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GEOTECHNICAL ENGINEERING
FISHING TECHNOLOGY
ENVIRONMENTAL
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HYDROBIOLOGY
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Abstract Book

26-29 APRIL 2018

KASTAMONU - TURKEY



INTERNATIONAL CONGRESS ON ENGINEERING AND LIFE SCIENCE
ICELIS 26-29
APRIL
2018



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INTRODUCTION

We are honoured to welcome you in Turkic World Culture Capital 2018 Kastamonu for International Congress on Engineering and Life Sciences hosted by our university.

Worthy Guests

Another action as important as production of new information in order to constitute basis of new researches. Accordingly, the most important activities are conferences, congresses and symposiums.



International Congress on Engineering and Life Sciences inaugurated today is an important organization that gathered different disciplines which have high level of scientific information validity and interaction between.

There will be 131 oral presentation and 3 poster presentation sessions during our congress that will last three days in the field of Engineering, Agriculture, Veterinary Medicine, Forestry and Fundamental Sciences

We will have presenters from Philippines to Bosnia erzegovina, from Lithuania to Cameroon. 550 Scientists from 15 different countries will present 655 oral and 148 poster presentations. On that sense our congress will give participants the scientific pleasure at maximum levels and also it will give participants opportunity to know Turkic World Culture Capital 2018 Kastamonu well through its rich social and cultural programme. As it will allow room to taste far-famed local tastes such as Banduma, Tirit, Etili Ekmek it will also enable to visit Küre Mountains National Park which includes lots of natural beauty such as Valla canyon and Ilıca waterfall.

Dear Guests, As you know, making these kind of organizations are considerably toilsome. In this context, I would like to thank organizing committee and my colleagues, our scientific committee that evaluated scientific researches, our precious administrative staff those who contributed to every single stage of organization, Partner universities of our congress; Mindanao State University, State Agrarian University of Moldova, Southern Federal



University of Russia, S. Seifullin Kazakh Agrotechnical University and Bogor Agricultural University.

I also thank our invited speakers who will give scientific feast to participants dear Prof. Dr. Muhammed Haşimi BİNTORO, dear Dr. Caludiu SUTAN and finally dear Prof. Dr. Mükerrerem KAYA who has momentous contributions about designing scientific programme.

I also express my thanks to the foundations Agricultural Engineers Association Erzurum Branch, Göktuğ Advertising, Hilal Stationery, Doğuş Machines, Kastamonu University Youth and Sports Society Association, Kastamonu Project Education and Research Cooperative that supported us financially.

Finally

On behalf of me and my organizing committee I thank exemplary person with his support to scientific activities alongside his successful municipal work, Mayor of Kastamonu Province Tahsin BABAŞ who contributed financially and actual from beginning to end at every stage, Prime Ministry Turkish Collaboration and Coordination Agency Presidentship, Kuzey Su Ürünleri Board Chairman dear Osman PARLAK and Kastamonu University Technology Transfer Office.

Dear scientists, I wish these 4 days you will spend in Kastamonu will ensure you a congress nameable socially and scientifically, my organizing committee and I are at your service 24/7.

By indicating that we are glad to host you here once again, accept the assurance of my highest consideration.

Assoc. Prof. Dr. Adem Yavuz SÖNMEZ
General Coordinator of Congress



We are honored to host you here at Kastamonu University for International Engineering and Life Sciences Congress.

Our university has been established in a city which has been a home to many civilizations and has a rich historical and cultural progress. In this consciousness, it has a mentality that sustains and conserves national, cultural and



moral values. Therefore, we have hosted many national and international scientific symposia, congresses, panels in the fields of theology, history, aquaculture, tourism, literature, forestry, and development of Kastamonu and that of the Turkic and Islamic world so far.

Also, comprehensive efforts have been made in order to be a university that can cooperate with universities at international level. In this context, we have organized symposia in different countries such as Azerbaijan, Kyrgyzstan, Kazakhstan, Turkish Republic of Northern Cyprus and Serbia.

Today, we are carrying out one of the international activities that contributes Kastamonu University to be a world university under the mission of 2018 The Cultural Capital of Turkic World.

900 papers will be presented by 550 academics from 15 different countries during 4 days of the congress. Not only will you enjoy scientific feast, but also you will have the chance of enjoying historical and cultural sides of Kastamonu in a broad perspective from The Seljuk Empire to Ottoman Empire and from Sheikh Şaban-ı Veli to Mehmet Feyzi.

Dear distinguished guests,

Today, with its 13 faculties, 3 Schools, 13 Vocational Schools, 3 Institutes, 20 Research Centers, approximately 800 academics and 29500 students, Kastamonu University has already taken its place among the recognized and respected universities of Turkey. It has also become a scientific center preferred by 2250 international students from 49 different countries.

The use and development of technology is of great importance to keep up with the level of contemporary civilizations. The vital role of universities in research and development cannot



be ignored. With this objective in mind, we have always supported the academic research of our academics since the day we came to the office and this support has been on a continued increase. The registration of our 8 patents in machinery, energy, aqua culture and forestry fields and 1 industrial design certificate are the fruitful outcomes of such endeavors. Apart from these, we have 6 patents, 4 of which in process of research and 2 in application. They will also be registered in a very short time. In our university, we have established Coordinatorship of Technology and Transfer Office and Science, Industry and Technology Application and Research Center. Our fully equipped Central Research Laboratory that meets the needs of the region is also active. Now we are a university that produces technology.

Today, Kastamonu University has attained a level where it benefits from scientific activities it has been working on for years. In this direction, our university is on the point of starting of manufacturing its patents in cooperation with industry. Thus, all scientific activities have started to become meaningful as a result of our commercial ventures. We are now establishing an industrial facility to produce three domestic brands of our university. The most obvious example of what we have already covered is that we are about to actualize the prototype of 12.5 tons weight and 142 horsepower Earth Cylinder. We are also preparing to manufacture breaking card and reducer.

We are trying to contribute to our university, Kastamonu, our country, Turkic and Islamic world. From now on, these and similar activities will continue with your support and contribution in accordance with the goals of our State 2023, 2053, 2071.

I would like to express my gratitudes to Inland Water and Sea Fishes Production, Application and Research Center Administration, academic and organizing committee of the congress, The Municipality of Kastamonu, Turkish Cooperation and Coordination Agency and Mr Osman PARLAK, the Chairman Kuzey Aqua Products.

I would also like to extend my thanks and appreciation to Prof. Dr. Habib MACOYONG, the Rector of Mindanao State University, Muhammed Haşimi BİNTORO, the Vice Rector of Indonesia Bogor Agricultural University, prominent deans, and academics from all over the world.

I wish that the International Congress of Engineering and Life Sciences will make a contribution to the whole world, especially Turkic and Islamic geography, and bring goodwill



and I wholeheartedly wish that such scientific gatherings will continue to bring us together in the forthcoming occasions.

With my kindest regards

Prof. Dr. Seyit AYDIN

Rector- Hanorary President of Congress



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INVITED SPEAKERS



Traditional Foods and Food Safety

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Abstract: Traditional foods constitute an important part of cultural heritage as well as being important contributors to the product diversity. The demands for traditional foods, which are perceived by the consumers as more credible and healthier foods, are increasing day by day. Increased human mobility in a globalized world increases awareness of such foods and quick dissemination of information about traditional foods over the Internet enables formation of new markets for these foods. This situation has a positive impact on production as studies on industrializing the production of traditional foods while preserving their specific characteristics are gaining momentum. Nevertheless, the inclusion of new methods into the production processes of these foods for fast production particularly increases concerns about food safety. Moreover, it is also frequently reported that products marketed as “traditional product” do not reflect typical characteristics of that particular traditional product. Therefore, traditional products are protected in many countries by specific regulations, thereby aiming to produce more reliable products as well as to contribute to the economies of small-and-middle sized enterprises. Although there is a high demand for traditional foods, determining food safety criteria for all stages from production to consumption of traditional foods and providing control of such foods with related regulations are important issues for consideration. In this respect, there is a need for extensive research on the chemical composition of each traditional food along with studies on physical, chemical and biological hazards that are important for that specific product. However, it should be kept in mind that monitorability is as important for efficient and sustainable food safety as regulations. An evaluation of traditional Turkish foods in terms of food safety will have a positive impact on their production as well as on their marketability in global markets by making them known to a greater number of consumers.

In this study, the studies on traditional Turkish foods and their adaptation into industrial production are investigated from the point of view of food safety, taking into account different product groups, and some recommendations are made.

Keywords: Traditional Foods, Traditional Turkish Foods, Food Safety, Regulations, Industrial Products



Mix Farming Based on Sago Palm in Meranti Island District, Riau Province, Indonesia

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Abstract: Sago can be used as raw material for sugar and bioenergy on a national scale because Indonesia has huge sago area especially in the eastern part of Indonesia. Sago can grow well in peat soil. However, so many problems occur in that area, i.e. lack of job, land not maintained, buyers fulfill farmer needs before harvest season and by sago starch at a very low price at harvest season, forest burning destruction of mangrove forest. Sago at peat soil must be developed in order to make better sago palm utilization. Mixed farming among sago palm, cattle, duck, fish and horticultural crops must be developed due to overcoming that problem. The aim of this research is to develop peat soil optimally at Tanjung Peranap Village, Meranti Island District, Riau Province. The research involved land owner in the region burned down in 2016, extension service and local government. Research form activities indicates that the local people income increase because they harvested cayenne chili, big red chili, sweet corn, baby corn, corn kernel, green kale and watermelon. Their income was Rp 7.200.000, Rp 2.625.000, Rp 2.774.400, Rp 4.368.000, Rp 2.995.230, Rp 5.400.000 and Rp 4.900.000 respectively. Various income from mixed cropping can change the farmer mind. They realize that mixed cropping can be reliable as an income source and change their activity from destroyed the forest and mangrove to cultivated mixed cropping. It can minimize the environmental damage.

Keywords: Economic Income, Mixed Farming, Mangrove, Peatland



Side Impact Passive Protection System SIPPS

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Abstract: Side Impact Passive Protection System (SIPPS) is a very low cost and effective system created in order to improve the resistance of a vehicle in case of side impact. The system is based on existing reinforcement structure of any kind of car and is based on the principle that the penetration towards the passengers will be lower if many structural parts of a vehicle will be involved in the impact.

The method uses horizontal high resistance steel band which connect Pillar A, B and C. Also, other vertical steel band creates links between horizontal steel band and the threshold. These links will distribute the energy of impact to all parts of the side of the car and will reduce the penetration towards the passengers.

The invention was patented and won gold medal at International Inventions Saloon, Geneva, Switzerland 2013.

Keywords: Side Impact, Protection System, Vehicle, SIPPS



ORAL PRESENTATION

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ORAL PRESENTATIONS



A Model Proposal for Assessment of Wind Power Installation Sites in Konya

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Abstract: The importance of energy has increased even more by the acceleration in global warming and the importance of environmental activities. Climate change and the exhaustion of energy resources have increased the orientation to new and sustainable resources. For this reason, renewable energy has been trending and renewable energy sources have started to be used besides fossil energy sources. Wind energy which provides electricity to many people has a large investment volume and provides many people with business opportunities, shows a rapid development. Wind energy from renewable energy sources can be seen as one of the most important energy sources depending its potential in Turkey. However, due to lack of sufficient awareness in the past, wind energy development, which is more limited in progress, is gaining momentum every day with the contribution and encouragement of the state.

This study aims to evaluate the wind energy potential in the inner parts of Turkey. The wind power potential maps (REPA) for Konya provides data for wind speed, slope, elevation, unavailable areas etc. for the determined area. In addition to these data, distance criteria to airports, highways, water sources and fault lines were added to the software named Aeronautical Reconnaissance Coverage Geographic Information System (ArcGIS). Areas that have not been invested in the Konya have been evaluated according to these inputs and suitable areas are determined. A mathematical model targeting the minimum investment cost has been established to select the most suitable one from the available alternatives. This model aims to minimize the investment and operating costs. Assuming that the alternative areas are square or rectangular to determine the number of turbines while the model constraints are being constructed, and the assumption that the turbine layouts within the region are arranged side by side and regular in row, the distance between two turbines side by side is minimum 250 meters, maximum 300 meters; the distance between two consecutive turbines was considered to be at least 500 meters. The turbine capacity to be installed is set at 3.3 MW. Costs constituted for installation are unit cost for energy production, initial cost, annual cost, maintenance cost, rent, transportation cost.

In this context, the number of turbines is determined by assessing the location which minimize cost and satisfies the physical criteria for installation in Konya region.

Keywords: Wind Power Plant, Site Selection, Energy, ArcGIS, Konya



Effect of Biodiesel Fuel Use in Diesel Engine on Engine Performance and Emission Values

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Abstract: Today, one of the fundamental needs for human life is energy. As population increased, energy consumption increases. Especially, as there are technological developments, demand for vehicle use increases. Thus, automotive-based consumption increases. Work in internal combustion engines in vehicles is produced by burning fossil-based fuels. Since fossil fuels are exhaustible resource, different and renewable alternatives are investigated. While these researches were conducted, the main objective is to decrease effect of fossil fuels on air pollution and increase engine power performance. With advancements in technology, different engine technologies are developed and offered. However, using numerous engine vehicles actively, it is impossible to find a solution to fossil-based problems. Therefore, in current internal combustion engines, to decrease fossil fuel consumption, alternative fuel use should be increased. It is important to use current engines for different conditions.

For this purpose, in this study effect of biodiesel fuel use in a diesel engine (SI) on engine performance and emission values was investigated. "Rapeseed oil methyl ester" (RME) was selected as biodiesel fuel. For four-quadrant, single cylinder, direct injection engine, numerical simulations were conducted for different injection advances and different revolutions. First, results were compared with other studies in the literature. Thus, reliability and validity of the numerical model was identified. For the engine in the study, "diesel" fuel (D100) and "rapeseed oil methyl ester" fuel (RME100) were investigated. For two types of fuel, 4 different injection advances (9°, 11°, 13°, 15° crankshaft angle before upper dead spot) were analysed. For each injection advance, simulations were conducted in each revolution (750 rpm, 1000 rpm, 1250 rpm, 1500 rpm, 1750 rpm, 2000 rpm, 2250 rpm, 2500 rpm, 2750 rpm, 3000 rpm). Effects of diesel and biodiesel fuel injection advances were compared and analysed on graphics.

Results of the numerical analysis indicated that with alternative fuel use, there were changes in engine performance and emission values. When biodiesel fuel was used instead of diesel fuel, it was observed that engine power, engine moment, specific fuel consumption, and NO_x emission increased. There was decrease in Bosch smoke intensity and PM emission. When diesel fuel was used, as injection advance increased, engine power, engine moment, Bosch smoke intensity, and PM emission decreased. Yet, specific fuel consumption and NO_x emission increased. When biodiesel fuel was used, as injection advance increased as in diesel fuel, engine power, engine moment, Bosch smoke intensity, and PM emission decreased. Similarly, specific fuel consumption and NO_x emission increased.

Keywords: Biodiesel, Engine performance, Injection Advance, Rapeseed Oil Methyl Ester, Emission



Numerical Analysis of Alternative Fuel Use in Diesel Motor

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Abstract: Today technological, economic, and political developments constantly increase use of automobile use. This increase also increases the need for fuel. Currently engine technology mainly uses fossil-based fuels. Emission gases caused by fossil fuels is harming environment and human health. Additionally, with increased litre prices and decreased reserves, there are disadvantages for long term use. Due to certain negativities of fossil fuels, it is important to use alternative fuels in internal combustion engines. Therefore, in this study effects of using alternative biofuel in diesel engine on engine performance and emission values was numerically analysed. For this purpose, four-quadrant single cylinder diesel engine was modelled with real research values. Numerical analysis was conducted on Diesel-RK package program. Analysis were conducted for diesel fuel and 5 different biodiesel fuels in 10 different engine revolutions. As biodiesel, “rapeseed methyl ester” (RME), “soy oil methyl ester” (SME), “cotton oil methyl ester” (PMYE), “flax seed oil methyl ester” (FOME), and “nut oil methyl ester” (NOME) were used. For all these fuels, engine speed was changed between 750-3000 rpm. The results obtained from the simulations for all these fuels are considered for analysis. When engine power values were considered, for all fuels, increased engine speed and power was observed. Power values for rapeseed methyl ester was maximum compared to other fuels. Diesel fuel and cotton oil methyl ester values were minimum. Similarly, rapeseed methyl ester had best torque values. For specific fuel consumption values, best specific fuel consumption values were identified for diesel fuel and biodiesel nut oil methyl ester (NOME). NO_x values observed for diesel fuel was higher than all other biodiesel fuels. As a result, for the engine in this study, it could be stated that using biofuel instead of diesel fuel generally increased engine power and torque where decreased NO_x.

Keywords: Biodiesel, Diesel, Performance, Specific Fuel Consumption, NO_x



Evaluation of the Usability of Fly Ash as Raw and Filling Materials in Turkey

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Abstract: It is well known that increasing electric energy demand due to increases in population, improvements in human living standards, and industrial development, especially in developing countries, is met by the burning of fossil fuels such as natural gas, fuel oil and coal. Turkey has become one of the fastest-growing energy markets in the world with its rapidly growing economy. During lignite burning, huge amounts of fly ash, bottom ash and slag are produced as by-products, which also contain the natural radionuclides mentioned above. Depending on emission control systems such as cyclone and bag filters and electrostatic precipitators, a large proportion of the fly ash is collected, and is usually stored in piles or dumped on the land near the lignite-burning power plants. Therefore, the usability of fly ash, produced as by-products during lignite coal burning, in the construction sector and geotechnical applications is very important in view of economic and environmental protection. In this study, the activity concentrations of ²²⁶Ra, ²³²Th and ⁴⁰K in fly ash collected from the Kangal lignite-burning power plant with a power of 457 MWe were measured using gamma-ray spectroscopy with a high purity germanium detector HPGE detector. Radiological assessment of the usage of fly ash samples as raw material in construction sector and filling materials in geotechnical applications was carried out by estimating activity concentration indices. The average activity concentrations of ²²⁶Ra, ²³²Th and ⁴⁰K in fly ash samples were 937 ± 30, 38 ± 2 and 272 ± 17 Bq/kg, respectively. Additionally, the total annual effective doses (the sum of the effective doses of external gamma radiation, inhalation, and ingestion received by workers and adult members of the public) were estimated for different exposure scenarios (outdoor storage, transportation and road construction for workers, and residence in a house near the fly ash pile or landfill) using methods given in Radiation Protection 122. The highest average of the total annual effective dose is estimated at 153 µSv for members of the public and 74 µSv for workers, lower than the recommended annual limit of 1000 µSv.

Keywords: Coal, Fly Ash, Slag; Radioactivity, Activity Concentration Indices, Annual Effective dose



Heavy Metal Concentrations in Sepiolite Samples from Central Anatolia Region of Turkey

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Abstract: Heavy metal is naturally occurring chemical element that has a relatively high density compared to water. Heavy metals can be considered systemic toxicants that are known to induce multiple organ damage, even at lower levels of exposure when they can directly or indirectly interact with the human boy. Recently there has been an increasing ecological and global public health concern associated with environmental contamination with heavy metals. Sepiolite have been widely used as additive raw material in pharmaceutical, cleaning-detergent, paper, paint, cosmetic agriculture, fertilizer, livestock, ceramics and cement industry due to its absorption (or adsorption), rheological and catalytic properties depending on physicochemical properties such as porosity, surface area, fibrous structure, crystal morphology and composition. In the present study, the concentrations of heavy metals (Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Rb, Sr, Zr, Cd, Hg and Pb) in sepiolite samples collected from Central Anatolia Region (Polatlı, Beylikova and Sivrihisar sepiolite quarries) were analyzed by using energy dispersive X-ray fluorescence (EDXRF) spectrometry. The average concentrations of Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Rb, Sr, Zr, Cd, Hg and Pb were found as 22.0, 59.3, 3566.8, 1.9, 23.3, 8.5, 16.1, 7.8, 13.8, 734.0, 8.8, 1.4, 0.5 and 1.5 µg/g, respectively. The average concentration results obtained for heavy metals were compared with the average of earth crust. The average concentration of Cr, Mn, Fe, Co, Ni, Cu, Zn, Rb, Zr and Pb is significantly lower than the average of earth crust of 83, 1000, 46500, 18, 58, 47, 83, 150, 170 and 16 µg/g, respectively while the average concentration of As, Sr, Zr, Cd and Hg is significantly higher than the average of earth crust of 1.7, 340, 170, 0.13 and 0.083 16 µg/g, respectively. The results revealed that the reason for the high As, Sr, Zr, Cd and Hg concentrations in the sepiolite samples should be investigated.

Keywords: Sepiolite, Heavy Metal, Porosity, Toxicant, Central Anatolia Region



Investigation of the Effects of Region Animal Husbandry and Economy of Neonatal Period Calf Diarrhea in Narman County of Erzurum Province

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Abstract: In this study, it was aimed to determine the damages caused by the neonatal period calf diarrhea in Narman County of Erzurum Province.

The number of female cattle, pregnant cattle and calves that died in the first six months were used in research. These 2017 data were obtained from Narman Food, Agriculture and animal husbandry County Directorate. The calf which is a major problem in the cultivation of the neonatal period, diseases and death rates are highest in the period. The calf diarrhea can occur pathogenic and non-pathogenic causes. Diarrhea usually results in a high mortality rate in newborn calves. According to the data obtained; the number of calves that died in the first month are 1487, unit price are 1950₺, financial damage are 2.899.650,00₺, the number of calves that died in the second month are 508, unit price are 2350₺, financial damage are 1.193.800,00₺, the number of calves that died in the third month are 342, unit price are 2850₺, financial damage are 974.700,00₺, the number of calves that died in the fourth month are 186, unit price are 3100₺, financial damage are 576.600,00₺, the number of calves that died in the fifth month are 93, unit price are 3250₺, financial damage are 302.2500,00₺, the number of calves that died in the sixth month are 51, unit price are 3450₺, financial damage are 175.950,00₺. In unhealthy state of the calf causes economic loss and medical expenses. Moreover, this loss does not change due to the death or the survival of the calf. Yield loss stake even in the life of the calf, is significantly damaging to animal husbandry in the region. Calf deaths as a result of the restriction of the genetic material is a problem that cannot be ignored.

As a result, the most critical issue in the region for animal husbandry in the solution of problems, which is unhealthy calves, walkthought identified with diarrhea, calf mortality can be reduced and the chance of treatment can be increased. Animal husbandry in the region can be recovered from the economic losses that occur due to calf death and the loss of genetic material can also be prevented.

Keywords: Calf, diarrhea, Narman, Neonatal



Probiotic and Humate Effects on Performance Parameters in Milk Suckling Period of Calves

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Abstract: In this study searched the effect on performance parameters that use of probiotic and humate as feed additives in the feeding in suckling period of calves.

In the experiment, 24 -day-old Brown Swiss calves were used as part of the experiment, they were divide into 3 different groups as control (basal diet: full fat milk+alfalfa dry grass+calf stater concentrate feed), probiotic (basal diet+0,15% probiotic) and humate (basal diet+0.15% humate) which including 8 calves each with the average weight of 42,5 kg (± 2.5 kg). As feedstuff, full fat milk, alfalfa dry grass, humate and probiotic with additives concentrated feed were used. Performance parameters were determined by measurements throughout the experiment. The study continued for 12 weeks. While humate group decreased dry matter (DM) consumption of concentrate feed and alfalfa hay, it increased milk DM intake (0–56 days) ($p < 0.01$). Also probiotics group decreased DM consumptions of milk and concentrat feed ($p < 0.01$). Humate group significantly improved the feed efficiency compared with the control and probiotic groups. There were no effects of both humat and probiotic groups on live weight gains.

As a result of this study, the effect of the humate group has found to be higher than the probiotic group on the performance parameters, however to say that humate performance parameters in calves have apositive effect, further work about it has necessary.

Keywords: Calves, Feed Additive, Humate, Performance, Probiotic



The Role of Female Labour on Hazelnut Farms: A Case Study from Çarşamba District of Samsun Province, Turkey

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Abstract: Women work substantially as unpaid workers without social security in the agriculture sector in Turkey. Women are the principal contributors of on-farm labour due to their contributions to agricultural production besides their domestic roles on farms. Hazelnut production, one of the principal industries of the Eastern and Central Black Sea Regions, is an important source of employment for farming families, as well as yielding a valuable product.

The aim of this research was to determine the status of women in terms of education and labour, and to document the roles of women in the stages of production hazelnut. The research data were obtained through questionnaires from 48 hazelnut farms in the Çarşamba District of Samsun Province. The number of farms to be surveyed was determined by a simple random sampling method based on the area of land.

The average land area of the surveyed farms was 32.3 decares (3.23 ha) and on average 52% of this area was under hazelnut cultivation. Women constituted 53% of the inhabitants per farm. The average age of the farm women surveyed was 49.5 and their formal education periods averaged 3.16 years. The average number of years that these women attended a school was 50% lower than the average education span for males which was 6.27 years. Women work in labour-intensive activities, particularly harvesting, as well as doing housework and child care. On the other hand, they are overwhelmingly in a passive position in the decision making related to financial matters such as the purchase of inputs and the marketing of products, and in the production stages which require the use of machinery, and also in training activities related to agriculture.

Keywords: Hazelnut Farm, Female Labour, Employment



The Importance of Hazelnut Production and the Policy Regarding the Restriction of Hazelnut Areas in Turkey

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Abstract: As of 2016 Turkey was responsible for 54% of world hazelnut production, followed by Italy with 15%, the USA with 4.47%, and Azerbaijan with 4.41%. Turkey generated 70% of world hazelnut exports in 2013. Hazelnut production in Turkey is extremely important due to its contribution to national income, employment and exports. An unplanned increase in hazelnut areas, especially after 1980, raised the issue of excess supply. As the supply surplus became an ongoing problem every year, government policy aimed to control hazelnut areas with the law numbered 2844 that was gazetted in 1983.

In this paper, the importance of hazelnut production to Turkey, the post-law hazelnut areas removed from production in every province, and the alternative crops substituted for hazelnuts are examined.

The law enacted to control hazelnut areas was neither effective in reducing the hazelnut areas, nor prevented the establishment of new hazelnut plantations. On the contrary, hazelnut planting areas continued to increase in provinces and districts where the removal was targeted. From 2002, when the policy of taking hazelnut areas out of production was first implemented, until the present, 1.1% of the number of producers and 0.6% of the area targeted for removal from production, has been achieved. The highest amount of cases took place in Samsun Province with 83.3%. This was followed by Sakarya Province with 11.3% and Düzce Province with 3.2%. The most preferred alternative crops to hazelnuts are corn, kiwis and walnuts.

Keywords: Hazelnut, Hazelnut Uprooting, Alternative Crops



An Overview on Meat Production of Livestock in the World and in Turkey

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Abstract: The purpose of this research was to evaluate the changes over the years the amount of meat produced by livestock in Turkey and in the world.

Today, the demand for the meat of livestock is increasing day by day. Among the animal species dominant in the global dimension in world meat production are poultry, cattle-buffalo and pigs respectively while livestock such as sheep-goat are less common.

When the continental meat production is taken into consideration, it is observed that the continent of Europe in 1986 (59.91 million tons) has taken over the leadership of meat production in Asia (74.81 million tons) since 1996. When the animals are examined as species, it is observed that the meat obtained from the poultry sector in total meat production in recent years has increased considerably. This increase in the poultry sector has tripled in 2016 compared to 1986, while pork production has been determined to be nearly twice as high as in the same years. Over 50% of the meat produced in the world is produced by China, America, Brazil, Germany and India respectively. The meat production in Turkey is about 1% of the world. The per capita meat production in the world was 44.55 kg in 2016 and, the same year, this rate has been identified as 43.21 kg in Turkey, 136.18 kg in America.

In this results indicate that meat production has shown a certain increase in the world, but this rate is particularly high in Asia and less in Europe.

Keywords: Meat, Production, World, Turkey



Image Processing Based License Plate Recognition System using Raspberry Pi3 Microcontroller

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Abstract: Thanks to the technological developments experienced in recent years, there has been a noticeable increase in the clarity of the images obtained through the camera systems. This increase has generally started with the launch of high-resolution lenses. Cameras may not be used in images that are worn or damaged, despite increase of the image quality. Image processing techniques have been developed to eliminate these kinds of problems. In this study, a system prototype has been realized which will automatically open and close the door at the entrance of the building by recognizing the vehicle arriving at the entrance door with the help of image processing algorithms. License plate recognition includes capturing photographic video or images of license plates. By image processing algorithms, it is realized numeric text conversion of the captured license plate images.

This study contains software and hardware parts. In hardware part, we used Raspberry Pi 3 microcontroller, servo motor and ultrasonic sensor. Raspberry Pi 3 microcontroller was used to perform sensors and motor control operations in the proposed license plate recognition system. Besides it was utilized to run OpenCV library and to make database inquiries. In terms of software part, the license plate recognition system has six steps. First step is to localize identified license plate. Then license plate is got sized and oriented. Third is normalization process to regulate the contrast and brightness of the captured license plate image. Then alpha numeric characters are separated on the license plate. The last step is optical character recognition (OCR) process. This translates the captured image into an alpha numeric text entry. To test the proposed license plate recognition system, the automatic park entry scenario was designed. It consists of a input barrier with servo motor, a prototype vehicle and Rasp Pi3 microcontroller with camera and ultrasonic sensor. The results show that the license plate of vehicle was recognized successfully.

Keywords: Car Plate Recognition System, Image Processing, Raspberry Pi.



Real-Time Object Tracking System using Raspberry Pi3 Microcontroller

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Abstract: One of the research topics in computer vision area is about video surveillance for different objects like as humans and vehicles. Video surveillance is used different area such as traffic monitoring, activity recognition, automotive safety, and surveillance. In object tracking system, identified object is basically detected from a video by being used different image processing algorithms. The object tracking methods consists of an object detection mechanism in every frame of the video. There are three main steps: object representation, object detection and object tracking. There are various representations of object shape, such as points, geometric shapes, silhouette and contour, skeletal model, etc. In the object detection methods, point detectors, background subtraction, segmentation can be given as example methods. Object tracking are divide into three methods: point tracking, kernel tracking and silhouette tracking.

This study involves designing of the real-time object tracking system using Raspberry Pi3 microcontroller. This work consists of three stages. The first step is to detect the object that falls within the specified distance. The second is the comparison of the detected object with the camera and predefined objects. The final step is to mark the object with the laser pointer. In design of object tracking and marking system, we used Raspberry Pi3 microcontroller, Raspberry Pi camera, ultrasonic sensor onto the servo motor and laser marker. In software design of this study, OpenCV image processing library and python programming language were used. To track the object, we used CV_TM_CCOEFF_NORMED that is one of the OpenCV methods. In test works, a target image is determined firstly, then this image is searched in the real time video frames by servo motor. When the target is found, it is taken into a square frame and target is marked by laser marker. In future works, it is aimed to mount this prototype on a vehicle and to track the object by the proposed system on the moving vehicle.

Keywords: Image Processing, Raspberry Pi, OpenCV, Object Tracking



Identification of Frequency Dependent Series Resistances and Surface States for Metal Semiconductor Structures with Zn Doped Polymer Interlayer

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Abstract: Considering the series resistance (R_s) and interface states (N_{ss}) effects, Au/polyvinyl alcohol (Zn-doped) /n-Si Schottky structure's capacitance-voltage (C-V) and conductance-voltage (G/ω -V) characteristics were examined between 1 kHz- 5 MHz frequency range at ordinary room temperature conditions.

The characteristic data indicates that capacitance and conductance of the Zn-doped polymer interlayer Schottky structures were considerably sensitive to frequency at relatively lower frequencies and decrease with increasing frequency. Interface states existed at Si/PVA interface is the reason of the increment in capacitance particularly at lower frequency levels. Thus, interface states can more easily track an AC signal at lower frequencies, and this has also a contribution for improving the electrical properties of Schottky structures.

In addition, utilizing from the Nicollion and Brews method, the distribution profile of diode resistance (R_i) was acquired from C and G/ω data for each frequency under both forward and reverse biases. Besides, the energy density distribution profile of N_{ss} was derived from the high-low frequency capacitance (C_{HF} - C_{LF}) methods.

Consequently, the C-V and G/ω -V characteristics confirm that, R_s and N_{ss} are significant parameters that eminently influence the electrical parameters of Schottky structures. It can be concluded that the measured C and G/ω are strongly dependent on bias voltages and frequency.

Keywords: Schottky Structure, Organic Polymer Interlayer, Electrical Characteristics, Interface States, Series Resistance



Evaluation of Learning Forms of Students Based on Data Mining: Bartın Vocational School Example

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Abstract: Education and training methods are constantly changing. Today, learning styles are personalized. For this reason, determining the appropriate learning style has become an important issue for the students. Information society comes to life with educated individuals. Data mining is concerned with obtaining meaningful information from many sources. The amount of data is increasing rapidly every day in the world. For this reason, data mining has become a major issue. Developed countries are investing heavily in data mining. In addition, data are used in all areas of the scientific world. The combined use of education and data mining is very limited. In this study, learning styles of students were evaluated with data mining. Demographic information (age, sex, country, department) and learning styles (visual, auditory, tactile) of the students in two different departments (material and material technology, marketing and advertising department) in Bartın Vocational School were asked in the study. A dataset was created on this count. Later, meaningful information was obtained from the data set by decision tree and association algorithms. As a result of the study, it was determined that the most important factor determining the predisposition to learning style was gender. It has been found that the student's age and country are important in the second degree. At the same time, it was discovered that women learned visually better by the association algorithm. It is known that data mining algorithms can be used in the field of education for more effective learning-teaching. More work is needed in this regard.

Keywords: Data mining, Learning Style, Student, Vocational School, Algorithm



Evaluation of Employee's Happiness by Data Mining and Statistical Methods in the Process of Internal Public Relations

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Abstract: Institutional personnel are the first to be encountered in the presentation of services related to the institution. Institutional personnel are also good faith actors of an institution. It is an important tool in shaping the image and reputation of the institution. Therefore, if the happiness of the institutional staff is not achieved, it is very difficult to be successful in the services for the external target groups. Having a happy staff in this context constitutes the direct objective of the process of relations within the institution.

The happiness level of Amasra Municipality staff in city of Bartın was investigated. Sample selection was not made in the sample of the researcher and it was aimed to reach the entire universe. The required data were collected on the basis of volunteerism and 40 staff members (42.5% female and 57.5% male) participated in the survey in the Amasra Municipality.

The data obtained within the scope of the research were analyzed with the help of SPSS and Rapidminer programs and tried to determine the most decisive factors in happiness level and happiness of institution personnel. The Oxford Happiness Scale Turkish Form was used in the study, and this form is a 5 scale likert which is determined as the most unfavorable 1 and the most favorable 5 for all the variables was used in the scale. The happiness level of the personnel of Amasra Municipality was determined as 3.56 (71.2%) because of high happiness scores in the Oxford Happiness Scale. In addition, it is seen that the female staff (3,69) are happier than the male (3,47), the middle age group (26-35 and 35-45) in terms of age mean 3,65 happiness average and 18-25 year average happiness (3,47) than those who are 46 years and over (3,37), and finally the unmarried staff (3,58) are less happy than the married staff (3,55). However, no significant difference was found in the results of t test and one way analysis of variance with the help of SPSS program in terms of average of happiness. In this context, decision tree algorithm is used to determine happiness factors and it is determined that data mining is the most effective factor in happiness.

Keywords: In-house Public Relations, Happiness, Staff, Algorithm, Data Mining



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The Ecological Corridors Passing Through the Cities

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Abstract: One of the most important factors in choosing a settlement is the presence of water since history. Human communities have aimed to provide easy access to water for life by establishing residential areas near water surfaces such as streams, lakes and streams in the history. There are other reasons for positioning the residential areas near the water. The purpose of water surface according to use have effects such as transportation, creating transition zone, increasing species diversity, creating microclimatic effect and visibility. Turkey is a very rich region due to its geographical location and landforms in terms of water surface such as ecological corridors. For this reason, there is no province that does not cross the river. However, the water corridors are not located entirely within the urban settlement structure. While some cities are established around water corridors some of them are made entirely of natural areas. For the study, the corridors passing through the city settlement are divided into two groups; corridors traded and untreated in terms of planning and design. In the study, according to the Nomenclature of Territorial Units for Statistics (NUTS), two sample cities were selected from each of the sub-regions of the TR8 West Black Sea Region, creek and river passing through the urban settlements were examined. Bartın and Karabük from TR81; Çankırı and Kastamonu from TR82; Tokat and Amasya from TR83 are selected for the case of study. As a result, through the selected as example cities passing water corridors were examined and some suggestions in terms of landscape architecture occupational discipline have been developed.

Keywords: Ecological Corridor, River, City, Settlement, Landscape Architecture



Determination of the Minimum Inhibitory Concentration of Aqueous Extracts of Four Selected Plants Against Antibiotic Resistant Clinical Isolates

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Abstract: Increasing emergence of drug resistance in consequence of unwise use of antibiotics, many novel and safer therapeutic methods are being investigated. Some of these are bacteriophages, virophages, monoclonal antibodies, nanomedicines, probiotics, antioxidants, herbs. The antibacterial activities of herbs are associated with phytochemicals, concentration of phytochemicals and their synergistic/antagonistic actions. These phytochemicals comprise flavonoids, steroids, β -carotene, glycosides, coumarins, alkaloids, saponins, tannins, phenolic acids, alkaloids, gallic acid and others. The aim of this study is to discover new plant extracts that inhibit growth of antibiotic resistant clinical isolates.

In this study, *Acinetobacter baumannii* (n=1), *Klebsiella pneumoniae* (n=1), *Pseudomonas oleovorans* (n=1) and *Escherichia coli* (n=1) isolated from clinical specimens that had been collected at Fatih State Hospital (Trabzon) between October 2017 and August 2017 were included. Antimicrobial susceptibility testing was carried out using the Vitek 2 Compact system (bioMérieux, Craaponne, France). The results obtained with Vitek 2 were interpreted according to EUCAST (Version 8.0). Genomic DNA used as a template for PCR assays was made with using boiling method. PCR method was used for detecting *bla*_{OXA-48}, *bla*_{KPC}, *bla*_{NDM} genes. *Rhododendron ponticum* flowers, *Rhododendron luteum* flowers and *Vitis labrusca* fruits were collected in Trabzon, while the *Robinia pseudoacacia* flowers were collected in Çorum. Solid-liquid extraction method was used for preparing an aqueous extract of plant parts. Minimum inhibitory concentration (MIC) of each plant extract was determined by the micro-dilution method. MIC values were determined by observing the turbidity. Antibiotic susceptibility results showed that *A. baumannii* and *K. pneumoniae* were resistant to imipenem and meropenem, whereas *P. oleovorans* was resistant to only imipenem. *E. coli* was found susceptible to imipenem and meropenem. *bla*_{OXA-48}, *bla*_{NDM}, *bla*_{VIM} genes were found in *Acinetobacter baumannii* (n=1), *Klebsiella pneumoniae* (n=1), *Pseudomonas oleovorans* (n=1), respectively. The aqueous extracts of *Vitis labrusca* fruit and *Rhododendron luteum* flower inhibited growth of *Pseudomonas oleovorans* carrying *bla*_{VIM} gene, and only aqueous extracts of *Vitis labrusca* fruit inhibited growth of *Acinetobacter baumannii* carrying *bla*_{OXA-48} gene and *Escherichia coli*. In contrast, growth of *Klebsiella pneumoniae* carrying *bla*_{NDM} gene could not inhibit any of the four aqueous extracts. MIC values of aqueous extract of *Vitis labrusca* fruit against *Pseudomonas oleovorans*, *Acinetobacter baumannii*, *Escherichia coli* were 20 mg/ml, 20 mg/ml and 40 mg/ml, respectively. Also, MIC value of aqueous extracts of *Rhododendron luteum* flower against *Pseudomonas oleovorans* was found 20 mg/ml.

Among the studied aqueous extracts, *R. luteum*, and *V. labrusca* aqueous extracts showed antibacterial activity against antibiotic resistant clinical isolates. In future studies antibacterial activity of methanol extracts of these plants and other plants against antibiotic resistant clinical isolates will be examined. Natural products from plants are promising in fighting with antibiotic-resistant bacteria.

Keywords: Antibiotic Resistance, *Pseudomonas oleovorans*, *Acinetobacter baumannii*, *Escherichia coli*, Minimum Inhibitory Concentration, Plant Extract



Evaluation of Organic Agriculture and Good Agricultural Practices in Terms of Economic, Social and Environmental Sustainability in Turkey

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Abstract: Increasing needs for agricultural products due to rapidly growing world population have been tried to be met with increasing productivity in agriculture by intensive chemical input applications. However, negative effects of inputs overused in agricultural activities have been increasingly felt on human health and environment. As a result, sustainable agricultural systems based not only on the idea of increasing productivity, but also the protection of human health and environment have become important. While the beginning of organic agriculture movement, one of the sustainable agricultural systems in the world, went back to the 1970s, the contents of good agricultural practices were determined in 1997. Organic agriculture has been raised in developed countries towards domestic demand, however, in Turkey it has emerged at the request of the importing companies in the mid-1980s. Although good agricultural practices in Turkey started in 2007, they have showed remarkable progress particularly after 2013. From 2007 to 2016, organic agriculture area increased 3 times while good agricultural practices area within the same period increased by 88 times. In order to ensure economic and social sustainability there is a need for improving local and farm oriented operations. On the other hand, macro-level and long-term policies are necessary to ensure environmental sustainability. Achieving sustainability in organic agriculture and good agricultural practices will be possible by establishing the balance between three main components. In this study, economic, social, and environmental aspects of organic agriculture and good agricultural practices that contribute to sustainable agriculture in Turkey will be examined.

Keywords: Sustainable Agriculture, Organic Agriculture, Good Agricultural Practices



Awareness of Ecological Corridor Notion at Landscape Architecture Undergraduate Level: Case of Kastamonu University- Bartın University

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Abstract: The landscape ecology, which is defined as the science field that studies the relationship between living and nonliving entities, investigates the structure, function and change of landscape. When the landscapes are examined within the scope of landscape ecology working on ecological processes at different scales it is concluded that landscapes are dynamic structures that are constantly changing. These changes occur in patch - corridor and matrices that make up the structure of the landscape. The discipline of Landscape Architecture covers these issues as a discipline with ecological base. One of the corridor types is the ecological corridors. Ecological corridors affect the quality of life of every living creature in the landscape. The impact rate of ecological corridors for every living and non-living entity on Earth changes depending on the status of the ecological corridor. The conversion of ecological corridors over time directly and / or indirectly affects all ecosystems. Therefore, the functions of ecological corridors should be well known. In addition, to protect and improve the ecological corridors that can be described as communication networks on the earth, the necessary operations should be done sensitively. In the context of all these data, a survey was conducted to measure the ecological corridor perception of landscape architecture students of the undergraduate level . In this research, undergraduate students of Landscape Architecture department from Kastamonu University and Bartın University were selected as sample. As a result of statistical evaluations of the questionnaires, knowledge level differences between grades of landscape architecture undergraduates are provided. In the general scope; the recognition level of the ecological corridor concept by undergraduate students of landscape architecture was evaluated. Thus, the awareness status of the students that are expected to have ecological corridor sensitivity from the beginning which is required by the landscape architecture discipline has been put forward.

Keywords: Landscape Architecture, Landscape Ecology, Ecological Corridor, Awareness, Kastamonu, Bartın



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Importance of Hadron Colliders in High Energy Physics

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Abstract: The universe is made of twelve particles of matter and four forces of nature. The particles are divided into two subatomic sets: quarks and leptons. To reach these subatomic particles of hadrons and understand the forces between the particles, hadron colliders are used during last decades. The colliders already performed groundbreaking work, which were awarded with Nobel prizes in the past. Therefore, hadron colliders have played crucial role to understand our universe in details such as their contribution to the discovery of Higgs boson (God particle). Some of the well-known hadron colliders are Tevatron, Large Hadron Collider (LHC) and Future Circular Collider, which are giant and amazing engineering structures. Tevatron already completed its mission and was shut down. LHC is still colliding protons and collecting data, and Future Circular Collider is planned to be built for post-LHC era, which will have about 10 times bigger centre-of-mass energy than LHC. In the talk, predictions and experimental results of these hadron colliders and their contributions to science will be presented and discussed. Main focus will be stressed on the structure of the colliders and their single boson measurements.

Keywords: Hadron Colliders, High Energy Physics, Particle Physics, Leptons, Boson



Designs for Solar Energy Systems with Application to Rural Areas

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Abstract: Since the 1990s, world attention has been focused on global warming caused by greenhouse gases such as CO₂. Even, in 1997, the Kyoto protocol, requiring reduction of greenhouse gases, was adopted. Since renewable energy sources releases lower CO₂ emissions than fossil energy systems, renewable energy is expected to play a major role in the 21st century. Many studies have been conducted on the economics and design of renewable energy sources. Unfortunately, Turkey's energy supply still depends heavily on fossil fuels. Based on the solar energy capacity of Turkey, new designs are needed to be developed to use solar energy effectively. This study presents efficient ways to integrate solar energy systems to provide electricity in rural areas. Grid electricity might be available to rural areas or not, but it is relatively expensive than solar energy. Usage of solar panels can be economic in many applications of industry. We present two fully solar powered designs: irrigation system in agriculture and feeding system for animals. Both systems rely on charging battery, and the biggest advantage of these designs is that the systems works automatically and does not need any manual work. They will be explained using 3D drawn gifs and pictures of their prototypes. There is only one obstacle to use solar power: it may not be dense during 365 days of the year and may require large land areas to achieve substantial levels of power.

Keywords: Solar Energy, Rural Areas, Alternative Energy, Solar Powered Irrigation System, Solar Powered Feeding System For Animals



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K Factors at High Order Matrix Elements

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Abstract: This study presents QCD predictions of ZZ production in proton-proton collisions with most recent Parton Distribution Functions (PDFs) which are defined as the probability density of finding a particle with a certain longitudinal momentum fraction, x , in the resolution scale Q^2 . To estimate the cross section of a particle, higher order QCD predictions provide more precise and reliable results comparing to LO correction. Because of this, we present NLO QCD predictions and K Factors of ZZ boson pairs at Higher Order matrix Elements of two most recent PDFs. Then, NLO K factors for different renormalization and factorization scale values are discussed. The results show that K factor is inversely proportional to the renormalization and factorization scales.

Keywords: K Factor, QCD, Renormalization, Factorization.



Theoretical Evaluation of W Boson Differential Cross Section at 8 TeV Center of Mass Energy

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Abstract: Large hadron collider (LHC), which collides protons at 7, 8, and 13 TeV, offer researchers great opportunities to study existing particles as well as searching new ones. The experiment groups of high-energy physics community perform physics measurements of particles using LHC data to confirm the standard model predictions. In this regard, measurement of differential cross section for any particle is one of the crucial studies for validating standard model; therefore, we present QCD predictions as a function of muon pseudorapidity at 8 TeV center of mass energy for $W \rightarrow \mu\nu$ events. These predictions are computed at next-to-next-to leading order QCD using publicly available monte carlo simulation tools FEWZ 3.1 and DYNNLO 1.5. Here, the tools are interfaced with latest parton distribution models such as CT10, NNPDF 3.0, MMHT 2014, and HERAPDF 1.5. After providing predictions at next-to-next-to leading order QCD, we also show the next-to leading order QCD predictions to identify the differences between different orders of quantum chromodynamics. Another topic covered in the presentation is the comparison of theoretical predictions with experimental results so that we could provide the reliability of the publicly available monte carlo simulation tools.

Keywords: W Boson, Standard Model, Differential Cross Section, Muon, QCD



Determination of Malachite Green in Environmental Water using Molecularly Imprinted Nanoparticles with Surface Enhanced Raman Scattering

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Abstract: Malachite green (MG) is a triphenylmethane dye, which has been widely used as in the textile and paper industries. Also, MG is highly effective against fungal and protozoal infections as well as skin fukes and gill fukes [1]. So it has been extensively used as a biocide in the aquaculture industry in the past [2,3]. However, with its genotoxic and carcinogenic properties, MG is toxic to mammals Nowadays, MG has been prohibited from being used in aquatic products for human consumption in many countries. However, MG is still used illegally in the aquaculture industry in many parts of the world due to its low cost and high effectiveness. MG residues in water for fish culture may cause pollution to surface and ground water systems.

Herein, a novel, simple and ultra-sensitive method, for rapid detection of trace malachite green (MG) in environmental water using molecularly imprinted nanoparticles coupled with surface-enhanced Raman scattering (SERS) is described. Molecular imprinted polymers were constructed on the magnetic nanoparticles via reversible catalyzed chain transfer polymerization and silver nano-dendrimer was used as a SERS substrate. The obtained results indicated that the developed method could be used for determination of MG in trace levels with high recoveries and low relative standard deviations.

Keywords: Malachite Green, Molecular Imprinting, Magnetic Nanoparticles, SERS, Chain Transfer Polymerization, Dendrimer



Comparison of Various Physical, Chemical and Sensorial Properties of Yoghurt Produced from Cow and Water Buffalo Milk

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Abstract: Yoghurt is the most consumed fermented dairy product due to the increase of studies on the effects on the human health. The chemical composition of yoghurt varies depending on the composition of used and the technological processes applied. Water Buffalo (manda) milk has rich composition, high nutritional value and characteristics aroma, is differ from other milks. In addition to it's higher dry matter and fat content, the bigger fat globules size increase technologically importance of this milk. This study attempted to reveal physical, chemical, textural and sensory characteristics of yoghurt made from cow milk, cow-Water buffalo (50+50 %) and Water buffalo milk. It was observed that there was a statistically difference between the dry matter and fat ratios of the trial yoghurts produced using cow milk, buffalo milk and the milk consisting of their equal mixture. The highest dry matter and the highest fat content were determined in yoghurt produced from buffalo milk as 18.78 % and 7.1 % respectively. It was seen that there was a significant difference between pH and titration acidity values of the samples. The lowering of the fat ratio generally resulted in a lower pH but did not affect the titration acidity. In addition, the value of hardness has decreased with the increase of the fat ratio. The results of the sensory analysis revealed that the panelists showed a certain level of difference in appearance and color, serum separation, taste and smell, the consistency in the mouth and spoon, the feeling of fatness, but this difference was not statistically significant. It can be said that as a result of sensory, textural and chemical analysis, the most popular example was the yoghurt produced with Water buffalo milk.

Keywords: Yoghurt, Buffalo Yoghurt, Buffalo Milk



Possibilities of Using Stevia as a Sweetener in the Production of Fruit Yoghurt

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Abstract: Yoghurt consumption has increased around the world due to its functional properties, nutritional value and therapeutic effects. In recent years, in order to appeal to every segment of society, yoghurt has begun to be produced in a variety of features. These yoghurts can be flavored with various fruit purees, fruit mixes, frozen fruit, fruit jams or fruit concentrates. The use of different fruits and additives in fruit yoghurt production increase its nutritional and sensory properties. Type 2 diabetes mellitus and obesity-like metabolic syndromes are becoming a major public health problem in developed and developing countries. For this reason, the use of sugar-free (containing sweeteners) and calorie-reduced foods and beverages is preferred. Due to the low energy value of stevia to sweeten food products, it is a great possibility of its use in the dairy industry. Stevia is 200-300 times sweeter than sucrose and it is a natural sweetener. In this study, the advantages and disadvantages of the fruit yoghurts produced with stevia compared to the existing ones in the market have been researched. Using sugar and stevia to give the same sweetness level; plain, strawberry and banana yoghurts were produced and some physical, chemical, rheological and sensory analyzes were carried out. As a result of these analyzes, it was observed that the yoghurt to which the sugar was added had a high viscosity value at a considerable degree and the dry matter values of yoghurt samples were close to each other. The pH and acidity values of the samples varied between 3.9-4.02 and 1.05-1.30, respectively and it was seen that there was a statistical difference between the pH and acidity values of the samples. The most favorite examples of sensory evaluation were strawberry yoghurt with stevia and sugar followed by plain and banana yoghurt added with sugar and stevia. In conclusion it can be said that stevia can be used as a sweetener in the production of diabetic fruit yoghurt.

Keywords: Fruit Yoghurt, Stevia, Diabetic Yoghurt, Food Additives



Determination of Antioxidant Capacities of Orange and Pomegranate Shell Extracted by Different Methods

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Abstract: Fat oxidation is an important problem that leads to a reduction in the shelf life of foods as well as quality. Because of this reason, synthetic antioxidants are used in most of today's industrial applications. However, because synthetic antioxidants are toxic and have negative effects on human health, consumers have started to prefer natural products and the use of plants as antioxidants has been on the agenda. In this work, the effect of different extraction conditions on the antioxidant activity of orange and pomegranate crusts was investigated. Orange and pomegranate shells taken from the market were extracted at 60 ° C for 24 hours in hot water (75 ° C), cold water (40 ° C) and ethanol (40 ° C) concentrations of 25g / L and 50g / L. After extractions, the sweeping activity (DPPH% inhibition) of each sample DPPH (1,1-diphenyl-2-picrylhydrazyl) radical was calculated using the spectrophotometric DPPH method. According to the obtained data; the orange peel inhibited the DPPH radical from 14.64 ± 0.40 to 46.18 ± 0.70%. The highest antioxidant activity in orange peel was obtained in hot water at a sample concentration of 50 g / L, extracting in ethanol at a sample concentration of at least 25 g / L. Pomegranate inhibited DPPH radicals in extraction at 50 g / L sample concentration in cold water and 50 g / L sample in ethanol at the highest concentrations of 95.04 ± 0.14% and 95.03 ± 0.45%, respectively. The pomegranate inhibited DPPH radicals in extraction at the lowest concentration of 25 g / L in ethanol (64.00 ± 0.30%). According to the statistical evaluation, significant differences were found between the amount of antioxidant activity of orange and pomegranate samples (p <0.001).

Keywords: Antioxidant activity, Orange Shell, Pomegranate Shell, DPPH, Extraction



Response Surface Approach for Optimizing Uptake of As(III) from Aqueous Media by Mercapto-modified Bentonite

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Abstract: The presence of heavy metals such as arsenic (As), nickel (Ni), lead (Pb), cadmium (Cd) is a global concern in aqueous environment. Heavy metal contamination in water sources has the harmful effects on natural and human activities. As is one of the most toxic contaminants in aquatic media. Long-term exposure to As can cause serious disease such as cancer, diabetes, gastrointestinal, dermal, mutagenic, respiratory, cardiovascular disease. Taking into account all of these, removal of As(III) from aqueous environment is of great importance. In this work, uptake of As(III) from aqueous media was studied by using 3-mercaptopropyl trimethoxysilane-modified bentonite (TMB) and the optimal adsorption conditions for As(III) were determined via response surface methodology (RSM). Central Composite Design (CCD) in RSM was performed to analyze the most important adsorption parameters including initial pH, temperature (T (°C)), initial As(III) concentration (C_0), adsorbent dosage (g) and contact time (min). The optimal As(III) adsorption conditions obtained from CCD were found to be 5.98, 42.87 °C, 31.02 mg/L, 0.33 g and 127.48 min for initial pH, T (°C), C_0 , adsorbent dosage and contact time, respectively. With these optimal conditions, the maximum adsorption yield and adsorption capacity were found to be 91.01% and 8.56 mg/g, respectively. The isotherm models (the Langmuir, Freundlich, Dubinin–Radushkevich) have been investigated to clarify the adsorption characteristics. Langmuir isotherm model showed a better fit to adsorption data. The pseudo-first-order, pseudo-second-order and Weber-Morris models were applied to explain how the removal of adsorbate changes with time. Kinetic results indicated that As(III) adsorption onto TMB was followed the pseudo-second-order and Weber-Morris models. Moreover, thermodynamic studies revealed that the As(III) adsorption was endothermic, feasible and spontaneous.

Keywords: Adsorption, Arsenic, Bentonite, Mercapto, Optimization



ORAL PRESENTATION

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Kinetic Approaches to Food Stability

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Abstract: The processes may be defined as a series of processes involving the conversion of substances in the input stream to specific products, and processes are designed to cause an action. In the food processing, food processors are interested in changing the flavor, color, texture, undesirable microorganisms, enzymes or extending the shelf life of the product. To design a process with specific outcome requires that the measurable desired attribute changes with time must be quantified. The area of kinetics in food systems are received a great deal of attention due to efforts to optimize or maximize the quality of food products during processing and storage. The science of kinetics involves the study of chemical reaction rates and mechanisms. Understanding of reaction kinetics can provide a better idea of how to formulate or fortify food products to preserve the existing components in a food system. There are three main areas of concern when dealing with reaction kinetics. These are the stoichiometry, the order and rate of reaction, and the mechanism. For simple reactions, the stoichiometry is the first consideration. When this is clarified or elucidated, the mechanisms involved in the reaction are determined. The determination of the order of the reaction is significant in the reaction kinetics. Understanding the mechanisms involved in the reaction is important to obtain and report meaningful kinetic information, select reaction conditions leading to a desired end product, and/or minimize the appearance of undesirable compounds. The purpose of this review is to provide a fundamental understanding of chemical kinetics, describe processes for determining kinetic parameters, quantify the effect of the most important environmental parameters on kinetics, and provide examples of kinetic parameters important in food engineering.

Keywords: Kinetic, Food Stability, Food Processing, Reaction Order, Reaction Rate Constant



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The Quality and Thermal Properties of Plain and Cocoa Yogurt Ice-Cream Samples Produced with Stevia and Honey

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Abstract: In this research, stevia and honey which is an alternative sweetener were added to yoghurt ice-cream mix. Then, the quality properties of yoghurt ice-cream were examined. The samples of yoghurt ice-cream samples were analyzed for physical, chemical microbiological and organoleptic properties. The samples of yogurt ice-cream were analyzed as overrun, butter fat, acidity, pH, first dropping time, last dropping times, thermal conductivity and heat capacity. However, the glucose, sucrose and lactose amounts of yoghurt ice-creams were determined.

The TAMB, lactic acid bacteria and yeast and molds, of ice-cream samples were counted. As results, the diabetic yoghurt ice-cream with stevia and honey were produced and compared with plain yoghurt ice-cream samples. The analyses were carried out in two replications on days 1, 7, 15, 21 and 28 of the storage.

Keywords: Stevia, Yoghurt Ice-Cream, Diabetic, Honey, Cocoa



The Effect of Transglutaminase Enzyme on Physico-Chemical, Microbiological, Sensory and Textural Properties of Pastırma

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Abstract: In the study, the effects of using different levels (%0, 0,25, %0,50 or %1) of transglutaminase enzyme on physico-chemical, microbiological, sensory and textural properties of pastırma were investigated. *M. Longissimus thoracis et lumborum* muscles obtained from two different carcasses were used in production. The muscles obtained from the right and left sides of each carcass were divided in two and a total of four pieces muscles were obtained. After the first drying stage, these pieces were treated with different ratios of transglutaminase enzyme. %5 NaCl and 150 ppm sodium nitrite were used in the pastırma production. Pastırma production was carried out under controlled conditions. According to the results of analyses, it was determined that the pH value was affected by the enzyme application at a significant level ($P < 0.05$). Enzyme application showed an effect at $P < 0.01$ level on lactic acid bacteria count. On the other hand, it was detected that transglutaminase application had no significant effect on a_w value, *Micrococcus/Staphylococcus* and yeast-mold counts ($P > 0.05$). *Micrococcus/Staphylococcus* formed the dominant flora in pastırma, and the number of Enterobacteriaceae was found under the detectable limit. Enzyme application factor had a significant effect ($P < 0.05$) on texture and had no significant effect on other investigated sensory properties (color, odor, taste and general acceptability) ($P > 0.05$). Enzyme application significantly affected cohesiveness and springiness of samples at $P < 0.01$ level. Firmness, adhesiveness, gumminess and chewiness were not affected by application of different level transglutaminase ($P > 0.05$). On the other hand, max. shear force ($P < 0.05$) and max. force ($P < 0.01$) were also affected.

Acknowledgement: This study has been supported by General Directorate of Agricultural Research and Policy (TAGEM 16/AR-GE/29)

Keywords: Pastırma, Transglutaminase, Texture, Sensory, *Micrococcus/Staphylococcus*



Some Characteristic Properties of Traditional Butteroil Produced in Karacadağ Region of Şanlıurfa

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Abstract: In this study, a total of 17 traditional butteroil samples, which were obtained from small family producers in Karacadağ region of Şanlıurfa, stored at two different conditions (4 and 20 °C, in dark) for 180 days. Some characteristic properties of traditional butteroil was examined during the 1st, 30th, 90th and 180th days of storage period. According to the results of the analysis obtained from the samples, mean values of moisture content, refractive index, water activity, L^* value, a^* value and b^* value was $1.38\pm 0.01\%$, 1.46 ± 0.00 , 0.79 ± 0.07 , 67.86 ± 4.91 , -2.66 ± 0.48 and 8.23 ± 4.00 , respectively. The mean values of acidity degree, titratable acidity and peroxide number were lower and the induction time was higher in the butteroil samples stored at refrigerator conditions (4°C, in dark) than the samples stored at room conditions (20° C, in dark). During the storage period, titratable acidity and the acidity degree values of the samples increased, also it was found that the samples stored at room conditions have higher acidity degree and titratable acidity values than the samples stored at refrigerator conditions. The average pH value of the butteroil samples increased after one month storage and then decreased relatively. The average peroxide value increased until the 90th day of the period, and then decreased relatively; the samples stored at room conditions have higher peroxide values than the samples stored at refrigerator conditions. It was found that the mean value of induction period did not show any significant change until the 90th day of the storage period, and after that day the mean value of induction period of the samples stored at room conditions was shorter than the samples stored at refrigerator conditions. As a result of the study, storing butteroil, which was traditionally obtained from yayıkaltı butter, at different conditions (4 and/or 20° C) is not a significant risk in terms of oxidative stability but it has been concluded that storing the butteroil in refrigerated conditions is more suitable for the longer storage periods than 180 days.

Keywords: Traditional Butteroil, Oxidative Stability, Water Activity, Peroxide Value, Induction Period



Control of the Formation of Biogenic Amines in Fermented Meat Products

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Abstract: Fermentation is a food preservation and production method, dates back years ago. It is a natural process that provides protection by preventing the deterioration of food and enriches the nutritional value of foods with fermented metabolites. Besides meat preservation, the most important reason for producing fermented meat today is to produce products with desired taste by consumers. Biochemical reactions as well as, the desired changes such as characteristic taste, aroma, texture and color development in the environment can provide the formation of biogenic amines in the process. Decarboxylase-positive microorganisms can be produced by enzyme activity carried out under suitable conditions, as well as from amino acids as a result of raw material-specific decarboxylase activity. Small molecular weight toxic compounds biogenic amines are in aromatic (tyramine, phenylethylamine), aliphatic (cadaverine, putrescine, spermine, spermidine) and heterocyclic (histamine, tryptamine) structures. Consumption of biogenic amines is toxic at high concentrations or in inadequate conditions of detoxification mechanism in the body. The formation of biogenic amines in food depends on many factors, many of which are closely related to the food source. Furthermore, when we look at the formation of biogenic amines in meat products, it differs firstly according to the product. The ripening and storage conditions of meat and meat products directly affect the quality of these products in terms of biogenic amines. It is necessary to determine the sources of formation of amines well during ripening of fermented products in order to prevent the formation of high concentrations of biogenic amines. Currently, various methods of using additives such as starter culture, sulphite, sugar and nitrite can be preferred to limit the formation of biogenic amine in many food and fermented meat products. In this review, studies were carried out to prevent the formation of biogenic amine in fermented meat products.

Keywords: Biogenic Amine, Fermented Meat Product, Decarboxylase



Lead(II) Adsorption from Aqueous Solutions onto Amine-Functionalized Magnetic Fe₃O₄ Nanoparticles: Optimization of Process Parameters by Using Response Surface Methodology (RSM)

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Abstract: The toxic metals have released to the environment from various industries, the metal, the battery, the electroplating, paint, and mining. The presence of toxic metal in wastewater have hazardous effect to humans, animals, and other living creatures. Lead (Pb) is one of the most toxic metals. Pb can lead to various disease such as kidney, nervous, hematopoietic for public health. Thus, removal of Pb(II) from aquatic environment is an issue of great significance. Fe₃O₄ nanoparticles forming a magnetic field due to their magnetic properties can be separated quickly and easily from aqueous environment. The amine-functionalized Fe₃O₄ nanoparticles are a great way to removal Pb(II) ions from aqueous media. In present study, influence of Fe₃O₄@[poly(vinyl tris(amino ethyl)amine)] for removal of Pb(II) ions from aqueous solutions was investigated and the optimization of the most important parameters for Pb(II) adsorption (initial pH, initial Pb(II) concentration (C₀), contact time (min.), and adsorbent dosage (g)) was studied by using response surface methodology (RSM). The relationships between the parameters and response (Pb(II) adsorption) were determined using central composite design (CCD) in RSM. According to CCD, thirty experiments were conducted to evaluate the effects of these parameters on the adsorption system. The results showed that the optimum Pb(II) adsorption conditions were 5.88, 46.51 mg/L, 108.21 min, and 17.41 mg, for pH, C₀, contact time, and adsorbent dosage, respectively. Under the optimum adsorption conditions, the maximum adsorption capacities and the adsorption yield were 129.65 mg/g and 97.07%, respectively. The results demonstrate that the adsorbent has great potential for the uptake of Pb(II) from aqueous environment.

Keywords: Adsorption, Lead, Nanoparticle, Optimization, Response Surface Methodology



Zn: Fe₂O₃, Mg: Fe₂O₃ and Fe₂O₃ Thin Films Grown by Spray Pyrolysis and Gas Sensor Application

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Abstract: Iron oxide semiconductor gas sensors are used in a variety of different applications and industries. They are relatively cheap compared to other sensing technologies and benefit from high material sensitivity, repeatable, reliable and quick response times. Spray pyrolysis (SP) is one of the solution based coating technique to grow thin or thick films. The technique of SP without the requirement of vacuum is a method that can be preferred in the industry, in order to allow the production of large size films in both cheap and fast. When we get the gas sensor measure we see that Zn:Fe₂O₃ (Zinc Ferrite), Mg:Fe₂O₃ are the p type semiconductors and Fe₂O₃ is n type semiconductor. For Fe₂O₃ thin film, because of the electrons that emerge as a result of the reaction increase the carrier concentration. Thus resistance is reduced. For Zn:Fe₂O₃, Mg:Fe₂O₃ thin films, because of the electrons that vanish as a result of the reaction decrease the carrier concentration. Thus resistance is increased. X-Ray Diffraction (XRD) measurements of the obtained films were taken. As a result of Atomic Force Microscope (AFM) measurements, was obtained information about surface morphology. Optical properties were measured by Double-Diffracted UV-VIS photoelectron spectroscopy. Vibrating sample magnetometer (VSM) techniques have been used for magnetic properties and I-V (Van der Pauw) technique has been used for responses of gas sensor.

Keywords: Zinc Ferrite, Gas Sensors, VSM, Iron Oxide



Investigation of Seismic Analysis Methods in Buildings with Torsional Irregularity

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Abstract: Turkey is situated on a very active earthquake zone of the world. Because of the great earthquakes have occurred for centuries, many loss of lives and goods have been experienced.

It is very important that the effect of the earthquake load on the structure is defined correctly. There are some irregularities due to architectural concerns and economic concerns in the phase of the design of the structures. The effect of these irregularities on earthquake behavior is usually negative. Recent earthquakes have caused this experience to be painfully experienced.

Although the irregularities that should not have been made are determined in TSC - 2007, they are often confronted with practice. The methods used in earthquake analysis vary by depending on the irregularities that occur in the structures.

In this study, earthquake load is calculated by the methods defined in TSC - 2007 in a building with torsional irregularity. In the scope of the study, a four-story structure model with torsional irregularity in the x and y directions is created. In order to provide torsional irregularity, an "L" shaped shear wall is placed in one corner of the structure. Application of L shaped shear wall is also very common in practice. It is assumed that structure is located in 1st degree earthquake zone. Equivalent Earthquake Load Method, Mode Superposition Method and Time History Analysis Method are used to calculate earthquake loads acting on the structure. It is tried to determine the best method for buildings with torsion irregularity by comparing the results obtained from the analyzes.

Keywords: Torsional Irregularity, Equivalent Lateral Load Method, Mode Superposition Method, Time History Analysis Method



Recent Trust-Based Security Solutions for Cluster-Based WSNs

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Abstract: Due to the advantages of low complexity and low power requirements, Wireless Sensor Networks (WSNs) have becoming widespread at an accelerated rate over the past decade. However, unreliable nature of wireless medium makes WSNs vulnerable to various types of attacks. Besides, traditional security mechanisms are not suitable for these networks due to the limited resource capabilities of sensor nodes. Hence, designing novel security solutions considering unique characteristic of these network is required. Routing attacks are among the most dangerous attacks in WSNs, which disrupt data flow originated from sensor nodes and directed to a central station, i.e. base station. The studies in literature regard to routing attacks propose either intrusion detection based or trust based schemas. Intrusion detection approach is successful due to identifying the location/source of the attack, which allows further actions to be taken, i.e. recovering the network. On the other hand, designing an intrusion detection system is an energy consuming solution and is not advisable for battery-limited sensor nodes. However, trust based schemas offer the sensor nodes to carry their data around the infected area by trustable routes. Although the attack is not conducted away from the network in these approaches, data of the sensor nodes is not affected from the attack due to tracing a trustable path. Hence, in this study, recent trust based security solutions in literature are investigated and key strengths are highlighted. In this respect, this study enlightens the future studies about the updated trust based schemas.

Keywords: Wireless Sensor Networks, Security, Trust-based, Cluster, Survey



Data Loss Rate of Cluster Based WSNs under Routing Attacks

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Abstract: The limited resources of the sensor nodes with the hostile deployment environment incline Wireless Sensor Networks (WSNs) to be prone to various kinds of attacks originated from both outside and inside. Although cryptography based solutions are favourable for detecting outsider attacks, they are ineffective for insider attacks. Routing attacks are among the most dangerous insider attacks in WSNs, which disrupt data flow originated from sensor nodes and directed to a central station, i.e. base station. Sinkhole attack, in which the intruder node tries to attract the neighbouring nodes to use it as a relay node on the purpose of delivering their data to base station, is one of the earliest among them that has been identified in WSNs. Once an intruder node launches a sinkhole attack, it can carry out various attacks against data traffic, including selective forwarding and black hole. In selective forwarding attack, attacker drops a certain ratio of the collected data packets, while it blocks all packets in black hole attack. In this study, due to observing the damage caused by routing attacks in cluster-based WSNs, initially, sinkhole attack is modelled by selecting a certain node to be a cluster head once every five round. After conducting a sinkhole attack, the malicious node also launches selective forwarding attack by dropping 50% of data packets and black hole attack by dropping all data packets. The loss ratio of data originated from sensor nodes and reaches up to base station is estimated. If the sinkhole node does not bring about any further attack, data loss rates are 0.09%, which is negligible. However, packet loss rates reaches up to 4.84% for selective forwarding and 9.64% for black hole attack, on average for a 100-node network. Our future work aims to detect these attacks and recover the network successfully in an energy-efficient manner.

Keywords: Wireless Sensor Networks, Cluster, Sinkhole, Black hole, Selective Forwarding



Selectivity of 40 mm Square Mesh Polyamide Codend for *Merlangius merlangus* in the Southern Black Sea

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Abstract: This study aimed to determine the selectivity of 40 mm square mesh codend (40S) for *Merlangius merlangus*. Fishing trials were conducted on board the commercial trawler Sinyor Paşa (14,95 m LAO, 380 HP) from 21-24. September 2016 on Sakarya coast of the Southern Black Sea. The selectivity data of 40 mm square mesh polyamide codend were recorded for 5 valid hauls with a total time of 5.5 hours. Data were collected at depths ranging from 52 to 55 m, 60-80 minutes of haul time and 3.1-3.4 knots of haul speed. Covered codend method was applied in the sampling and selectivity curve was estimated for *Merlangius merlangus* with logistic function from pooled data using the CC2000 software. The total catch volume in the cover 563 kg, while in the tested codends 95 kg. A total of 49667 whiting were caught throughout the sampling. The calculated L_{50} and SR values of whiting were 16.51 cm and 3.2 cm. The L_{50} value of 40S for whiting is much above the MLS (13 cm) as well as the first maturity size. This result is important for the sustainability of whiting stocks but it is presumed that fishermen will experience economic losses due to the low retention rate of 40S. Selectivity characteristics of 36 or 38 mm square mesh PA codends that are expected to give closer results to the MLS value should be investigated.

Keywords: Trawl Selectivity, Square Mesh, Codend, Black Sea, Whiting



Effects of Square Mesh Codend on the Benthic By-catch for the Veined Rapa Whelk (*Rapana venosa*) Beam Trawl Fisheries

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Abstract: The veined rapa whelk beam trawl fisheries causes small benthic organisms to be captured and also damage the other species living on the sea floor. To solve this problem, a proper modification which minimise the by-catch must be designed and put into practice. This study aims to compare 72 mm commercial diamond mesh codend with 72 mm square mesh codend to minimise the by-catch in this fisheries. Totally 15 hauls were carried out in eastern Black Sea Region between 10-14 August 2017. Two beam trawls had been towed simultaneously by a commercial vessel to compare the by-catch compositions of two codends. Paired t test was used to compare the catch amount of two codends based on species. GLMM (Generalised Linear Mixed Models) was used to compare the length of captured the veined rapa whelk, mussel, and crab species. Results showed that there was a 78% decrease in the weight of the by-catch in square mesh codend when compared with commercial diamond mesh codend and this difference was found statistically significant ($p < 0.01$). In conclusion, the square mesh codend was found successful in decreasing the by-catch amount of many benthic species except for flatfish species and large crabs. In addition to this, the veined rapa whelk amount fell by half. If square mesh codend is wanted to be used for this fisheries to decrease the negative impact on benthic species, new regulations which can compensate financial loss of fishermen are needed firstly. In addition to this, new studies should be carried out to decrease the loss of target species.

Keywords: Beam Trawl, The Veined Rapa Whelk, Benthic By-Catch, Square Mesh Codend



Determination of Growth Performance and Feed Utilisation of Goldfish (*Carassius auratus* L.1758) Fry Fed with L-Carnitine Supplemented Diets

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Abstract: In this study, we investigated the effect of L-carnitine supplementation to diets on growth and feed utilization of goldfish (*Carassius auratus* L. 1758) fry. Five different L-carnitine supplemented (control, 250, 500, 750 ve 100 mg L-carnitine kg⁻¹) isonitrogenous, isolipidic and isoenergetic diets (contain 40% crude protein, 6% crude lipid, and 3540 digestible energy kcal kg⁻¹) were prepared for trial. All experimental groups were planned randomly allocated to triplicate groups of 20 fish. The experiment has been carried out in a glass aquarium (65 lt) for 84 days. Fishes with 0.31±0.01 g mean weight were fed twice a day *ad libitum*. The results of our experiment showed that there was no statistically significant difference between the groups in terms of live weight gain, condition factor, specific growth rate, feed utilization, protein efficiency ratio. The survival rate of all experimental groups is 100%. As a result, no positive effect of the addition of L-carnitine was found on the growth and feed conversion ratio of goldfish fry.

Keywords: *Carassius auratus*, Diets, Fed, Goldfish, Growth, L-carnitine



A Preliminary Study in Behaviour Observations for Discard Reduction of Thornback Skate (*Raja clavata*) in Black Sea Bottom Trawl Fisheries

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Abstract: Bottom trawling is the most efficient way to capture commercial demersal marine species in Black Sea. Studies on discard in Black Sea bottom trawl fisheries showed that the large quantities of thornback ray (defined as near threatened species by IUCN for Mediterranean population) were captured as unwanted and thrown back into the sea dead or alive by fishermen. In addition, this species is quite fragile due to the external pressures such as overfishing and internal pressures such as slow growth rates, late maturity, and low fecundity. Proper modification to eliminate of this discarded species depends on existing knowledge of behavioural differences between discard and target species for bottom trawl. The aim of this study is to define main behavioural patterns of Thornback Ray (*Raja clavata*) observed in the mouth and tunnel areas during trawling by using cameras to find appropriate modification for future studies. A total of 4-day sea trials were carried out with Karadeniz Research Vessel owned by Recep Tayyip Erdogan University between November 2017 – March 2018 in the south-eastern Black Sea. A total of 11 hauls with 30-minute towing time were performed in depths between 20 - 65 meters. Underwater records were obtained with GoPro and Sony action cameras suited for underwater videos and they were taken under the day light and an extra lighting device was not used. During the study, a total of 8 hour and 38 minutes of video was recorded and approximately 3 hours of it were taken in tunnel section of the trawl.

Observations showed that majority of observed individuals had swam for a while in front of the lead line of the trawl until they get tired. After this stage, many of them tried to escape under the lead line of the trawl and if they could not escape, they showed rising behaviour and swam to codend section. In tunnel section, some individuals exhibit swimming behaviour toward to middle and top section of the net and some of them preferred to stay close to bottom section of the net.

Keywords: Black Sea, Behaviour, Bottom Trawl, Thornback Skate



Occupational Safety and Health Risks in Turkish Aquaculture Industry

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Abstract: Work accidents are one of the most important problems of our lives. Every year, many employees are wounded, injured and even die in the end of the accidents that happen to them on the working fields. One of the most important problems in the aquaculture sector due to these risks and dangers is that they do not have a safe and healthy working environment. For this reason, occupational health and safety issues should be scrutinized and necessary precautions should be taken. With the recent developments and growth in the aquaculture sector, employment growth has become inevitable. This increase in employment and the physical conditions of the aquaculture facilities made the sector more vulnerable to danger and accidents. The aquaculture sector is an indispensable sector to focus on in terms of occupational health and safety, given the constantly growing potential, the number of people employed and the extremely dangerous working conditions. The concept of occupational health and safety is very important in terms of companies, employees and country economy. In companies that have good health and safety precautions, the financial and moral losses of the employees are avoided and the work efficiency of the employees is increasing and this efficiency increases the productivity of the firm. In addition, thanks to these health and safety measures, company and country economies are overtaken by large expense items caused by occupational accidents and occupational diseases. As a result, the prevention of work accidents and occupational diseases is very important in terms of reducing the most material and moral losses at the individual and community level. In this study, the general problems, risks and solutions for occupational health and safety in the aquaculture sector have been reviewed in recent years.

Keywords: Aquaculture, Occupational Health and Safety, Risks, Sector, Turkey



Investigation of Seismic Analysis Methods

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Abstract: Earthquake is a ground action with destructive effects. In order to prevent the destructive effects of the earthquake, the earthquake action must be acted on the structure correctly. Then the structure should be designed according to the results obtained. However, earthquake is a harmonic action that is very complex. Many methods have been developed to understand the earthquake action correctly and to apply it to the structure. Three of the methods developed are located in the Turkish Seismic Code (TSC-2007). These methods are Equivalent Lateral Load Method, Mode Superposition Method, Time History Analysis Method.

In this study, a four-story reinforced concrete structure model is analyzed with finite element method. It is assumed that the model is a dwelling type. A symmetrical plan is taken to see the effect of the analysis methods when creating the structure model. Any irregularity in the structure occurred is avoided. It is assumed that all the beams in the structure are loaded with a infilled wall. It is assumed that structure is located in 1st degree earthquake zone. The soil class is chosen as Z4 to be able to see the maximum possible seismic load. In order to match the stiffness center of the structure with the center of gravity, the columns are tried to be placed evenly on both directions. The earthquake acceleration records which should be used in time history analysis are selected as the records of the Düzce earthquake records. Seismic load is calculated by the methods located in TSC – 2007. The differences between the methods are examined by comparing the obtained results.

Keywords: TSC - 2007, Equivalent Lateral Load Method, Mode Superposition Method, Time History Analysis Method

**Mono Fiber Reinforced Expanded Glass Aggregate Added Gypsum Composites**

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Abstract: Gypsum based composites are widely used in construction industry for many purposes. Multidimensional studies on the mechanical properties of the gypsum composites have been conducted in order to expand its usage area. In this study, mechanical performance of expanded glass added mono fiber reinforced gypsum composites were analyzed. Mono fibers were added into the mix design up to 1.5 % by wt. The flexural, compressive strength and the shrinkage behavior of the gypsum composites were examined. 50 x 50 x 50 mm and 40 x 40 x 160 sized specimens were prepared for the mechanical performance tests. The test results showed that flexural strength and shrinkage behaviors of the composite were significantly improved with the addition of mono fibers; however, compressive strength values were not enhanced. Mono fibers and expanded glass aggregates potential for gypsum composites were revealed.

Keywords: Mono Fiber, Glass Mono Fiber Reinforced Gypsum Composites, Expanded Glass Aggregate



The Effect of Winding Angle on Hoop Tensile Characteristics of the Glass Fiber Reinforced Composite Pipes

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Abstract: In today's world, polymer-based composites have been developed by scientists since they can be alternative for classical engineering materials by providing more economical usage and technical requirements. In order to obtain them, there are some manufacturing methods such as hand layup, pultrusion, filament winding, resin transfer molding, injection molding according to the desired product. Among them, filament winding is the most reliable production method which is recommended for obtaining round shapes. Nowadays, it has been used for fabrication of high pressure vessels, high pressure piping systems, oxygen and fire extinguisher tubes, helicopter rotor, golf clubs, wind turbine blades, transmission shafts, bus shafts, aircraft body parts, ship body parts, space shuttles. The method consists of fiber reinforcement and resin matrix which are the main components composing the composite material and its products may have different design parameters such as the desired winding angle, fiber type, mandrel diameter, resin type etc. The required design according to the field of application is easily passed on with the specified parameters.

The aim of this study is to investigate the hoop tensile strength and modulus characteristics of the glass fiber reinforced and epoxy based matrix composite pipes which are fabricated by filament winding technique. Five specimens for each winding angle configuration (40° , 55° and 70°) were prepared and tested according to ASTM D2290 standard. Also, fiber mass fractions were obtained from the analysis of ignition loss tests in accordance with ASTM D2584 standard. The results show that winding angle has a significant role on determination of hoop tensile properties of filament wound composite pipes.

Keywords: Filament Winding, Glass Fiber, Winding Angle, Hoop Tensile, Composite Material



On the Tensile and Flexural Behavior of Basalt-Epoxy Fiber Reinforced Composite Laminates with Nanoclay

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Abstract: In recent years, the increasing competition on the global market has made the necessity that production and use of higher strength, more functional, lighter and less costly materials in industrial applications. Composite materials with high strength/weight ratio, high stiffness/weight ratio, good fatigue strength, high corrosion resistance and vibration damping properties are the prerequisites of this necessity. With the increasing usage of the composite materials in engineering application, some studies to improve mechanical characteristics of them has been performed. Scientists and engineers who try to improve the properties of polymer based composite materials by adding various particles to the polymer structure. It has been observed that the addition of various additives to the polymeric body improves the various mechanical properties of the polymer such as strength, fatigue, vibration damping and fatigue.

The current study presents the effects of nanoclay particle addition on the mechanical behaviors of basalt/epoxy fiber reinforced composite laminates having $(0^{\circ}/90^{\circ})_6$ configuration fabricated by vacuum assisted resin transfer molding (VARTM). In this context, four different nanoclay percentage (0%, 1%, 2% and 3% wt.) were used to observe tensile and flexural characteristics of the specimens. The experimental tests were performed according to ASTM D638 and ASTM D790, respectively. The results showed that the maximum increase in tensile strength has been obtained from 2% nanoclay addition as 57.6%. However, %1 nanoclay inclusion has given the best result as 269.92 MPa in flexural strength of the specimens. The nanoclay particles has crucial effects on the characteristics of the basalt/epoxy fiber reinforced composites.

Keywords: Composite Material, Basalt Fiber, Nanoclay, Tensile, Flexural



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Barite Sand Added Glass Fiber Reinforced Concrete

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Abstract: The early types of matrices for Glass Fiber reinforced composite include only cement paste in the production industry. The cost of the matrix material became the major cost problem, and it could be reduced. Soon it became very obvious that some mechanical behavior of the hardened concrete could be improved with the inclusion of the fine aggregates. Silica sand has been widely used for various types of glass fiber reinforced concrete (GFRC) panels since the first fine aggregate addition into the GRC mixes. In this study, silica sand was replaced with the barite sand during the mix design of the GFRC, in order to reveal barite sand potential and applicability for different engineering purposes. Barite sand was replaced by 5 %, 10 % and 15% by weight of the silica sand. The flexural strength and freeze-thaw resistance of the barite added GFRC were examined. The experiment results showed that barite replacement up to 15 % improves the mechanical behaviors of the composite against freezing-thawing effect. It was also obtained that barite addition significantly increased the tensile strength of the composites.

Keywords: Glass Fiber, Glass Fiber Reinforced Concrete, Barite Sand, Silica Sand, Tensile Strength



Investigation of Electrical Properties of GaSe Single Crystal Depending on Temperature

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Abstract: In this paper, the p-type GaSe crystal was obtained by the Bridgman-Stockbarger method. Ohmic contacts for the Hall and magnetoresistance measurements were made by thermal evaporation system in 10^{-5} Torr. The ohmic contacts of the indium metal evaporated GaSe material were annealed in nitrogen medium at 305 ° C for 3 minutes in the annealing furnace. It provides better control of thermal conditions to grow high quality single crystals; the Hall coefficient was made using a four-point direct current at temperatures to obtain the effects of temperature on the concentration and mobility of carrier. The current was made to flow in the surface planes and a magnetic field (2.3 T) was applied perpendicular to these planes. The temperature dependencies of the Hall mobility of holes, the carrier concentration, the electrical conductivity, Hall voltage, resistivity and the transverse magnetoresistance effect has been investigated in p-GaSe in the sample temperature range 10–340 K. The carrier concentration increases with increasing temperature according to the properties of semiconductors.

Keywords: GaSe, Hall Effect, Electrical Properties



Image Processing on GPU by Using CUDA

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Abstract: Image processing applications in science and engineering such as robotics, industrial automation, autonomous vehicle control, surveillance, bio-medical science, agricultural and geological science are demanding less processing time and faster response. Real time performance are crucial to robotics application and other automation applications. Real-time performance is a very challenging task to realize even on the most advanced central processing units (CPUs). Taking advantage of massive parallelism, rather than taking advantage of high clock rate can be more efficient in image processing where data of millions of pixels should be required to processed in one cycle. By using the graphic processing unit (GPU) architecture, it is possible to obtain a considerable speed-up factor with respect to CPUs for algorithms those have high data parallelism and high work-load or computational intensity. CUDA (Compute Unified Device Architecture) is a C-like programming language for parallel computing on NVIDIA GPUs. In this study, we have summarizes distinct features of NVIDIA GPUs and explore the CUDA programming models and principles to obtain best performance by taking full advantage of CUDA and NVIDIA GPUs. We have ported color to gray scale conversion algorithm and parallel prefix scan algorithm, which is an algorithm to parallelize integral image computation, to GPU by using CUDA. It is observed that as the image size or data size increased, gained speed-up on GPU with respect to CPU is increased. Efficient memory access is also key to high performance gain. It is understood that the specific features of the GPU architecture, such as memory transfer overhead, shared memory bank conflicts and the impact of control flow need to be considered when programming.

Keywords: GPU, CUDA, Image Processing, High Performance Computing



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One-step Microwave Energy-based Nano-manufacturing of a Hybrid Electrode Material and Its Use in Energy Storage

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Abstract: A hybrid electrode material (HEM) for supercapacitors (SCs), composed of carbonized conducting polymer (CP), i.e. polypyrrole nanofibers (PPy NFs), nanostructured zinc oxide (nano-ZnO) and carbon nanotubes (CNTs), was successfully prepared in one-step via a hassle-free, rapid and highly efficient microwave (MW) energy-based approach. The overall morphology and content of the nano-ZnO and CNT compounds could be altered by simply changing the process parameters, i.e. ratios in the feedstock mixture or the MW process time. The thermal and morphological features, crystalline nature, elemental composition and also the electrochemical performance of the as-prepared HEM were thoroughly investigated by using relevant characterization methods such as scanning and transmission electron microscopy (SEM, TEM), energy dispersive X-ray spectroscopy (EDX), X-ray diffraction (XRD), cycling voltammetry (CV) and galvanostatic charge/discharge (CD) tests. It is aimed that by synergistically blending the high conductivity from CNTs, the ultra-high porous surface area from carbonized NFs and the abundant pseudo-capacitive features from nano-ZnO in its structure, the as-synthesized HEM would afford to exhibit promising capacitive performance along with the excellent long-term CD cycle stability and high energy/power densities for SC applications.

Keywords: Conducting Polymer, Carbon Nanotube, Zinc Oxide, Microwave Energy, Supercapacitor



Algorithmic and Conceptual Differences between the Gradient Projection Method and the Sequential Quadratic Method for the Dual Response Optimization Model

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Abstract: Response surface methodology (RSM) is an effective technique to describe a response when estimating interaction and even quadratic effects. The response surface-based robust design optimization model is able to identify optimum process settings when minimizing the estimated response function of the process variation as small as possible. In the literature, the dual response model, one of the response surface-based robust design optimization model, is used to find an optimum operating condition for the process variance reduction while applying to the gradient projection method (GPM). Indeed, the GPM is an iterative bound constrained optimization concept based on the trust-region concept. However, there is an important disadvantage of this algorithm in large scale optimization problems because of the convergence issue. Therefore, the sequential quadratic programming (SQP) technique, which is a sequential optimization method based on the linearization of constraints, may be used as an effective technique. The essential notion of the SQP is to formulate the optimization model by using as a quadratic sub problem model and applying the solution to the sub problem to build an improved approximation of the input variables. The SQP procedure is well-suited the dual response optimization model due to an inequality form and second-order response functions. It is also strong and iterative solution procedure for the dual response optimization model. In this research work, algorithmic and conceptual differences between the GPM method and SQP method are studied for the dual response optimization model. In addition, comparison studies of the GPM technique and the SQP technique are also conducted. The numerical example shows that the SQP procedure is a highly effective technique to optimize the estimated response functions while considering the dual response optimization model.

Keywords: Robust Design, Response Surface Methodology, Optimization, Gradient Projection Method, Sequential Quadratic Method



A Perspective of Convex Hull within the Design of Experiments

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Abstract: The design of experiments is a significant process improvement tool in order to develop new processes, provide insights and improve process performance. The central composite design (CCD), one of the design of experiment techniques, is widely used for fitting a second-order model in the literature. Constraints are generally nonlinear due to a circle or a sphere design region when the CCD is applied. By using the CCD's convex hull, the constraints will be linear and the solution space is reduced because the feasible region for the CCD and its convex hull are not the same. Therefore, the computational efficiency for integer nonlinear programming model (INLP) is increased in order to obtain optimum operating conditions for a response variable while considering both continuous-valued and integer-valued input variables. In addition, INLP optimization models are considered as NP-hard problems. In this research work, linear constraints and an objective function of an integer linear programming (ILP) model reduce the complexity of the INLP in the CCD's convex hull. The relaxation of the ILP is reduced as a polynomial time algorithm in order to increase the tractability of the optimization problem. Moreover, a search algorithm is used in order to obtain integer feasible solutions. The numerical example is also provided to illustrate the effectiveness of the proposed technique in this research work. Finally, the successful completion of this research work will lay out the theoretical foundations of convex hull within the design of experiments and have the potential to impact many engineering science problems and ultimately leading to process improvement.

Keywords: Design of Experiments, Central Composite Design, Integer Nonlinear Programming Model, Convex Hull, Complexity Analysis, Optimization



Investigation of Antioxidant Properties of Ethanol, Methanol and Ethyl Acetate Extracts of Different Parts of Endemic *Achillea teretifolia* (Civan Perçemi) from Gümüşhane

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Abstract: The genus *Achillea* of the *Asteraceae* family is diversely spreaded in Anatolia and represented by 42 species of which 23 are endemic for Turkey. Not only in Turkey but also around world *Achillea* species is an important biological resource in folk medicine against most of health problems such as gastro-intestinal complaints, inflammatory disorders, for wound healing, as emmenagogue, as diuretic, against jaundice, and for many other complaints. Particularly, some of yarrow plants inflorescence or aerial part is recorded as an official plant in the European Pharmacopoeia and suggested as choleric, antibacterial, astringent, and antispasmodic remedy in official monographs and prescribed as herbal tea, sitz bath, or pressed juice. There are some reports about this plant that it has also antioxidant properties. But as we know that plants can accommodate their land by using more and different kind of seconder metabolites like phenolic and flavonoids, they have a big role on radical scavenger systems. And plants can store these kinds of metabolites in stems or flowers. Because of that, we investigated *Achillea teretifolia* (endemic) plants which using by rural people as a folk medicine. This plants collected from Gümüşhane, has extreme climate conditions and difficult habitat, during flowering time (July). In these study antioxidant properties of ethanol, methanol and ethyl acetate extracts of endemic *Achillea teretifolia*'s different parts (stem and flowers) has been investigated. After collection and dried, plants extracted with mentioned solvents. Total phenolic and flavonoid contents were measured by spectrally as gallic acid and quercetin equivalents, respectively. Antioxidant activity of extracts were determined by 2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) di-ammonium salt (ABTS) and 1,1-diphenyl-2-picrylhydrazyl (DPPH) methods by spectrally and calculated as trolox equivalent. The results showed that acetate extracts of stem parts have exhibited the highest DPPH activities as 899, 6 µg/ml. On the other hand, total fenolic and flavonoid contents are higher than others. In conclusion, endemic *Achillea teretifolia* plants have partly antioxidant properties and these plants might be suggested a natural alternative source of drug or food industry.

Keywords: Antioxidant, Ethanol, Methanol, Ethyl Acetate, *Achillea teretifolia*



Investigation on Antibacterial Activity of a *Dianthus* species

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Abstract: Plants have been using with different purposes by people for a long time. While some of them consume as nutrients, many plants use for medicinal purpose. According to investigations lots of people firstly apply medicinal plant when they have health problems. Therefore, people investigated on biological activity of the plants. These activity screening studies are still going on. In this study, the antibacterial activity of *Dianthus orientalis* obtained from Gümüşhane was investigated.

Firstly, plants were collected and dried. The plant materials (10 g) were extracted with 200 ml each solvents (ethanol, methanol and ethyl acetate) at 37 °C 125 rpm during 24 h. The extracts were filtered and then concentrated. Disk diffusion method was used for determine antimicrobial activity. Fourteen microorganism were preferred to detect the activity. 10 mg/ml stock solution was prepared by plant extract dissolved in DMSO. Then extract impregnated discs were put on petri dishes with inoculated test organisms (0.5 McFarland). After this treatment petri dishes were incubated at 37 °C and 25 °C for bacteria and yeast, respectively. Afterwards 2 days incubation, inhibition zone around the discs was measured as millimetre. As a positive control chloramphenicol was used equal concentration with samples.

As a results, the extracts exhibited antimicrobial activity against to at least one test organisms. The extracts showed antimicrobial activity against both gram-positive and gram-negative organisms. Ethyl acetate extract has shown strong antimicrobial activity on *Candida albicans* with 13mm inhibition zone. Consequently, it is predicted that *Dianthus orientalis* has potency to be used as a natural antimicrobial agent.

Keywords: Antimicrobial Activity, *Dianthus*, Disc Diffusion, Gram-negative Organisms, Gram-positive Organisms



Plant Cell Wall Proteins: Arabinogalactans

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Abstract: The presence of a cell wall confers many of the gross morphological characteristics of plants and is one of the features that distinguish them from animals. The cell wall is a complex composite of cellulose, high molecular weight polysaccharides, proteins, and aromatic substances that undergoes dynamic changes. In addition to providing structural support and a passive barrier against invading pathogens and pests, the cell wall controls cell expansion and is involved in the exchange of water and substances throughout plant development. It also constitutes a reservoir of antimicrobial compounds and is a source of signaling molecules. Arabinogalactan proteins (AGPs) are a class of Hyp-rich glycoproteins that are highly glycosylated and are abundant in the plant cell wall and plasma Membrane. In Arabidopsis, the glycosylphosphatidylinositol (GPI)-anchored AGPs can be divided into four subclasses, the classical AGPs, those with Lys-rich domains, and AG peptides with short protein backbones. The fasciclin-like AGPs (FLAs) constitute a fourth distinct subclass of AGPs. AGPs have some significant roles such as pattern formation, cell expansion, salt tolerance, disease response, plant - microbe interactions and programmed cell death (PCD). However, plasma membrane AGPs in cell wall integrity control still speculative and should research with details. Especially, how it works under salt stress and how connects with plant growth regulators. If we can enlighten these pathways, it might be important to protect plants and these kinds of studies are so important for industry related to cellulose, hemicellulose and pectin. On the other hand, if we can understand genes that have role on plant cell wall, it will help to develop plant biotechnological studies.

Keywords: Plant, Cell Wall, Stress, Arabinogalactan Proteins

**Essential Oils Compounds of Seed of Palm (*Phoneix dactylifera*) Grown in Libya****Mousa S. M. GABALLAH^{1,2}, Nejdet GÜLTEPE^{2*}**¹Omar AL-Mukhtar University, Veterinary Faculty, Al Bayda-LIBYA²Kastamonu University, Engineering and Architecture Faculty, Genetics and Bioengineering Department, Kastamonu-TURKEY***Corresponding Author:** ngultepe@kastamonu.edu.tr

Abstract: The aim of the study, investigation of the essential oil of seed of palm (*Phoneix dactylifera*) grown in from Libya.

Palm seed were collected from Libya. The essential oil was obtained from crushed seed by hydro-distillation, using a Clevenger system with 150 g dry seed material and 1500 mL water. The oil was obtained after 3 h of distillation at boiling temperature and stored at 4 ± 1 °C in airtight glass vials covered with aluminum foil. The gas chromatography–mass spectrophotometry (GC–MS) analysis of the obtained essential oil was conducted at the Kastamonu University Center Research Laboratory Application and Research Center by using a Shimadzu GCMS QP 2010 ULTRA.

Essential analyses of the palm seed results show that, 50 compounds were found both aroma and fatty methyl esters (FAMEs) analyses. 21 of these 50 compounds at the FAMEs analysis, and also 18 of 50 compounds at the aroma analysis could not be determined with data library. The highest amount of compounds was found methyl stearate (48.70%) in the FAMEs analysis. The highest amount of compounds was found β -citronellol (31.70%) in the aroma analysis.

According to the study results, essential oil of the palm seed can be used in both cosmetic industry and pest control.

Keywords: *Phoneix dactylifera*, Palm Seed, Essential Oil, Methyl Stearate, Citronellol



Determination of the Secondary Metabolite Production Potential of Marine-Derived Actinomycetes by Molecular Techniques

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Abstract: Actinomycetes are gram positive bacteria with high G+C content and they are known for their capacity to produce novel compounds that have important biological activity. Many actinomycetes group especially *Streptomyces* are active secondary metabolite producers. Actinomycetes are abundant in the soil although they are found in various habitats. But over time the same active compounds have begun to be repeatedly isolated from the bacteria. This has led to a reduction in the discovery of new natural products from microorganisms. Just because of this, scientists have focused on actinomycetes isolation from different sources. Marine ecosystems are among the world's richest habitats and are expected to be excellent sampling points due to microbial diversity in sea water and sediments. Studies have shown that marine actinobacteria species differ physiologically and phylogenetically from terrestrial relatives and are a rich source of new, chemically versatile bioactive secondary metabolites that have potential applications in antimicrobial and anticancer therapy. Surveys for natural products from marine actinomycetes have proven to be tremendous potential for sea strains as producers of biologically active secondary metabolites, even at an early stage when compared to terrestrial relatives. Various natural products belong to the polyketide and non-ribosomal peptide chemical families. Polyketide synthases (PKS) and non-ribosomal peptide synthetases (NRPS) are multi-domain megasynthetases that are involved in the biosynthesis of a large group of different microbial natural products, known as polyketides and non-ribosomal peptides, respectively. In addition, the method of screening the PKS and NRPS gene region on the genome can be used to identify bioactive secondary compounds. Actinobacteria derived from the sea also has PKS and NRPS pathways for the production of secondary metabolites. Therefore, marine-derived actinomycetes have the ability to produce various compounds such as terpenes, terpenoids, polyketides, peptides, caprolactones, quinones and alkaloids.

As a result, molecular techniques with the suitable primers targeting the PKS and NRPS gene regions can be used to determine the secondary metabolite production capacity of an actinomycete.

Keywords: Actinomycetes, NRPS, PKS, Secondary Metabolite, Screening



The Effect of the Features of Time, Frequency and Time-Frequency Domain on the Performance of Classification

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Abstract: Emotion estimation from brain signals (Electroencephalography, EEG) is one of the most important issues with regard to directly evaluating inwardness of a user for human-machine interaction. There are various methodologies for extracting valuable features from these signals in Time, Frequency and Time-Frequency Domain. In this study, the effect of the features obtained from these 3 different domains, on the performance of emotion estimation is investigated. For this purpose, 330 samples of EEG signal, which are collected from an experiment using 256 channels with a sampling frequency of 256 Hz, are used. 22 participants, including 13 male and 9 female, are used in this experiment, in which emotion evaluations of these participants were taken into account and the signals indicating brain activations were recorded at intervals of three seconds for 15 different emotions. After making the participants listen to emotional voice recordings, they were asked to remember an emotional event or an emotion they had experienced before. Considering the studies in literature, 16 of 256 channels, in which emotion is observed, are selected for feature extraction process. Statistical metrics, including power, mean, standard deviation, 1st and 2nd difference, and Hjorth parameters are used in Time Domain; Short Time Frequency Transform (STFT) is used in Frequency Domain, while Hilbert-Huang Transform and Wavelet Transform are used in Time-Frequency Domain for the purpose of feature extraction. As a result of classification, the performance increase of 76.66%, 96.36%, and 93.63% are yield in Time, Frequency, and Time-Frequency Domain, respectively. Particularly, the effect of the features of Frequency Domain on the performance of classification is significant.

Keywords: EEG, Feature Extraction, Time Features, Frequency Features, Time-Frequency Features



Big Data Processing with Different OLAP Approaches

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Abstract: An organization should be able to manage, analyse and prepare large volumes of data to gain competitive advantages. From this point of view, data warehouses help organizations with both analytical databases and OLAP tools in decision support. Besides, an OLAP data is a large data class with information-rich content. These types of dimensional data analysis techniques allow big data analysts to identify the anomalies in data and to understand the structure of big data sets. Therefore, OLAP is a system that is used frequently and is supported by many companies as decision mechanism in database systems. The ever-growing amount and variety of data have led to the need for more OLAP usage in data analysis. For the stage of designing data warehouse cubes, there are different OLAP approaches for different usage purposes. OLAP approaches such as MOLAP (Multidimensional Online Analysis Processing), which is made by extracting data completely through the database of the analysis server, and ROLAP (Relational Online Analysis Processing), which is done by retrieving queries through the relational database, are used. HOLAP (Hybrid Online Analysis Processing) combines the advantages of these two approaches; aggregate data is stored on analysis server, and detailed data is stored on database resource. In this study, the differences between OLAP and OLAP approaches are investigated under the titles of storage, data form, query analysis, and access. We have used AdventureWorksDW, which is a publicly shared data warehouse. This data warehouse has been questioned about which OLAP approach will be more efficient in which case. As a result of these comparisons, while MOLAP stands out in excellent performance and complex calculations, ROLAP steps forward especially for processing large amounts of data.

Keywords: OLAP, MOLAP, ROLAP, HOLAP, Big Data, Data Warehouse



A New Wideband Microstrip Patch Antenna Design and Investigation

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Abstract: In recent years, the development of wireless and mobile communication has necessitated the development of the design of suitable antennas with particularly low return loss and high bandwidth. Between the bands in mobile systems used in home, office and industrial applications; The ISM (Industrial, Scientific and Medical) band covering 2400-2485 MHz is the most widely used. The general name of the WLAN (Wireless Local Area Network) standard, which is the wireless network developed by the IEEE (Institute of Electrical and Electronics Engineers) is IEEE 802.11 and the wireless local area network standard operating in the ISM 2.4 GHz band is defined as IEEE 802.11b and IEEE 802.11g. Although there are differences, basically, the 802.11 family uses the same communication rules, in wireless network communication, it is necessary to design suitable antennas with miniature size, especially with low return loss and high bandwidth, in order to increase the data volume and to ensure the data transmission is continuous and fast. For this purpose, microstrip patch antennas are preferred because they have advantages such as easy production, small volume and light weight, low production cost. When patch antennas in the literature are compared according to their bandwidth, those microstrip transmissin feed with slots have been observed to have higher bandwidth characteristics, lower transmission loss and higher insulation characteristics between higher radiation element and feed. In this study, it is planned to propose a new patch antenna with slots covering ISM band (2400-2480 MHz) in order to increase bandwidth and power gain. Simulation analysis of the proposed design will be implemented in CST Microwave Studio commercial software. The reflection coefficient of the antenna, radiation pattern, power gain and surface current distribution performance will be analyzed. In our laboratory, the antenna production will be performed and the reflection coefficients will be measured. It is expected that the results will be consistent when the measurement results are compared with the analysis results.

Keywords: Microstrip Patch Antenna, Wideband, CST Microwave Studio, Reflection Coefficients, Antenna Gain



A New Ultra-Wideband Frequency Selective Surface Design

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Abstract: Millimeter wave is the band of radio spectrum between 30 GHz and 300 GHz that can be used for high-speed broadband access. The millimeter-waves has been increasingly important in the field of wireless communications, radar, remote sensing technology and radio astronomy. Mostly FSS are designed for narrow band frequencies. This study aimed to propose a new single layered ultrawide-band (UWB) frequency selective surface (FSS) for V- band (40-75 GHz) millimeter-wave applications. Proposed FSS structure consists of a conventional square loop and four separate line added each side of the square loop. It seems like lines rotated 90 degrees on face to obtain F-shape on single layered of the low-cost FR-4 fiberglass dielectric substrate. Finally, it seems like four F shapes rotated 90 degrees and mounted on substrate. A numerical analysis of transmission properties of the designed UWB FSS was performed through simulations using CST Microwave Studio commercial software. Transmission coefficients are obtained and it has been observed that the proposed design exhibits a broad stop-band of 47.36 GHz, from 32.08 to 79.44, The maximum rejection performance with normal incidence was measured as 66 dB at 53.84 GHz. Along with that its symmetric structure provides polarization independent nature. The CST Microwave Studio simulation results show that the proposed FSS structure has a bandwidth (BW) of 87.9% from 32.08 to 79.44 GHz. The single layered miniaturized geometry and wide stop band nature are the advantage of this FSS. The proposed FSS filter can be used in numerous mm-wave applications where system protection is required.

Keywords: Frequency Selective Surfaces, Ultra-Wideband, CST Microwave Studio, V-Band Applications, Stop-Band



Terahertz Intersubband Photodetectors Based on GaN/AlGa_N Materials

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Abstract: We report the development of terahertz quantum well photodetectors based on intersubband transitions in GaN/AlGa_N heterostructures, covering the frequency range that is fundamentally inaccessible to existing Arsenide-based devices due to Reststrahlen absorption. In this work, two different approaches have been implemented to reduce the deleterious effects on the intrinsic polarization fields of nitride-based materials. The first approach is to employ a suitable double step quantum wells on a c-plane GaN materials, which is more convenient from the materials perspective. The second approach is to grow GaN/AlGa_N heterostructures on a semi-polar GaN substrate as a host material to reduce the internal polarization fields effectively, which is more convenient from the design perspective. We have experimentally confirmed that based on these two approaches the total internal polarization fields that complicate the device design and growth, can be reduced or eliminated effectively in nitride-based devices. Electrical characteristics of the associated devices indicate a significant decrease in dark current with decreasing temperature especially the device grown on semi-polar substrate. The symmetric behavior in current-voltage characteristics have suggested that the quantum wells are nearly in a rectangular shape which confirms the absence of internal electrical fields. The photocurrent spectra of the two devices overlap with the reststrahlen band of GaAs and also the device grown on semi-polar substrate indicates narrower bandwidth than the device grown on c-plane (polar plane), which is due to reduced scattering at the interfacial layers. Promising results are obtained with both approaches, which could be extended to other device applications as a way to utilize the intrinsic advantages of nitride semiconductors for THz intersubband optoelectronics. The same materials platform is also promising for the development of THz quantum cascade emitter with possibility of room temperature operation.

Keywords: Photodetectors, Intersubband Transitions, Quantum Wells, Terahertz Detectors



Encapsulation of Tomato Peel Extract into Zein Nanofibers by Electrospinning

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Abstract: The processing of tomatoes generates significant amounts of tomato waste (seeds, skins, and pulp) which is usually used for animal feeds or similar areas having low economic value. However, tomato waste, especially skin, is a rich source of antioxidant compounds, including carotenoids mainly in the form of lycopene. Tomato carotenoids are generally intended for use as natural food colorants and antioxidant in a wide variety of food areas. They can be also used as food supplement providing many health benefits. However, it is difficult to incorporate the carotenoids into different food formulations because they are insoluble in water and relatively unstable in food systems. Fortunately, encapsulation of the carotenoids can be an efficient way in order to stabilize and preserve them from deterioration during processing.

In this study, it was aimed to increase thermal stability of carotenoids, extracted from tomato peel (TP), and to improve their antioxidant activities by encapsulating them into zein nanofibers by electrospinning. Composite zein nanofibers containing the carotenoid extract was successfully produced by electrospinning with above 90% encapsulation efficiency. The TP extract-loaded fibers did not show different morphology from the zein fibers without the extract. All nanofibers were bead-free, smooth, and homogeneously distributed. The FTIR results also showed the compatibility of the encapsulated extract with zein fibers. The DSC thermograms indicated that the crystalline structure of the carotenoid extract had turned to the amorphous state in zein fiber and its thermal stability performance was improved by retarding the degradation temperature of it from 242.0 °C to 261.9 °C. Moreover, the nanoencapsulation of the extract into nanofibers significantly ($p < 0.05$) increased the antioxidant activity of the extract about 5 times. This study showed that nanoencapsulation by electrospinning is an effective way to stabilize carotenoids and use them in food systems.

Keywords: Nanofiber, Electrospinning, Zein, Encapsulation, Carotenoids, Tomato Peel



Convective Drying Characteristics, Kinetics and Some Properties of Apple Slices

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Abstract: Convective drying characteristics, kinetics, modeling, energy consumption, color and rehydration properties were investigated for apple slices. Drying process was performed by use of a domestic dehydrator at 50, 60 and 70 °C air temperatures and 0.5 m/s air velocity. The drying continued until the moisture content of apple slices reached to 20% from 86.3% (wet basis, w.b). Drying time required to reach final moisture content of apple slices were 280, 340 and 480 min for 70, 60 and 50 °C, respectively. Constant rate period was not observed and drying entirely occurred in falling rate period. In order to describe drying behavior of apple slices nine semi-theoretical models were applied. The best model was determined by according to the highest coefficient of determination (R^2) and the lowest chi-square (χ^2) and root mean square error (RMSE). In this concept, the modified logistic model fitted the best our experimental data ($R^2 = 0.9993-0.9997$; $\chi^2 = 5.25 \times 10^{-5}-1.20 \times 10^{-4}$ and RMSE = 0.0055–0.0080). The effective moisture diffusivity (D_{eff}) values were calculated by Fick's second law and ranged from 2.34×10^{-9} to 3.94×10^{-9} . The activation energy (E_a) values were calculated by use of D_{eff} and the rate constant of the best model (k) and found 20.92 kJ/mol and 24.20 kJ/mol, respectively. Energy consumption and specific energy requirement of the drying of apple slices decreased and energy efficiency of the drying system increased with increasing air temperature. Color values of apple slices were generally preserved after drying process. Total color difference (ΔE) values were found less than 10. Rehydration capacity of dried apple slices increased with drying temperature and reached to almost stable approximately 240 min of rehydration process.

Keywords: Apple Slice, Dehydrator, Modified Logistic Model, Activation Energy, Color, Rehydration Capacity



The Effect of Drying Conditions on Drying Kinetics, Characteristics, Total Phenolics Content, Antioxidant Capacity, Lycopene Content and Color Properties of Tomato Slices

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Abstract: Effect of convectional drying (50, 60 and 70 °C air temperatures and 0.5 m/s air velocity) on drying characteristics, kinetics, modeling, effective moisture diffusivity, activation energy, total phenolics content (TPC), antioxidant capacity (AOC), lycopene content and color properties of tomato slices were investigated. Drying time of tomato slices decreased with increase in air temperature. Because mass and heat transfer within the samples were rapid during higher air temperatures. The time required to dry tomato slices from initial moisture content of 95% to final moisture content of 20% was 520, 690 and 1080 min for 70, 60 and 50 °C, respectively. Drying rate increased with increase in air temperature. Constant rate period was not observed and drying took place in falling rate period. This probably indicated that the dominant mechanism was diffusion during the drying. Nine semi-theoretical models were used for describing the drying behavior of tomato slices. The modified logistic model was the best model to fit our experimental data because the highest coefficient of determination (R^2 ; 0.9992-0.9999) and the lowest chi-square (χ^2 ; 8.57×10^{-6} - 1.28×10^{-4}) and root mean square error (RMSE; 0.0024-0.0095) were obtained among the evaluated models. Effective moisture diffusivity (D_{eff}) increased with increasing air temperature and ranged from 6.69×10^{-10} to 1.56×10^{-9} m²/s. Activation energy (E_a) values calculated according to the Arrhenius equation by using both D_{eff} and the best model rate constant (k). TPC and lycopene content of tomato slices decreased after drying treatments. However, the degradation ratio decreased with increase in air temperature. On the other hand, AOC of tomato slices increased after drying treatment. Color values were measured and evaluated according to CIELAB system. L^* , a^* and b^* values of dried tomato slices were generally same with fresh ones means that the color properties were preserved after drying.

Keywords: Convectional Drying, Tomato Slices, Modified Logistic Model, TPC, AOC, Lycopene Content, Color



Process Simulation and Economic Evaluation of Bioethanol Production from Industrial Food Wastes

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Abstract: The increase in energy demand and the environmental effects of fossil-based energies are at the forefront of fundamental problems threatening our earth. Therefore, interest in renewable energy sources is increasing every day. Bioethanol production is at the forefront of current issues. As a result of the industrial processes of carbohydrate-containing foods, it is also accompanied by a considerable amount of waste, which is the environmental impact. The most important of these wastes are sugar beet molasses and citrus waste. Process simulation is a tool used for the development, modeling and optimization of production stages. Process simulation software is software that identifies the processes that involve the flow of products and their production stages, solves the mass-energy balances for an appropriate operation, and performs their economic analyzes. Purpose of process simulation software; to ensure that the most suitable production conditions are available for the process being worked on. The effects of all variables of the production process on energy, mass and economic outcomes are analyzed. Simulation results in the optimization and modeling of these variables. In this study, techno-economic analysis bioethanol from industrial food waste was studied by using Superpro Designer process simulation software. The proposed process flowsheet was analyzed and the results from the techno-economic analysis were presented. In addition, results obtained from techno-economic analysis are included in this study. In the economic analyzes, the parameters such as unit investment cost, unit production cost, payback time, net present value and break even points were obtained. Sensitivity analyzes were carried out using Taguchi's experimental design, while the economic and process parameters of bioethanol production were the effects on profitability.

Keywords: Food Waste, Simulation, Economy, Bioethanol, Environment



Valorization of Pistachio (*Pistacia vera* L.) Hull by Extraction of Bioactive Compounds: Comparison between Conventional and Microwave-Assisted Extraction

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Abstract: Pistachio nut (*Pistacia vera* L.) is one of the tree nuts that are widely consumed due to its health-related benefits, sensorial and nutritive properties. Pistachio nuts consist of hull surrounding the nut shell, which is one of the major by-products of pistachio industry. Pistachio hull is removed by dehulling process during the industrial post-harvest processing of pistachios and accumulated in large volumes. If not processed further, this by-product can lead to environmental pollution and waste management problems. In this study, bioactive compounds were extracted from pistachio hull by using microwave-assisted solvent extraction (MASE). The effects of four parameters, microwave power, extraction time, solvent to sample ratio and ethanol concentration, were evaluated. The extraction conditions were optimized by response surface methodology to enhance the extraction of phenolic compounds. The optimum conditions were found to be microwave power of 140 W, extraction time of 4.5 min, solvent to sample ratio of 19 (v/w) and ethanol concentration of 56%. The total phenolic content (TPC) was 62.24 ± 0.92 mg GAE/g dry hull under the optimum conditions. Furthermore, the MASE was compared with conventional solvent extraction (CSE) and the results showed that the MASE gave a higher TPC (62.24 ± 0.92 mg GAE/g dry hull), yield (51.67%) and stronger antioxidant activity with the IC_{50} value of 1.06 mg extract/mL while these values were 48.35 mg GAE/g dry hull, 42.85% and 1.59 mg extract/mL, respectively, for CSE. The overall results indicated that MASE can be a good alternative to CSE and the presented study contributes to valorization of pistachio hull as a source of value-added products to be used as ingredients in functional foods, pharmaceuticals and cosmetics.

Keywords: Pistachio Hull, Microwave-Assisted Solvent Extraction, Response Surface Methodology, Conventional Solvent Extraction, Bioactive Compounds



Physicochemical Analysis of Surface Waters in Gümüşhane (NE Turkey) for Assessment of Water Quality

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Abstract: Water, which is consumed for many purposes, has a vital importance for survival of living organisms. Therefore, water is clearly one of our most valuable resources. Unfortunately, the world's clean water resources are steadily declining due to increasing population and rapid industrialization. Protection of clean water resources should be a common task for everyone.

Surface waters are generally affected by environmental pollution, both anthropogenic and geologic origin. Gümüşhane, one of the Turkey's mining areas, has rich mineral deposits. The surface waters are likely to be contaminated by some of heavy metals present in these areas. In addition, anthropogenic activities around the surface waters also contribute to pollution. For this reason, the water quality must be constantly monitored in order to determine the extent of the pollution resulting from these activities.

In this sense, a study was conducted to find out extent of possible anthropogenic and geologic pollution in surface waters of Gümüşhane. Surface water samples were taken twice from 39 sampling points (Gökdere-Beyçam and Kelkit Road Valleys) in 2017 for two terms (Spring and Fall). Physicochemical parameters of water quality, such as temperature, pH, conductivity, nitrite, nitrate, total phosphorus, sulfate, ammonium, total hardness, dissolved oxygen, total dissolved solids, salinity, total alkalinity, chloride and some metals were analyzed, and the results discussed. In addition, a critical evaluation was made by comparing the obtained results with the worldwide limit values recommended by Turkish Standard (TS) 266, World Health Organization (WHO) guidelines and Environmental Protection Agency (EPA).

Since the weather was quite dry during the second season, some streams were either completely dried or their flow rates were too low. Due to the evaporation of water in the dry season, the contents of the water samples taken in the second term were found to be higher than those of the first term. As a result, it has been determined that the surface waters under investigation are subject to both anthropogenic and geological contamination in terms of some water quality parameters.

Keywords: Water Quality, Surface Water, Gümüşhane, Mining Area, Pollution



ORAL PRESENTATION

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Investigation of Phenolic Compounds, Antioxidants and Aroma Properties of Noodles Enriched with Flaxseed

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Abstract: In this study, phenolic compounds, antioxidants and aroma characteristics of noodles enriched with flaxseed were investigated. Flaxseed was added into the noodle dough at three different concentrations (0, 10, 15 and 20%). After shaping, the samples were dried and analyses were conducted. Phenolic compounds content of samples increased significantly with the addition of flaxseed flour ($P < 0.05$). Phenolic matter contents of the samples were in the range of 58.09-109.13 mg/100g and the highest Phenolic compounds was found at 20% flaxseed level. Antioxidant contents of noodles increased significantly with addition of flaxseed flour ($P < 0.05$). Maximum antioxidant value was determined to be 536.25 mg/100g in the noodle sample enriched with 20% flaxseed while the antioxidant value of control was 300.50 mg/100g. Aroma contents of noodles increased with the addition of flaxseed flour. Aroma matter contents of the samples were in the range of 23-62 and the lowest and the highest aroma compounds were found at 0 (control) and 20% flaxseed level, respectively. The noodle could be produced with using flaxseed and thus the new noodle was the healthier and alternative products for the consumers.

Keywords: Noodle, Flaxseed, Phenolic Compounds, Antioxidants, Aroma Profile Analysis



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Issues to be Considered in Statistics Applications

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Abstract: This paper summarizes the subject of statistics and discusses what features data sets must have in order to be a subject matter of statistics. The paper emphasizes the concept of modeling in science and explains with examples that events, which are not a subject of deterministic models, are a subject of statistics. The purpose of this paper is to remind researchers the issues that need to be considered in using statistical methods. Statistical methods are needed during the setting up, implementation and result evaluation of a test. Failing to consult with a statistician while setting up a test but bringing the results after the test's completion often causes an inextricable knot of problems.

Keywords: Statistical Methods, Statistical Data, Abuse and Misunderstanding of Statistical Methods

**Effect of Different Plant Densities on Organic Cucumber Cultivation in the Greenhouse**

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Abstract: This study was carried out to determine the effects of different plant densities (1.67, 1.11, 2.38, 2.05, 3.09, 2.37, 1.93 and 2.67 plants m⁻²) on leaf characteristics and yield of organic tomato cultivation in the greenhouse. The study was conducted during the first season period in the unheated greenhouses of the Ondokuz Mayıs University Agriculture Faculty and 8 planting systems were carried out to obtain different plant densities. In the planting systems, two single row of plantings (150 cm between rows, 40 and 60 cm on rows), two double row plantings (40 cm between rows, 65 and 80 cm on the rows), three triangular plantings (40 cm between rows, 50, 65 and 80 cm on rows) and for control purposes a standard double row planting system (40 cm between rows and 50 cm on the rows) was applied. In the research, when the leaf characteristics were determined as leaf chlorophyll content (CCI), leaf stoma conductance (mmol m⁻²s⁻¹) and mean leaf area (cm²), the yield values were determined as yield per plant (kg m⁻²) and total yield (ton/da). According to the obtained results, the highest chlorophyll content and leaf stomatal conductance were obtained from single planting application with plant density of 1.67 plant m⁻². Leaf stoma conductance ranged from 0.64 to 5.81 mmol/m², leaf chlorophyll content ranged from 11.76 to 18.62 cc1 and mean leaf area ranged from 107.64 to 216.6 cm². The highest yields were obtained from plants with a triangle planting system and a plant density of 1.93 plants/m². As a result, it was determined that the plant density significantly affected some leaf properties and yield values of cucumber that grown in greenhouse organically (P < 0.05) and it is determined that the triangle planting system applied as 40 cm between rows and 80 cm on the row is the most suitable planting system.

Keywords: Planting Patterns, Leaf Chlorophyll Content, Stomatal Conductivity, Leaf Area, Yield



Chemical Composition and Bioactive Properties of the Essential oil of *Digitalis ferruginea* subsp. *ferruginea*

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Abstract: Members of *Digitalis* show distribution in Europe, Western Asia and Mediterranean region. Flower, leaf and stem in *Digitalis ferruginea* have poisonous characteristics. However, all parts of some *Digitalis* species used as folk remedies in Turkey.

This study aimed the chemical composition of *Digitalis ferruginea* subsp. *ferruginea* found in Turkey and the antimicrobial, antioxidant and antifungal properties of its volatile oil.

The chemical composition of the essential oil obtained from the dried aerial parts of *Digitalis ferruginea* subsp. *ferruginea* was analyzed by GC-FID/MS. The chromatographic column used for the analysis was a HP-5MS capillary column. Fifty five components have been identified in the volatile oil of *D. ferruginea*. The major compounds of essential oil were hexadecanoic acid (34.45%), 6,10,14-Trimethyl-2-pentadecanone (6.71%) and 3-Ethyl-4-methylpentanol (3.51%). The constituent of oil was identified by comparison of their mass spectra with those of mass spectral libraries (NIST and Wiley 7NL) and literature data. The antimicrobial activity of the essential oil was also investigated and it showed moderate antimicrobial and antifungal activities. The essential oil extracts of plant showed antibacterial activity against *B.cereus*, *E.coli* and *S. aureus* in the 500 and 1000 ppm concentrations. The amount of total phenolic and DPPH reducing activity quantified essential oil in *P. D. ferruginea* were found as 356.8 GGA/L and % 31.28% respectively.

Keywords: *Digitalis ferruginea* subsp. *ferruginea*, Antimicrobial and Antioxidant Activity, Essential Oil, GC-FID/MS, Hexadecanoic Acid



The Effect of Rosemary Extract (*Rosmarinus Officinalis*) on Carbon Tetrachloride Induced Acute and Chronic Hepatic Damage

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Abstract: The aim of this study is to investigate the hepatoprotective role of rosemary extract (RE) (*Rosmarinus officinalis*) on histological structure, some biochemical parameters and lipid peroxidation on acute and chronic liver injury induced by carbon tetrachloride (CCl₄) in rats.

Study material consisted of 80 Wistar albino rats including 40 rats for acute and 40 rats for chronic period. Hematoxylin-eosin stained sections with steatosis, inflammation, necrosis and fibrosis were evaluated semiquantitatively. Serum AST, ALT and ALP enzyme activities and glucose, triglyceride, total cholesterol, HDL-cholesterol, LDL-cholesterol, total protein, albumin and liver MDA and NO levels were measured.

Acute and chronic control and RE group livers showed normal architecture but in the acute CCl₄ treated group, an intensive macro and microvesicular steatosis, mononuclear inflammatory cell infiltrations in portal area and parenchyma, and necrotic alterations; in the chronic group additionally to acute findings mild to severe fibrosis with lobulation formation were observed. In both study periods it was shown that administration of RE did not change liver damage parameters caused by CCl₄ (P >0.05).

The results suggest that administration of RE has no effect on the recovery of liver tissue damage or histopathological changes and biochemical parameters induced by CCl₄ in acute and chronic period.

The experiments were carried out in accordance with the guidelines for animal experimentation approved by Erciyes University, Experimental Animal Ethics Committee (permit no: 11/59).

Keywords: Biochemistry, Carbon tetrachloride, Histopathology, *Rosmarinus officinalis*, Rat



The Effect of Pumpkin Seed Oil on Caspase Activity in Carbon Tetrachloride Induced Chronic Hepatotoxicity in Rats

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Abstract: In the present study, the protective effect of pumpkin seed oil (PSO) on hepatic malondialdehyde (MDA), superoxide dismutase (SOD), and glutathione peroxidase (GPx), serum alanine aminotransferase (ALT), vitamin E, plasma 8-hydroxy-2'-deoxyguanosine (8-OHdG) and apoptosis in rats treated with carbon tetrachloride (CCl₄) was investigated. Eight experimental groups of ten rat each were constructed: a control group (group I) received 0,9% NaCl (1.0mL/kg) only; groups II-IV received PSO dose of 1, 2 ve 3 mL/kg, respectively; a CCl₄ group (group V) received intraperitoneal (i.p.) dose of CCl₄ (0.2 mL/kg b.w) twice a week for 8 weeks; Groups VI-VII received i.p dose of CCl₄ 0.2 mL/kg twice a week and simultaneously oral dose of PSO at 1, 2 ve 3 mL/kg, respectively for 8 weeks. Livers from animals administered only PSO (Groups III-IV) and control group (Group I) showed a normal histological architecture. Liver tissue in rats treated with CCl₄ revealed intensive liver damage, characterized by macro- and micro vesicular lipid vacuoles in the hepatocytes, lymphocyte-rich cell infiltrations around the portal area and moderate to severe fibrosis. Hepatosteosis and caspase 3, 8 and 9 activities in the CCl₄+2 and 3 ml/kg PSO groups were decreased partially when in the CCl₄+1 mL/kg PSO group were similar compared to the CCl₄ group.

Administration at a dose of 2 and 3 mL/kg PSO on CCl₄ treated groups, caused a significant elevation in vitamin E, SOD and GPx activity with a significant decrease in ALT activities and insignificant decrease in MDA levels. While administration at a dose of 1 mL/kg PSO has no effect, 2 and 3 mL/kg PSO showed partially ameliorative effect on biochemical and lipid peroxidation parameters. Nevertheless, dose- and duration- dependent further investigations need to be performed to understand the dose that produces the best result without any side effect. The experiments were carried out in accordance with the guidelines for animal experimentation approved by Erciyes University, Experimental Animal Ethics Committee (permit no: 16/52).

Keywords: Carbon tetrachloride, Histopathology, Immunohistochemistry, Pumpkin Seed Oil, Rat



Myxozoan Parasites of Some Teleost Fishes in the Black Sea

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Abstract: Myxozoan parasites of both freshwater and marine fishes include about 2200 identified nominal species so far. Members of the genera *Ceratomyxa* and *Myxobolus* are generally coelozoic in marine fishes and rarely histozoic in freshwater fishes while members of *Fabespora* and *Sinuolinea* are typically coelozoic in marine fishes. On the other hand, parasites belonging to the genus *Myxidium* are coelozoic, rarely histozoic parasites in marine and freshwater fishes.

In the present study, a parasitological survey on myxosporean fauna of annular seabream *Diplodus annularis* (n:55), black scorpionfish *Scorpaena porcus* (n:103), common sole *Solea solea* (n:55) and European flounder *Platichthys flesus* (n:2) was conducted by conventional methods on fish samples collected from Sinop coasts of Black Sea. Gills, fins, skin, urinary bladder, kidney, gall bladder, intestine and gonads were examined using a phase contrast Olympus microscope (BX53) equipped with a digital camera (DP50) and DIC attachment.

A total of five myxosporean species belonging to 5 genera have been identified from investigated fish species and they were *Ceratomyxa elegans* in the gall bladder of *S. porcus*; *Ceratomyxa* sp. in the gall bladder and *Sinuolinea rebae* in the muscle of *S. solea*; *Fabespora nana* and *Myxidium gadi* in the gall bladder of *P. flesus* and *Myxobolus muelleri* in the kidney of *D. annularis*. The prevalence of infection and the intensity of each parasite species were also determined, their morphometric characteristics were measured and morphological peculiarities were illustrated in detail.

This research study makes more contributions to our current and limited knowledge on the myxozoan parasites of fish in Turkish coastal area of the Black Sea by recording *F. nana* and *M. gadi* on their new host species as well as *S. rebae* in the muscle of *S. solea* for the first time.

Keywords: Myxozoa, Myxospora, Fish, Sinop, Black Sea



Current Status of Myxosporean (Cnidaria: Myxozoa) Parasites of Marine and Freshwater Fishes in Turkey

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Abstract: Myxozoan parasites of fishes have a cosmopolitan distribution worldwide and myxosporean infections occur in a wide range of both marine and freshwater fish species. A total of about 2400 nominal species classified to 64 genera and 17 families. Myxosporea represent a major group of fish parasites and their impact on wild and cultured fish is significant. The majority of species are located in skeletal muscle, but also other target tissues in the gills, brain, heart, kidney, spleen, ovary, gall bladder, urinary bladder, oesophagus, intestine, mesentery, and smooth muscle. Heavy infections with some *Kudoa* species have been reported to be the cause of post-harvest soft flesh in fish meat creating serious economic losses for the fisheries industry. In some recent studies, one *Kudoa* species has been reported to be the causative agent of novel food poisoning outbreaks by consumption of infected raw fish in Japan and Korea. Moreover, some species, such as *Enteromyxum leii*, are also known to be highly pathogenic in mariculture. However, studies on this parasite phylum is scarce in Turkey and, in recent years, a significant increase has occurred in the number of myxosporean parasite species infecting especially marine fish in Turkish coastal areas.

This study investigated aimed to provide insights on the current status of Turkish myxosporean fauna and make comparisons on how host and tissue specific occurrences recorded when compared with the current literature on this significant parasite group. Thus far, a total of 36 myxosporean parasite species has been identified from 25 fish species from mostly marine environment of Turkey. Tissue specificity is a very well-known issue in myxosporean parasites and the occurrences of identified species in Turkey indicated that several parasite species belonging to some families preferred either kidney, urinary bladder, gall bladder, muscle, gills or lower jaw of their hosts. When their occurrences either in marine and freshwater environments considered, recent studies in the Black Sea fishes dominated the number of identified parasites in Turkey.

This study is the first to provide a comprehensive and detailed data on the current status of the myxosporean parasite fauna of fishes in Turkey. Considering the vast amount of marine and freshwater fish species and the culture potential of some species Turkey, it is very significant to conduct more studies on cultured fish species as well as wild ones to reveal the actual fauna of this significant group of fish parasites. Recent studies yielding new myxosporean species identifications in in fish species in our country also support the need for further studies.

Keywords: Myxozoa, Kudoa, Fauna, Fish, Turkey



Infections of *Ortholinea mullusi* and *Myxobolus* sp. (Cnidaria: Myxozoa) in *Mullus barbatus* (Mullidae)

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Abstract: The red mullet *Mullus barbatus* is a teleost fish of great economic value in the Mediterranean Sea and the Black Sea including Turkish coastal areas. Myxozoan parasites are obligate parasitic cnidarians with more than 2400 species from marine and freshwater fish worldwide. The genus *Myxobolus* is the largest within the myxozoan fish parasites with more than 900 species reported mostly from freshwater fishes. On the other hand, the genus *Ortholinea* comprises a total of only 22 nominal species which are mostly coelozoic in the excretory system of mainly marine fishes.

In the present study, a total of 215 red mullet were collected from the coastal zone of Sinop in the Black Sea, Turkey. Gills, fins, skin, urinary bladder, kidney tubules, gall bladder, intestine and gonads were examined for myxozoan parasites. Overall infection prevalence and intensity values of parasites were determined, their occurrences in relation with host length classes were also calculated. We have found two myxozoan parasites *Ortholinea mullusi* found in the kidney tubules and urinary bladder and *Myxobolus* sp. infecting only kidney tubules *Mullus barbatus*. Both parasite species were also found co-existed in kidney tubules of host fish. The prevalence of infection and intensity levels of *O. mullusi* in kidney tubules and urinary bladder were 23.3% and 3, respectively, while these values for *Myxobolus* sp. in kidney tubules were 23.3% and 1+, respectively. Both parasite species also co-existed with the prevalence value of 1.4% and intensity of 1+ only in the kidney tubules of *M. barbatus*. Gradual decreases in the prevalence of infections of both parasite species were determined as the length classes of fish increased. However, intensity of infections of both parasite species were similar at all length classes of fish.

This study is the first to provide a detailed infection levels of two recently described parasite species in *M. barbatus* and it is clear that more studies are needed to reveal actual myxosporean parasite – fish host related infections in the Black Sea.

Keywords: *Ortholinea mullusi*, *Myxobolus*, *Mullus barbatus*, Sinop, Black Sea.



How to Calculate Institutional Carbon Footprint: A Theoretical Study

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Abstract: The most important actors in global warming and climate change that starting with the industrial revolution are CO₂ and 5 other greenhouse gases recognized by the Kyoto Protocol. Greenhouse gases arising from rapidly developing industrialization have brought global climate change. Climate change, on the other hand, negatively affects life in the world. The nations of the world who are aware of the danger that threatens life on the earth have begun to take measures against global warming. In this context, the United Nations Framework Convention on Climate Change was signed and the Kyoto Protocol was signed to reduce emissions of greenhouse gases. Under the agreement, developed countries committed to reduce greenhouse gas emissions by 5% compared to 1990. Depending on the contracts and protocols signed, a number of standards have been released to regulate the calculation and trading of greenhouse gas emissions. The PAS 2050 standard used in product carbon footprint calculation and the ISO 14064 standard used in the carbon footprint calculation of institutions are the most preferred ones. In greenhouse gas emission calculations, there are three comprehensive calculations for activities that directly affect the company's greenhouse gas emissions in order to obtain the healthiest and detailed result, activities resulting from the services or product purchases that the institution carries out and activities related to greenhouse gas emissions with the literature studies done. Based on the calendar year or fiscal year, it is important to calculate the corporate carbon footprint in order to make the calculation more accurate and accurate. Knowing the carbon footprint of institutions is important for the measures to control greenhouse gases arising from their activities. The purpose of this study is to calculate the adverse effects of climate change caused by greenhouse gases on the atmosphere as the institutions perform their activities. By introducing the calculation methods of "carbon footprints" originating from this negative effect; is to discuss the downsizing strategies and prejudice of the carbon footprint at the institutional level.

Keywords: Climate Change, Kyoto Protocol, Carbon Footprint, Institutional Calculation



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Turkey's Longest Trekking Route Project: Extended Independence Route

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Abstract: Tourism, today to increase the livelihood and quality of life using the socio-economic engine and is used by many countries such as Turkey as an important tool in raising the prosperity and ultimately aims to reduce poverty and grow in this way. Although it was founded in 1963 in Turkey Ministry of Tourism, easy and inexpensive access to resources developed specifically targeted incentive systems have been tried to increase the supply of accommodation and this situation still continues. Travel and tourism in the world creates a market of \$7.6 trillion (0.2% of global GDP), 292 million jobs in 2016 (1/10 in the global economy). It constitutes 6.6% of total global exports and approximately 30% of total global service exports. It is predicted that the sector will support more than 380 million jobs by 2027 and provide the necessary financing to further protect natural habitats and biodiversity. Turkey cannot receive a share of proceeds giant as it should. The travel and tourism industry in Turkey directly contributes to the GNP 29.1 billion (4.1% of GDP), while the total contribution is 88.0 billion dollars (12.5% of GDP Total). Trekking routes were introduced in Europe in the 1930s, and the route marking rules, including the famous red-white markings, were adopted in the second half of the 1940s. Trekking federations and associations started to be established in Europe these years. Nowadays, many western countries support such nature tourism activities, thus achieving high-level benefits such as widespread tourism, decreasing health spending due to healthy population, and increased tax revenues due to new investments.

The Independence route (İstiklal Yolu) is a great old way of transporting weapons and ammunition during the War of Independence by primitive transport vehicles and human power from Inebolu to Ankara. The current Independence route is a 344 km long road from Inebolu to Ankara. With this project, the route will be extended to Izmir through the battlefields of the War of Independence. The new route will become Turkey's longest trekking route with length of nearly 1,000 km. This project is based on the application of sustainable tourism, as a history and outdoor tourism. Contrary to the purpose of mass tourism, cultural tourism support a cultural communication by protecting cultural, natural and historical resource values and minimizing adverse effects on the environment with short and long distance walks, bicycle riding and horse riding. Therefore, this project serves many of the purposes of sustainable tourism. Since mass tourism activities have been strategically supported in Turkey for many years, their destructive effects on the natural and cultural environment harm these resource values. The purpose of this project to create a historical walking route and to spread the historical consciousness to the wider community and to enable the rural people to benefit from the tourism pie in the rural parts of Turkey with a respectful and sustainable approach to resource values.

Keywords: Inebolu, Izmir, Cultural Routes, Sustainable Tourism



The Evaluation of the Effectiveness Level of Management in the Soğuksu and Yozgat Çamlığı National Parks

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Abstract: In order to ensure the expected benefits of national parks from protected areas, there is a need for effective management and well-prepared long-term development plans. Since the principle that unmeasured things cannot be managed in all management processes is valid, the level of management efficiency of national parks should be also determined and evaluated according to international criteria in terms of protecting and using resource values. For this reason, in the study; Soğuksu National Park (SNP) and Yozgat Çamlığı National Park (YÇNP), which are from protected areas, having long-term development plans and located in the area of the IX. Regional Directorate of General Directorate of Nature Conservation and National Parks of Ministry of Forestry and Water Affairs in Turkey, were selected as sample areas and the level of management efficiency of them was comparatively examined, scored, and evaluated.

The data derived from both long-term development plans of the national parks and field observations, from interviews with managers, and from the management evaluation form (METT-Management Effectiveness Tracking Tool method) developed by World Commission on Protected Areas (WCPA) attached to the International Union for Conservation of Nature (IUCN) were used as material in this study. The implementation of METT, which is used as a means of determining the effectiveness of management, was made by an expert/evaluation commission of three people consisting of National Park managers and researchers in terms of 41 criteria based on planning, inputs, processes and outputs. Effectiveness level of the SNP and YÇNP was scored between 0 and 3 for each criterion and results were evaluated over 102 points.

The collected data were compared through a scoring table, evaluated and interpreted in terms of the effectiveness of management. As a results, it was determined that SNP had total of 67 and an average of 1.63 point of management effectiveness, and YÇNP had total of 60 and an average of 1.46 points of management effectiveness. It was also found that both national parks had a management effectiveness between “medium and good”, but the SNP was 7 overall in total and was 0.17 points better in the average than the YÇNP. The evaluations, which will shed light to the sustainable management of two national parks, were made and some suggestions were developed based on the results.

Keywords: Protected Areas, National Parks, Effectiveness of Management, Long Term Development Plan, METT Method



Comparison of Different Extraction Methods for the Extraction of Tannin from Taurus Cedar Bark

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Abstract: It is possible that the bio-waste materials as tree barks can be converted to renewable raw material by different processes. Tannins are the most common secondary components of the tree barks and extractives in the phenolic structure. The most important step in the tannin production process from lignocellulosic materials such as tree bark is extraction stage with high efficiency and low energy consumption without causing condensation reactions, enzymatic reactions as well as the oxidative and thermal effect caused by light, air, high temperature. High efficiency and low energy consumption of the extraction and high purity of the extract can be achieved using the right extraction methods and parameters.

This study is aimed to investigate the effect of different extraction methods on bark tannin yield of Taurus cedar and phenolic composition of the tannins. The bark sample of cedar was collected as a result of logging production of naturally grown Taurus cedar tree (*Cedrus libani* A. Rich.) in Adana-Feke region. Using different extraction parameters, conventional process, ultrasound-assisted extraction (UAE) and microwave-assisted extraction (MAE) methods were applied and the extraction stage was tried to be optimized. After the extraction, chemical composition of the phenolic extracts was determined by stiasny number method. The amount of free sugars in the extracts was also determined by DNS reducing sugar method.

According to the results obtained in the study, the highest tannin yield values for Taurus cedar bark were determined by microwave-assisted extraction method. The extracts obtained by microwave-assisted extractions have highly phenolic compounds and the ratio of non-tannin compounds is lower. Functional group analysis of the tannin samples were investigated by using an attenuated total reflectance with Fourier Transform Infrared Spectroscopy (ATR-FTIR).

Keywords: Tannin, Extraction, Ultrasound, Microwave, FTIR



The Investigations of Excavation Techniques of Bulldozer at Forest Road Construction (A Case Study of Gursu Foest Enterprises)

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Abstract: Forest roads are a very important installation for all forest operations. The excavation techniques during forest road constructions should be taken into account in terms of damages below road construction area and in stream beds. In this study, environmental damages and road construction techniques by using bulldozer were investigated in forested regions in Antalya in Turkey. The simple road section, decision variables were collected from 52 cross sections. In these cross sections areas, the excavation techniques of bulldozer were investigated according to slope, ground type and power of machine. Also, the productivity of bulldozer was found according to different ground types. Besides, the number of damaged trees and undamaged trees were determined between two cross sections as gradient groups. Another damages type, stream beds were investigated filling with excavation materials during forest road construction operation. The slope in this research area was changed between 25-80%. Besides, maximum length and minimum length of fill on different cross sections was found to be between 2 and 16 meters, approximately. In this study, the amount of damages at trees were founded during forest road construction. The number of damaged trees regarding with various gradient classes were also determined in study area. Along the road section, some areas were determined fill of stream bed. The amount of excavation material was changed to bulldozer blade size, slope and ground type. The amount of excavation materials and rolling distance of materials were investigated in this study.

Keywords: Forest Road, Bulldozer, Excavation Techniques, Rolling Distance, Damage



Grafted-Rooted Vine Production by a New Motorized Grafting Machine

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Abstract: This study was designed to increase the efficiency of grafted-rooted vine production. Grafted-rooted vine production is usually done by using of Omega grafting-machine. All around the callus formation remains small and weak because the length of cambium which Omega grafting-machine makes on the joint surface of scion and rootstock is not enough and a firm grip does not occur between the scion and the rootstock. This condition reduces the efficiency of vine production up to 25-30 %. To eliminate those problems a grafting machine which works with a rotating disc-shaped knife system has been developed by us. In the preliminary experiment, the quality of first class rooted vine increased to 55-60 %. This grafting machine provides a firm grip between the rootstock and the scion by making desired depth and length of intrusion and ridge; though the length of contact surface of cambium of rootstock and scion is 4-5 cm in the standard grafting machine, this length reaches to 10-12 cm by making 1.5 cm depth and length of intrusion and ridge by the new grafting machine. This is important in increasing efficiency of 1st class saplings as well as increasing callus formation. This new grafting machine can also be used for grafting of rooted fruit rootstocks such as apple and walnut. In this research, the usability of the new motorized grafting machine which works with a disc-shaped circular knife was developed to increase the efficiency of 1st class grafted-rooted vine production was compared with Omega grafting-machine.

Keywords: Grafting, Rooted Vine, Omega, Callus, Callusing



Investigation of Specific Surface Area and Pore Size Distribution Changes of CaSO₄ in the Presence of Poly (sodium 4-styrenesulfonate)

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Abstract: Although, people does not desire the calcium sulfate (CaSO₄) fouling deposits in the industrial heat exchangers, CaSO₄ has been widely used in many areas. Its anhydrous form is used as a desiccant. Calcium sulfate hemihydrate (CaSO₄·0.5H₂O) is used in building sector, and also used in dentistry as cast or die, and in medicine for drug carriers. CaSO₄·0.5H₂O is transformed into calcium sulfate dihydrate (CaSO₄·2H₂O), called gypsum by reacting with water. Gypsum is quite common in nature. Generally, it is burned in kiln in process and thus some part of the water is removed and converted into hemi hydrate form for commercial product. The properties of hemi hydrate or the anhydrate form affect the properties of the final product synthesized after reacted with water.

The differentiation in the structures of the synthesized powder product can possible with the using additives during the crystallization. The changes in properties such as crystal morphology, particle size distribution, BET specific surface area and pore size distribution of these synthetically produced materials may be investigated instrumentally.

The aim of this study is to investigate to BET specific surface area and pore size distribution change of CaSO₄ after calcined in the presence of the poly (sodium 4-styrenesulfonate).

Keywords: Crystallization, Specific Surface Area, Pore Size Distribution, Calcium Sulfate, Additive



Effect of Parameters on Borax Extraction from Ulexite at Atmospheric Pressure

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Abstract: In today's world, where science and technology are developing rapidly, it is of utmost importance that materials with industrial, economical, safe and aesthetic qualities are presented and used. Among the most important factors affecting the development of materials, the countries' underground wealth is of great importance. Over the world, considering the total production value, thanks to 53 different metals and minerals located in, Turkey is the 28th among top 132 countries in mining. Boron ores are one of Turkey's most important mineral assets. In Turkey, the processing of these ores is vital in terms of both employment and added value. The boron ores produced commercially in Turkey are colemanite, tincal and ulexite. Colemanite and tincal is exported as finished product, while ulexite is exported as concentrated ore.

In this study, the interaction of ulexite with water at atmospheric pressure was investigated. The work was carried out in a jacketed glass reactor. In the studies the temperature (30, 50, 70, 90 °C), solid / liquid ratio (1/100, 2/100, 3/100, 4/100, 6/100, 10/100 g.mL), particle size (-590+350, -350+250, -250+180, -180+150 µm) and mixing speed (350, 450, 550 rpm) were used as parameters.

As a result, it was determined that extraction of boric acid was performed in the form of dissolution of ulexite mineral in studies and chemical structure was not observed any change.

Keywords: Ulexite, Boron Mineral, Extraction, Dissolution



Examining Structural Systems of Traditional Kastamonu Houses

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Abstract: The use of wood as a building material has a long history in Turkish architecture. Wooden constructions, a part of the cultural heritage of Kastamonu, reflect the social, cultural and economic life of Selçuklu, Candaroğulları, and Osmanlı periods and directly convey information to the future. Due to a number of factors related to the geographical structure of Kastamonu, wooden constructions display a rich diversity in terms of construction techniques and designs in accordance with the human geography of the region they are located in. In Kastamonu, traditional residential areas are concentrated eastward and westward on the slopes of the valley formed by Kastamonu Creek.

The study aims to examine the types of structure and structural features of traditional Kastamonu houses. These houses are built according to multi-room plans suitable for families, and they are usually cohabited by three generations. They are generally two or three-storey wooden framed structures built on a laid stone foundation. The walls of these wooden carcass system buildings are filled with mudbrick, brick or wood, and then they are plastered with mortar on both sides. They feature hipped and gabled roofs covered with traditional Turkish roof tiles. Kastamonu Wooden houses make use of thick-sectioned wood columns and beams, floor beams supported by these beams, and diagonal elements to counter horizontal loads. The rooms of Kastamonu houses open to a large central hall. Another interesting characteristic of these houses is the use of wood carvings, a traditional decorative art, in different parts of the building.

To conclude, generally more than a hundred years old, Kastamonu houses are instances of historical civil architecture that accurately reflects the history of the city. These structures greatly contribute to Kastamonu in terms of history, culture, and economy. Therefore, it is a necessity to protect these houses, which serve as a bridge between the past and the future, and to utilize their cultural tourism potential.

Keywords: Kastamonu, Wood Constructions, Structural System, Traditional, Historical, Culture



Trend Analysis of Annual Maximum Streamflow in the Çoruh Basin, Turkey

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Abstract: As any changes in streamflow data are directly related to various types of water-related problems (e.g. drought, flood), it is important to ascertain how this hydrological variable change over time at a given station or at a number of locations in any specific area. In the present study, we aim to determine significant trends in the annual maximum streamflow data from 1970 to 2013 at ten stations located in the Çoruh basin, Turkey. To achieve this purpose, traditional Mann-Kendall (MK) test and recently developed innovative Şen's trend method were used. The traditional MK method is usually used to determine monotonic trend in the time series data but innovative Şen method separates clusters trend behavior in a time series. By using the Şen's method, it is easy to analyze trends distinctively in the low, medium, and high values. The Şen's method also does not impose different type of constraints including normality of the sampling distribution, independent structure of the time series and data length. According to the MK test, increasing trends were mostly detected for the data series in the upper part of the basin while decreasing trends were occurred for the data series in the middle and lower parts of the basin. Among these results, only a gauge station (namely 2316) showed a statistically significant increasing and two gauge stations (namely 2328 and 2330) indicated a statistically significant decreasing trend. Moreover, the innovative Şen's trend method showed these significant increasing and decreasing trends are mainly occurred in high streamflow values. The Şen's method also detected some increasing and decreasing trends in low and high streamflow values of the other stations, although no significant trends were defined by the MK test.

Keywords: Annual Maximum Streamflow, Çoruh Basin, Mann Kendall Trend Test, Şen's Trend Method, Turkey



Nutritional Composition and Sensory Properties of Salted Pearl Mullet (*Chalcalburnus tarichi* Pallas, 1811) Consumed in Bitlis, Turkey

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Abstract: In this research, it was aimed to determine the nutritional composition and sensory properties of salted pearl mullet (*Chalcalburnus tarichi* Pallas, 1811) consumed in Bitlis, Turkey.

Samples of salted pearl mullet (*Chalcalburnus tarichi* Pallas, 1811), produced by six different methods, were obtained from domestic producers at the end of the hunting season of 2016 and 2017 (May-June). Samples stored in a cold storage were analyzed in August and September of 2017. Moisture, ash, protein and fat analyzes were performed to determine the nutritional composition of the samples. Sensory analyzes were performed by eight trained panelists in both raw and cooked samples. Analysis results were calculated as mean±standard deviation. One-way analysis of variance was used to determine whether there was a statistically significant difference between the sample groups analyzed, and $P < 0.05$ was considered significant.

It was determined that the sample EN11 had the highest amount of dry matter and protein ($82.77 \pm 0.52\%$ and $44.52 \pm 0.28\%$), the sample YN11 had the lowest ash amount ($17.08 \pm 0.11\%$), and the sample YN22 had the lowest amount of fat ($5.57 \pm 0.58\%$) ($P < 0.05$). It was found that the sample EN11 had the highest energy value (404.59 ± 1.33 Kcal) ($P < 0.05$). The highest taste score (6.88 ± 0.83) and the highest overall acceptance score (7.25 ± 0.73) in raw sensory analyzes were obtained by the sample YN31 and the sample YN32 ($P < 0.05$), respectively. The lowest taste score (2.63 ± 1.92) and the lowest overall acceptance score (2.60 ± 1.03) in cooked sensory analyzes were obtained by the sample EN22 ($P < 0.05$).

It was seen that the salted pearl mullet (*Chalcalburnus tarichi* Pallas, 1811) produced by different methods had a high nutritional value, samples produced in one year ago season were liked less according to the results of raw sensory analysis, the samples of the new season, except the samples produced by dry salting method in bottom perforated plastic can were liked less according to the result of cooked sensory analysis.

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Keywords: Salted Pearl Mullet, *Chalcalburnus tarichi* Pallas, 1811, Salting Method, Nutritional Composition, Sensory Properties



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Sustainable Urban Open-Green Areas and Xeriscape Approach: The Example of Nevsehir

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Abstract: Today, the demand for water is increasing due to the global climate change, industrial development and accordingly increasing environmental problems. Excessive consumption of water resources has led to the reduction of usable water resources, and this is a major problem all over the world. In this context studies have begun on the concept of xeriscape, where water is used effectively in open-green areas.

The aim of this study is to determine the suitability of the plants for xeriscape used in Nevsehir, which is a Central Anatolian city with arid climatic conditions, and to bring proposals solutions. As a result, considering of the natural ecology of the region natural plant species in landscape design or drought-resistant species should be especially careful to choose and use.

Keywords: Xeriscape, Landscape Design, Urban Green Spaces



Ameliorative Effects of Vitamin C on Cellular Oxidative Damage and Apoptosis Induced by Glycidamide in Sertoli Cells

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Abstract: Exposure to the food contaminant acrylamide and its reactive epoxide metabolite glycidamide (GA) induce reactive oxygen species (ROS) mediated oxidative stress and subsequently cellular death. Recent studies revealed that the toxic effects of acrylamide may due to GA especially on male reproductive system cells. In this regard, it is increasingly important to determine the effects of GA on Sertoli cells, which are an essential cell for male reproductive system, and to ameliorate these effects with an antioxidant. Antioxidants should be consumed in sufficient quantities to minimize the effects of free radicals or ROS and thus, to prevent oxidative stress.

This study aimed at determining the direct oxidative effects of GA and protective effects of vitamin C against GA induced damage in TM4 Sertoli cells through measuring cell viability, cytotoxicity, lipid peroxidation, ROS and apoptosis/necrosis rate. TM4 Sertoli cells were exposed to GA for 24 hours at four different concentrations (ranging between 0.001mM and 1 mM) and in addition to these GA concentrations to vitamin C (50 µM) as an antioxidant.

The results of cytotoxicity markers like cell viability and lactate dehydrogenase (LDH) showed that GA significantly reduced cell viability and increased LDH levels in a concentration-dependent manner. We also found that GA induced overproduction of intracellular ROS like hydrogen peroxide and hydroxyl radical, increased lipid peroxidation in cellular membrane and triggered cell apoptosis/necrosis rate in a concentration-dependent manner. In return, vitamin C supplementation ameliorate the adverse effects of GA on Sertoli cells with this respect. Consequently, these findings suggest that GA may cause cytotoxicity in Sertoli cells depending on the concentration. Besides, it was evidenced that vitamin C has an ameliorative effect on toxicity and oxidative damage caused by GA in Sertoli cells.

Keywords: Glycidamide, Vitamin C, Sertoli Cells, ROS, Oxidative Stress, Apoptosis



Therapeutic Effect of Curcumin on Acrylamide Induced Apoptosis Mediated by Mitogen Activated Protein Kinases Signaling Pathway in Leydig Cells

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Abstract: The aim of this study is investigating the mechanism related to acrylamide induced toxic effects and possible therapeutic effects of curcumin on TM3 Leydig cells. Acrylamide is a water-soluble and chemically reactive molecule widely used in the laboratory, in industrial processes such as the production of polymers, cosmetics, paper and textiles, and for waste water treatment. Studies reported the presence of acrylamide found in carbohydrate-rich foods heated to over 120 °C, formed through reaction of glucose with amino acids, especially asparagine. Curcumin a widely used spice in food is well documented for antiinflammatory and antioxidant properties. Mitogen activated protein kinases (MAPKs) signaling pathway components including extracellular signal-regulated kinase (ERK), c-Jun N-terminal kinase (JNK) and p38 kinase (p38) are play a key role in the regulation of many cellular processes, including apoptosis.

In this study we evaluate the antioxidant related enzyme levels (glutathione peroxidase, glutathione s transferase and catalase), apoptosis necrosis rates and phosphorylation status of MAPKs. TM3 Leydig cells were exposed to four concentrations of acrylamide (1, 10, 100 and 1000 µM) in the presence and absence of curcumin (2.5 µM) for 24 hours. Apoptosis and necrosis rates determining by propidium iodide-Hoechst stain and Western blot analyzes were performed for determining the phosphorylation of MAPKs.

According to our results curcumin has a protective effect against acrylamide induced apoptosis in TM3 Leydig cells. Phosphorylation of p38, JNK and ERK kinases were activated in high acrylamide treated groups. Moreover, acrylamide impaired the antioxidant enzyme levels with dose dependent manner. Taken together, we suggest that acrylamide induced apoptosis through activation of MAPKs signaling pathway and curcumin has a protective effect against the acrylamide induced damage in Leydig cells.

Keywords: Acrylamide, Curcumin, Apoptosis, MAPK Pathway, Leydig Cell



Usability of Chia Plant (*Salvia hispanica*) Seed as an Alternative Herbal Protein Source in Fish Feeds

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Abstract: In the aquaculture field, more than half of the operating cost constitutes feed costs. Therefore, it is being investigated ways of reducing feed cost in order to grow cheap fish. In order to reduce the cost of feed, it is necessary to find cheap and high quality feed materials for both animal and herbal sources to meet the nutritional needs of fish. For this reason, the ways of utilizing from Alternative protein sources suitable for fish species are being investigated. It is necessary to carry out researches on new herbal raw materials which are not yet scientifically proved that the possibilities of use in fish feeds are unknown and how much it can be used. Chia (*Salvia hispanica*) which is a kind of sage is a plant that grows in South America and is known all over the world by this name. This plant is rich in protein (15-25%), fatty acids (omega 3) and mineral contents. Chia plant is known to have a higher level of protein in seed than nourishing grains such as wheat (14%), corn (14%), rice (8.5%) and oat (15.3%). It has been determined that the literature survey on the Chia plant is used as food for human consumption as well as the feeding of laying hens and the effects on the eggs contents. but It has been determined that chia plant is not used as fish feed nutrition in aquaculture. We think that this plant, which is rich in protein, fatty acid and mineral content may be an alternative source of raw materials in fish feed. In this review, a comprehensive abstract of the studies that were made about the nutrient content of chia plant and its usability in fish feeds are given.

Keywords: Chia, *Salvia hispanica*, Protein, Raw Material, Feed



Effect of the Zirconium Phosphate Addition on the Properties of SPEEK Based Composite Membrane for Proton Exchange Membrane Fuel Cell

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Abstract: During the development of polymer industry a remarkable increase was observed in the efforts to bring the organic and inorganic materials together in order to improve the resultant product quality. In membrane synthesis, inorganic materials were mostly used as fillers in polymeric matrixes in search of the improvements of the material properties. These properties are especially thermal and mechanical stability of the membrane when fuel cell application is considered. Proton exchange membrane, serves as the medium for the transportation of protons from anode to cathode, is generally considered as the heart of PEMFC by scientists. Perfluorosulphonic acid membranes have been used commercially due to their good chemical and mechanical properties, and Nafion is one of the most widely used one among them. Sulfonated poly(ether ether ketone) (SPEEK) based composite membranes are synthesized by using classic sol-gel method. Zirconium phosphate are added to the membrane matrix in different ratios in order to enhance the membrane properties. Characterization of the synthesized membranes were performed by SEM, impedance (by using Solartron 1287 together with Solartron 1296 by means of four probe technique) and FT-IR measurements and also by carrying out the water hold up and ion exchange capacity (IEC) and fuel cell performance analysis. As a result of performance experiments highest performance values are obtained for the membrane containing 12% zirconium phosphate at 0.6 V and 640 mA/cm². Water uptake capacity, swelling ratio, ion exchange capacity and proton conductivity of this membrane are found as 43%, 3%, 1.24 meq/g and 0.26 S/cm, respectively. These values are close to the values obtained ones for perfluorosulphonic acid membranes. Therefore this membrane can be regarded as a promising candidate for usage in fuel cells.

Keywords: PEMFC, SPEEK, Zirconium Phosphate, Composite Membrane, Fuel Cell Performance



Optimization of Extruders Suitable for Semi-Liquid Food Printing in 3-D Printers

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Abstract: In recent years, the rapid development of three-dimensional printer technology, in areas such as industrial and architectural designs, construction and automotive industry, medicine and dentistry has become widespread. Adapting this developing technology to the food industry offers new opportunities for production. The purpose of using three-dimensional printers in the food industry is to create complex geometries and achieve three-dimensional structures with detailed textures. It is intended to be used in the production of chocolate, confectionery, cookies, pizzas, pasta and many more foods in different shapes and specifications that can be designed according to the consumer demand. Rheological properties, humidity, density, permeability, thermal conductivity will be determined depending on temperature and pressure in order to observe the behavior of foods during printing. According to these parameters, the development of 3D printers with suitable extruders is needed to enable the shape design of semi-liquid foods. Since the study will already be done on a stable 3D printer, mechanical, electronic and software, the entire motivation of the team will be to develop the appropriate extruder and introduce the user food items to the appropriate form and content. The three-dimensional printer used is a device with open source and sensitive positioning on 3 axes, with fourth and fifth axis outputs for extruders, which can be controlled automatically with G codes. Within the scope of this study, a universal extruder was developed for food products that are in the target group of 3D food printers and the integration of extruder developed into a 3-D printer platform that makes filament-based production. 3-dimensional food printing trials are carried out with the developed food extruder and the extruder is continued to be improved in line with the data obtained. Design studies, design constraints and preliminary findings are presented.

Keywords: Food Printing, 3-Dimensional, Chocolate, Printer, Extruders



The Impact of ORKÖY Activities of the Giresun Regional Directorate of Forestry on Sustainable Rural Development

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Abstract: This study was handled to investigate and evaluate the impacts of activities of the ORKÖY (Forest and Village Relations) of the Giresun Regional Directorate of Forestry (GRDF) on developing forest villages, reduction rural poverty, providing employment, prevention immigration etc., and thus to determine how successful of the ORKÖY is in rural development.

For this aim, the GRDF having intensive forestry and the ORKÖY activities (economic and social credits, informing and training-consulting services etc.) was selected as the study area. The data obtained from the records of the GRDF and affiliated forestry enterprises related to the ORKÖY and forestry activities in the period of 2012-2016, and the information obtained from the questionnaires conducted on the forest villagers and forest managers were used as material in this study.

The data was evaluated by graphs, charts and statistical analyses. At the end of the study, between 2012-2016, it was determined that the ORKÖY gave total 12,613,594 TL credits to forest villagers to economic and social purposes, provided annual average 2,522,719 TL economic contribution, and the GRDF made total 1,406,898 TL firewood surplus (subsidies) to forest villagers. In addition, it was determined that satisfaction levels of both forest villagers and forest managers from the activities of the ORKÖY were “good”, that the ORKÖY activities made positive contributions to rural development and to socioeconomic structure of forest villagers, to rural poverty reduction, immigration prevention, forest protection and sustainable forest management.

Thus, it was understood that the ORKÖY was effective and successful at “medium-good” level (50-75%) in sustainable rural development, and according to this results some recommendations were developed for implementation.

Keywords: Giresun Regional Directorate of Forestry, Forest Village, Forestry, ORKÖY, Sustainable Rural Development



Inhibitory Effects of Some Sulfonamides' on Lactoperoxidase

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Abstract: Lactoperoxidase (LPO, E.C. 1.11.1.7) is an important milk-protein with oxidoreductase activity. The main functions of the enzyme are to catalyze oxidation of molecules in the presence of hydrogen peroxide and aid in production of molecules with a wide range of antimicrobial activity. The biological importance of lactoperoxidase enzyme involves its role in providing a natural defense system against the invasion of microorganisms.

The present study aimed to investigate the *in vitro* inhibitory kinetics of some sulfonamide derivatives (2,5-Dichlorothiophene-3-sulfonamide; Naphthalene-2-sulfonamide; 6-aminopyridine-3-sulfonamide) on the lactoperoxidase enzyme (LPO) purified from bovine milk using affinity chromatography method.

Sulfonamide compounds (R-SO₂-NH₂) are aromatic molecules used as medicines. Sulfonamides form the basis for several drug classes, and they are the first drugs used systemically against bacterial infections with a selective action on bacteria. They were also shown to display protease-inhibitory characteristics. In general, sulfonamide-based compounds and their derivatives are known for their use as anti-epileptics, anti-obesity, anti-glaucoma, anticancer and anti-neuropathic pain drugs. The analysis of the inhibitory kinetics of these molecules on LPO intended to compare these molecules with each other and with the other sulfonamide molecules. Thus, bovine milk LPO was purified by 509.09 folds, with 168 EU / mg specific activity and 34.67% yield using Amberlite CG-50 H⁺ resin and CNBr-activated Sepharose-4B-L-tyrosine-5-amino-2-methylbenzenesulfonamide affinity chromatography. Afterwards, enzyme activities were measured, and Lineweaver-Burk diagrams were constructed for each enzyme; K_i constant and inhibition types were calculated from these diagrams. *In vitro* inhibitory effects of the molecules on LPO were investigated. These molecules are potentially reversible inhibitors of LPO. K_i values of these molecules varied between 0.5055 – 4.7135 μM. Naphthalene-2-sulfonamide demonstrated the most effective inhibitory characteristics of LPO purified from bovine milk at K_i values of 0.5055 ± 0.1603 μM with a non-competitive type of inhibition.

Keywords: Lactoperoxidase, Purification, Sulfonamide, Kinetics, Enzyme Inhibition



The Influence of Surface Material on Pool Boiling Process in n-Pentane

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Abstract: Boiling is the fluid change process from liquid phase to vapor phase. This process starts at saturation temperature of liquid with a certain pressure. Boiling heat transfer is an efficient method for heat removal of various engineering systems such as the electronic devices, nuclear reactors and gas turbines due to latent heat of phase change.

In this paper, an experimental study of pool boiling heat transfer was conducted for two smooth heated substrates; copper and 304 stainless steel (SS). All experiments were performed at a saturated condition under atmospheric pressure. In the experiments, n-pentane was used as working fluid. The test surface was the upper surface of copper and SS materials, having a diameter of 40 mm and horizontally oriented. Three K-type thermocouple of 0.1 °C accuracy were used to measure surface temperature and the fourth thermocouple was used to measure temperature of working fluid. Pool boiling curves for two base materials were obtained, and compared. It was found that the type of surface material have significant effects on the boiling heat transfer coefficient as well as critical heat flux. The experimental results indicated that the critical heat flux for the steel surface improved up to 20% compared to the copper surface. The boiling heat transfer coefficient for the copper surface was significantly improved by more than 200% as compared to the steel surface, which was reasoned because of density of active nucleation cavities.

Keywords: Pool Boiling, Enhanced Heat Transfer, Critical Heat Flux, Heat Rate, Surface Material



The Effect of Concentration of CuO-pentane Nanofluid on Pool Boiling Heat Transfer

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Abstract: Nanofluids are colloidal suspensions having solid particles (size of 0-100 nm) dispersed in a base fluid such as water or ethylene glycol. They have been of interest for the last decade as an advanced coolant for many industrial sectors including nuclear reactors, refrigeration systems and microelectronic device cooling systems, etc. Compared to the traditional fluids, they have enhanced thermo-physical properties and thus can exhibit better heat transfer performances.

This paper is tried to explain how concentration of nanofluid will affect the boiling heat transfer. The CuO-pentane nanofluids with two different concentrations of 0.05 and 0.1 vol% are prepared by using two-step method and used as working fluid. To provide the fine dispersion of particles in the base fluid, sodium dodecylbenzenesulfonate (SDBS) is used as a surfactant. The boiling takes place the upper part of a copper and stainless steel sample with 40 mm diameter, which are mounted to the bottom of the Pyrex glass test vessel (Ø100x200 mm). To measure the surface temperature, three K-type thermocouples imbedded 2 mm below the boiling surface are used. All experiments are performed at a saturated condition under atmospheric pressure. The boiling heat transfer coefficient and the critical heat flux are experimentally investigated in various concentrations and heat fluxes. For comparison, the experiments are conducted for pure n-pentane. The results are compared with predictions from several widely used correlations in the literature, which showed the deviation to be within $\pm 13\%$. In the case of copper surface, it is observed that the nanofluids deteriorates the heat transfer coefficient with increasing nanoparticle concentration. Contrary to the copper surface, the heat transfer coefficient for the steel surface improves by the presence of nanoparticles in solution, while it decreases with the increasing particle concentration. On the other hand the critical heat flux deteriorates for all test condition. These observations are related to the modifications of both surface wettability and roughness caused by nanoparticles deposition during the boiling processes.

Keywords: Pool Boiling, Heat Transfer Coefficient, Critical Heat Flux, Nanoparticle, Nanofluid



Jet Impingement Cooling of a Hot Surface with a Facing Step using Hybrid Nanofluids

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Abstract: Impingement jets are used in a variety of engineering and technological applications ranging from drying to turbine blade cooling and the aim was to obtain higher heat and mass heat transfer coefficients. In the cooling of electronic components, heat treatment of metals, tempering of glass, cooling of gas turbines, drying of paper, textile products and food processing performance of the jet impingement cooling could be enhanced by using nanofluids. The use of nanotechnology in heat transfer fluids is growing and many thermal designs are obtained with the inclusion of metallic or non-metallic nano-sized particles to the base fluid. In this study, we performed a numerical study for the jet impingement cooling of a hot surface with a facing step. The introduction of the step like effect adds additional complexity for the flow separation and may be more realistic for real life applications. The numerical simulations are performed by the ANSYS-FLUENT CFD packet program which uses the finite volume method. The cooling efficiency was investigated on the basis of water and Al₂O₃-Cu-water hybrid nanofluid as the impingement jet fluid. Numerical simulations are performed for various values of Reynolds number and solid particle volume fraction of the hybrid nanofluid and geometry of the configuration. Results are presented with streamlines, isotherms, local, maximum and average Nusselt number variations for different pertinent parameters of the system. It was observed that the local, maximum and average Nusselt number enhances with Reynolds number and solid particle volume fraction. Changing the step size and jet to imping surface height was found to affect the fluid flow and heat transfer characteristics.

Keywords: Impingement Jet, Cooling, Hybrid Nanofluid, Computational Fluid Dynamics, Heat Transfer



Numerical Study of A Thermoacoustic Refrigerator

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Abstract: The thermal-acoustic interactions between the fluid and fluid contacting solid surfaces which is a result of pressure and temperature oscillations within the sound waves are termed as thermoacoustic. Thermo-acoustic systems have the advantages of low cost, simple construction. There is also no moving part and harmful gases to the atmosphere are not used. These systems can be used for power generation and refrigeration applications. These systems are used in various areas, including space shuttles, refrigeration of radar circuit elements, natural gas liquidation in gas plants, etc.

A vast amount of numerical and experimental studies is conducted to obtain more efficient thermoacoustic systems. The basic physics behind the thermoacoustic phenomena is well understood but there are many effects such as gas property, complex geometry of the stacks, boundary conditions which complicates the analysis of thermoacoustic systems. The complicated dynamics of the thermoacoustic systems is studied in many studies but in order to have a deep understanding of the phenomena, analytical or semi-analytical treatment of the system is necessary. In the present study, we considered a thermoacoustic refrigerator. For the numerical simulation of the refrigerator, DeltaEC (Design Environment for Low-amplitude ThermoAcoustic Energy Conversion) from the Los Alamos National Laboratory was used. For the thermoacoustic refrigerator, effects of different parameters to the systems coefficient of performance (COP), such as pressure drive ratio, stack geometry, stack porosity, the distance between stack and loudspeaker, stack position, stack material and the type of gas being used was analyzed. The best parameters combinations are sought for which parameter combination can make the maximum contribution to system efficiency. The total cooling capacity, COP normalized by Carnot COP values were determined for various system parameters. It was observed that by increasing the stack porosity and reducing the stack-to-speaker distance by a certain amount reduced the degree of cooling zone. Other parameter changes such as the drive ratio, stack type, gas type and porosity of the porous medium have resulted in efficiency changes. The overall system efficient is very low as compared to Carnot efficiency.

Keywords: Thermoacoustic, DeltaEC, Thermoacoustic Cooler, Refrigerator



Water Chemistry of Meliksah-Cubuk Area (Ankara)

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Abstract: The aim of the study is to investigate hydrochemical properties of selected waters in study area. Study area is located in northeastern part of the Ankara city center (Meliksah-Cubuk area). Temperature measurements, EC (electrical conductivity) and pH values of selected waters are between 16 °C and 32°C, 320 and 1727 $\mu\text{s}/\text{cm}$ and 8.1 and 8.3, respectively. According to obtained primary results, water resources are CaMgHCO_3 and NaHCO_3 facies. Values of $\delta^{18}\text{O}$ and δD are -10.6 to -9.03 ‰ (VSMOW) and -73.98 to -64.98 ‰ (VSMOW) respectively. Samples plot on the Global Meteoric Water Line (GMWL). It depicts that, waters replenished by global precipitations. The results of mineral equilibrium modeling indicate that the all examined waters are undersaturated with respect to gypsum and anhydrite. Most of the waters are over saturated with dolomite, aragonite and calcite. Hot waters are exposed to geothermometer analysis and it is seen that hot waters are classified as immature waters. In this study silica geothermometers are applied to some thermal waters in geothermal area suggest that the temperatures of the reservoir systems vary between 60 °C and 75 °C with silica geothermometers. These results show that there is no extra heat source rather than the local/normal geothermal gradient for the area. In addition to these, this study presents primitive results and a detailed geochemical study should be implemented to be able to get more reliable results.

Keywords: Meliksah, Cubuk, Hydrogeochemistry, Isotope, Geothermometry



A Comparison of Fatline Widths

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Abstract: Fatlines are widely used tool in computer aided geometric design for calculation of the curve intersections. In particular, in an animation process, intersection of two curves is calculated very often. Therefore, a little improvement in computational complexity and computational load may result in huge savings in the whole. The most popular algorithm for an efficient computation of the intersection point is the fatline algorithm. In this algorithm, each curve entering the process is confined between two parallel lines where the area between them is called the fatline. Performance of the curve intersection algorithm directly depends on the fatline width. The narrower widths result in better convergence of the algorithm. For this algorithm, the curves are modelled as Bezier curves. This transfers the curve representation into the parametric domain. In this domain, polynomial's degree plus one Bezier control points are sufficient for an efficient representation of the curve. In the original introduction of the fatline widths, a formula in terms of the signed distances of control points was given. This formula was not tight enough so that tighter formulas with a similar computational complexity have emerged later. It is illustrated in the sequel that the fatline formulas depend on the cases where each case is determined by the sign of the product of signed distances of the control points. Examples show that a formula performing well in a case may or may not perform similarly in the other cases. In this manuscript comparison of the fatline width formulas are presented. Illustrative examples are presented for insight into the formulations.

Keywords: Fatline, Bezier, Curve, Intersection, Fatline Algorithm



A Test Bench for Electrical Motor and Propeller Components of a Lightweight Quadcopter

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Abstract: Quadrotors have become widespread due to their vertical take-off and landing and hovering abilities. Their efficient usages have therefore become a matter of extensive research in a multidisciplinary research community. Electrical motor and propeller efficiencies are of primary importance in quadcopter design. Unfortunately, catalogue information for these products is not reliable in a significant number of cases. Furthermore, even each of the motor and propeller product information is correct; this does not guarantee their performances in the case where they work together. This necessitates the extensive testing process in which both of the motor and propeller are used together for performance validation. In this article, a test bench for comparison of given motor and propeller pairs is introduced. The test bench implemented consists of a fixed pole mounted on an aluminum base, a rigid bar pivoted by the tip of this pole, a propeller and a brushless direct current (BLDC) motor pair at each end of the rigid bar, and an electronic weighing scale. A basic description of the testing process has two steps: (1) BLDC motor at one end of the rigid bar is powered so that the rotating propeller produces a lift force, (2) When one end of the rigid bar is lifted due to propeller's rotation the other end goes downward and exerts a proportional force on the weighing scale. Using the weighing scale of test bench, the lifting force produced by the propeller is measured. Besides, the current drawn by the BLDC motor is also measured. The tests determine the best fitting motor and propeller pair among different motor wattages and different propeller sizes. In addition to this, the testing process obtains range of efficient operation.

Keywords: Quadrator, BLDC, Propeller, Thrust, Efficiency



Energy Analysis of Overseas Solar Power Tower Plant to be Constructed in Iskenderun

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Abstract: The increase in the world population is constantly rising commitment to energy sources. This rapidly growing energy demand is met by renewable and non-renewable sources of energy. 15% of the world's energy need is derived from renewable energy sources. Hydropower, geothermal energy, biomass energy, solar energy and wind energy are used as renewable energy sources in the world. Investment around the world on renewable energy is increasing because of the potential to reduce carbon emissions and to minimise the adverse effect on the environment. At the same time, the renewable energy is never ending energy which reduces the dependence of the Turkey on the foreign countries resources. For this reason, it has found wide use everywhere where there is human life. One of the most important renewable energy technologies that using the sunrays as energy source is the solar tower system. In addition, it is possible to generate high power amounts with these systems. Turkey, which have a rich solar energy potential due to its geographical location has more advantageous position compared to many other countries.

In the solar tower power plants, the sunrays are concentrated by using mirrors and reflected to the receiver on the tower. The intense heat concentrated on the receiver centre on the tower top is used to produce superheated steam. By blowing the superheated steam into the turbines the thermal energy is transforming into the mechanical work and then electric energy by power systems. Because of the efficient operation of the system and the impact on the natural life and human health in the region to be set up, the choice of the area for the installation of solar power tower system has a vital importance. Therefore, the determination of land slope, transportation, average monthly temperature values of the region, tourism potential and agricultural areas are critical for the site selection. Solar power tower systems can be built on the sea as well as on land. For this reason, the determination of the annual maximum wave heights in the selected region and the selection of an area where the water is shallow is necessary to reduce the adverse effect on the operating performance of the system. This is because the system to be installed should not be affected by salty water from the wave. In addition, wave height and sea depth have vital importance in terms of the selection of system materials from saltwater resistant materials.

Based on these criteria, the Arsuz Cove Region is selected as the most suitable area for the construction of the solar power tower plant in Iskenderun Region, where there is not much ship traffic and touristic activity. The selected area is partly shallow and which is one of the areas with low wave height because it is located in a cove inside the Iskenderun region. Within the scope of the study, meteorological data of 12 months belonging to Iskenderun Region, wave height and sea depth values were taken from Turkish State Meteorological Service. These data have been examined in terms of determining whether the region is suitable for the system. As a result of the data, it has been seen that the selected region in terms of solar radiation values and sunshine duration as well as wave height and sea depth meet the need for system installation. The solar power tower plant was designed using the EBSILON® Professional software developed by Steag GmbH. In the designed system, the water is evaporated directly by the concentrated heat in the tower, and then power is produced by sending it into the steam turbines. The system is optimized for 100 bar and 500 °C tower output steam temperature. The net power production, total pump power consumption, vapour mass flow rate and energy efficiency values at tower output steam parameters of 100 bar and 500 °C put were calculated as 40262.01 kW, 1431.84 kW, 45.72 kg/s and 38.11%, respectively.

Keywords: Solar Power Tower, Steam Cycle, Offshore, Energy, Exergy



Smoke Removal System Design of Metro Station

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Abstract: Today, especially in metropolitan cities, metro systems in one of the most common transportation methods. Metro has an important role in inner-city transportation for cities with high population density, and traffic and parking problem. High number of people are using metro trains via underground metro stations. In case of fire in these stations, loss of life and property is possible. Therefore, redirecting and removing smoke because of fire in metro stations is an important problem. Fast and controlled way of smoke removal can minimize loss of life. Metro tunnels follow different ventilation methods. These methods vary based on different parameters including length of tunnel, and tunnel capacity. Depending on intensity of fire, air flow rate in the tunnel, and temperature change and smoke distribution in given direction are important parameters for metro ventilation system. When ventilation is made with the help of jet fan, flow speed, temperature, and smoke distribution in given direction can easily be changed. Ventilation with jet fans works by pushing and removing the smoke by moving the air at certain speed. In this study, a metro station and related metro tunnel ventilation was investigated together. For possible fire scenario in this stations, smoke and temperature distributions within metro station and tunnels were numerically analysed. For this purpose, the station was modelled, and time-based simulations were conducted on Pyrosim package program. Length of train was determined as 590 metres with 6 metre train track width. Dimensions of the station were designed as 24x12 metre. The scenario was fire in passenger waiting room of the station. Numbers and arrangement of 6 jet fan inside the tunnels were changed and different models were created. These models were numerically analysed for 3 different jet speeds. Analysis were conducted in first 360 seconds after the start of fire and temperature and smoke distributions were obtained. Based on data obtained from this study, important parameters effecting smoke removal were identified. It was observed that these parameters were input speed of air, tunnel structure, size of fire, operation type of jet fans, and flows of jet fans. As number of jet fans and flow of jet fans increased, it was determined that temperature of the environment was decreased, and smoke was removed more. However, if the number of jet fans were increased continuously, it was observed that smoke was failed to be removed, collided with station walls, turned backwards, and dissipated within station. Hence, temperature in the station increased. Among analysed models, model with 4 jet fans and 30 m³/s flow provided optimum smoke and temperature control.

Keywords: Metro Tunnel Fire, Station Fire, Jet Fan, Smoke Control



Numerical Analysis of Possible Fire Situation and Smoke Control on Highway Tunnel

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Abstract: Highway vehicle tunnels are significant in road transportation systems. Tunnels help overcoming harsh geographical structures and shorten distances. Also, tunnels make transportation easier by decreasing time and cost. Due to accidents in highway tunnels or any other reasons, fires can be observed in those tunnels. To minimise loss of life and property in such possible fires, ventilation systems have significant role. Ventilation systems are used for redirecting and removing current air in the tunnel and possible smoke. Mainly, tunnel ventilation systems work according to diluting polluted air with clean air and keeping within acceptable range. Additionally, ventilation systems decrease and removes exhaust gas accumulation caused by vehicle emission inside the tunnel. For this purpose, jet fans are used in highway tunnels. Jet fans remove exhaust gases accumulated in the tunnel and smoke in case of fire. When a possible fire event is considered, smoke layers gradually moves to tunnel surfaces and descends in regions far from fire. With transversely positioned jet fans on upper part of the tunnels, smoke and temperature is removed without dissipating to other sections of the tunnel. Thus, systems and vehicles in the tunnel are protected. Additionally, smoke is removed from range of vision of people in the tunnel, and human evacuation and medical intervention to accident victims can be made. In literature, there are researches about tunnel ventilation systems with jet fans. Generally, researchers focused on straight tunnels and lengthwise ventilation systems. In this study, smoke, and temperature distribution in case of a possible fire inside a tunnel with transverse ventilation system was numerically analysed. For this purpose, with Pyrosim package software, straight highway was modelled, and simulations were made for different jet fan arrangements and flows. Dimensions of the tunnel were accepted as 10x5x500 and the fire happened in the middle of the tunnel. Numerical models for different positions and numbers of 10 jet fans in the tunnel were generated. All the models were simulated for 3 different fan speeds. Simulations were conducted for first 360 seconds after start fire. Thus, temperature and smoke distribution over time was observed. Analysis results indicated for all models that CO₂/air mixture in fire pool field dissipated across the tunnel in a fast way. When fire pool was positioned at the centre of the tunnel, first model where jet fans worked with 30 m³/s speed was the optimum model for smoke removal. Based on analysis results, regions for evacuation of people during fire were determined. During operation of fan groups positioned inside highway tunnel, it was found that tunnel geometry, ventilation type, heat dissipation rate were important parameters for evacuation of fire at the centre of the tunnel. Additionally, it was observed that increased number of jet fans and flow rate removed the smoke in the environment faster.

Keywords: Highway Tunnel, Tunnel Fires, Axial Ventilation, Jet Fans, Smoke Removal Control



Heavy Metal and Platinum Group Elements Potential of Yesilova-Tefenni Chromites (Burdur)

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Abstract: The study area covers two different sites located on the northwest of Tefenni (Burdur) district involving Tefenni plateau and environs with an area of 12 km² and located on Niyazlar Koyu (Yesilova-Burdur) district with an area of 50 km².

The lithologic units observed in the study area from old to young are Late Jurassic–Early Cretaceous aged Yesilova ophiolites, Upper Cretaceous aged Kızılcadag melange, Pliyo-Quaternary aged Niyazlar Formation and Quaternary aged alluvions.

Yesilova ophiolite consist of tectonites, ultramafic and mafic cumulates, isotropic gabbros, plagiogranites and basalts from bottom to top. Yesilova ophiolite represents a missing row character ophiolite group because sheeted dike complex and pillow lavas are not seen. Chromite deposits of the investigation area show disseminated, nodular and massive character.

Chromite deposits also observed in irregular shapes such as lens and are members of podiform type chromite deposits. 30 samples collected from the investigation area are chemically analyzed due to determine the petrographic character and rock geochemistry. 9 thin section obtained from chromite ore and lateral rock samples and 4 pieces of polished thin section obtained from chromite samples are examined with the polarized microscopes in laboratories of Istanbul Technical University, Geological Engineering Department in order to appoint the mineral composition. 6 pieces of thin section obtained from chromite samples are due to microprobe analysis.

Different types of diagrams are formed using the data of chromite analysis and these diagrams are correlated with the diagrams formed using the data of chromite analysis in other investigated areas in order to find geochemical similarity.

Keywords: Platinum Group Elements, Chromites, Yesilova (Burdur), Tefenni(Burdur), Ophiolites



Hydrothermal Fluids and Polymetallic Ore Genesis Process, Yayladalı (Manisa)

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Abstract: The aim of this study is to characterise fluid origin of polymetallic Pb-Zn-Cu-Ag and Au mineralization at Yayladalı. Porphyry Cu-Mo-Au-Ag (Pb-Zn) breccias and veins at Türkali 3 km² by deciphering geochemistry, fluid inclusion and ore paragenesis studies and hydrothermal alteration (using Ishikawa Alteration Index (AI) and Chlorite-Carbonate-Pyrite Index (CCPI)).

Hydrothermal alteration could be characterised as chloritization, sericitization, silicification and carbonitization. The alteration of chlorite and sericite alteration have been observed close to the ore body and probably indicate fluid was hot at the time of deposition or hydrothermal effect. The presence of sericite shows hydrothermal breakdown of sodic plagioclase sodium depletion and potassium enrichment. The AI-CCPI box-plot show samples plot above the diagonal line indicating hydrothermal origin of the samples and closer to the above said alteration types.

Ore paragenesis show coarse-grained to massive aggregates of sphalerite, galena, pyrite, chalcopyrite and other sulphide minerals like tennantite, tetrahedrite, realgar, orpiment. Chalcopyrites occur as row inclusions blebs within sphalerite showing exsolution or epitaxial growth. Ore paragenesis is complex indicating sporadic deposition of base metals riched fluid within fractures. The texture shows colloform banding of sulphide minerals which probably indicate a change in fluid characteristics from high (H) to intermediate (I) sulphidation mineralization and occur as hydrothermal veins replacement or open space fillings. Also, the main gauge minerals are quartz, carbonates and barite with supergene enrichment zones of malachite, azurite, covellite, cerussite, smithsonite and anglesite.

Furthermore, barite probably characterised deposition of fluid under decreasing temperature and oxidising conditions. Porphyry Cu-Mo is probably derived from the Türkali granodiorite stock which is from a post rift setting and is presumably source of most Cu-Mo deposit. The presence of hydrothermal breccia and vein zones indicate an overprint of intrusion-related Au-Ag (Pb-Zn) stockwork.

Keywords: Hydrothermal Fluids, Porphyry Cu-Mo, Fluid Inclusions, Ishikawa Alteration Index (AI), Chlorite Carbonate Pyrite Index(CCPI)



Stabilization of Clayey Soils with Lime and Its Effects on Highway Pavement

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Abstract: In recent years, along with technological and economic developments, traffic density in transportation networks has been increasing all over the world. When the passenger and freight transport in Turkey shows that the largest increase occurred in the highways. This increase in traffic brings about the construction of new roads and the rehabilitation of existing roads.

Highway designs are based on long-term performance and comfort. There are many factors that affect comfort and performance on highway. One of the most important of these factors is the highway pavement. The main task of the road structure is to safely carry the loads that will be passed over the project life, without being exposed to excessive deformations and cracks. The ability of the pavement to fulfill this task depends on two factors. The first factor is the high bearing capacity of the subgrade, and the second factor is the building quality. The road pavement is made up of base, subbase and covering layer built on the subgrade as it is known. Depending on the CBR (California Bearing Ratio) value of the subgrade soils, the thicknesses of the base and subbase layers vary. If the CBR value of subgrade soils, the layer thicknesses decrease; if it is low, the layer thicknesses increase. In most cases the base and subbase layer thicknesses are high due to the low CBR values of subgrade soils. Increasing the thickness of the base and subbase layers also means increasing the cost. Because there are not many quarries near the site of many construction sites. The material to be used in the base and subbase layers is brought away from the quarries if there is no quarry in the nearby places. It is of utmost importance to reduce the thicknesses of the base and subbase layers in areas where oil is expensive, such as our country. It is possible to reduce the layer thicknesses by improving the subgrade soil.

Many soil stabilization methods are used in practical. Shallow soil stabilization methods are often used to improve the subgrade soils. In this study, a clayey soil was improved by lime stabilization. As a result of the improvement, the variation in the thickness of the layer thicknesses was investigated by CBR and AASHTO method. As a result of the examination, the cost analysis was made according to the variations in the base and subbase layers thicknesses and the gain obtained was examined.

Keywords: Lime, Stabilization, Clayey, CBR, Highway Pavement



Mechanical Investigation of Brake Pads of Urban and Intercity Railway Vehicles

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Abstract: In recent years, the popularity of the rapidly developing rail systems has increased considerably in both urban and intercity. These vehicles are known to be quite good and efficient in the passenger or freight transport duty. The size of these vehicles helps to carry more cargo or passengers but we must also think about slowing down such a large vehicle as acceleration. The brakes are an important part of the rail system vehicles. Considering that the weight of vehicles in unloaded and loaded conditions is tons, we consider the magnitude of the friction and braking force required to slow down or stop these vehicles. In this study, we have examined the brake systems of developed vehicle systems and we have provided information on the brake pads or brake shoes on these systems. Two different test methods were applied for both brake pads of urban and intercity railway vehicles. These tests include; wear and microhardness. The general introduction of the railway vehicles used in the urban or intercity, the type of braking system used, the description of the brake pads, the types and the materials used are given.

Keywords: Railway, Brake, Brake pads, Brake Shoes, Railway Vehicles



Investigation on the Abrasion of Rails in Iron Road and Turnout

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Abstract: Rail system transportation has an important place in today's transportation system. Both passengers and passengers have become increasingly in need of improvements in railways in the direction of increasing demand. Infrastructure studies are also included in these improvement studies and they have an important place. Rail abrasions leads to significant financial loss. To prevent these financial losses, researches and studies are being carried out towards material development. In this study, the rail sections exposed to more abrasion are emphasized. The mainline of the railway and turnout is compared for its abrasion. Three different test methods were applied for both rail sections. These tests include; wear, friction and spectral analysis. Because of these tests, the comparison of the mainline and the rails in the turnout have been made.

Keywords: Rail System Transportation, Rail Abrasion, Turnout, Wear, Friction



The Insensitive Derivative Designs of RDX Explosive by Amination

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Abstract: The “insensitivity” term in energetic materials describes the ease of storage, transportation, handling and safety. The focus molecule in this study was a well-known and widely used secondary explosive RDX (1,3,5-Trinitroperhydro-1,3,5-triazine) which can be used alone or as a component in explosive formulations. New derivatives of RDX were designed by substituting nitro groups with amine ($-NH_2$) groups to obtain more insensitive explosives compared to RDX. The computational calculations were performed using DFT UB3LYP/6-31+G(d,p) theoretical level of Gaussian 09. RDX-1 was obtained via amination of one nitrogen atom of RDX ring while RDX-2 and RDX-3 were obtained via that of two and three nitrogen atoms, respectively. The insensitivities of derivatives were predicted from the bond dissociation energies of $N-NO_2$ and $N-NH_2$ bonds in addition to ring C-N bonds. The detonation performances were obtained by calculations of crystal densities and standard heats of formation which were used in Kamlet-Jacobs equations. The heats of detonation and the volume of produced gases per gram of explosives were calculated for obtaining power index values. As a result, RDX-3 derivative having three amine bonds was chosen as the most insensitive material among all derivatives and RDX. However, its detonation performance and power index were found to be lower than all. The second insensitive derivative was RDX-2 having two amine groups. Its detonation performance was better than RDX-3 but lower than RDX. However, the power index of it was the best among all derivatives but still lower than RDX. Either RDX-2 or RDX-3 may be chosen as insensitive RDX candidates but which predominates the other depends on what purpose it is used for. If fully insensitive derivative is needed, RDX-3 may be preferred. If insensitive but more powerful explosive is needed, RDX-2 may be considered.

Keywords: Energetic Materials, RDX (1,3,5-Trinitroperhydro-1,3,5-triazine), Bond Dissociation Energy, Insensitivity, Detonation Performance, Power Index.



Electrical, Superconducting and Flux Pinning Properties of Bi-site Tm Substituted Polycrystalline Ceramics

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Abstract: The present work, we examine the significant variations in the Bi-2212 superconducting materials In with the partial replacement of bismuth nanoparticles for thulium impurities in the crystal structure by means of powder X-ray diffraction (XRD), dc electrical resistivity ($\rho-T$) and critical current density (J_c). The solid materials of $\text{Bi}_{2.1-x}\text{Tm}_x\text{Sr}_{2.0}\text{Ca}_{1.1}\text{Cu}_{2.0}\text{O}_y$ are produced with the different Tm foreign impurity concentration level of $x= 0.00 \leq x \leq 0.30$ by the standard solid-state reaction route at the room temperature in the air medium. It is found that the optimum dopant concentration level is observed to be $x=0.07$ where the Bi/Tm substituted material exhibits the highest electrical conductive, superconducting and flux pinning characteristics. Namely, the material prepared with $x=0.07$ presents the minimum room temperature resistivity of 3.67 m Ω cm and residual resistivity parameter of 0.40 m Ω cm. Besides, the sample obtains the highest onset-offset critical transition temperatures of 85.85 K-85.61 K, respectively. This is attributed to the fact that the presence of optimum Tm inclusions improves the mobile hole carrier concentrations, interaction between the superconducting grains, crystal structure quality, homogeneities in the oxidation states and morphological characteristics. Likewise, the optimum Tm dopant concentrations highly dispersed throughout the crystal lattice bind tightly to form the effective nucleation centers so that the Bi/Tm substituted material shows the maximum transport critical current density of 95 A/cm². Also, the variations in the high phase volume fraction, average grain size and a -axis/ c -axis lengths deduced from the XRD results confirms the optimum dopant concentration level of $x=0.07$.

Keywords: Bi-2212 Superconductor, Bi/Tm Substitution, J_c , $\rho-T$, XRD



Design of a Laser Scanning RangeFinder Based Feedback System for a 2DOF Robotic Balancer

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Abstract: Robotic systems and robots have been commonly using in different industrial applications for the last two decades. Applications are ranging from welding to painting, brushing to joining tasks. Especially, in the automobile manufacturing industries, robots are almost in everywhere. Starting from prototype development stage, they are in use till ultimate product is reached. Pick and place robots are the other examples for the common use. These robotic systems are specially designed so that the base of them can be able to turnaround. In some cases, i.e. welding operations of automobile structure, the turn of the base of the robot may not be easily performed. Instead of turning the whole robotic system, the table, on which the part working on it, may be turned according to the need. This case is common in welding robotic systems due to decreasing processing time, control effort and number of feedback sources. Such robots are known as robotic balancer or balancing systems. These robots are also used in the robotics and control courses in the engineering education since the physical meaning of the feedback in a robotic system can be effectively shown to the students when a robotic balancer is used. The feedback sources of balancing robots are the integration of high resolution encoders, tachometers and high quality cameras. The control algorithm should get the data from these sensorial systems and perform required decoding processes and run the planned control loop. In this study, it is proposed that the feedback sensorial system can be created by the use of a laser scanning rangefinder sensor for a 2DOF robotic balancer. 2DOF robot's motion in two axes is achieved using two dc motors having gearheads. DC motors are suited with high resolution encoders and tachometers as well. These sensors provide the information about at which tilt angles the platform is rotated in two axes. A camera, which is placed at the top of the robotic system, is also used for getting the localization feedback for the object located on the platform. In this system, the data coming from the camera and the other sensors are replaced with the data obtaining from a laser scanning rangefinder sensor. While the balancing systems is in motion, the algorithm, which uses the laser sensor data, predicts where the object is on the platform and estimates what angles the platform rotates in two directions. At the same time, the data flowing from encoders, tachometers and camera is also collected in order to make verification about whether the robotic system follows a reference trajectory or not. In other words, their outputs are used as the ground truth. The proposed system is mathematically modeled, simulations are conducted and the results are verified with the results obtained from the experimental studies. The results highlights that laser scanning rangefinder sensors can be adapted into the robotic balancing platforms for getting fast, accurate and usable feedback. This enables to increase the performance of the control strategy and keep the object and the platform under observation during a real-time operation.

Keywords: Laser Scanning Rangefinder, 2DOF Robot, Feedback, Balancer



An Investigation of Local Scour around Bridge Piers under Gradually Decelerating Flow Conditions

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Abstract: The local scour around bridge piers is investigated under gradually decelerating flow conditions. The experiments were carried out at the laboratory of Hydraulic of Department of Civil Engineering, at Engineering Faculty of Gazi University. The channel dimensions which was used in experiments were spanning to 10-meter of length, to 0,50-meter of width and 0,50-meter of height. The local scour experiments were performed around cylindrical bridge piers. Experimental results showed that as the value of U/U_c increases, the value of y_s/h also increases. Similarly, when the Froude number value increases, y_s/h value increases. This situation is consistent with the results in the literature. The scour data from experiments were compared with the literature scour prediction models results. The results of this study show that gradually decelerating flow is an important parameter for local scour. The difference of this study among other similar studies at the literature is that the flow conditions are non-uniform flow (gradually decelerating flow). The non-uniformity of the flow conditions is closer to the natural conditions, hence, the results of the study are thought to be more suitable for the field conditions.

Keywords: Local Scour, Clear Water Scour, Bridge Piers, Gradually Decelerating Flow, Non-uniform Flow



Optimum Tm Concentration Level for Bi-2212 System and Defining of Relationship between Resistivity Based on Disorders-Defects and Transition Temperature

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Abstract: In the present work, we examine the significant variations in the Bi-2212 superconducting. This study focuses strongly on explanation of two important questions: (I) what is the optimum thulium impurity concentration for perfection between the Cu-O₂ consecutively stacked layers within the minimum disorder, and (II) At which conditions do we obtain the highest onset and offset critical temperature values for the Bi-site Tm substituted Bi_{2.1-x}Tm_xSr_{2.0}Ca_{1.1}Cu_{2.0}O_y ceramic materials. The answer to the first question is solved by means of the scanning electron microscopy, dc electrical resistivity and powder X-ray diffraction measurements whereas the latter question is in correspondence to the empirical relationship between the structural disorders and transition temperatures. In this regard, the combination results deduced from the experimental measurement findings show that the Bi-2212 material exposed to the trivalent Bi/Tm substitution level of x=0.07 in the active Cu-O₂ sheet of adjacent superconductive layers exhibits the lowest porosity, smoothest and densest for the surface morphology, the highest metallic characteristics; onset and offset critical transition temperatures for electrical and superconducting features; and largest high phase, average grain size and lattice constant parameter of *c*. Additionally, we survey the differentiation of the transition critical temperatures as a function of the parameters of residual resistivity ratios (*RRR*), residual resistivity (ρ_{res}), resistivity at 90 K (ρ_{90K}), $\Delta\rho$ ($\rho_{300K}-\rho_{90K}$) and ρ_{norm} ($\rho_{90K}/\Delta\rho$). According to the modelling approaches, in case of the full perfection between the Cu-O₂ consecutively stacked layers within the minimum disorder, the result with respect to the parameter of $\Delta\rho$ gives the highest onset and offset critical temperature values.

Keywords: Bi-site Tm Substituted Bi_{2.1-x}Tm_xSr_{2.0}Ca_{1.1}Cu_{2.0}O_y, Optimum Tm Concentration, *RRR*, ρ_{res} , $\Delta\rho$, ρ_{norm}



Nitrated Isooctane Fuel Formations via Nitromethane Additive

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Abstract: Isooctane fuel with an IUPAC name of 2,2,4-trimethylpentane can be used alone or as a major component in fuel mixtures. It acts as a primary reference fuel in octane ratings and has the 100 point on the rating scale. Octane rating is an important parameter in spark-ignition engines.

The second component of this study, nitromethane, is a liquid material with a low toxicity and high thermal stability. Having high energy density makes it possible to be used as a monopropellant. It is also used as a fuel in mixture with methanol in drag racings. Another function of nitromethane is to improve performance in small combustion chambers when used as an additive to other fuels.

The possible radicalic nitration reactions of isooctane fuel with nitromethane propellant were investigated thermodynamically. The study temperatures were chosen as 298.15 and 691.15 K. The temperature of 691.15 K was the auto-ignition temperature of both isooctane and nitromethane and it was believed to represent the engine conditions better than any other lower temperature. The study includes computational calculations which were performed at DFT UB3LYP/cc-pVDZ theoretical level. Nitration reactions were performed from four different positions of isooctane and finally four different nitrated products were obtained. Thermodynamically the most and the least favorable nitrations were observed in primary and secondary carbons of isooctane, respectively, at 691.15 K. All the considered reactions were endothermic at this temperature. The other observation was that there was a relationship between the thermodynamic tendencies of the considered reactions and the ballistic performances of their nitrated products.

Keywords: Isooctane, Nitromethane, Nitration, DFT, Ballistic Performance



The Use of ROS in the Development of an Autonomous Forklift Project

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Abstract: Autonomous vehicles and mobile robots have been using in different areas for different purposes especially for the last decade. In the near future it is expected that the needs for the autonomous vehicles will be dramatically increasing since the developments in computer and communication techniques directly feed the improvements in autonomy. The autonomous vehicles, nowadays, find places in industry for themselves. They are replaced with the manned vehicles in the industrial applications. The one, of which usage has been sharply increasing, is the autonomous forklifts. They almost are being in use in anywhere in the industrial tasks. Due to increasing demands, both the number of usage and the researches focused on developments of autonomous forklifts are rising up. In order to follow the researches related to autonomous forklift subject and make a contribution in this field, this study is conducted. The study focuses on design, simulation, manufacturing and assembly, control and tests of an autonomous forklift prototype. The most challenging part of a mechatronics / robotics project is the programming environment since the mathematical representations of each mechanical / electrical subsystems need to be combined using a control strategy under a smooth computational & communicational structure. In this study, this challenging issue is overcome by the use of ROS, which is the initials of the words of “Robot Operating System”. It runs stably under Linux-Ubuntu environment and provides all its details in open-source approach. It works based on the idea of publisher-subscriber couple. If the ROS is planned to be integrated into a system, the important point is tools, equipment, sensors, motion controllers, microprocessors and embedded computing systems, used in the study, should be chosen by considering their libraries and drivers are available in the ROS architecture. In this study, the autonomous forklift designed has four wheels and controlled via all-wheel-differential-drive technique. Four dc motors coupled with gearheads are commanded by the use of ROS supported motion controllers. The motors are also suited with high resolution encoders connected to a high speed encoder interface board which is also recognized by the ROS. The autonomous vehicle’s forklift part is also controlled using an actuated mechanism of which required signals are provided via a ROS supported controller. A laser scanner range finder used for mapping tasks and an indoor-GPS system used for localization purposes are integrated into the vehicle as well. These systems run also under ROS. The main computing unit is an embedded PC, which runs ROS under Linux-Mint. In ROS, the required decoding and encoding processes of the sensors, sub-computing units and the coding strategies are performed using C++ and / or Python programming languages. In case the performance, accuracy and processing speed are the focus, ROS provides a good engineering programming platform for the researchers. It is experienced that when the autonomous system includes sensors which require heavy computation for processing and mathematical representations which demand overload computing on computer, ROS is one of the solutions in the robotics research area. There is another advantage of using ROS that if the prototype of an autonomous system developed in the laboratory is controlled via ROS and it is intended to develop its industrial version, all computing and communicational infrastructures can be easily transferred to the industrial version by the use of ROS-Industrial Architecture.

Keywords: ROS, Autonomous Forklift, Control, Automation, Mobile Robot



Effect of Tm Impurity on Mechanical Performances and Characteristics of Bulk Bi-2212 Type Superconductor and Stabilization of Durable Tetragonal Phase

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Abstract: In the current work, we deal with the influence of thulium particles inserted in the Bi-2212 superconducting crystal structure on the mechanical performances and identifications with the aid of microhardness experimental measurements performed at the different external indentation test loads in the range of 0.245 N-2.940 N. The load-dependent Vickers microhardness values obtained enable us to determine semi-empirically the mechanical performance parameters such as Young's (resistant against the permanent plastic deformation), fracture toughness (resistant towards to the beginning of permanent deformation), yield strength (beginning point of permanent distortion), tensile strength (an upper limit to the applied indentation test load or resistance to the plastic flow) and brittleness index (corrosion rate of material prepared under the applied indentation test load) for the virgin and Bi-site Tm substituted $\text{Bi}_{2.1-x}\text{Tm}_x\text{Sr}_{2.0}\text{Ca}_{1.1}\text{Cu}_{2.0}\text{O}_y$ ceramic compounds ($x=0.00\leq x\leq 0.30$). According to the experimental results inferred, the presence of optimum Tm concentration in the Bi-2212 crystal structure strengthens the mechanical performance due to the improvement in the mechanical durability, critical stress, stiffness, fracture and flexural strength parameters. Similarly, the mechanical identifications deduced from the change curves of Vickers hardness parameters over the applied test loads show that every material exhibits the typical indentation size effect (ISE) but in improvement trend up to the concentration value of $x=0.07$. All in all, the optimum Tm inclusions retard the formation of flaws, dislocation movements and crack-producing crack/void propagations.

Keywords: Bi-2212 Crystal System, Partial Bi/Tm Replacement, Vickers Microhardness, Mechanical Performances, Mechanical Characterization



A Study on Description of Homogenous Clusters in Superconducting Paths of Bi/Gd Substituted Bi-2223 Ceramics

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Abstract: In the present work, the bulk $\text{Bi}_{2.0-x}\text{Gd}_x\text{Sr}_{2.0}\text{Ca}_{2.1}\text{Cu}_{3.2}\text{O}_y$ ($0 \leq x \leq 0.3$) superconducting materials are prepared by the standard solid-state reaction technique in the atmospheric air medium. The characterization properties as regards the superconducting, electrical and microstructural of Bi-site Gd nanoparticle substituted Bi-2223 crystal are explored using the standard temperature-dependent resistivity measurements in the temperature intervals 30 K-130K so that we can develop the theory of Percolation to discuss the influence of partial replacement of homovalent Gd^{+3} impurities by Bi^{+3} nanoparticles in the Cu-O_2 consecutively stacked layers of Bi-2223 superconducting compounds. It is found that the optimum dopant level leads to more and more stabilize the superconductivity in the homogeneous regions, and thus, much more percentage of small homogenous clusters (related to the formations of cooper-pair probabilities) form remarkably in the superconducting path as a result of the increment in the Josephson coupled energy. The experimental results deduced from the superconducting and electrical investigations are also confirmed by the microstructural examinations. According to the microstructural surveys performed, the porosity/voids/cracks/distortions, structural defects, grain misorientations, disorders in orientation of adjacent layers and grain boundary coupling problems improve thoroughly as the T_m impurity dopant substitution level of $x=0.1$.

Keywords: Bi-2212 Crystal Structure, Homovalent Bi/Gd Substitution, Percolation Model, Josephson Coupled Energy, Superconducting Clusters, Stabilization of Superconductivity



Resource Usage for Academic Activities in the University Department

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Abstract: Usage of resource is one of the most important decision problems in also the universities as each public institutions. University units present resource to participate academic activities for academics. So, university units supply budget for them.

Resources must be allocated/used optimally in such a way that the performance of academic units of university can be improved. This study presents an AHP and goal programming model for an optimum allocation of resource in university department.

In the study, AHP methods applied to determine the priority importance of academic activities for goals of the university. Then, selecting the best academic activities are made by using goal programming. Established mathematical model are solved with ILOG commercial packages. At result, the best academic activities are selected with required optimal usage of resource for both university unit and academics.

Keywords: Resource Usage, Academic Activity, Analytic Hierarchy Process, Goal Programming



Use of Particle Swarm Optimization to Determine the Optimal Transmitter in Passive Radar Systems

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Abstract: In this study, it is aimed to determine the best transmitter of opportunity in a region for a passive radar system by using particle swarm optimization algorithm.

The developed algorithm utilize real terrain maps to increase the usability. In this work, the Shuttle Radar Topography Mission elevation data of the National Aeronautics and Space Administration is used to generate the terrain. The publicly available SRTM 3 version of this data set has 3 arc-seconds resolution and the elevations are calculated relative to the WGS84 ellipsoid, which is the default datum used for the Global Positioning System (GPS). Hence, the transmitters in the region are placed on the map with respect to their latitude and longitude. The search process involves an imaginary target which is placed on the intended coverage area. According to the target and the generated terrain, a line of sight test is performed to eliminate the transmitters without for the direct view. On the remaining transmitters, particle swarm optimization is applied to the radar equation to define the transmitter with the highest signal to noise ratio.

It is found that the proposed particle swarm optimization based best transmitter determination algorithm, without including the effects caused by the modulation content, can successfully find the best transmitter in the region for operation. Especially on rough terrain with many transmitters, the search for the best transmitter is a time-consuming problem. The proposed algorithm can reduce the required installation time and complexity of the passive radar systems. Additionally, the algorithm ensures the best possible receiver location with the highest signal to clutter ratio by using swarm particles with less iteration and enhances the overall system performance.

Acknowledgements: This work is supported by the Scientific and Technological Research Council of Turkey (TÜBİTAK) under grant 117E008.

Keywords: Passive Radar, Particle Swarm Optimization, Location Determination, Terrain Maps, Radar Equation



Low-Cost 3W AlGaAs Diode Pumped Compact Tm: LuAG Laser

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Abstract: Tm³⁺ doped laser systems (depending on their host crystal) can operate at 2 μ m regime if they are pumped in the 770-800 nm band. Because of high water absorption in this band, Tm³⁺ doped laser systems are used in some of the medical operations that required water absorption like tissue welding or early diagnostics of urological cancer tissues. Furthermore, these lasers can play critical roles in LIDAR, atmospheric transition, communication and spectroscopy applications.

In earlier studies, Tm³⁺ doped laser systems have been pumped by flash lamps, output of other laser systems and high-power multimode AlGaAs diodes. However, these systems are typically inefficient, bulky and costly. Furthermore, in those lasers, mainly a cooling mechanism (such as water or nitrogen type) are necessary to obtain stable laser operations which increase the complexity of the lasers. Due to these reasons, the progress and improvements in the aforementioned areas negatively affected so far.

In this work, we report Tm:LuAG solid-state lasers effectively pumped by a standard low-cost (<250 \$) commercial compact multimode 3W AlGaAs C-mount free space laser diodes at 780 nm that can be driven with a low-cost compact electronic cards. Laser operations were achieved in an astigmatically compensated 4-mirror x-cavity containing a 7-mm long 6% Tm³⁺ ion doped LuAG crystal at room temperature without any cooling mechanism. With absorbed 2.6 W pump power, the system provide more than 500 mW output power at 2029 nm. Overall system could lie in a compact 60 x 30 cm table. Furthermore, by inserting birefringent filter into the system the output further tuned over 100 nm in 2 μ m band. Because of compact and low-cost layout of this system, this laser could be an indispensable light source in the necessary fields.

Acknowledgements: This study was supported by the Scientific and Technological Research Council of Turkey (TÜBİTAK) under the Project 115F053.

Keywords: Lasers, Solid-State Lasers, Tm:LuAG Lasers, Eye-safe Lasers, Tunable Lasers, Diode-Pumped Lasers



Evaluation of Expansion Strategies for Rail System Network of Ankara

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Abstract: The Ankara metropolitan municipality, where the number of automobile per capita is the highest, develops various projects in order to meet the increasing urban transportation demands. The Ankara Metropolitan Area is planning to increase the existing rail system network to 600 kilometers with 11 new lines. This paper presents a model for the expansion of urban transportation networks incorporating specific requirements about population coverage, budget constraints, demand and verity goals. Three different multicriteria decision making processes, AHP, ANP and fuzzy AHP are used in the evaluation. As a result, it is concluded which projects should be prioritized among the strategies to extend the rail system and which strategies are more important in improving urban transportation. Finally, the most suitable ranking is made for Ankara urban transport among rail systems projects and the result of three method solution are compared, are evaluated.

Keywords: Ankara, Urban Transport, Rail System Network, AHP, ANP, Fuzzy AHP



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Synthesis of Un-Doped Sb_2S_3 and W-doped Sb_2S_3 Thin Films and Their Characterization

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Abstract: In present study, un-doped Sb_2S_3 and W-doped Sb_2S_3 thin films have been synthesized on glass substrates by chemical bath deposition (CBD) method at room temperature. Ammonium tungsten oxide hydrate as W source, antimony (III) chloride as Sb source and sodium thiosulphate as S source have been used during synthesis process. Un-doped Sb_2S_3 and W-doped Sb_2S_3 thin films synthesized on the glass substrates have been annealed at 350 °C for 1 hour under N_2 gas to be formed crystalline structure after synthesis process has been completed. The structural, optical, morphological, and elemental properties of un-doped Sb_2S_3 and W-doped Sb_2S_3 thin films have been investigated by x-ray diffraction (XRD), optical absorption, scanning electron microscopy (SEM) and energy dispersive x-ray (EDX) measurements.

Keywords: Characterization, Chemical Bath Deposition, Doping, Sb_2S_3 , Thin Film, Tungsten

**Synthesis of Un-Doped PbS and La-Doped PbS Thin Films and Their Characterization**

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Abstract: In present study, un-doped PbS and La-doped PbS thin films have been synthesized on glass substrates by chemical bath deposition (CBD) method at room temperature. Lanthanum (III) nitrate hexahydrate as La source, lead nitrate as Pb source and thioacetamide as S source have been used during synthesis process. The triethanolamine (TEA) has been used as capping agent. The pH of the mixture has been controlled by NaOH. The structural, optical, morphological, and elemental properties of un-doped PbS and La-doped PbS thin films have been investigated by x-ray diffraction (XRD), optical absorption, scanning electron microscopy (SEM) and energy dispersive x-ray (EDX) measurements.

Keywords: Characterization, Chemical Bath Deposition, Doping, PbS, Thin Film



The Seropositivity of Parvovirus B19 among Kidney Transplant Recipients in Libya

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Abstract: This study aims to detection the seroprevalence *parvovirus B19* among kidney transplant patients in Libya. The virus is a single strand DNA virus belongs to the Parvoviridia family and only parvovirus known to be a pathogen in human.it causing several problems in human especially in immunosuppressed patients such as organ transplant recipients. In kidney transplant patients parvovirusB19 can continue for years due to failure the immune response and it may be associated with chronic clinical manifestations such as anemia and another reticulocytopenia.

Our study includes fifty renal transplant patient (10women and 40men) who checked up in two main kidney transplant centers in Libya in Tripoli city (Tripoli Central Hospital) and Benghazi city (General Hawari Hospital) during the period from first of January 2017 to end of December 2017in different years post translation , the age ranged between 12-64 years old, 5ml of blood samples collected from each patient in white tube to getting serum by centrifugation them for 5 min at 3000RPM, and kept frozen at (-20) till analyses. The samples were collected support by questioner include some information about patient include age, sex, date of translation, immunosuppression drugs and medical history. All samples were analyzed by enzyme-linked immunosorbent assay technique (ELISA) for detection antibody against parvovirus B19 IgM (ORG-Germany) and antibody against parvovirus B19 IgG (ORG-Germany) depended on indirect ELISA principles. The seropositive of *parvovirus B19* rate was 3/50 (6%) for IgM (acute infection) and 34/50(66%) for IgG (chronic infection). Seropositive of *ParvovirusB19* in Libyan kidney transplant (Both IgM, IgG) depends on age; most age affected was between 20-39 years old. The conclusion demonstrated that *parvovirusB19* common among kidney transplant in Libya and 35% of Libyan kidney transplant patient were susceptible to the infection by B19 (do not have antibodies).

Keywords: Parvovirus B19, ELISA, Kidney Transplant, Anemia, Reticulocytopenia



Effect of *Tribulus terrestris* Extract on Motility and Longevity of Rainbow Trout (*Oncorhynchus mykiss*)

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Abstract: *Tribulus terrestris* is an annual herb and belongs to the Zygophyllaceae family. It has antioxidant and aphrodisiac properties.

Tribulus terrestris was collected from natural habitats in Osmaniye during summer season. Whole (aerial parts and fruits) plant sample was rinsed with water and air-dried in shade. It was powdered (25 g) and extracted with 50 ml 70% ethanol in a Soxhlet apparatus, then the extracts were evaporated to dryness under pressure at 45 °C using a rotary evaporator and stored at - 20 °C until those were used. Activation solution was supplemented with levels of 0 µg/l (Control), 200 µg/l, 400 µg/l, 600 µg/l, 800 µg/l and 1000 µg/l. *T. terrestris* extract and, motility and survival of sperm cells were assessed. Motile sperm percent was assessed as actively moved sperm. Duration of forward motility was time from activation initiation to sperm stop move.

T. terrestris had sperm motility-promoting effect. Highest motility rate (91.67±2.89%) and duration (49.00±3.61 s) of sperm for *O. mykiss* were at concentration of 400 µg/l.

Based on the present results, sperm quality was positively affected by quantitative changes different concentrations of *T. terrestris*. In addition, *T. terrestris* can be used in activation medium for *O. mykiss*.

Keywords: *Tribulus terrestris*, Activation Medium, Sperm Motility, Rainbow Trout, *Oncorhynchus mykiss*



Pyrazoles: An Approach to the Discovery of New Anticancer and Apoptosis Inducer Agents

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Abstract: Cancer contains many disease states generally characterized by abnormally proliferating cell and is a major and often fatal disease. It is a collective term used for a group of diseases that are characterized by loss of control to grow, divide, and spreading of cells, leading to a primary tumor that attack and destroy other tissues and normally caused by abnormalities of genetic material of the affected cell.

It is well known that compounds containing pyrazole rings have been reported to possess antimicrobial, antifungal, analgesic, antioxidant and anticancer activity. Therefore, there is a need for new drugs of novel structural classes. A literature survey revealed that especially, 3,5-dimethyl-1H-pyrazoles have been implemented as antitumor and apoptosis inducing activity besides their capability to exert remarkable anticancer effects through inhibition of different types of enzymes, proteins and receptor.

In our laboratory, some 3,5-dimethyl-1H-pyrazole derivatives were obtained by the reaction of some hydrazides with acetylacetone and investigated for their anticancer activities. The selected compounds by National Institute of Health were screened for their anticancer activity. These three compounds were tested against 60 human tumor cell lines, from 9 cancer types. Initially, a single high dose was used (10⁻⁵ M) in the full NCI 60 cell panel. Among the compounds, 3-[(3,5-dimethyl-1H-pyrazol-1-yl)carbonyl]-2',4'-difluorobiphenyl-4-ol demonstrated highest activity against K-562 leukemia cell line with growth inhibition of 69.95% at 10⁻⁵ M concentration. Further experiments with this compound have been made. The compound containing the pyrazole structure was found to have an IC₅₀ value of 4 µM on growth of K-562 cells.

Keywords: Synthesis, Hydrazide, Pyrazole, Anticancer, Apoptosis



Biodiversity and Treatment Areas of Urtica

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Abstract: Urtica species have spread almost all over the country in forests, rocks, stream coasts. The family has 2,600 species of about 79 genus. The presence of burning villus on their leaves is the most prominent feature of the family. Five species are common in Turkey but two species are used for medical purposes. These are *Urtica dioica* and *Urtica urens*. Diuretic, antiulcer, antidiabetic, antihistaminic, antiallergic, antirheumatic, anti-inflammatory effects as well as anticancerogenic effects are also used in the treatment of prostate and breast cancer. Numerous biological activity studies have been investigated on *Urtica dioica* in recent years. Thus, it is ensured that the products are obtained and the usage of the products is increased. These products are herbal medicines as well as food supplements. The aim of this study is to investigate the therapeutic properties of Urtica genus plants on many diseases by scanning available researches. In our study, we informed about the treatment areas on diseases based on the biodiversity and pharmaceutical properties of Urtica species.

Keywords: Urtica, *Urtica dioica*, Medical Plant



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Development of Stand Height Curve Models on *Fagus orientalis* Stands of Black Sea Region, Turkey

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Abstract: Total height is less frequently used in the development of forest models than diameter, as it is hard and costly to measure, and as a result inaccurate measurements are often made. When actual height measurements are not available, height-diameter functions can also be used to indirectly predict height growth. A total of 26 models that estimate the relationship between height and diameter in terms of stand variables (basal area, quadratic mean diameter, maximum diameter, dominant diameter, dominant height, arithmetic mean height, age, number of trees per hectare and site index), were fitted to corresponding to 1000-1200 trees, using linear and non-linear regression procedures. The precision of the models was then evaluated by cross validation. The data were collected during 35 permanent plots of Oriental beech (*Fagus orientalis* Lipsky) stands, in the Black sea region of Turkey. Comparison of the models was carried out by studying the coefficient of determination, bias, mean square error. Akaike's information criterion and by using a F-test to compare predicted and observed values. Best results were obtained with those models that included any independent variable related to the height of the stand (mean or dominant height), although this implies a greater sampling effort for its application.

Keywords: *Fagus orientalis*, Forest Modelling, Height Model, Diameter-Height Relationship



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Modeling of Volume Increment-Crown Dimensions Relationships on *Cedrus libani* Trees, Isparta

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Abstract: Taurus cedar (*Cedrus libani* A. Rich.) is significant from the historical, cultural, aesthetic and economic perspectives and it is one of most important natural resources in Turkey. Taurus cedar has high survival, good adaption, and rapid growth when planted on good soils compared to karstic lands. In this study aim, relationships between crown diameter, crown height, crown ratio and volume increment of *Cedrus libani* trees were investigated and regression prediction models were derived in Isparta. The objective of study is to use linear and non-linear equations for estimating volume increment for Taurus cedar. For each tree, diameter, total height, crown width, crown length were measured. SPSS statistical package was used to fit the selected equations. Akaike's information criterion (AIC), adjusted coefficient of determination (R^2_{adj}), root mean squared error (RMSE), numerical and graphical analyses of the residuals were used for evaluating the models. The results showed that, all fitted equations gave acceptable results with R^2_{adj} and RMSE for *Cedrus libani*. The study concluded that, the volume increment could be estimated by crown dimensions as it is easy to measure for ground-based inventory and stand structure determination. This study recommended that, future research is needed with a greater variety of site and stand conditions in addition to a greater variety of tree sizes and ages. It should be noted that, the models used by this study were based on data collected from Isparta; therefore, it should be used with caution outside this area.

Keywords: Forest Canopy, Crown Diameter, Crown Length, Linear And Non-Linear Equations, Model Evaluation



Determination of Performance Properties of the Oriented Strand Board Manufactured with Nano-TiO₂ Modified Urea-Formaldehyde

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Abstract: In this study, the effect of TiO₂ on some physical, mechanical and morphological properties of OSB will be investigated. TiO₂ at three levels (0,2, 4 and 6 %) was added to urea formaldehyde (FF) and melamine urea formaldehyde (MUF) resin. To evaluate physical properties thickness swelling and water absorption were determined while modulus of rupture, modulus of elasticity, and screw holding strength tests were carried out to evaluate mechanical properties of the unreinforced and reinforced OSB panels. Scanning electron microscopy will be used to determine the morphological characteristics. In addition, advanced thermal performance tests will be performed. According to the results obtained, the improvement of the performance of OSB panels produced using urea formaldehyde graft modified with nano material has been determined.

Keywords: OSB, Nano TiO₂, XRD, SEM, DSC



The Survival Rate and Growth Performance of Different Tree Species in Arid Lands of Central Anatolia

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Abstract: *Fraxinus angustifolia*, *Pinus nigra*, *Calligonum polygonoides*, *Amygdalus orientalis* and *Spartium junceum* species were planted in experimental plantations in Acıpınar, İncesu, Karapınar, Sazlıpınar and Emirgazi aridland regions located in Central Anatolia.

Upon planting, soil samples were taken and diameter and height of seedlings were measured for initial data. The same samplings were repeated at the third year of plantation to determine absolute and relative growth rates of seedlings.

The data revealed that the top 20 cm of the soil have low salt but high lime contents across all sites. At the end of the third year, about 60% of the *Fraxinus angustifolia* seedlings and 40% of the *Pinus nigra* seedlings were survived. *Fraxinus angustifolia* seedlings had 140 % more height growth compared to that of *Pinus nigra* seedlings. At the end of the third year, 97% of the *Amygdalus orientalis* seedlings were survived. While, the corresponding values for the other two shrub species, *Calligonum polygonoides* and *Spartium junceum*, were 42 and 26%, respectively.

As a result of the study, it was determined that the most successful species were *Amygdalus orientalis* and *Fraxinus angustifolia*. Therefore, these two species can be used in the restoration practices implemented in similar arid regions.

Acknowledgement: This study is funded by TÜBİTAK (The Scientific and Technological Research Council of Turkey) through a project no: 1120946 and titled as “Kurak Bölge Bitkilendirmesinde Farklı Ağaç, Çalı ve Otsu Türler Kullanımının Fidan Büyümesi ve Beslenmesi ile Bazı Toprak Değişkenlerine Etkisi”.

Keywords: Arid-region, Afforestation, Central Anatolia, Restoration



Growth Performance of *Elaeagnus Angustifolia* and *Robinia Pseudoacacia* as Nitrogen Fixing Species in Afforestation Practices in Arid Lands of Central Anatolia

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Abstract: To assess the growth performance and changes in soil nitrogen two nitrogen-fixing tree species *Elaeagnus angustifolia* and *Robinia pseudoacacia* were planted in five designated afforestation sites located in the Central Anatolia Basin. Intensive site preparation included ripping the subsoil (to 80 cm) and plowing the upper soil were employed before planting bare root (1+1) seedlings in December 2012. Two sets of five random soil samples on each experimental units were taken in summer 2012 from the first 30 cm of the soil on 5 spots (locations) of each plot using a 200 cm³ core sampler. The same soil sampling was repeated 50 cm away from the seedling stem base in summer 2017 to gauge changes driven by the seedlings Data from 2012 sampling were used as co-variance on the analysis of 2017 data. Initial diameter and height of seedlings were measured in April 2013 and at the end of the fifth growing season in 2017.

At the end of the fifth vegetation season *E. angustifolia* had 80 % survival rate compared to 52% for *R. pseudoacacia*. The both species had an average 34 cm total absolute height growth for five growing season. *F. angustifolia* and *R. pseudoacacia* had also a similar absolute growth rate for diameter in five growing season. *F. angustifolia* had almost two times higher relative height growth and diameter increment compared to those of the *R. pseudoacacia*. *E. angustifolia* and *R.pseudoacacia* increased soil N in the first five years, by about 25%.

Acknowledgement: This study is funded by TÜBİTAK (The Scientific and Technological Research Council of Turkey) through a project no: 1120946 and titled as “Kurak Bölge Bitkilendirmesinde Farklı Ağaç, Çalı ve Otsu Türler Kullanımının Fidan Büyümesi ve Beslenmesi ile Bazı Toprak Değişkenlerine Etkisi”.

Keywords: Arid-land, Afforestation, Plant Nutrition, Soil Productivity



Use of Green Area of Kastamonu: Case study of Clock Tower

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Abstract: The intensive living conditions in urban have a very serious negative effect on the stress level of people. The positive effects of open green areas on human are known by everyone. Urban open-green areas and plenty of sunshine and fresh air establish a healthy, well-balanced, refreshing and beneficial environment for human beings, and consequently, for the society through providing freedom of movement. The aim of the study is to show which areas mainly preferred when the people want to carry out recreational activities in the Kastamonu city center and determine the appropriateness of this area for recreative activity. A questionnaire study was conducted with 100 randomly selected people in order to determine the most frequently used open green area in terms of recreational activity in Kastamonu and the results showed that 89% of the participants prefer the Clock Tower. Thus Clock Tower was determined as a research area in this study. It is revealed the current state of the Clock Tower in scope of the study, plants are used in this area and the purpose of use of these plants is determined and how frequently users use this area and the reasons for not frequent use. In addition, activities that are effected in the area and changes in mood after using the area. The second survey study was conducted on users of the area consisting of 118 people. It is revealed space features existing at Clock Tower and events area identified after that space features that users want to be in this area and events areas. Thus, the aim of the area is to determine the users' expectations and the deficiencies and problems in this area.

Keywords: Clock Tower, Recreation, Use Of Area, Preference, Activity



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Psychophysical Effects of Changing Life Environments, Expectations and Interactions; Sample of Nevsehir Hacı Bektaş Veli University

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Abstract: Throughout history, human life has been shaped within the environment it is in, and behaves in the direction of existence or change with its components and processes. In studies on human psychophysical processes in the context of landscape-human relationships, the issues such as the effects of living environments on human psychology, the qualities of positively perceived landscapes, the preferential decisiveness of perceptions and feelings are emphasized. The natural / cultural environment and its constituents are a versatile field of work in terms of the effects of the environment on the human as well as the effects of the human on the environment. In that case, immigration and settlement from one living environment to another living environment of an individual who does have a resident living in today's society should be evaluated in terms of psychophysical processes. In this study, first-year students of Hacı Bektaş Veli University in the 2017-2018 school year was selected as the sampling and the questionnaire was conducted. In the questionnaire, students who started university education and separated from the city where they lived and were settled in a new social and environmental life area were asked about their feelings, perceptions, expectations and interactions in order to analyze the process of change. Statistical analysis was applied to individual questionnaires carried out in the study, and evaluations were carried out according to these analyzes.

Keywords: Perception, Landscape, Living Environment, University Student



Perceptions of University Students towards Nevsehir Urban Identity

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Abstract: Cities are shaped by interaction of natural conditions such as topography, climate, water, vegetation, geographical location with culture and socioeconomic structure, and create different identity. The main elements that bring the urban pattern are the building blocks, the open-green spaces around the building masses and the ways that connect them together. Their features create the visual character of the city and form the city identity based on people's perceptions. Perceptions of people about their surroundings can show differences according to many factors such as the socio-cultural characteristics of the people, their experiences and environmental awareness.

This study aimed to reveal the identity of Nevsehir city from university students' perspectives. Face to face surveys were applied to students who are in the main campus of Nevsehir Hacı Bektas Veli University. Within the scope of the research, questions were asked which identify the students' individual characteristics, districts where they frequently used in the city, their views about the environmental structure and urban images. It has been questioned by the statistical analyzes whether the data obtained vary according to the individual characteristics of the persons and the length of time they live in the city. As a result, because of being located in the Cappadocia Region, importance of studies about Nevsehir city image and urban identity has been emphasized and it has been revealed how the city is perceived by foreigners.

Keywords: Nevsehir, Urban Identity, Urban Image, Student, Perception



Status of Drinking Water in Kastamonu City: A Comparative Study using Water Quality Index (WQI), Ammonia, Iron, Phosphate and Manganese Concentrations between (2011-2015)

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Abstract: During this paper, the technique water quality index was successfully applied to evaluate water quality and determine the role in Kastamonu, Turkey. This study aimed to determine Status of Drinking Water in Kastamonu City using Water Quality Index, Ammonia, Iron, Phosphate and Manganese of drinking water quality in kastamonu City-Turkey. For this purpose, Data collection based on the average of 120 of water samples were taken either at station (before treatment), or from station (after treatment) in kastamonu city between (2011-2015). The major water quality constituents include water temperature, pH, EC, Turbidity, Chloride (Cl), ammonium (NH₄-N), nitrate (NO₃-N), nitrite (NO₂-N), phosphate (PO₄-P), Iron (Fe), Sulfate (SO₄), and Manganese (Mn). The results of the drinking water of kastamonu city analysis were assessed to check if they satisfy the permissible limits of water quality parameters given in Turkish Water Pollution Control Regulation and USEPA standards for drinking water quality. The The average concentrations of the Physicochemical Parameters Water in the kastamonu city (before and after treatment) for (NH₄-N, PO₄-P, Fe, and Mn) averaged between (0.0313-0.026, 0.0522-0.0331 ,0.0473-0.0233 ,0.0512-0.0262 mg/l) respectively. Findings display that the physical and chemical quality (NH₄-N, PO₄-P, Fe, and Mn) were considerably below the Turkish Water Pollution Control Regulation (WPCSR) and USEPA standards for drinking water quality in both station.

The Water quality index (WQI) is valuable and special ranking to depict the average water quality status. The Water quality index shows that the (before treatment) a higher (WQI) of 31.50 at Good water quality grades as against 17.18 at Excellent water quality grades recorded in (after treatment) in drinking water of kastamonu city the results indicated the Situation of drinking water in kastamonu city was high quality.

Keyword: WQI, Kastamonu, Water Quality, Drinking Water, Karaçomak Dam

**Management of Forest and Behavior of Atlas Cedar (*Cedrus atlantica*) - Case Study (Azrou-Morocco) -**

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Abstract: The management of forests and rangeland is the tool the forest to ensure both a growth, a sustained-yield forestry, the sustainability of its capital and the biological balance. The evolution of knowledge, techniques and demands of society have made the forest a fundamental instrument for sustainable management of forest ecosystems. He had to meet a goal of preserving and balanced growth of the forest stand. The forest manager who acquired new experiences, forge new tools to improve forest conditions through a division of forest areas into series according to a thorough diagnosis and planning of interventions in time and space. Thus, the objective of this study is to evaluate the impact of silvicultural treatments in the forest of Azrou (Morocco), on increasing the Atlas cedar (*Cedrus atlantica*), advocated in the group improved by forest management. However, due to environmental heterogeneity, we studied the effect of the predominant factors of the station (substrate, depth of soil...) on the same phenomenon of tree growth. The results of our study at shows that regeneration is better in areas where we have silvicultural treatment and were site conditions are good: favorable climate, recovery means trees, deep reddish brown soil types, slightly acidic, light texture and rich in sodium and magnesium. Investigations have also shown that in the current context, the conservation of forest areas also requires the development of legal and socio-economic tools.

Keywords: Atlas Cedar, *Cedrus atlantica*, Silvicultural Treatments, Regeneration



The Effects of Active Organisms on the Physiological Characteristics of Taurus Cedar (*Cedrus libani* A. Rich.) Seedlings

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Abstract: Because of the differences in ecological conditions caused by global climate change and environmental pollution, plants are exposed to stressors as other living things and they need some external biochemical support to continue developing in these conditions. Plant growth regulators, arbuscular mycorrhizae, and effective organisms are used in this context. All of these elements are synthesized entirely from the natural environment and are used to support to plant growth and development. Effective organisms represent the most recent element among other elements.

The present study evaluated the effects of Biohumus EM-A, EM-1, EM-5 and EM-Gold application on physiological variables such as chlorophyll-a, chlorophyll-b, total chlorophyll content, transpiration, relative humidity and photosynthesis levels of on Taurus cedar (*Cedrus libani* A. Rich.) seedlings, which can adapt to different conditions in Turkey owing to its broad geographic spread, and which is a highly valuable forest tree species ecologically, silviculturally, and economically.

Within the context of the study, one-way analysis of variance (One-Way ANOVA) was used for the comparison of data with regard to physiological parameters, and Duncan test was used for grouping. According to the results obtained from statistical analyses, there was a statistically significant difference at the 0.01 level between effective organisms in terms of chlorophyll-a, chlorophyll-b, and total chlorophyll levels. According to the results of Duncan test, EM-A and EM-1 constituted the first group for the same physiological variables, EM-5 the second group, and EM-5 and EM-Gold the last group. When the results of the ANOVA for relative humidity and transpiration level were examined, a significant difference was found at the 0.01 level. According to the result of the Duncan test that was performed to determine homogeneous groups, the first group included EM-A, EM-1 and EM-gold, whereas the second group included EM-Gold and EM-5 in terms of relative humidity and transpiration variables. In the statistical analysis performed for photosynthesis level, a significant difference was found between the types of effective organism at the 0.01 level. According to the results of Duncan test performed at the 0.05 significance level, EM-A was found to be in the first group, EM-1 and EM-Gold were in the second group, and EM-Gold and EM-5 were in the third group.

Based on these results, it was found that all physiological variables investigated on Taurus cedar seedlings were significantly altered because of the effect of Biohumus.

Keywords: Effective Organisms, Physiology, Taurus Cedar, Seedling Quality, Adaptation



Variation of Age-Dependent Litter Quantity of Kazdağı Fir (*Abies nordmanniana* sbsp. *bornmüelleriana*) in Kastamonu Region

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Abstract: The aim of this study is to determine the effect of litter quantity on age-dependent and Fir₅₇, Fir₆₆, Fir₁₈₃, Fir₂₅₀, Fir₂₈₃ and Fir₃₀₆-year-old fir trees growing under similar environmental conditions on some litter quality as a result of this change on Kazdağı fir (*Abies nordmanniana* sbsp. *bornmüelleriana*) which is naturally distributed in the Ilgaz, at a distance of 50 km from Kastamonu province, which has semi-moist climate and is located in northeast Turkey.

Fir litter on mineral soil was collected at three randomly selected sites of 50x50 cm (0.25 m²) size from each sample area. The dry weights of the soil surface litter components were determined by using the moisture values obtained from the difference between the wet and dry weights of the litter samples and the litter quantities were calculated as tons/hectare (t h⁻¹) by multiplying with hecturnal conversion coefficient.

According to results, litter quantity for the different tree ages from the Kazdağı fir were ranked in Fir₃₀₆ (30,3 t h⁻¹) > Fir₂₈₃ (24,3 t h⁻¹) > Fir₂₅₀ (21,1 t h⁻¹) > Fir₁₈₃ (18,0 t h⁻¹) > Fir₆₆ (14,7 t h⁻¹) > Fir₅₇ (8,4 t h⁻¹). As a result, it has been found that the amount of dead cover on the soil surface of firs of different ages increases with age.

We can say that the tree canopy consisting of different ages, the production of the amount of the needle depending on the age and the difference in the characteristics of the microclimate under the stands, is effective on the litter quantity on the soil above ground. Litter quantity which is poured on the soil surface in young aged trees is usually needle cast, while older ages are more effective the branches and shoots.

Keywords: Kazdağı Fir, Litter Quantity, Tree Age, Needle Cast, Kastamonu



Effects of Pure and Mixed Stands on Some Soil Properties, Soil Organic Carbon and Total Nitrogen Stock Capacities

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Abstract: In this study, some soil properties (bulk density, soil pH, soil sand, silt and clay contents), soil organic carbon and total nitrogen concentrations and stock capacities of pure and mixture stands of Scots pine and fir tree species were studied using 6 different soil depths (0-5 cm, 5-10 cm, 10-15 cm, 15-20 cm, 20-25 cm and 25-30 cm). Mean bulk density was 0.60 g cm⁻³ for fir pure stands, 0.57 g cm⁻³ for Scots pine pure stands and 0.54 g cm⁻³ for Scots pine and fir mixture stands. Mean soil pH was 7.31 for Scots pine pure stands, 7.29 for Scots pine and fir mixture stands and 6.99 for fir pure stands. Pure Scots pine stands had the highest sand (50%) and silt (43%) followed by fir pure stands (46%) and (37%), and Scots pine and fir mixture stands (43%) and (20%). Percent clay was however higher for Scots pine and fir mixture stands (37%) than both pure Scots pine and fir stands which had similar clay (33%). Pure Scots pine stands had the highest soil organic carbon and total nitrogen (6.19% and 0.30 % respectively) followed by mixture stands of Scots pine and fir (4.42% and 0.25% respectively) and pure fir stands (3.44% and 0.20 % respectively). As for the SOC and TN stock capacities, mean soil organic carbon stock capacity was also highest for pure Scots pine stands (95.8 Mg C ha⁻¹) followed by mixture stands of Scots pine and fir (70.0 Mg C ha⁻¹) and pure fir stands (57.7 Mg C ha⁻¹). Similarly, pure Scots pine stands had the highest mean total nitrogen stock capacity (4.55 Mg N ha⁻¹) followed by mixture stands of Scots pine.

Keywords: Soil Organic Carbon, Total Nitrogen, Stock Capacity, Soil Depths



Some Morphological and Physiological Characteristics of Mahaleb (*Prunus mahaleb* L) Seeds

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Abstract: In this study, it was aimed at determining some seed characteristics of Mahaleb (*Prunus mahaleb* L) seeds. In this context, it was evaluated 19 seed samples which came to The Seed Quality Control Laboratory from The Seed Stock Centers. Forest Tree Seeds and Tree Breeding Research Institute Directorate carries quality control studies of the seeds sent from the Seed Stock Centers in Seed Quality Control Laboratory. In this context, 19 mahaleb seed samples from different origins were investigated. Tetrazolium test is used in order to know the vigor and germination potential of some species seeds in a short time. In this study, the tetrazolium test was conducted to determine the viability percentages of seeds. All tests carried out in the laboratory were conducted in accordance with ISTA (International Seed Testing Association) rules. The variations among the morphological and physiological characteristics of the seeds were determined according to the origins. For this, 1000-seeds weights, moisture contents and in addition, tetrazolium test results were evaluated. The study showed that the 19 see samples varied in terms of seed morphological characteristics. The average 1000- seed weight of the seed samples was measured as 109, 27 gr. The moisture content of the seed samples was found to be 8.97% on average, it was also found that the average seed viability percentages were very variable according to the origins of the seeds. The overall average percentage of seed viability was determined as 50,05. Seed viability was very low (0-7) with low moisture content (4-5%) and high moisture content (26,3%).

Keywords: Mahaleb, Seeds, Tetrazolium Test, Seed Viability, 1000-seeds Weight



Solid Waste Management and Public Awareness on Solid Waste Management in Libya – Benghazi

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Abstract: Libya like most developing countries is faced with problems of solid waste management. In Benghazi, the Municipal Solid Waste is ultimately disposed of in both authorized and unauthorized waste dumps. All kinds of wastes, regardless of their nature, are being dumped indiscriminately into depressions, sand pits, old quarries, beaches, drains and even in certain areas, along streets, without due regards to the nuisance and harm caused to the environment.

In order to solve the problems related to Solid Waste Management (SWM) in Benghazi in this study and to select the best method, some questionnaires were made by interviewing public to determine the restrictions on solid waste management authorities and sustainable solid waste management in Libya.

Survey number one was Sample of Questionnaire for Members of the Public. Survey number two was Sample of Semi-Structured Questionnaire for Interview Sections Questionnaire (Semi-Structured). Survey number three was Sample of Questionnaire for Members of Benghazi Municipal Council. While data generated from the questionnaire survey were analyzed using the Statistical Package for the Social Sciences (SPSS).

According to the results of the surveys; where it is important to note that 43.3% of the participants reported that they are dissatisfied or very dissatisfied with waste management. On the other hand, 39.7% of the participants reported that they are satisfied or very satisfied with waste management. This suggests that most of the participants are not satisfied with waste management in the country. While the survey number two 65% of the participants reported that they are neither Satisfied nor Dissatisfied about waste management. In survey number three for Sample of Questionnaire for Members of Benghazi Municipal Council. they are asked: which would you say is your level of Satisfaction or Dissatisfaction about solid waste management in this country? Almost half of the participant was neutral according to satisfaction and dissatisfaction

Keyword: Solid Waste, Solid Waste Management, Survey, Benghazi, Libya



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Coating of Wood Materials with *Cotinus coggygia* and SiO₂ Mixes and Its Effects on Combustion Properties

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Abstract: This study aimed to protect wood materials with natural plant colorant of smoke tree (*Cotinus coggygia*) and liquid glass (SiO₂) against fire. According to that, natural colorant was extracted from smoke tree by boiling method and added as mordant in ratios 3% oak ash, and 10% vinegar (CH₃COOH). Liquid glass added to obtained mixtures in ratio 20% and applied to the wood samples scots pine (*Pinus sylvestris* L.) and beech (*Fagus orientalis*) by classic dipping and vacuum method. Combustion tests were performed on coated wood materials according to ASTM-69 standard and weight loss (%), temperature (°C), gasses (CO, O₂) were measured during the combustion. The results showed that; smoke tree has well potential to color the wood material, but unfortunately test performances are not enough to retard the fire effect on the wood materials. Eco-friendly smoke tree colorant maybe uses in places where protection against fire is not desired, instead of synthetic paints.

Keywords: Smoke Tree, Liquid Glass, Combustion, Natural Colorant, Fire Retardant



Determination of Cadmium Accumulation Levels in Some Poplar Taxa

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Abstract: Various technologies have been developed for reducing the Cd accumulation in soil. One of these technologies is the using plants as reservoirs to absorb Cd in the soil, in other words, phytoremediation. Then soil is cleaned with harvesting of plants that store Cd. The success of phytoremediation in Cd-contaminated soils depends on the selection of plants that will allow Cd accumulation into their tissues. Utilization of poplar taxa for phytoremediation is recommended. Poplar tree species are preferred because they are rapid growing, they have deep root systems and short rotation times. Some researchers have reported that Cd accumulation in plant from the most accumulated part to the least accumulation part is sorted as; root>body>leaves>fruit>seed. In this study; the amounts of cadmium accumulation in leaf, root and branch tissues of poplar taxa were determined by using AAS (Atomic Absorption Spectrometry) device. We were investigated six poplar taxa; *P. alba*, *P. tremula*, *P. nigra* of Geyve, N03.368A clones and hybrid poplar clones of I-214 and Samsun. As a result of the analysis of leaf tissue samples, the highest amount of cadmium was detected in *Populus tremula* L. with the amount of 12,45 ppm. The minimum cadmium accumulation was determined in *Populus alba* L. poplar species with the amount of 0,84 ppm. As a result of analysis of root tissue specimens, the highest amount of cadmium was determined in I-214 (*Populus euramericana* Dode. Guinier/I-214) with the amount of 34 ppm. The minimum cadmium accumulation was determined in *Populus alba* L. poplar species with the amount of 4.6 ppm. As a result of analysis of branch tissue samples, the highest amount of cadmium was found in *Populus deltoides* Bartr. Samsun (I-77/51) clone with the amount of 5,54 ppm. The minimum cadmium accumulation was determined in *Populus nigra* L. - Geyve poplar clone with the amount of 0.44 ppm level. It has been estimated that the cadmium accumulation in the leaves may range from an average of 0.1 to 17 ppm for non-evergreen species. It is determined that the highest amount of cadmium accumulation is observed in the root tissue in poplar taxa. The results of the aforementioned studies are consistent with our findings.

Keywords: Phytoremediation, Heavy Metal, Cadmium, Poplar Clones, AAS



Therapeutic Power of Natural Areas

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Abstract: Today's living conditions cause people to live under intense stress. This intense stress creates many negative effects on people in terms of physical, psychological and behavioral and triggers serious diseases. Many studies have shown that nature has many positive effects on people such as reducing stress hormones and relaxing. In this study, the negative effects of stress on human and the positive effects of nature on stress will be determined and the rehabilitating characteristics of natural areas on humans will be revealed. In addition, the characteristics of the therapeutic areas will be determined. In order to reveal the healing properties of natural areas, these areas have been investigated under three headings of Experiential Qualities: Sensory Stimulation, Movement and Control. The result shows how the landscape characteristics of the therapy provider areas should be. Therefore, it is important that not only to consider these areas as green areas but also taking them into account as therapeutic open area units when designing the open-green areas. When designing this type of areas, it is very important to pay attention to these criteria to increase their therapeutic effects. Therapeutic areas giving power to people should contain place diversity and a green-intensive feature by taking the type of plants to be used in these areas into consideration. Providing diversity in the area provides the user with the chance to choose and encourages him/her to use the area. This kind of area lowers the level of stress as it increases the sense of self-guidance. While these types of open-green areas provide activity diversity, it is necessary to pay attention to use of sensuous elements. When doing this, using natural elements and minimizing artificiality make positive contributions to the therapeutic effect of the area. Areas used by individuals must accommodate staying alone and thinking to empower the individual to get rid of his/her problems by means of environmental factors while areas particularly designed for common use shall provide an opportunity for socialization.

Keywords: Natural Area, Therapeutic Effects, Healing Garden, Therapeutic Landscape



Determination of Site Index with Growth Intercept Model in Brutian Pine

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Abstract: Brutian pine (*Pinus brutia* Ten.) is an important tree species in our country. The reason is, brutian pine has the highest share in terms of supplying the needs of wood product of our country and expansion of growing brutian pine range. That is why we need to know *Pinus brutia* Ten. which shows expansion in different region-characteristic of brutian pine growth and yield in a correct way. The important point to determine the qualities of the growth and yield is indentify the growing crops strength that is also known as site index and habitat of the tree. With this study, site index table has been created thanks to forestation in brutian pine stand in the region of Isparta and Burdur. During summer months of 2015-2016, it was taken 54 sample fields upon different age and class of site index to create site index table. 3 dominant or co-dominant trees cut at each sample field was measured up to rings of branches by taking into consideration annual height growth of the dominant or co-dominant tree. Regional site index table is created by using measured values and growth rate method of which the principles laid down by Nigh (1996). The yield strenght of habitat will be indentified more realistically by using site index tables on brutian pine forestation endemics.

Keywords: Plantations of Brutian Pine, Site Index, Growth Intercept Model, Branch Ring



Growth Performance in Seedlings of Common Hornbeam (*Carpinus betulus* L.) in Nursery Conditions

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Abstract: Common hornbeam (*Carpinus betulus* L.) is located in the Black Sea Region, but it is also locally found in the Amanos Mountains. While it generally exists in mixed forests together with beech, chestnut, oak and redwood trees; it can be seen pure stands of this species in some regions. In the study is aimed to investigate of development belong to the period of first four-years of some seedling characteristics of common hornbeam, naturally spreads over in Turkey. Seedlings were obtained from seeds that were collected from populations growing at three different altitude zones up to 1200 m above sea level in the watersheds of Trabzon-Maçka, Trabzon-Çaykara, Rize-Çamlıhemşin and Giresun-Espiye. Seedling length, root collar diameter and sturdiness quotient were measured at 1, 2, 3 and 4-year-old seedlings. Measurements were made on total of 1800 seedlings to be 3×50 seedlings from each populations throughout four years. Data were analyzed using the SPSS 23.0 statistical program. The analyses included ANOVA, Duncan's test, hierarchical cluster and discriminant analysis. Among populations, morphogenetic variations were found in terms of measured characteristics. As a result of the study, the average seedling length was determined in the period of first four years as 20.68 cm, 44.69 cm, 52.69 cm and 90.92 cm, respectively. In addition, the average root collar diameter occurred as 3.74 mm, 5.41 mm, 7.01 mm and 11.42 mm, respectively. While the average sturdiness quotient was 5.61 in 1-year old seedling, it was 8.14 in 4-year old seedling. As a result of the analysis of variance, it was determined that there was statistically significant difference ($P < 0.01$) among the populations in terms of all measured seedling characteristics. There was only no significant difference ($P > 0.05$) among the populations in terms of root collar diameter at four-year old seedling. The cluster analysis was conducted in order to determine degree of similarity or dissimilarity among the populations with regard to morphological characteristics in seedlings of common hornbeam. The significance of groupings occurred as a result of the cluster analysis was tested by discriminant analysis. As a result of discriminant analysis, dividing into two of groups was statistically significant ($P < 0.05$). While the populations in low altitude created first group, the populations in high altitude took place in the second group.

Keywords: *Carpinus betulus*, Seedling Morphology, Hornbeam, Altitude



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Investigation of the Effects of Production and Transport Activities in Forestry on Water and Wetlands

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Abstract: Forested wetlands provide and reserve a significant portion of utilizable and quality water in all over the world. Water quality and productivity in forest areas is approximately six times higher than the water quality and in non-forested areas. As a big part of efficient and quality water in the world come from forestry areas, it is very importance to protect and / or improve the water productivity and water quality of forested basins and to provide erosion - avalanche measures in these areas.

Within the scope of the study, the possible effects of the production and transportation activities in forestry on the productivity and quality of in-forest water areas are emphasized and measures to be taken in order to protect wetlands and increase water quality have been examined.

Keywords: Production in Forestry, Forest Transport, Wetlands, Water Quality

**Fruit and Seed Characteristics of *Smilax excelsa* L. as Medicinal and Ornamental Plant**

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Abstract: *Smilax excelsa* L., belonging to *Smilacaceae* family, is a deciduous woody climbing shrub up to 20 meters with thorny stems at least below. It is very common in the North Anatolian part of Turkey. This plant, which is important in terms of biodiversity, has great importance as medical with edible fruits, fresh shoots and especially leaves and rhizomes with antioxidant properties, although it appears to be harmful in technical forestry applications. At the same time, it can be used in landscaping as outdoor ornamental plant in terms of many aesthetic features such as hedge plant with protection purpose and visual quality (autumn coloring and red fruit). In the scope of this study, fruit and seed characteristics of the species were investigated. For this purpose, fruit and seed materials were obtained from four different populations (Arsin, Araklı, Sarıca, Erfelek) located in the natural distribution areas of the species. Fruit length and fruit width, 1000 seed weight, seed length and seed width measurements were made for each population.

Variance analysis (ANOVA) was applied the data by using SPSS 23.0 statistical program. Statistically significant differences ($P < 0.05$) revealed in terms of fruit length, fruit width, seed length and seed width among the populations. As a result of the study, 1000 seed weights of Arsin, Araklı, Sarıca and Erfelek populations were found as 64.23 g, 69.10 g, 117.55 g and 70.33 g, respectively. Depending on these properties, seedlings should be cultivated and provided use for multi purposes.

Keywords: *Smilax excelsa*, Morphology, Medicinal Plant, Variation



Results of Research Works at the Sites of Forest Reclamation

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Abstract: Scientific and practical interest in the topic of reclamation is determined by the extent of the disturbed lands that have arisen in more than 300-years of history of metallurgy and industry in Russia. Studies on the biological reclamation of territories in the Urals have a long history. Since the late 50s, the 20th century, methods of biological reclamation of disturbed lands began to be actively developed, which proved to be more effective than technical remediation.

We have created two landfills for forest reclamation experiments in the taiga zone of the Urals after technogenic territories: 1 - in the South Urals in a source of contamination with magnesite waste (1981-1983); 2 - in the Middle Urals on the ash dump of a large thermal power station operating on coal (1992-1994).

Our studies have established the main factors that limit the creation of sustainable forest crops in a hotbed of pollution from emissions from magnesite production: high alkalinity of soils (in the zone of strong pollution pH 8.5 to 9, average - 7.8 to 8.5 and weak 6.5 to 7.8 units) and over-saturation soil absorbing complex with magnesium cations. Experimental works on reforestation with the help of various ameliorants and soil preparation methods in 6 plots of 2 hectares showed the possibility of reforestation in zones of medium and low pollution where the soils pH does not exceed 8.5 units. Here at the age of 30 years, experienced cultures of Scots pine (*Pinus sylvestris* L.), Sukachyov's larch (*Larix sukaczewii* Dylis; Synonym of *Larix sibirica* Ledeb.) and Silver birch (*Bétula péndula* Roth.) are in a satisfactory condition. When the acidity of soils pH is close to 9 units landing dies.

The analysis over the 27-year period of the results of the experiments on reclamation of the ash dump makes it possible to draw a conclusion about the possibility of forest reclamation by applying the soil soil both by a trench method and a continuous covering and subsequent planting of 2 summer seedlings of the main forest-forming species. An assessment of the status of experimental planting of forest-forming species on an area of 6.1 hectares: Scots pine (*Pinus sylvestris* L.), Silver birch (*Bétula péndula* Roth.) and Downy birch (*Bétula pubéscens* Ehrh.), Siberian spruce (*Picea obovata* Ledeb.), Sukachyov's larch (Synonym of *Larix sibirica* Ledeb.) showed positive results.

The chosen direction of biological reclamation of technogenic territories - forestry with an orientation primarily on artificial reforestation is quite justified, since in this case the corresponding process is accelerated and at the same time forest ecosystems are restored that become self-regulating, which is very important in ecological-economic and social relations.

Keywords: Taiga Zone, Technogenic Territories, Biological Reclamation, Forest Replantation



Antioxidant Properties of Different Populations Nuts of Oriental Beech

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Abstract: There are substances produced in the chemical content of the seeds, especially against the toxic effects of oxidative stress. Among these, phenolic compounds that known with antioxidant properties are important for human health. Phenolic compounds have positive effects on human health in terms of anticarcinogenic, antimutagenic and antimicrobial activities depending on their antioxidant properties.

The parameters of the total antioxidant capacity, total phenolic and total flavonoid content analyzes were carried out to determine of the antioxidant characteristics of the oriental beech (*Fagus orientalis* L.) nuts collected from 6 different populations in this study. Total antioxidant capacity analysis results are expressed as mg ascorbic acid equivalent per gram of fresh sample (mg AE/g FW). The total phenolic and the total flavonoid content analysis results are given as mg gallic acid equivalent per gram of fresh sample (mg GAE/g FW) and mg quercetin equivalent per gram of fresh sample (mg QE/g FW), respectively.

The highest total antioxidant capacity was found to be 2.68 mg AE/g FW in the nuts collected from the Sinop-Turkeli population and the lowest total antioxidant capacity value was found to be 1.55 mg AE/g FW in the nuts collected from the Kastamonu-Cide provenance. The highest and the lowest of total phenolic content were found to be 2.21 mg GAE/g FW in the nuts collected from Kastamonu-Bozkurt population and 1.34 mg GAE/g FW in the seeds collected from Kastamonu-Cide population, respectively. The highest amount of flavanoid content was detected in the nuts collected from the Sinop-Turkeli origin (0,52 mg QE/gram sample), although the lowest amount (0.44 mg QE/gram sample) was found in the nuts collected from the Kastamonu-Cide population. These suggests that nuts with high antioxidant phenolic content may have been exposed to more stress than others.

The results were compared with those of other oily seeds in the literature. The total phenolic compound content of the oriental beech seeds was found to be less than that of walnut but more than pistachio and pine nuts, similar to almond, brazil nuts and cashew nuts. Thus, it has been concluded that consumption of the nut of the oriental beech as food may be beneficial for human health.

Keywords: *Fagus orientalis*, Seed, Antioxidant, Phenolic, Flavonoid



The Use of Black Locust (*Robinia pseudoacacia* L.) in Restoration Practices of Degraded Forest Lands Located in Duzce Province of Western Black Sea Region

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Abstract: This study was conducted in five-year-old black locust plantations established in degraded forestland (bushes) in northern Black-Sea region of Turkey. In 2009, all woody and herbaceous vegetation were scarified with a bulldozer equipped with a brush rake in a degraded forestlands located in three different sites in northern part of Duzce valley. The plantation site was ripped to 80-90 cm soil depth with the same bulldozer. Then 2 +0 bare root black locust seedlings were planted in late fall of 2009 and early 2010. Following four year after establishment manual vegetation control were applied in all experimental sites. In July and August 2015 30 seedlings from each site were uprooted for analysis. Soil samples were taken around each sampled trees from three directions and four distance (0, 50, 100 and 200 cm) at 30 cm soil depth. Soil samples were analyzed for pH, bulk density, total N and C.

Trees growing on northwestern aspect had accumulated about 64 % more biomass then that on southeastern site in five years. Soil C (2.4 %) and N (0.15 %) rate were similar in 200 cm periphery of the tree base. Data indicate that black locust can be used as part of restoration practices in degraded forestlands as a N-fixing species to facilitate the site for the later species.

Acknowledgement: This research was funded by the Duzce University BAP program through a project no: 2013.02.02.185) and titled as “Batı Karadeniz Düzce Yöresinde Bozuk Orman Alanlarının Yalancı Akasya (*Robinia pseudoacacia* L.) İle Ağaçlandırılmasının Topraktaki Azot Birikimine Etkisi”

Keywords: Black-Locust, Degraded-Lands, Restoration, Düzce



Variations in Eastern Strawberry Tree (*Arbutus andrachne* L.) related to Some Leaf Characteristics

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Abstract: An effective tree breeding program predicts to determine variations of forest trees. In this way, the economic ones should be kept for future use. On the other hand, by utilizing the selection and hybridization methods in breeding, it is aimed to provide mass production of the improved seeds by these methods and to use the obtained seedlings in the forest establishment studies. For this reason, the best start in breeding is to reveal the variations in populations for a species. In the present study, it is aimed to determine variations related to some leaf characteristics including leaf width (LW), leaf length (LL), leaf area (LA), distance from leaf base to the leaf maximum width (BW) and petiole length (PL) for leaves obtained from five different populations (Bartın, Kastamonu, Sinop, Samsun and Trabzon) naturally located in the Black Sea Region. By making these measurements on the leaves for the all populations, variations among the populations were determined. Total of 50 individuals from five different populations were used. Measurements were made on total of 1500 leaves to be 30 leaves from each individual. ImageJ (Image Analysis Software) was used to make measurements related to all measured characteristics. SPSS 23.0 statistical program were used to analysis (ANOVA and Duncan's test) of data.

As a result of the analysis of variance, it was determined that there was a statistically significant difference ($P < 0.01$) within and among the populations in terms of all measured characteristics. Duncan's test was used to determine the groups among the populations. Accordingly, five different groups occurred in terms of LW, PL and LA, four different groups took place with regard to BW, and three different groups emerged for LL. Although the lowest values for LL, LW, BW and LA were in Kastamonu population, it was determined in Trabzon population for PL. While the highest values for LL, BW and LA were found in Samsun population, it was determined in Bartın population for LW and PL. The average LL, LW, BW, PL and LA values of all populations were 9.40 cm, 5.07 cm, 4.51 cm, 2.41 cm and 37.44 cm², respectively.

Keywords: *Arbutus andrachne*, Tree Breeding, Variation, Leaf Morphology



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Types of Matrix Used in Production of Nanocellulose Composite Films

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Abstract: Obtaining nanocellulose from biomass such as wood, agricultural sources etc. and production of nanocomposite films from nanocellulose have aroused researchers' interest in recent years. These bio-based nanocomposites have been preferred instead of petroleum-based traditional materials in automobile, military materials, electronics, coating materials, medicine, pharmaceuticals and cosmetics, adhesive, food and textile industries. It is predicted that technological developments will increase further by new researches which will be conducted in this area. In general, the main components in production of nanocomposites are nanocrystalline cellulose (NCC) or nanofibrillated cellulose (NFC) and matrix. Types of matrix used in the production of nanocomposites change according to usage areas of these materials. For example, polyvinyl alcohol (PVA), polyethylene (PE), polyvinyl acetate (PVAc) are used to advance mechanical properties, whereas graphene and carbon nanotube are preferred for surface smoothness and boron derivatives also are wanted for high thermal properties in nanocomposite film production. As a consequence, in this review study some properties of matrix used in production of nanocomposite films were introduced and to be acquired a current source to literature was aimed.

Keywords: Nanocellulose, Bio-Based Nanocomposites, Matrix



The Content of Heavy Metals in the Snow-Soil-Needles of Scots Pine (*Pinus sylvestris* L.) System under the Conditions of Aero-technogenic Pollution

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Abstract: The research was carried out in the zones of influence of the Combine Magnezit, which is the world's largest enterprise for the production of highly resistant refractory materials. The receipt of the maximum volumes of magnesite dust in the atmosphere was in 1963 and reached 182.5 - 328.5 thousand tons per day. Later in 1978, new electrostatic precipitators were installed at Combine Magnezit and dust emissions dropped to 70-90 tons per day. In addition to magnesite dust, sulfur dioxide, carbon monoxide, nitrogen oxides, phenols, alkalis and fluorine enter the atmosphere. The influence of Combine Magnezit on the approximate forests lasts more than 100 years. The study area is located in the South Ural Province of mountainous taiga and mixed forests in the forest zone. Experimental plots and trial plots are located in the gradient of pollution to the northeast toward the main demolition of dust under the influence of prevailing winds. Background areas are located to the north-west and south of the plant, 20 km from the source of emissions.

The samples of snow were taken in the spring before the beginning of snow melting on each investigated site in fivefold repetition. The soil was selected in autumn in layers at experimental sites in 15 multiple replicates. The pine needles (first, second and third years of life) were taken from 12 trees in each experimental plot. The results of the chemical composition of snow water have shown the amount of suspended matter to be almost 40 times higher in the impact zone than in the background conditions. The caustic magnesite dust settling on the snow has pH = 10-11 units. The magnesium content in the snow water in the zone of severe contamination is 7203 mg / m². In 1 km from the plant pH of snow water is - 10.1, in 3 km - 9.7, in 10 km - 8.9 units; 6.9 - 7.3 units in background conditions in the south and north-west direction, respectively. In the zone of severe pollution, the content of metals in the solid fraction of snow water is several times higher than in the control. The iron content in all the experimental sections is higher than in other metals. Based on the results of the study, the following series was obtained near a number of metals: Fe(462.6)>Zn(169.7)>Mn(54.1)>Pb(2.6)>Ni(0.6)>Co(0.1) mg/m². In conditional control, a number of metals lined up differently: Zn(44.3)>Fe(29.9)>Mn(3.4)>Pb(0.2)>Ni(0.1)>Co(not found) mg/m².

In the soil, mobile forms of metals were determined, since they represent the greatest ecological danger for plants. The actual acidity of the soil as it approaches the plant is pH = 9.3 units. Metals of technogenic origin are concentrated in the forest litter and root layer (0-30 cm). Iron in the soil near Combine Magnezit is technogenic in nature (230 mg / kg), as it is contained in magnesite ore. In the forest litter, the zinc content is several times higher than in the mineral part of the soil. Significant accumulation of manganese (up to 433.3 mg / kg) in the upper horizons of soils is associated with the fixation of this element by humic substances. The lead content near Combine in the forest litter is 2-4 times higher, in comparison with the conditional control.

The pine needles of the second year of life accumulate more magnesium (6000 mg/kg), lead (4 mg/kg) in the zone of severe aero-technogenic pollution than pine needles of the same age 25 km from Combine (Mg 2000 mg/kg, Pb 1.5 mg/kg). In alkaline soil environment near Combine, the basic nutrients (NPK) become inaccessible to plants. Drying of coniferous trees near the source occurs due to the concentration of gases and dust coming from Combine. With a decrease in emissions over the last 10-15 years, changes have been observed between elements in the soil-absorbing complex. There is a positive shift towards a decrease in exchangeable magnesium with respect to calcium and a high soil pH. Forest regeneration is possible on soils with a pH of less than 8.5 units.

Keywords: Aero-Technogenic Pollution, Snow, Soil, Pine Needles, Heavy Metals



Bitcoin Lightning Network

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Abstract: Initially introduced by Satoshi Nakamoto's Peer-to-Peer Electronic Cash System's named paper, Bitcoin and the blockchain that technology behind it, as well as the convenience it brings to existing money transfer systems, is also very costly in terms of price fluctuations, loss of time in transfer transmission and high fees as well as disadvantages such as payments. The main reason for the long waiting period in the transfer process is that each transfer process that is desired to be done between the ends is written in blocks to blockchain. To add a transaction to nearest block which will be added to chain, that means performing a transaction immediately, may be required a transaction fee higher than the transfer amount. The lightning network is an open source project that is being developed to reduce these problems in the bitcoin blockchain. Lightning network transfer operations, which are based on the principle that each transaction should not be stored in the blockchain, can be performed faster and cheaper than the current situation. The main technology that provides this is payment channels in the lightning network. Peers that want to perform transactions open up a payment channel between them. They deposit a certain amount of crypto money in order to finance the transactions that they will make to the account of this channel and this payment channel is recorded to blockchain. As long as this payment channel is open, no transaction between the endpoints is recorded to blockchain. When this channel is closed, this information is recorded to blockchain. The endpoints which do not have directly opened payment channel between them can perform their peer to peer transactions faster and cheaper if they have common endpoints which has already opened payment channels between them. Thanks to these payment channels, it can be said that the transfer operations which have to be processed in the bitcoin blockchain can be reduced to a great extent and the waiting times for transactions waiting to be added to the current chain can be reduced.

Keywords: Blockchain, Lightning Network, Bitcoin, Payment Channel



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Student Attendance Systems Supported by Intelligent Mobile Telephones

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Abstract: Student attendance have been taken on sheet by signature in the past. In this study, it is developed a student attendance system with intelligent cellular telephones. BLE beacon devices with low energy technology are increasingly used in many fields such as commerce, home, events, transportation, delivery, etc. because of their low energy consumption and operating system support. Smart devices such as BLE beacons can be detected by mobile telephones when they arrive the area where the pointer devices are located. Many distance and proximity sensitive applications can be developed. The aim of this study is to provide a student polling system with intelligent mobile phone application that interacts with the markers' features. As a result, the developed system is compared with a traditional way.

Keywords: Education, Intelligent, Distributed Systems, BLE Beacon



Investigation of Members of the Family Micrococcaceae in the Water Column of Güllük Bay, Aegean Sea, Turkey

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Abstract: This study aimed to determine *Micrococcaceae* family members in the water column of Güllük Bay, Aegean Sea, Turkey under the coverage of the project supported by TUBITAK (The Scientific and Technical Research Council of Turkey-Project number:110Y243).

The seawater samples collected under aseptic conditions from the surface (0-30 cm), middle (25-33 m) and bottom (max 66 m) from 12 different stations in the period between May 2011 and February 2013 periodically. Variable environmental parameters; temperature (°C), dissolved oxygen (mg/L), and salinity (‰) values were measured in situ using portable multi-parameter (Hach Lange HQ 40D) in the stations.

The samples transferred to the laboratory in the cold chain. The diluted samples were prepared in 9 ml amounts of sterile seawater and inoculated on marine agar, and the plates incubated for five days at 22°C. The pure isolates were Gram stained and then Gram-positive isolates identified using GP cards (special card for identification of Gram-positive cocci) in the automated micro identification system VITEK 2 Compact 30 (Biomereux, France).

Three species belonging to Micrococcaceae family; *Kocuria kristinae*, *Kocuria varians* and *Micrococcus luteus* were identified. These species also reported from various marine environments of Turkey such as Aegean Sea and the Sea Marmara. They also found in some ships' ballast water incoming from various marine regions to the Sea of Marmara.

Determined species considered as pathogens and rare pathogens in previous studies. They were found to be related to infection diseases, acute peritonitis, bacteremia, brain abscess, endocarditis, pneumonia, septic arthritis, urinary tract infections, cholecystitis and meningitis among some immunocompromised patients. They are also capable of producing biofilms in the environment.

On the other hand, these species might be important for applications of microbial biotechnology due to theirs' capability associated with the production of halophilic α -amylase, antimicrobials, glutaminase, thermostable alkaline protease and nitrile hydrolyzing enzymes also nitrobenzene and putrescine degradation.

As the conclusion, it is recommended to conduct more scientific progress on Micrococcaceae family in order to have a closer look at further biotechnology and health concerns in marine areas.

Keywords: Micrococcaceae, Bacteria, Aegean Sea, Güllük Bay, Turkey



Occurrence of *Staphylococcus* spp. in the Surface Sediment and Sea Water of the Güllük Bay, the Aegean Sea, Turkey

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Abstract: In this study, Staphylococcaceae species was investigated in the sea water and sediment samples taken from Güllük Bay, the Aegean Sea, Turkey within the scope of a TUBITAK project (The Scientific and Technical Research Council of Turkey-Project number:110Y243) in the period between

May 2011 and February 2013. The seawater samples collected throughout water column such as surface (0-30 cm), mid-point (25-33 m) and the lowest point (max 66 m) from twelve sampling stations. The surface sediments gathered using bottom sampler, Ekman Grab (Hydrobios) at the same stations during the study period.

The samples were arrived to the laboratory by preserving the cold chain. Serially diluted samples plated on marine agar. After five days of incubation at 22°C, growing strains of mix culture were streaked. After Gram staining, the pure Gram positive isolates were identified using GP cards (special card for identification of Gram-positive cocci) in the VITEK 2 Compact 30 automated micro identification system.

Three different species, belonging to Staphylococcaceae family, were identified as *Staphylococcus aureus*, *S. xylosus* and *S. warneri*. Although occurrence of *S. aureus* was documented in the different studies, *S. xylosus* and *S. warneri* were not reported from marine environment in Turkish coasts. *S. aureus* was considered as a major opportunistic human pathogen. It may cause common and serious clinical infections such as skin and soft tissue infections, abscesses, bacteremia, respiratory infections, sinusitis, endocarditis, osteoarticular disease, food poisoning and device-related infections. It may improve its resistance to drugs and antibiotics. *S. xylosus* was reported to responsible of septicemia and pyelonephritis in humans occasionally where appears more common in animals. *S. warneri* was described as an emerging pathogen, which is capable of causing important infections on implant materials and orthopedic issues. However, *S. xylosus* and *S. warneri* were reported as useful species for production of lipase and naringinase also biosorption of cadmium, chromium and nickel ions from heavy metal polluted materials.

This study contributed to increasing knowledge on distribution of *Staphylococcus* spp. in the Gulluk Bay. Furthermore, this study emphasized that identified *Staphylococcaceae* species in Güllük Bay might be important for biotechnological approaches but also for bacteriological pollution and protecting human health.

Keywords: *Staphylococcaceae*, Bacteria, Aegean Sea, Güllük Bay, Turkey



Using Artificial Intelligence Algorithms in Damage Detection of Structural Elements

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Abstract: In recent years, artificial intelligence approaches have been often used to find a solution or to prevent potential problems in usage of structural elements. It is important to detect damages in structural elements like plates and beams for both the structure itself and the system in which they belong. Damage detection can be performed in many ways. Damage or damages can be determined by using classical methods like X-ray inspection or ultrasonic inspection or via smart algorithms like fuzzy logic, artificial neural network and support vector machines. In addition, optimization systems have also been used.

In artificial intelligence algorithms, natural frequencies of both damaged and undamaged plates or beams have been used as input data. In many studies, natural frequency data of plate or beam have been obtain by experimental studies or by analyses results from computer aided design (CAD) programs. Algorithm use these inputs and relate it with length, width, thickness and location and scale of the damage if the plate or beam is damaged. System decides whether the structure is damaged or not by considering the difference between healthy and damaged structure in terms of natural frequency. The algorithm can also predict if the structure will have damage by using the same logic. Apart from natural frequency, deviations in geometrical properties of the structure (bending, elongation etc.) or electrical parameters can also be used as input in artificial intelligence algorithms to determine the damage. Every artificial intelligence method can be used singly or together. Although application and arrangement of hybrid algorithms can be complex, it is widely known that they give better results.

Damage detection in structural elements like plates and beams can be performed fast, cheap and with high accuracy by using artificial intelligence algorithms. Additionally, these procedures reduces risks, production costs and maintenance costs. In this study, artificial intelligence algorithms that have been utilized to find damages/damage potentials in plates and beams have been investigated. In addition, efficiency analysis for this problem have also been researched.

Keywords: Artificial Intelligence, Damage Detection, Natural Frequency, Plates, Beams



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Synthesis, Anticancer Activity and ADMET Studies of N-(5-methyl-1,3,4-thiadiazol-2-yl)-4-[(3-substituted)ureido/thioureido]benzenesulfonamide Derivatives

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Abstract: Cancer can be identified as a growing major health problem for both developed and undeveloped countries. According to the World Health Organization (WHO) it is responsible for 8.8 million deaths in 2015 and this rate could increase by 50% to 15 million by 2020.

Sulfonamides, ureas and thioureas are important structures taking part in several biologically active molecules. There are anticancer drugs carrying sulfonamide or sulfonyl structure (Bicalutamide, Vismodegib, Belinostat) either bearing urea moiety (Sorafenib, Regorafenib). Furthermore, there are urea and thiourea derivatives being reported to exhibit cytostatic activities against colon and cervical carcinoma. Additionally, there are studies on sulfonamide bearing urea/thiourea and sulfonylurea/sulfonylthiourea derivatives possessing anticancer activities. In view of these facts, we have aimed to obtain a new series of sulfonamides bearing urea and thiourea moiety as potential anticancer agents. The newly synthesized compounds were characterized by IR, ¹H-NMR and MS spectroscopic methods, besides elemental analysis. Their cytotoxic activities were measured by using MTS assay in HeLa and HCT116 human cancer cells. Beside the experimental studies, *in silico* techniques were utilized to describe the drug-likeness properties of ligand and its interaction mechanism with the target. *In silico* absorption, distribution, metabolism, and excretion – toxicity (ADMET) analysis were applied to get an early assessment of the studies compounds by using ADMET subprotocol of Discovery Studio in this study.

Keywords: Urea, Thiourea, Synthesis, Characterization, Anticancer Activity, *In Silico* ADMET



***In Vitro* Inhibition of Azithromycin and Amikacin Sulphate Used as Anti-infective Drug on Human Serum Paraoxanase 1 Enzyme Activity**

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Abstract: We studied *in vitro* effects of two different drugs (azithromycin and amikacin sulphate) which are often used as anti-infective on human serum paraoxanase1 (PON1) enzyme activity. The drugs decreased the *in vitro* PON1 activity. The inhibition mechanism of azithromycin was competitive whereas amikacin sulphate was a noncompetitive inhibitor. The IC₅₀ values for azithromycin and amikacin sulphate were calculated to be 0.363 mM, and 4.92 mM, respectively, and the Ki constants were calculated to be 0.343 mM, and 5.90 mM, respectively. These results showed that azithromycin is more effective than amikacin sulphate. We propose a prediction scheme for the interaction of azithromycin with the PON1 active site because we thought that azithromycin interacts with the amino acids which are in the PON1 enzyme active site. The results we found showed that these drugs *in vitro* inhibit the activity of the enzyme with different inhibition mechanisms at low doses.

Keywords: Azithromycin, Amikacin Sulphate, Paraoxanase, Enzyme, Inhibition



The Important Roles of Fungi and Their Products in Biotechnological Applications

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Abstract: Fungi are essential components of several processes in ancient and modern biotechnological applications. Their different morphology, physiology and ecology have inspired modern biologists to classify into their own kingdom. They range from microscopic (yeasts and molds) to macroscopic forms (truffles and mushrooms) and are everywhere.

Up to now, millions of different fungal species on Earth have been discovered but only about 300 of those are known to be pathogenic for humans. Although we often think that fungi only cause disease to humans and other organisms, they influence human life in many ways. In the simplest term, they are part of the nutrient cycle in ecosystems. The mycorrhizal relationship between fungi and plant is essential for the productivity of farmland. Besides, these organisms and their products are commercially used in many industries including food, beverage, biofuel, chemical, farming and medicine, and in the production of antibiotics, enzymes, organic acids, pharmaceuticals and alcohols.

Fungi can produce secondary metabolites such as antibiotics, immunosuppressive agents, cholesterol-lowering drugs, antitumor agents and pigments and are potential goldmine for the manufacturing of medicines. Since the discovery of the first antibiotic, penicillin produced by *Penicillium* sp., we have obtained about 22% of antibiotics from fungi until date. Nowadays, more than 10 of the 20 most profitable products in human medicine are produced by using fungi.

In the history of humankind, fungi have been widely used in the production of foods and beverages including cheese, bread, wine, beer, spirits and milk products. Humans have also consumed edible fungi due to their excellent flavor, high vitamin and mineral content and positive health effects.

Enzymes are catalytic proteins mediate the chemical reactions in the living systems. They usually operate under mild condition of pH and temperature and are alternatives to harmful chemical counterparts due to their important features such as biodegradable and non-toxic nature. Fungi can produce a wide range of industrial enzymes including amylases, asparaginases, cellulases, glucosidases, lipases and proteases.

Synthetic chemicals used in the control of agricultural products are costly agents that pollute the environment and potentially harmful for humans and animals. In addition, their long-term usage promotes the development of chemically resistant pathogens. Fungi have numerous characteristics that make them potentially ideal for bio-control agents. They may control pathogens through several modes of action such as competition for nutrient and space, antibiosis and direct parasitism and thus, they help to maintain the quality of crops, foods and feeds and reduce the undesirable usage of synthetic chemicals.

Fungi play tremendously vital roles in our planet. Although they have amazing influences directly or indirectly on our lives, we have known relatively little about them. Therefore, the increasing of our knowledge will develop our benefits provided from fungi.

Keywords: Fungi, Fungal Products, Biotechnology, Applications, Beneficial Impacts



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Potential Field of lncRNA Usage in Livestock

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Abstract: Several gene regions associated with complex phenotypic traits including meat yield, milk yield, fertility, and resistance to diseases in the genome have been revealed with genome-wide association studies (GWAS) via high-resolution genotyping and sequencing in livestock. The next-generation sequencing applications have contributed to genome-wide transcriptional activity and have provided that thousands of long noncoding transcripts (lncRNAs). While lncRNAs have not the coding capacity, they play a key role in several biological processes. Here, the main features of lncRNAs, computational tools, and the current state of knowledge about lncRNAs in livestock species were summarized. Although lncRNAs and their molecular mechanisms are characterized effectively in humans and mice, there is not enough characterization in livestock. The progression of whole transcriptome studies in livestock such as identification, functional annotation, and characterization of lncRNAs will help to better understand the basic biological pathways associated with development, immunological regulation and complex phenotypic traits in farm animals.

Keywords: lncRNA, Sequencing, GWAS, Livestock, Phenotypic Traits



The Role of Salt Inducible Kinase 3 in Insulin-dependent Retinal Müller Cell Survival

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Abstract: Müller cells are the main glial cells of the vertebrate retina and function to maintain tissue homeostasis and integrity. Müller glia dysfunction or death might lead to neuronal and vascular complications which in turn result in the development of retinal diseases. Insulin receptors (IR) and insulin receptor substrates (IRS) are expressed in retinal neurons and Müller glia, and they are activated in response to insulin stimulation. Deficiencies in insulin signaling are shown to contribute to the pathology of diabetic retinopathy. It is thought that insulin regulates cell survival through PI3K/Akt pathway in the retina. SIK3 is a serine-threonine kinase regulating glucose and lipid metabolism and it is expressed in Müller glia. Upon insulin stimulation, Akt activates SIK3 in *Drosophila* and decreased SIK3 levels are detected in human obesity and insulin resistance. In this context, we aimed to investigate the involvement of SIK3 in insulin-dependent Akt activation and cell survival in Müller glia. MIO-M1 cells, a spontaneously immortalized Müller cell line isolated from human retina, were used as a model system in this study. In our experiments, MIO-M1 cells were treated with insulin for 0, 5, 10, 30, 60 and 120 minutes. 2.5 fold increase in SIK3 protein level was detected after 30 minutes of insulin treatment. In vitro kinase experiments showed that there is a significant increase in SIK3 kinase activity, which is in line with the increase in protein level. SIK3 overexpressed and SIK3 silenced Müller cell lines were generated to analyze the effect of SIK3 on insulin-dependent Akt activity and cell survival. For SIK3 overexpression, MIO-M1 cells were transfected with pMYC-SIK3 vector, while control cells received an empty vector. 2.6 fold increase in SIK3 expression was detected in colony-3 which will be used in future experiments. The stable shSIK3 MIO-M1 cell line was generated using shSIK3 containing lentiviral particles. 64% decrease in SIK3 transcript level was detected in colony-2 which will be used in future experiments. This study will contribute to further understanding of insulin signaling pathway in Müller glia and give clues about molecular mechanisms underlying diabetic retinopathy which in the long run provides development of new therapeutic approaches.

Keywords: Retina, Müller cells, Salt Inducible Kinase 3, Insulin, Cell Survival



Nanoencapsulation of Antimicrobial in Food Industry

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Abstract: Nanotechnology is defined as creation, utilization and manipulation of materials, devices or systems in the nanometer scale. Nowadays, researchers benefit from nanotechnology for many valuable applications allowing to create innovative food products and technologies. Nanoencapsulation is a novel technology to pack substances in miniature and refers to bioactive packing at the nanoscale range. Nanocapsules obtained from nanoencapsulation are colloidal sized particles with diameters varied from 10 to 1,000 nm. This novel technology provides the protection against adverse conditions and controlled release of bioactive compounds at the desired time and place. Nanoencapsulation applications in food industry involve the incorporation of bioactive materials, including food ingredients, vitamins, antioxidants, enzymes and slimming agents, in small capsules with submicron diameters. Similar to most bioactive compounds, antimicrobial agents may exhibit the interactions with the food ingredients and lose their activity. Nanoencapsulation of antimicrobial compounds represents numerous advantages for food industry such as enhancing bioavailability and solubilization, decreasing their volatility, increasing chemical and thermal stability, and controlling the delivery. Additionally, nanoencapsulation for delivery of preservatives in food has generally showed resistance to stress factors in comparison to the use of free antimicrobials. The high surface area to volume ratio of the nanoencapsulation systems can increase the concentration of the antimicrobials in food areas exposed to microbial contamination and improve passive cellular absorption mechanisms that could lead to higher antimicrobial activity. Recent studies detected that various nanocapsules were available to delivery antimicrobial substances such as antimicrobial peptides (bacteriocins, lactoferrin), plant-derived substances (essential oils, polyphenols and isothiocyanates) and enzymes (lysozyme) against food spoilage and pathogenic microorganisms. However, researchers have mostly performed in vitro and so, additional studies for use of nanoencapsulated antimicrobial in real food products should be warranted. In the present review, we focused on applications related to nanoencapsulation of antimicrobials in food industry.

Keywords: Nanoencapsulation, Nanotechnology, Antimicrobial, Nanoemulsion, Nanoparticle



Dynamic System Identification using Extreme Learning Machine

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Abstract: As known, feedforward neural networks is used to solve many engineering and science problems. Generally gradient-based learning algorithms are operated to tune all parameters of them iteratively. This training method is a conventional one, but training process is so much time consuming due to the slowness of gradient-based learning algorithms. This drawback has been a major bottleneck in their applications for past decades. In order to overcome this disadvantage, extreme learning machine (ELM) concept introduced to science community in near past. Essentially ELM is a data-driven learning algorithm for single-hidden layer feedforward neural networks (SLFNs). The number of hidden nodes or neurons in SLFN is randomly chosen and its output weights are analytically determined based on least-squares solution using generalized pseudo-inverse in ELM algorithm.

In this study, performance of ELM algorithm is investigated on a few benchmark dynamic systems (BDSs) taken from the literature. These highly nonlinear systems are modelled with SLFNs using ELM algorithm. Both training and test data sets have already been prepared for each system. Each BDS is identified with a SLFN trained by ELM using training data set, and then obtained SLFN model of BDS is tested using testing data set to observe generalization performance of it. Based on findings from this research, ELM provides an extremely fast learning speed, but it has found that the performance of generalization is very poor for some randomly selected hidden node numbers. Cause of this surprisingly poor generalization performance may be randomly selected hidden node numbers as well as input and bias weights. Therefore, in order to obtain SLFN having a good generalization success, it has been recommended that a systematic heuristic approach should be developed instead of trial and error to determine an appropriate hidden nodes number. This task is the next stage of this work in the near future.

Keywords: Dynamic Systems, System Identification, Extreme Learning Machine, Neural Networks



Sales Forecasting of White Goods by SARIMA-ANN Hybrid Approach

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Abstract: Sales forecasting of a business is described as prediction of sales with past sales performance and an analysis of expected market conditions. White goods sector includes such products of washing machine, dishwasher, refrigerator and small home appliances. An accurate sales forecast for businesses is vital for survival in market condition. This study aims to propose a Seasonal Autoregressive Integrated Moving Average-Artificial Neural Network (SARIMA-ANN) hybrid approach for sales forecasting. 46-months sales data of a white goods wholesaler is used. In particular, SARIMA models contain a seasonal component and they are widely used for time-series analysis and forecasting. They include a seasonal autoregressive operator with p-order, seasonal moving average operator with q-order, seasonal differencing operator of order d , and seasonal length. Many researchers try to find a solution to improve predictive performance in time series forecasting. In hybrid models, several models are combined to reduce risk of failure and also obtain more accurate results. SARIMA model cannot deal with nonlinear time series patterns while the neural network model alone is not able to handle both linear and nonlinear patterns as well. Hence, by combining SARIMA with ANN models can give more accurate forecasts. The proposed SARIMA-ANN hybrid approach consists of two steps. In the first step, estimation is made by SARIMA method. In the second stage, residues obtained from the SARIMA method are used as input variables in the ANN model. Mean absolute percentage error (MAPE) is used to measure the performance of the proposed approach. On conclusion, results demonstrate that hybrid model developed for each amount of product sales give better accuracy values than single SARIMA and ANN methods. Overall, it is proved that using the hybridization of SARIMA with ANN is applicable for forecasting of monthly sales of white good products.

Keywords: Forecasting, SARIMA, ANN, Monthly Sales Data, White Goods



Evaluating Service Quality Criteria in Hospital Healthcare Management and Delivery Using a Causal and Effect Decision Making Model

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Abstract: Providing better hospital service quality is one of the major concern of healthcare industry over the world. Management and delivery of hospital healthcare services in Turkey is achieved in a competitive environment. For that reason, to make better decisions, the services provided by the public and private hospitals should be monitored and evaluated according to the viewpoint of stakeholders such as medical staff, hospital executives and auxiliaries in terms of more satisfaction. From this point on, this study aims to present a causal and effect decision making model in evaluating hospital service quality criteria. Since the decision-making process involves vagueness of human judgments, a combination of fuzzy sets and decision-making trial and evaluation laboratory (DEMATEL) is used. Considering the interdependence among criteria, proposed fuzzy DEMATEL reflects the causal relationships among criteria through a cause-effect relationship diagram. Through a case study, six main hospital service quality criteria and 32 sub-criteria are evaluated by two questionnaires (one for main criteria and the latter is for sub-criteria) filled by 22 health experts. The expert group includes employers from medical, administrative and auxiliary services such as governmental medical department, hospital administration, quality deployment department, medical staff from emergency department, intensive care unit, audiology and other inpatient units (doctor, nurse, technician etc.) and ward service provider. They are also well-experienced in the healthcare delivery and workflow of the hospitals. On conclusion, results of the proposed approach will contribute to hospital healthcare management in better providing healthcare services and as well as at a higher quality level.

Keywords: Service Quality, Fuzzy Sets, DEMATEL, Hospital Healthcare Delivery



Application of Artificial Neural Networks to Food Technology

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Abstract: An artificial neural network (ANN) is a data processing system based on the structure of the biological neural simulation by learning from the data generated experimentally or using validated models. Artificial neural networks are a family of mathematical models that share among themselves the characteristics that their main algorithmic features are somewhat inspired by some issues of the functioning of the human brain. Artificial Neural Networks (ANNs) have been applied in almost every aspect of food science over the past two decades, although most applications are in the development stage. ANNs are useful tools for food safety and quality analyses, which include modeling of microbial growth and from this predicting food safety, interpreting spectroscopic data, and predicting physical, chemical, functional and sensory properties of various food products during processing and distribution. ANNs hold a great deal of promise for modeling complex tasks in process control and simulation and in applications of machine perception including machine vision and electronic nose for food safety and quality control. However, compared to other areas, the diffusion of computational models based on neural networks for food analysis is still at a relatively earlier stage of development, so that on one hand many researchers either do not know about the existence of the technique or ignore its potential for solving food control-related problems, while on the other hand one can find in the literature examples of the misuse of ANNs due to an inadequate knowledge of their principles.

Therefore, the aim of this review is to critically discuss the possibility of applying artificial neural networks for food analysis and technology, by presenting a general introduction to the technique, a description of the main typologies of problems encountered in the field.

Keywords: Artificial Neural Networks, Food, Technology



Performance Comparison of Three Meta-Heuristic Algorithms for Training Multi-Layer Perceptron

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Abstract: In this study, three meta-heuristic algorithms are compared for training Multi-Layer Perceptron (MLP). For this reason, we selected recent meta-heuristic algorithms called Gray Wolf Optimization (GWO), AntLion Optimizer (ALO) and Spiral Optimization Algorithm (SOA). Gray Wolf Optimization algorithm was presented by S. Mirjalili and it imitates the leadership hierarchy and hunting strategy regarding gray wolves. In the gray wolf leadership hierarchy, there are four types of gray wolves: alpha, beta, delta, and omega wolf. Besides, there are three steps about the hunting mechanism of gray wolf. These are searching for prey, encircling prey, and attacking prey. Antlion optimization algorithm is a meta-heuristic optimization algorithm that basically mimics the hunting mechanism of antlions in nature. This algorithm comprises five steps of antlion's hunting mechanism: the random walk of ants, building traps, entrapment of ants in traps, catching preys, and re-building traps. Spiral Optimization Algorithm uses the dynamic step size in a spiral path trajectory to solve optimization problems. This dynamic step size is reduced towards the optimum point at the center of the spiral form during the optimization process.

Three meta-heuristic algorithms were adapted for training multi-layer perceptron. To compare the performance of these algorithms, we used three function-approximation datasets (sigmoid, cosine, and sine). The MLP structure for solving these dataset is of 1-15-1 and half of the data set was used for training and the other half was used for test. Maximum number of generations is 250 and population size is 200 for all training phase with meta-heuristic algorithms. The trainers for these datasets have 46 variables to be optimized by meta-heuristic algorithms. All datasets were solved by the trainers 10 times and the statistical results were obtained such as mean square error (MSE) standard deviation (STD) and test error.

Keywords: Meta-Heuristic, Training, Multi-Layer Perceptron, Gray Wolf, Antlion, Spiral



Modified Antlion Optimization Algorithm for Solving Bin Packing Problem

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Abstract: In computer science, an optimization problem is defined as the problem of finding the best solution among all feasible solutions. Today, it is possible to encounter many optimization problems in many areas. In this study, we focused solving bin packing problem which is a difficult combinatorial optimization problem. The examples of this problem consists of many real-world optimization applications, such as stock-cutting, loading trucks, railway carriages etc. In solving the bin packing problem, the items with different volumes have to be packed into a finite number of bins (or containers). It is aimed that minimizes the number of bins used. There are many different methods to solve this problem. One of these methods is based on meta-heuristic algorithm. AntLion optimization (ALO) algorithm is a meta-heuristic optimization algorithm that was presented by Mirjalili. It basically mimics the hunting mechanism of antlions in nature. The long running time of ALO algorithm is the big handicap for solving real-world optimization problems. By the developments on the random walking model and selection method in ALO algorithm, this deficiency was eliminated. The proposed modified antlion optimization (MALO) algorithm was adapted to the combinatorial optimization problem known as bin packing problem. The proposed MALO algorithm was compared with particle swarm optimization algorithm (PSO), firefly algorithm (FA), invasive weed optimization algorithm (IWO) and antlion optimization algorithm (ALO). The results present that the performance of IALO algorithm is better than those of meta-heuristic algorithms used in this study.

Keywords: Bin Packing Problem, Antlion, Particle Swarm, Firefly, Invasive Weed



Opposition Based Antlion Optimization Algorithm for Single Objective Optimization Problems

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Abstract: In this study, AntLion algorithm (ALO) which is one of the meta-heuristic algorithms was improved by the opposition-based learning mechanism. Opposition based AntLion Algorithm (OALO) comprises the opposition-based learning concept that continues with the opposition individuals according to the jumping rate throughout the optimization process. In general, the population's individuals are determined randomly at the initialization of the stochastic optimization process. In initializing the population by the opposition based learning mechanism, the opposition candidates are calculated for each candidate in the initial population. Then the random population and opposition based population are merged and sorted according their fitness values. The initial population is taken from the population size of this combined population. For each iteration, the random number compares with pre-determined jumping rate value at the end of optimization loop, if random number is less than jumping rate, then the opposition based learning mechanism is run. By the opposition based learning mechanism, we find the opposition population according to the jumping rate value and the fitter individuals are selected from combining of the current and the opposite population.

To evaluate the performance of the OALO algorithm, five benchmark optimization problems were used from the literature. We used different measurement metrics, such as mean best, standard deviation, optimality, accuracy, CPU time, number of function evaluations (NFE), etc. The proposed OALO algorithm was compared with meta-heuristic algorithms known as particle swarm optimization (PSO) algorithm, artificial bee colony (ABC) algorithm and antlion optimization (ALO) algorithm. The benchmark results show that OALO algorithm provides the competitive performance in comparison with the other algorithms and this proposed algorithm is alternative to meta-heuristic algorithms.

Keywords: Single Objective, Antlion, Opposition based Learning, Particle Swarm, Artificial Bee Colony



Examining Instructors' Intentions Towards E-Learning in Libyan Higher Education

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Abstract: This paper describes the development of an instrument to assess instructors' intention to use technology and e-learning in Libyan Higher Education (LHE). Based on the goals of this paper a pool of 29 items for Instructors' Questionnaire (ITQ) correlated to intention to use technology and e-learning was generated, sufficient review and investigation of the existing literature, covering faculty intention to use Information and Communication Technology (ICT) and e-learning. Validated items adapted from prior studies were used to measure Computer and Internet Experience (CIE), Computer Self-Efficacy (CSE), Technology-Internet Quality (TIQ), Attitudes toward Technology and Internet including E-learning (ATE), and Intention to use Technology and E-learning (ITE). The Likert scale was chosen, then the four-point and five-point scale were used to evaluate the different constructs. The questionnaire was translated to Arabic language and distributed to a sample of 210 faculty members in LHE (Zawia University and Institutions of the National Authority for Technical Education) in the academic year 2017-2018. A 64.8% response rate was achieved (136 usable responses). The reliability alpha coefficient for the scale with 29 items was tested and found 0.82 which indicated that the items in the scale were highly inter correlated and were all measuring ITE. Then we examined the reliability coefficient of each construct independently and found: 5-item CIE: 0.82, 10-item CSE: 0.88, 4-item TIQ: 0.82, 7-item ATE: 0.83, and 3-item ITE: 0.73, indicating high inter-item correlation within all these constructs. But, we were concerned in understanding how many constructs or variables underlay the set of 29 items in the scale. Therefore, we performed exploratory factor analysis on the sample. Four commonly rules were applied to decide which factors to be retained: (1) Minimum eigenvalue of 1. (2) Deleting items with factor loadings less than 0.5 on all factors, or greater than 0.5 on two or more factors. (3) A simple factor structure. (4) Scree test. Items that were not successful in these rules were excluded. From the result we could accept 25 items in five factors with explained variance 62.35%, and total Cronbach's reliability 0.805, reliability coefficient of each factor independently tested and found as follows: 8-item Factor 1: 0.893, 5-item Factor 2: 0.937, 5-item Factor 3: 0.822, 4-item Factor 4: 0.824, and 3-item Factor 5: 0.728. Thus, a high inter-item correlation for all the factors is indicated and it has been shown that these factors can be used to include a toll to measure the intention of instructors to use technology and e-learning.

Keywords: Computer and Internet Experience, Computer Self-Efficacy, Technology-Internet Quality, E-Learning



Effects of Commercial Hot Pepper Oil (*Capsicum sp.*) on Growth Performance and Blood Parameters of Rainbow Trout (*Oncorhynchus mykiss*)

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Abstract: In this study, the effects of using commercial hot pepper (*Capsicum sp.*) oil as a feed additives in rainbow trout (*Oncorhynchus mykiss*) feeds were investigated on the growth performance of and blood parameters at rainbow trouts.

The phenolic component analysis of the pepper oil was performed with GC/MS before the experimental diets preparation were carried out and it was found that the oil was contained high amount of β -Sitosterol, Campesterol and α -Tocopherol. The rainbow trout (7.19 ± 0.06 g) were placed in 15 tanks with volume at 0.2 m^3 . The mean initial stocking density was 15 fish per tank. Hot pepper oil (HPO) was added dosage of % 1,2,4 and 6 in experimental trout feed. Fish were fed three times a day for 60 days. At the end of feeding experiment, the growth and feed utilization parameters (Relative growth rate (RGR), Specific growth rate (SGR) and Feed conservation ratio (FCR)) were calculated considering the feed consumption and wet weight increase amounts in fish. The blood was used taken from fish which fed with experimental diets for 60 days for determined hematological and biochemical parameters in experimental fishes.

According to results all experimental diets were accepted by the fish and no mortality were observed throughout the feeding experiment. The feed supplemented with HPO have impact on fish growth performance. RGR and SGR values of the experimental group showed a significantly increase due up to a point HPO concentration. Hematological parameters were positively affected by the addition of HPO. In addition to no treatment group showed any adverse effect when compared to the control group hematological values. The use of HPO supplementation in rainbow trout diets were decreased the serum glucose level by up to %4, increased the serum protein level which used %1 concentration, and %2 addition decrease the amount of liver enzymes in the serum. In conclusion, it is reported that the use of HPO up to 4% in rainbow trout feeds positively affects growth performance and blood parameters in rainbow trout.

Keywords: Rainbow Trout, Feed Additive, Hot Paper Oil, Growth Performance, Blood Parameters



Web Platform Design for Telerehabilitation of Shoulder Rehabilitation Exercises

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Abstract: About 15% of the world's population is living with a disability. People with disabilities need physical therapy for part-time or through their lifetimes. These people encounter some difficulties in doing physiotherapy exercises. One of them is that the physiotherapist may not follow the healing process continuously. To solve this problem, telerehabilitation is a frequently used method. Telerehabilitation is a term used to describe the provision of rehabilitation services at a distance using telecommunication technology as the service delivery medium. In this study, a web platform was developed for telerehabilitation applications. This platform was developed in visual studio environment with MVC architecture using C #, .Net, JavaScript. MS SQL Server2017 was used as the database. The main purpose of this web platform is to inform the physiotherapists instantly about the results of the exercises made by the patients as meaningful data and to enable the physiotherapists to intervene instantaneously. There are two main users in this web platform: physiotherapist and patient.

On the main screen of the physiotherapist, a list of patients waiting for approval and a list of patients who have not exercised in one week are displayed. The patient's physiotherapist must approve the patient's registry. On the approved patient page, the physiotherapist can see information about the patient, get a diagnosis about the patient, and choose the exercises the patient needs to do. There is also a separate page where the physiotherapist can observe the exercises of the patients. At the request of the physiotherapist, all the data about the patient is collected from a single page. The physiotherapists can see all the personal information of the patient, write notes about the patient and view these notes. All of the exercises given to the patient appear in separate sections. Within each exercise section, the physiotherapist can observe the best, worst, average angle values of the exercises performed by the patient and how many times the patient performs the related exercise on a daily basis. At the same time, the physiotherapist can change the number of repetitions and the critic angle about the exercise. On the patient's main screen, the patients can access the summary information of their physiotherapist and their exercises information. In the future studies, it is planned to develop a software for monitoring the exercises of the patients using the camera and recording patient's exercises angular values into the database of this web platform.

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Keywords: Telerehabilitation, Physiotherapy, Physical Exercise, Web Platform Design, Shoulder Rehabilitation



Reduction of Intensity with Employment of Highly-Educated Advanced Nurses in Emergency Services: Application of Discrete-Event Simulation

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Abstract: Emergency services are the foundation stone of health care systems. In this study, the work of the emergency facility systems was examined in Turkey. The concentrations of the emergency services are flattering inestimable in the contemporary situation. This is primarily due to the fact that the majority of patients who come to emergency service area are not crucial in emergency departments.

This study suggests that patients who are not urgent or outpatient in emergency facilities should be examined by *highly-educated advanced nurses* (HAN). In this case, it is aimed to examine more patients, to decrease the waiting time of the patients and consequently the length of the patients' stay in the emergency services. It is also aimed to maximize the efficiency of the resources of emergency services.

According to the discrete event simulation model applied on twenty-four hours a day and seven days a week basis, it was observed that the number of patients examined by providing employment of HAN was increased by 26,71% on the basis of twenty-four hours a day and 15,13% on the basis of twenty-four sevenths. The waiting time for treatment was decreased by 38.67% on twenty-four hours a day basis and 53.66% on twenty-four sevenths basis, respectively, from the period the patients were registered in emergency services. Similarly, the time required for a patient to be treated in emergency service area for treatment was decreased from an average of 82.46 minutes to 53.97 minutes. Among the findings, it has been seen that the efficiency of the employment of HSN has provided a balance in the efficiency rates of the resources by not getting the efficiency as high as the resources employed in the emergency services. In addition, it has been found that the employment intensity of doctors of medicine reductions with the employment of HAN.

Keywords: Emergency Service, High Educated Advanced Nurses, Discrete Event Simulation, Length of Stay, Waiting Time



Implementation of Statistical Optimization Model to Improve Quality of Healthcare System in Turkey

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Abstract: In this study, statistical optimization method is intended to improve the quality of health care system in Turkey. Generally, health expenditures and health expenditure per capita are adopted as two indicators of the quality of a country's healthcare system.

There are many factors that are considered to be influential in these indicators. Factors directly or indirectly affecting health expenditure and health expenditure per capita were addressed as gross domestic product, per capita gross domestic product, life expectancy, population ratio, total number of active physicians and total number of hospitals. The data used for both factors and objective functions cover the years 1990 to 2016 in Turkey.

In the first phase of this study, the regression equations were calculated by determining the significance levels and the feasible values of the factors affecting the health system in Turkey by statistical analysis. In addition, the developed regression equations are intended to be used to calculate the degree of development within the healthcare system in the future years.

Reducing health expenditures and increasing health expenditures per capita which are defined as two objective functions are aimed at countries as well as Turkey. Statistical optimization method was used to minimize the health expenditure and maximize health expenditure per capita in the second part of the study.

As a result, with the help of mathematical optimization model, feasible values were calculated for the factors and objective functions. Accordingly, health expenditures have been reduced by 17,60% and health expenditure per capita has been increased by 18,25% by developing the statistical optimization models.

Keywords: Healthcare System, Statistical Optimization Model, Health Expenditures, Health Expenditure Per Capita, Feasible Values



Monogamous Adaptive Crab Optimization Algorithm for Single Objective Optimization Problems

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Abstract: Nowadays, the use of meta-heuristic algorithms is becoming popular with solving non-linear and complex problems. These algorithms are inspired by natural selection, swarm intelligence, physical events and nature. Crab mating optimization algorithm (CMOA) is one of the meta-heuristic algorithms which was developed by V.R. Chifu in 2014. The crab mating optimization algorithm is inspired by the crab mating process and life cycle. Although the algorithm has successful results in optimization problems, it is very slower than the other popular meta-heuristic algorithms. The main goal of this study is to improve the running speed of the crab mating optimization algorithm. For increasing CMOA, firstly in monogamous adaptive crab mating optimization algorithm, male crab was mated with only a female crab called monogamy feature. This feature is inspired by the mating success of crabs. As second improvement, the crossover and mutation coefficients are changed adaptively during optimization process.

The proposed Monogamous Adaptive crab mating optimization algorithm (MAC) was compared with original CMOA firstly. The performances of the algorithms were evaluated in terms of the mean cost value, standard deviation, number of functions evaluated (NFE), CPU time, optimality and accuracy metrics. Five benchmark functions were taken from the literature for this comparison. These test functions were chosen in different specifications. Rastrigin, Schwefel functions have more than one local minimum. Booth, Himmelblau, functions' surfaces are flat, and the surface of the Leon function is valley shaped. According to test results, MAC was able to provide 8-25 times faster than CMOA in terms of CPU time and NFE indicators especially. In future studies, it is aimed to further develop the MAC algorithm and apply it to real-world optimization problems.

Keywords: Meta-Heuristic, Crab mating, Benchmark, Monogamous, Adaptive, Optimization



Shoot Growth in Anatolian Chestnut (*Castanea sativa* Mill.) Forests Operated as Short Rotation

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Abstract: The purpose of the present study is to investigate the development of the period of first three years of the shoots that have sprouted after the clear cutting in the Anatolian chestnut forests which have high sprouting ability and are operated as short rotation. And, it is also identification of silvicultural interventions. Chestnut species widely spread in the temperate forest zones of the Northern hemisphere. Among these species, Anatolian chestnut (*Castanea sativa* Mill.) is the only species naturally found in Europe and Asia Minor. In Turkey, it can be found mainly over The North and Western Anatolia (Black Sea Coast), and The Marmara Region. Also, it is locally spread over the Mediterranean area. Anatolian chestnut has potential to provide important for multi-purpose usages. However chestnut forests are under threat due to biotic and abiotic pests in Turkey and all over the world. In addition, stand structure of chestnut forests are frequently degraded because of inappropriate silvicultural interventions.

The study area was selected from pure chestnut stands in Kocaeli-Gölcük region, where Anatolian chestnut is naturally distributed. Measurements were made in the shoots on the stumps, which were cut from the soil level before the 2015, 2016 and 2017 vegetation period in the same region. The measurements were carried out on each stump in the area by taking sample plots in the size of 100 m². Shoot number in one hectare, shoot length (cm), shoot diameter (mm) and shoot number per stump were determined. As a result of this study, the average shoot number was 59 shoots in terms of one year shoots on stump, while the average shoot number in terms of two and three years shoots on stumps was 31 shoots and 32 shoots, respectively. It was determined that the average shoot number in one hectare was 5940 shoots in one-year-old, 3128 shoots in two years old and 3247 shoots in three years old. In one-year-old shoots, the shoot length varies between 120 cm and 221 cm, with an average of 172.84 cm. In the shoots of two years old, the shoot length ranged from 235 cm to 550 cm, with an average of 404.54 cm. In the shoots of three years old, the average shoot length is between 309 cm and 505 cm, and their average is 423.97 cm. It seems that the shoots have grown very rapidly during the first two years and the developing of shoot length in third year has declined significantly. The average shoot diameters in the shoots one, two and three years old were determined to be 17.22 mm, 33.83 mm and 39.94 mm, respectively. The values of shoot diameter also showed a significant increase in the first two years, while the diameter increment in third year decreases.

Keywords: Sprouting Ability, Anatolian Chestnut, Stump, Short Rotation



Determination of Effective EEG Channels in Recognition of Positive-Negative Emotions by Applying Wavelet Decomposition and Support Vector Machines

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Abstract: People's lives and decision processing are affected by emotion all the time. People express their emotions via words, body language, facial expression and voice during thinking, decision making, observing or interacting with the environment. Thus, it is essential to comprehend the behaviour of emotions better. Emotion recognition systems based on EEG signals are beneficial in brain-computer interface (BCI) technology. BCI systems are applied in many different areas such as healthcare systems, education, virtual reality, video gaming industry. Although EEG signals give much valuable information about brain and emotions, brain-computer interface systems have not achieved the desired goals because of artefacts, false choice of EEG channels, data intensity and inappropriate feature extraction methods. In this paper, we aimed to determine which EEG channels are effective in order to estimate positive-negative emotions. Publicly available dataset (DEAP) was used in this work and 32 EEG channels were classified. In feature extraction phase, discrete wavelet decomposition, information measurement and statistical methods were applied. The features namely, maximum value, minimum value, mean value, log energy entropy and Higuchi's Fractal was computed from each sub signal which decomposed by 4 level Daubechies. In the last phase, these features used as an input to support vector machines (SVM) on behalf of discriminate the emotions. The classification performance of the proposed method evaluated by classification accuracy, four-fold cross-validation and positive-negative rates (false positive, true positive, false negative, true negative). Performance value was obtained from each EEG channel for positive-negative emotions and average accuracy was found 84%. The experimental results show the best EEG channels for distinguish positive-negative emotions with proposed techniques are AF3, C4, CP1, CP5, Fp1, P7 ve Pz.

Keywords: EEG, Emotion Recognition, Classification, Support Vector Machines, EEG Channels, Wavelet Decomposition, Entropy, Higuchi's Fractal



Performance of RSA Algorithm Against a Chaotic Encryption System for Image Encryption

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Abstract: RSA is asymmetric encryption algorithm that relies on the computational difficulty of factoring large primes. Asymmetric encryption algorithms have a public key and a secret key. The information is encrypted with public key and can only be decrypted with the secret key. In this study, it is desired to see the lack of RSA algorithm in digital color image encryption and therefore it is compared with chaotic system based image encryption. Each pixel of a color image consist of mixture of red, green, and blue (RGB) color values. All encryption algorithms do not give the desired results in image encryption, but it can be said that chaotic systems are successful.

Keyword length analysis, histogram analysis, key sensitivity, correlation coefficient, information entropy analysis and peak signal-to-noise ratio (PSNR), number of changing pixel rate (NPCR), unified averaged changed intensity (UACI) values are calculated for encryption performance. Sensitive dependence on initial conditions of chaotic systems makes these systems very successful against RSA in terms of key sensitivity, but major prime numbers are an alternative option in RSA. 5000 pixels are examined to find the image correlation coefficient. As a result, the correlation coefficient values (0.006, -0.05 << 1 etc.) of the RSA are within the desired range for RGB values.

PSNR, NPCR and UACI values show that successful results are obtained. The PSNR value is between 73 and 83 and it is suitable for this range. NPCR measures percentage of different pixel numbers between two images. UACI measures average intensity of the differences between two images. NPCR and UACI are differential analysis data that is obtained at around 0.99 and 0.30, respectively. These results show that RSA is a very successful algorithm, but it is not enough against chaotic systems in image encryption. Especially, encryption speed of RSA is slow and performance can degrade when image color intensity increases. Therefore, we can say that chaotic systems would be preferable for image encryption.

Keywords: Chaotic Encryption, Image Encryption, RSA Algorithm, Asymmetric Encryption, Digital Image



Fractional Order Sliding Mode Speed Observer for Induction Motor

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Abstract: This study aimed at designing sliding mode based speed observer for induction motor by using fractional integral to reduce the chattering and steady-state error.

Reducing the costs of industrial systems has become even more important with increasing competition nowadays. For variable speed drives, induction motors are more preferred to direct current motors because of its low-cost, smaller size per kW output power, robust construction requiring less maintenance. Despite its many advantages, the induction motors also have disadvantages such as complex driver structure and control algorithms. The driver is basically composed of six semiconductor switches such as MOSFET or IGBT. To generating the gate signals, the voltage/frequency control and the vector control methods are generally using in these systems. Today, the vector control method is mostly preferred in these systems because of its more stable working at low speeds.

Another cost reduction way for these systems is get rid of the expensive speed sensors which are usually magnetic or optical position sensors. This problem can be solved using machine model instead of sensor to calculate the motor position. To do this, firstly the mathematical model of the system is established. Then phase currents and voltages are obtained from current and voltage transducers which are quite cheap compared to the magnetic or optical position sensors. The obtained current and voltage data is used in the system model to estimate the motor position data. This process is called position observer. The observer is based on Model Reference Adaptive System (MRAS).

In this study, the observer is designed based on MRAS and sliding mode controller with boundary layer. To eliminate the chattering problem of the sliding mode controller Grünwald-Letnikov discrete fractional integral is used. Proposed observer is tested on the induction motor sensorless speed control system. The results show that the proposed observer is reduce the chattering and steady-state error.

Acknowledgment: This study is supported by Scientific Research Unit of Balikesir University (Project No: 2016/18)

Keywords: Fractional Calculus, Induction Motors, Observers, Sensorless Control, Sliding Mode Control



Musical Genre Classification Application using MFCC

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Abstract: With the development of technology, people are increasingly reliant on automatic classification devices or software. With the development of the music market, however, there is growing interest in the application of automatic musical genre classification, and the use of such systems is increasing day by day. Therefore, it is aimed to eliminate this necessity by developing the application of music genre classification. Music genres have certain characteristics in themselves. Each of its proprietary acoustical features are used in distinguishing this genre from other genres. To classify genres, people first need to know these genres. They need to listen many songs about that genre to learn it so that they can classify them. Digitally, it is in same manner. Classifiers must be trained using many songs for each genres. Then, the classifier can learn the genres and classify the test songs easily. As an acoustic feature, MFCC (Mel Frequency Cepstral Coefficients) is used for training and testing the classifiers in this study. MFCC is the most used and most effective feature in sound processing, especially in applications such as voice recognition and speaker recognition. It has been also used in the Music Genre Classification applications up to now. The MFCC works in a similar way to the perception of the human ear. According to the experiments performed, the human ear perceives the sound linearly in the first 1000Hz and logarithmically in the frequencies more than 1000Hz. Inspired by this, MFCC features have been obtained. In the literature, generally 13 MFCC coefficients are used. However, in this study four different number (9,11,13,15) of MFCC coefficients are used and their performance are compared to each other. Support Vector Machine(SVM) and k-NN (K-Nearest Neighbors) are used as classifiers and their performance are compared to each other. The application of k-NN classifier is a sort of classification that is simple. This classifier differs from the other classifiers in that it does not need the training phase. Training data is used directly by this classifier during classification. The support vector machine is a supervised learning type of classifiers. It is the most used method as classifier in image and sound processing field. This classifier performs the classification process by finding the best hyperplane to distinguish the different classes from each other. In this study, a system is implemented that classifies four types (metal, pop, classic and jazz) of music genres using acoustic features. It has been observed that the SVM performs better than the k-NN classifier in the study done. In addition, the results of four different MFCC coefficients were found to be identical in most cases. System implementation is performed on Raspberry pi 2.

Keywords: Audio Processing, Musical Genre Classification, MFCC, SVM, k-NN



Determination of Effective EEG Channels in Recognition of Positive-Negative Emotions by Applying Wavelet Decomposition and Support Vector Machines

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Abstract: People's lives and decision processing are affected by emotion all the time. People express their emotions via words, body language, facial expression and voice during thinking, decision making, observing or interacting with the environment. Thus, it is essential to comprehend the behaviour of emotions better. Emotion recognition systems based on EEG signals are beneficial in brain-computer interface (BCI) technology. BCI systems are applied in many different areas such as healthcare systems, education, virtual reality, video gaming industry. Although EEG signals give much valuable information about brain and emotions, brain-computer interface systems have not achieved the desired goals because of artefacts, false choice of EEG channels, data intensity and inappropriate feature extraction methods. In this paper, we aimed to determine which EEG channels are effective in order to estimate positive-negative emotions. Publicly available dataset (DEAP) was used in this work and 32 EEG channels were classified. In feature extraction phase, discrete wavelet decomposition, information measurement and statistical methods were applied. The features namely, maximum value, minimum value, mean value, log energy entropy and Higuchi's Fractal was computed from each sub signal which decomposed by 4 level Daubechies. In the last phase, these features used as an input to support vector machines (SVM) on behalf of discriminate the emotions. The classification performance of the proposed method evaluated by classification accuracy, four-fold cross-validation and positive-negative rates (false positive, true positive, false negative, true negative). Performance value was obtained from each EEG channel for positive-negative emotions and average accuracy was found 84%. The experimental results show the best EEG channels for distinguish positive-negative emotions with proposed techniques are AF3, C4, CP1, CP5, Fp1, P7 ve Pz.

Keywords: EEG, emotion recognition, classification, support vector machines, EEG channels, wavelet decomposition, entropy, Higuchi's Fractal



Heartbeat Classification Using DCVA

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Abstract: An electrocardiogram (ECG) beat classifier attempts to classify a heartbeat into a normal beat or a class representing one of other beat types, hence the rhythm of ECG signals can be determined. The most general ECG beat types are known as normal beat, left bundle branch block beat, right bundle branch block beat, atrial premature beat, premature ventricular contraction, and paced beat.

In this study, it is aimed to classify a given ECG signal into a class of normal beat or abnormal beat. The initial step of any classification problem is the pre-processing where noise reduction is realized. This step is performed by applying 3-level wavelet decomposition on the ECG signals using Daubechies 1 wavelet, and the approximation coefficients of the 3rd level are used in the feature extraction stage. The database used in this study consists of four 650000-dimensional ECG signals per class obtained from MIT-BIH Arrhythmia Database MLII-channel, hence the approximation coefficients of the 3rd level are at a size of 81250. Since the dimension of this signal is too large, it needs to be windowed. Therefore, the approximation coefficients of each ECG signal is windowed with duration of about 1.7 seconds.

The extraction of features intends to minimize the intra-class variability while maximize the inter-class variability. For this purpose, Linear Discriminant Analysis (LDA) uses the projection matrix which has the eigenvectors of $S_w^{-1} \cdot S_B$ on columns where S_w and S_B denote within-class scatter matrix and between-class scatter matrix, respectively. If the number of samples in the training set is smaller than the dimension of the sample space, S_w becomes singular, hence LDA cannot be applied directly. Thus, one of the proposed methods to overcome this problem is Discriminative Common Vector Approach (DCVA) is used for the feature extraction in this study. As a result, 60% accuracy is achieved by the introduced classification scheme. This result clearly shows that usage of pure DCVA is not accurate for ECG classification. This scheme can be improved by the hybridization of DCVA with different techniques in the future studies.

Keywords: ECG Signal, Classification, Linear Discriminant Analysis, Discriminative Common Vector, Scatter Matrix



Semantic Solutions and Security Challenges for the Internet of Things

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Abstract: In this work, an overview of IoT (Internet of Things) has been reviewed. Security issues related to the IoT distributed structure have been examined and information on solutions to these problems has been presented. IoT can be defined as a communication network where objects are connected to each other and to larger systems. IoT has also brought some problems. Within the OWASP (Open Web Application Security Project) Top 10, IoT security issues can be listed as: insecure web interfaces, faulty authentication / authorization, insecure network services, unencrypted communication, exclusion of sensitive data, insecure cloud interface, insecure mobile interface, insecure security configurations, physical security. As a solution to the challenges of IoT such as security, interconnection and interoperability using the service-oriented architectural approach, popular in recent years ontology-based access can be achieved by supporting semantic web technologies. The service oriented architecture approach for IoT frameworks is based on a layered structure. These layers can be listed as follows: Physical layer, information layer and functional layer. In the physical layer, device ontology is presented which represents things. The information layer contains ontologies belonging to the defined domain, including data and metadata about the information provided by things. The functional layer, which is the other layer, provides the ontology that is used by any intermediate software or application that requires IoT services provided by things. It aims to provide ontological demonstration interoperability of data, devices and services in IoT systems at semantic level and to create a reusable, shareable model in different applications. Thus, the application to be made with IoT or the hardware to be produced will be platform independent, making it easier to integrate with different platforms.

Keywords: Internet of Things, Ontologies, Semantic, Services, Security



Controller Design for an Islanded Microgrid Energy System with ESS

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Abstract: This study investigates energy storage systems (ESS) and their effects on the microgrid energy systems to enhance the performance of an islanded microgrid with the addition of an energy storage system. As well-known, when a disturbance occurred in the islanded microgrid, one can observe fluctuations on microgrid frequency and/or voltage. In the worst-case scenario, these fluctuations may cause to frequency/voltage collapse and then the microgrid will be blackout. In order to overcome these kind of problems, ESS should be used and to reduce the frequency/voltage fluctuations an accurate controller should be designed for the ESS to control active and reactive power transfer in the microgrid during contingencies.

For the above reasons, a detailed introduction for ESS has been given, firstly. Then, design stages of a controller for an energy storage system have been presented. Finally, the obtained results for the designed controller for an islanded microgrid utilizing an energy storage system have been demonstrated both in tabular and in graphical form. The simulation results illustrate that the proposed control strategy not only allow performing the dynamic stability of the microgrid but also maintain frequency and voltage within the acceptable ranges.

Keywords: Energy Storage Systems, Microgrid, PI Control, Frequency Fluctuations, Voltage Collapse



Link Discovery with SKOS on the Linked Open Data

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Abstract: Nowadays, resources in the web environment contain information in a non-dynamic form, and their availability and shareability is often difficult to efficiently combine by different computer systems. Information on the web can only be interpreted and understood by people. The semantic web, which is considered as the future of the web, provides a common model for reusing and sharing information. Linked Data, which is one of the important components of the semantic web, basically consists of linking the data in different sources in a way that makes semantic conclusions. One of the most important linked data application examples is the LOD (Linked Open Data) Project. This project aims to publish data clusters in RDF (Resource Description Framework) format and semantically associate these data clusters. The process of detecting links between data sets is known as link exploring. Data sets are heterogeneous in terms of dictionaries, formatting, and data representation. This link makes the exploring process much more complex. Determining whether two concepts from different sets of data express the same thing is an example of what is known as the concept resolution problem (ie, the detail information that can be read through). The purpose of this work is to provide data integration between different systems by exploring links between LOD resources such as FOAF (the Friend of a Friend), DBLP (Database Systems and Logic Programming) and SIOC (Semantically Interlinked Online Communities). In this way, special semantic links are defined and the usability of interlinked resources within the web is increased. FOAF defines the persons, the activities of the person and their links with other persons. SIOC aims the data of web-based community in any area is intended to be a connected entity. SIOC is considered as a mode of interacting with users with different web applications such as blogs, forums and mailing lists to easily access existing applications. The DBLP supports the full research of academic publications, the information of authors and co-authors in different researches, their information, journal articles, conference reports, editorial information and information of the different places in one place. The existing FOAF ontology has been expanded by adding new data type and object properties to the FOAF ontology for the DBLP values covered in the prototype work. The DBLP user profiles are defined after the result of the expansion of the FOAF ontology. For example; foaf: research_Interest, foaf: teaching, foaf: conference_duties, foaf: publications, etc. SKOS (Simple Knowledge Organization System) is a common data model for semantic interoperability of concept diagrams in a semantic web environment. SKOS is expressed as RDF triples. Three SKOS Mapping features will be covered in this work. Three SKOS Mapping features will be handled in this work. These are skos: closeMatch, skos: exactMatch, and skos: relatedMatch. For example; dblp: publication skos: exactMatch foaf: publications. As a result, there is a mapping file in the result of SKOS mapping between concepts of data sources. This RDF-based file shows the concept features, semantic associations, and mapping properties required for mapping. This file can also be used as a mapping ontology. This ontology includes classes and features that specify the relationship between ontology concepts and properties.

Keywords: Semantic Web, Linked Open Data, Ontology Mapping, SKOS



The Effects of Steam Curing Time on the Geopolymer Mortar

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Abstract: Global warming is due to the emission of a large number of greenhouse gases in the atmosphere. Cement production could represent nearly 10% of total anthropogenic CO₂ emissions in the close future, however, requires about 2.8 ton raw materials, including fuel and other materials and generates 5 to 10 % of dusts. The best alternative would be to create a new Portland cement-free bond by activating alkaline waste products. These wastes are the rich source of alumino-silicate. Geopolymerization can transform a wide range of alumino-silicate materials into waste materials with excellent physicochemical properties. The alkali activation of mortar blends containing Ground Granulated Blast Furnace Slag (GGBFS), Fly Ash (FA) and waste glass powder (GP), and standard aggregate according to TS EN196-1 with activation based on sodium hydroxide and sodium silicate, was investigated in this study. The geopolymer mortar samples were cast, dimensions 40 x 40 x 160 mm, and cured at temperatures of 6, 12 and 85 °C for 24 hours and compressive and flexural strength were measured. The results indicated that in this case, a 12-hour period was sufficient for steam curing at 85 °C and also showed that the compressive strength increases as the slag and fly ash + glass powder ratio (GGBFS / FA + GP) decreases until reach 4. While the flexural strength at the 24-hours cured was higher than those under 6 h and 12 h.

Keywords: Geopolymer Mortar, Sodium Silicate, Sodium Hydroxide, Fly Ash, Slag, Compressive Strength and Flexural Strength



Diagnosis and Molecular Identification of Some Bacterial Fish Diseases from Rainbow Trout Farms Located in Bayburt Province

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Abstract: In this study, it was aimed to screen of rainbow trout farms in Bayburt province in terms of Lactococcosis, Yersiniosis, Listonellosis and Cold Water Bacterial Diseases by microbiological and molecular methods.

For this purpose, 6 fish samples were collected from each of the rainbow trout farms in Bayburt province in 2017. Collected fish samples were brought to the laboratory at 4 °C with the thermometer probe transport containers on the same day. After the outer surfaces of the fish samples were disinfected with 70% ethyl alcohol, necropsy was performed under aseptic conditions. During the necropsy process, kidney tissues were taken for microbiological and molecular methods.

In microbiological analyzes, kidney tissues were cultivated separately for each disease effect. TSA medium cultured for *Lactococcus garvieae* was incubated for 24 hours at 21 °C. TCBS media grown for *Listonella anguillarum* were incubated for 48 hours at 22 °C. WS medium cultured for *Yersinia ruckeri* was incubated for 72 hours at 22 °C. AOA medium cultured for *Flavobacterium psychrophilum* were incubated for 5 days at 15 °C. For the molecular identification of the growing bacteria in the media, DNA isolation was carried out according to the manufacturer's instructions. Real-Time PCR was performed using the isolated DNAs and specific primer sets.

During the study, *Yersinia ruckeri*, *Flavobacterium psychrophilum* and *Listonella anguillarum* were not found as a result of microbiological primer isolations. *Lactococcus garvieae* were isolated from 2 different fish in 4th fish farm. Bacterial isolates were found to be gram positive, catalase and oxidase negative. In real-time PCR analysis, the isolated bacterium showed positive results with sigmoidal curves with *Lactococcus garvieae* primers.

As a result, the interactions between the fish farms are very few, the farms making their own productions and the use of different water sources have been identified as factors that prevent contamination of disease agents between the fish farms. The area where the study is conducted can be described as clean in terms of bacterial fish diseases.

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Keywords: Fish diseases, Rainbow trout, *Lactococcus garvieae*, *Yersinia ruckeri*, *Flavobacterium psychrophilum*, *Listonella anguillarum*



Anesthesia Practice in Sheep and Goats

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Abstract: In this study, it was aimed to give information about the practice of the anesthesia in sheep and goats. Although sheep and goats are evaluated together in terms of anesthesia, the levels of anesthetic response of these species are different. The risk of developing ventricular fibrillation due to shock and catecholamines (adrenaline, noradrenaline) release is high in goats who are quite sensitive to pain. Sometimes suddenly death can occur after surgery. For this reason, these losses can be prevented by appropriate anesthesia and analgesia. General anesthesia in sheep is not economical. Many surgical procedures can easily be done by local or regional anesthesia since normally the sheep can be captured more easily due to their physical structure. In some complex cases, however, general anesthesia especially in stud rams and precious sheep may be needed. However, although it is not economical, it is very important to apply general anesthesia in terms of animal welfare and ethical situations. In sheep and goats, general anesthesia is basically similar to cattle. There are no specific tools and equipment specific to general anesthesia, because these are not economical in sheep and goats. For this reason, equipments used for general anesthesia in pet animals can be used easily considering the special needs of sheep and goats. Although there is no license in some anesthetic drugs commonly used for anesthesia for use in sheep and especially goats, their use are recommended depending on its clinical experience.

Keywords: Anesthesia, Sheep, Goat, Practice, Complication



Antimicrobial Susceptibility of *Arcobacter* Strains Isolated from Buffalo Milk with Mastitis Suspect

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Abstract: In the present study was determined the minimum inhibitory concentration (MICs) of *Arcobacter* species in samples of buffalo milk suspected of mastitis to certain antimicrobial agents. Seven strains of *Arcobacter* was tested for their antimicrobial susceptibility to 12 antimicrobial agents.

The susceptibility of *Arcobacter* strains to amoxicillin/clavulanic acid, ceftiofur, cefquinome, vancomycin, tylosin, spyramicin, gentamicin, enrofloxacin, ciprofloxacin, marbofloxacin, levofloxacin and florfenicol were determined the NCCLS microdilution technique (National Committee for Clinical Laboratory Standards, 2008) at low not seen the blur according to the recommendations as the concentration of antibiotic.

In this study, among β -lactams agents used in this study amoxicillin/clavulanic acid was the most active agent against both *Arcobacter* isolates with MICs ranged from 0.01-0.16 $\mu\text{g mL}^{-1}$. The most active cephalosporin tested was cefquinome, although it was more active against *Arcobacter* strains. With spyramicin, a MIC of 10 $\mu\text{g mL}^{-1}$ was listed for Arco M10, whereas for the other strains MICs ranged from 0.02-0.31 $\mu\text{g mL}^{-1}$. MIC value of vancomycin have been to show wide variations. Florfenicol was the best-performing antimicrobial agents against these strains.

In conclusion, our study showed that amoxicillin/clavulanic acid is first-choice antibiotics for *Arcobacter* mastitis. Additionally, Cefquinome can be suggested for treatment of documented *Arcobacter*-related mastitis.

Keywords: Antimicrobial Susceptibility, *Arcobacter*, Buffalo Milk



Changes in Serum Biochemical Parameters Following the Administration of Kanamycin in *Alectoris chukar*

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Abstract: Kanamycin is a aminoglycoside antibiotic, which is widely used in the treatment of severe infections caused by the aerobic Gram-negative bacteria. It is available to use in cattle, horse, swine, sheep, goat and poultry. Chukar partridge (*Alectoris chukar*) plays an important role in the nutrition and hunting industries. The aim of the study was to determine the effect of kanamycin on biochemical parameters (albumin, alkaline phosphatase (ALP), alanine aminotransferase (ALT), aspartate aminotransferase (AST), blood urea nitrogen, cholesterol, creatinine, gamma-glutamyl transpeptidase, total bilirubin, total protein, triglyceride) in chukar partridge. The study was performed on the eighteen clinically healthy chukar partridge (6±1 months and 0.5±0.06 kg body weight). In the study, animals were randomly assigned to three equal groups. Kanamycin was administered intramuscular to each group at dose of 0 (G0), 15 mg/kg (G1) and 100 (G2) mg/kg q. 24 hours for 5 days. Blood samples were taken from *V. jugularis* at 24, 72 and 120 hours following the administration of kanamycin. Serum biochemical parameters were analyzed using commercial kits by auto analyzer. All of *animals* remained clinically healthy during the study period. The ALP level in G2 at 24, 72 and 120 hours was statistically higher ($p<0.05$) than that in G0. AST levels of G1 and G2 groups at the 24, 72 and 120 hours were significantly ($P<0.05$) higher when compared to that in G0 group. The albumin and cholesterol levels of G2 at the 72 and 120 hours were significantly higher than those in G0 group ($P<0.05$), and the albumin level of G1 was found to be significantly higher than that in G0 group. The results show that kanamycin at the dose of 100 mg/kg can cause liver and lipid metabolism damage in chukar partridge. In future, further studies on histopathological and molecular techniques are required to delineate the organ damage caused by kanamycin.

Keywords: *Alectoris chukar*, Aminoglycoside, Biochemical Parameters, Kanamycin, Safety



Pharmacokinetics and Bioavailability of Ceftriaxone in Brown Trout (*Salmo trutta fario*) After Intravenous and Intramuscular Administrations

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Abstract: The purpose of this study was to determine plasma and muscle pharmacokinetics of ceftriaxone (CTX) following intravenous (IV) and intramuscular (IM) administrations in brown trout (*Salmo trutta fario*) at 10–13 °C. One hundred forty clinically healthy brown trout (245±38 g body weight) were used in this study. Brown trouts received CTX by IV and IM at dose of 25 mg/kg. IV and IM doses were injected into the caudal vein and the right epaxial muscles, respectively. Plasma and muscle tissue concentrations of CTX were measured by high-performance liquid chromatography (HPLC-UV). Pharmacokinetic parameters were calculated using WinNonlin software. After IV administration of CTX, the elimination half-life ($t_{1/2\lambda_z}$), volume of distribution at steady state (V_{dss}), total body clearance (Cl_T), area under the concentration–time curve (AUC_{0-72}), and mean residence time (MRT_{0-72}) in plasma were 5.83 h, 0.09 L/kg, 0.02 L/h/kg, 1079.46 h* μ g/m L and 3.77 h respectively. After IM administration of CTX, plasma $t_{1/2\lambda_z}$, peak plasma concentration (C_{max}), time to reach C_{max} (T_{max}), and bioavailability were 22.78 h, 87.92 μ g/mL, 0.5 h and % 27.19, respectively. $AUC_{Muscle}/AUC_{Plasma}$ ratio after IV and IM administration were 0.02 and 0.04, respectively. CTX exhibited low bioavailability and long $t_{1/2\lambda_z}$ following IM administration. The long $t_{1/2\lambda_z}$ of CTX could be advantage for the use in brown trout. However, further studies are needed to determine clinical efficacy and pharmacokinetics following repeated administrations.

Keywords: Bioavailability, Brown Trout, Ceftriaxone, HPLC-UV, Pharmacokinetic



A Study of the Estimation of the Wind Speed in Ankara

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Abstract: One of the main factors of sustainable development is to produce energy and to supply that from renewable sources whenever possible. Wind power is the most common, widely applicable, feasible and productive renewable energy source. The wind energy has an important position in Turkey geography in terms of existing potential. But Turkey can not use this potential sufficiently. In our country, a supplied significant part of consumed energy is by fossil fuels and imported sources. This situation negatively affects our country strategically and economically. One of the major problems in the process of electricity generation from renewable energies, which includes the timing from planning to production, is the modeling of meteorological activities and corresponding production level. Correctly determining the renewable energy potentials will prevent the investment from falling into the idle position.

In this study, meteorological data set containing of the last 10 years of pressure, humidity, wind speed, temperature and rains data supplied by Turkish State Meteorological Service Department are used. Wind power estimation is studied for sample districts located in the Ankara city using data set. The estimates of wind speed were calculated using month of the year, temperature, pressure, relative humidity, wind speed and rains as inputs and wind speed as output.

In Matlab, different artificial neural network learning algorithms have been used to establish the ANN models. The results obtained with these models were compared with the actual data. The mean absolute percentage errors (MAPE) for testing data were found as 9.48% (for ubuk), 7.77%(for Keiren), 7.88%(for Polatlı), 6.83%(for Bala), 8.02%(for Őreflikohisar), 5.41%(for Haymana). The results show that the wind speed can be estimated using the data from month of the year, temperature, pressure, relative humidity, wind speed and rains data when compared to similar studies.

Keywords: Renewable energy, Wind Speed, Wind Energy, Artificial Neural Networks, Artificial Intelligences



Investigation of National Network Electrical Problems Because of Hydro-Electric Power Plants Integration and Efficiency Analysis of These Plants Case Study

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Abstract: Due to the industrialization, technological advances and growing world population have increased the need for electricity with passing day. The existing power plants have become unable to meet the desired electricity demand and the installation of various power generation plants has become inevitable. Lithium, coal, natural gas, wind, water, rock gas, nuclear, solar power plants are some of them. Hydroelectric power plants (HPP) are renewable energy plants that generate electricity by converting the potential energy of water first to kinetic energy and then to mechanical energy. To meet energy needs, countries have recently turned to more renewable energy sources. Because non-renewable power plants have produced harmful gases, such as carbon dioxide, methane, sulfur which damage humans, nature, living other things and ecological construction. In recent years, the construction of hydroelectric power plants in our country is increasing rapidly due to the availability of government incentives and suitable land structures. HPPs are connected to the interconnected network like other energy production plants and have continued their energy production activities in coordination with the national load distribution center. With this work; the problems that could be caused by connecting the Değirmenüstü Hydroelectric Power Plant which installed within the boundaries of Kahramanmaraş-Andırın and has 40 MW production capacity, were investigated. Power quality parameters such as voltage-frequency fluctuations, harmonics, flicker etc. were measured where Değirmenüstü HPP was connected to the distribution grid, with the aid of network analyzer for a week (7/24). It has been investigated that this power plant adverse effects on the distribution center to which it was connected and therefore on the interconnected network. In the cases which the power plant was switched on and off effects on the network were observed. In addition, an annual energy and economic efficiency analysis of this plant had been carried out.

Keywords: Power Quality Parameters, Harmonics, Flicker, Energy Efficiency, Economic Efficiency



Technical and Economic Analysis of a 403 MVA Step Up Power Transformer Failure

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Abstract: Power transformers (PT) are one of the most important components of interconnected power systems. PT takes major role in energy transmission process of interconnected power systems. So reliable and continues operation of PT is needed to maintain power system quality and reliability. Although power companies have done their best to obtain continuous transformer operation, many transformer failures have been witnessed. These failures are experiences for future works. In this study a 403 MVA PT failure is investigated from technical and economic point of views. Investigated PT is the step up transformer of Afşin-Elbistan B Thermal Power Plant unit. All failure and repair data are taken from Afşin-Elbistan B Power Plant Company. Initially, the origin of the failure, the physical damage on transformer and repair process are evaluated in technical manner. Secondly, the economic cost of power plant unit shut-down period caused from transformer failure and repair processes is calculated. Finally some implications and recommendations are summarized.

Keywords: Power Transformer, Step Up Transformer, Transformer Failure, Transformer Repair, Transformer Failure Cost.



Examination of the Lower Calorific Value of Lignite Coal by Multiple Regression Method

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Abstract: The calorific value of coal varies depending on type of coal and foreign matter content. The calorific value of coal from pits is determined by analyzing moisture, volatile matter, ash and sulfur content in laboratories. This analysis process imposes a burden on businesses both in terms of time and cost. However, it can be determined by simpler methods, especially using the values of temperature, ash and humidity. In this study, we are aimed to develop a model that reduces the time and labor costs by determining the relation between LCV value and variables by using statistical package program. The model was designed based on data obtained from the laboratory analyses of raw coals from the pits of Garp Lignite Enterprise operating under the General Directorate of Turkish Coals and raw coals extracted from the mining areas of Celikler Seyitomer Lignite Company. While the values of vault moisture, volatile matter, original ash, dry ash content and sulfur were determined as independent variables, the lower temperature values were selected as the dependent variable. A model was created by calculating the coefficients of the multiple regression equation. The LCV values calculated by the model were compared with the LCV values obtained in the real laboratory, and the R^2 value was found to be 0.952. As a result, we have developed a multiple regression model that can be used to find coal LCV without the need for laboratory analyzes.

Keywords: Garp Lignite Plant, Coal Analysis, Tunçbilek Coal, Seyitömer Coal, Multiple Regression



Effects of 1-MCP Treatments on Quality Characteristics and Bioactive Compounds of Jujube Fruits (*Ziziphus jujuba*) During Cold Storage

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Abstract: The study was conducted to determine the effects of post-harvest 1-MCP treatments (312.5, 625 and 1000 nL L⁻¹) on weight loss, respiration rate, color characteristics (L*, chroma and hue angle), firmness, soluble solids content (SSC) and titratable acidity as quality parameters and vitamin C, total phenolics, total flavonoids and total antioxidant activity (according to DPPH and FRAP) as bioactive compounds of jujube fruits during cold storage. Fruits were stored inside MAP (Xtend[®], 815-CH97/a) at 0±0.5 °C and 90±5% RH for 60 days. During the storage, weight loss increased in all treatments. At the end of cold storage, respiration rate and weight loss of 1-MCP-treated fruits was significantly lower than control. Higher firmness, L* and hue angle values were measured in 1-MCP-treated fruits. Throughout the storage, SSC increased, whereas titratable acidity, vitamin C, total phenolics, total flavonoids and antioxidant activity (both DPPH and FRAP) decreased. At the end of cold storage, SSC of 1-MCP-treated fruits was lower than control. But higher titratable acidity, vitamin C, total phenolics, total flavonoids and antioxidant activity were determined in 1-MCP treatments. It was concluded that post-harvest 1-MCP treatments could be used as an efficient tool in maintaining quality of jujube fruits.

Acknowledgements: This study was supported by the Scientific Research Project Unit of Ordu University (Project number: BY-1729).

Keywords: Antioxidant, Firmness, Respiration Rate, Weight Loss, Vitamin C



Chemical Composition, Antioxidant Capacity, Phenolic Content, and Antimicrobial Effect of Walnut (*Juglans regia* cv. Chandler)

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Abstract: This present study evaluated the chemical composition, antioxidant capacity, phenolic content and antibacterial effect of kernel, heartwood, and thin shell of walnut (*Juglans regia* cv. Chandler). The walnut samples were examined for moisture, ash and crude oil contents. The oils and defatted samples of kernel, heartwood, and thin shell of walnut were obtained by Soxhlet extraction. To determine the fatty acid composition, the fatty acids of oil samples were converted to fatty acid methyl esters analysed by Gas Chromatography–Flame Ionization Detector (GC-FID). Antioxidative capacity expressed as trolox-equivalent was measured using the DPPH-radical assay. The total phenolic content expressed as gallic acid equivalent was determined by the Folin-Ciocalteu assay. The antibacterial effects of samples have been tested against the growth of *Staphylococcus aureus* and *Escherichia coli* using agar well diffusion method. Skinless walnut and walnut with skin showed the same oil content (66.42 ± 1.25 % and 66.53 ± 3.4 %, respectively). The lowest oil content (0.95 ± 0.007 %) was found in heartwood. Linoleic acid (C18:2 c9, c12) was the most abundant fatty acid in walnut kernel oil (62.62 ± 0.52 %). The highest phenolic content and antioxidant capacity were observed in aqueous extracts of heartwood and thin shell of walnut. The aqueous extracts of thin shell of walnut were found to have higher antimicrobial effect against *S. aureus* than the others.

Keywords: Walnut Heartwood, Antibacterial Effect, Antioxidant Capacity, Phenolic Content, Fatty Acid Composition



Effect of Beta-Carotene on the Light-Induced Lipid-Stability of Refined Conventional and High-Oleic Sunflower Oil

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Abstract: In the present study, the influence of beta-carotene on the light-induced lipid-stability of refined conventional and high-oleic sunflower oil was evaluated. The not-supplemented oils and the beta-carotene (25 mg/kg) added oils were irradiated for up to 48 hours with two different light intensities (275 and 765 W/m²) in a xenon test instrument. To determine the fatty acid composition, the fatty acids of oil samples were converted to FAMES (fatty acid methyl esters) analysed by GC-FID (Gas Chromatography–Flame Ionization Detector). To investigate the degree of oxidation of samples, different analysis methods such as the measurement of induction time with an accelerated aging test using a Rancimat, the peroxide value, and the antioxidant capacity through DPPH-radical scavenging assay were applied. The oleic acid (C 18:1 c 9) content of high-oleic sunflower oil was 84.00 ± 0.33 %. Sunflower oil showed higher linoleic acid (C18:2 c9, c12) content (61.29 ± 0.82 %) than high-oleic sunflower oil (7.11 ± 0.23 %). Based on the results of the accelerated aging test and peroxide analysis, it was observed that oils supplemented with beta-carotene showed better oxidative stability during light storage than not-supplemented oils. Compared to conventional sunflower oil, the high-oleic sunflower oil indicated the higher lipid stability. The antioxidative activity of oil samples was decreased with increasing light exposure time and light intensity. It can be concluded that a beta-carotene supplement could prolongate the oxidation of the conventional sunflower oil in the storage process under the both irradiance as well as the oxidation of high-oleic sunflower oils.

Keywords: High-Oleic Sunflower Oil, Rancimat, Fatty Acid Composition, Antioxidative Capacity, Light-Induced Lipid-Stability



Effects of Maturity Stages and Modified Atmosphere Packaging on the Quality Characteristics of Cornelian Cherry Fruits (*Cornus mas* L.) During Shelf Life

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Abstract: The study was carried out to determine the effects of modified atmosphere packaging (MAP) on fruit quality attributes and bioactive compounds of cornelian cherry fruits (*Cornus mas* L.) harvested at two different maturity stages [Maturity (M); M-1: skin red color <10%, M-2: skin red color >90%] during the shelf life. Fruits were stored at 0±0.5 °C and 90±5% RH for 30 days, and then kept at 22±0.5 °C and 80±5% RH during 3 days for shelf life. In shelf life measurement of harvest, higher respiration rate, SSC, acidity, anthocyanin, flavonoids and phenolics was measured at M-2 stage than at the M-1 stage, but lower ethylene, firmness, L*, chroma and hue angle was determined. In the last shelf life measurement, lower respiration rate and ethylene production were measured compared to other applications from M-2 stage fruits. In MAP-treated fruits, significantly higher firmness, total flavonoids and total phenolics, as opposed to lower decay rates, were found to be significantly higher than non-MAP treated fruits. The color values of the fruits of M-2 stage were significantly lower than those of M-1, while vitamin C and anthocyanin were higher. Lower antioxidant activity was determined from M-1+MAP treatments compared to other treatments. As a result, M-2 fruits stored in the MAP were revealed to better in maintaining the quality characteristics during their shelf life.

Acknowledgement: This study was supported by the Scientific Research Project Unit of Ordu University (Project number:TF-1526).

Keywords: Anthocyanin, Decay, Phenolics, Respiration Rate, Weight Loss

**Fatty Acid Composition of Bastard grunt [Pomadasys incisus (Bowdich, 1825)]***Ayşe ÖZYILMAZ¹, Dilsat BOZDOĞAN KONUSKAN^{2*}**¹Iskenderun Technical University, Faculty of Marine Science and Technology, Iskenderun- Hatay, TURKEY**²Mustafa Kemal University, Department of Food Engineering, Faculty of Agriculture, Hatay, TURKEY***Corresponding Author: diboz1@hotmail.com*

Abstract: Bastard grunt (*Pomadasys incisus*, Bowdich, 1825) is a commercially important fish species in Mediterranean region and called “gargur” or “yalanci isparoz” in Turkey. The aim of the present study is to investigate fatty acid composition of this fish. A total of 61 specimens were bought in 2014 from Iskenderun fish market. To perform fatty acid analysis extraction of the lipid was carried out by using modified Bligh & Dyer by Olley and Hanson (1963). A GC-MS (Gas Chromatography-Mass Spectrometry) was used to determine fatty acids of the fish muscle. This research points out some basic information about fatty acid contents of bastard grunt which is a commercially important fish species around the region. The results indicated that the average level of the saturated fatty acids (SFA), monounsaturated fatty acids (MUFA) and polyunsaturated fatty acids (PUFA) of the fish muscle were calculated in the shown order; MUFA < PUFA < SFA. In addition, the average levels of arachidonic acid (ARA, C20:4n6) was found to be lower than that of eicosapentaenoic acid (EPA, C20:5n3) in muscle lipid of the fish. The mean docosahexaenoic acid (DHA, C22:6n3) level of the fish was almost three times higher than that of EPA. The total omega 3 fatty acids in muscle of the fish were calculated to be around 20% which was higher than total omega 6 fatty acids. The ratio of n6/n3, PUFA/SFA, and DHA/EPA in fish muscle were calculated to be 0.52, 0.89, and 2.84, respectively.

Keywords: Fatty acid, Bastard grunt, *Pomadasys incisus*, DHA, EPA



Artificial Mouth Model Design for Volatile Aroma Compounds Extraction from Food Compositions

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Abstract: Aroma; is one of the important organoleptic parameters affecting consumer preference in terms of food quality. In general, the aroma profiles of foods are put forward by determining the qualitative and quantitative characteristics of the volatile compounds obtained by extraction from the foods under vacuum and at high temperature. It is expressed as "volatile aroma compounds of foods". One of the most effective methods used in the literature for the extraction of volatile aroma compounds is the "Head Space Micro Extraction (HS-SPME)" technique. This sampling technique; is based on the adsorption of volatile aroma compounds onto the fuse silica fiber coated with the polymeric stationary phase. In the method, the volatile aroma compounds that accumulate in the top cavity of the flask passing through the gaseous phase at a certain temperature and for a certain period of time are adsorbed by the fiber through a sample of the sealed sample flask. However, it is known that oral physiology (saliva release, saliva composition, chewing, breathing, volume of oral cavity, mouth temperature, time, etc.) has a significant effect on the aroma sensation *in vivo* conditions. In this study, by taking an approach to measure the chewing motion from oral physiological effects, a chewing device was designed to mimic the food chewing process of the mouth and combined with the HS-SPME technique. In the mechanism used, chewing motion was achieved by rotating the teeth on the plate with a screw shaft. In addition, as the upper jaw, there is a mechanism designed to rotate only with teeth. The designed mechanism is prototyped with 3D printer.

Keywords: Food, Volatile Aroma Compounds, HS-SPME, Artificial Mouth Model



Comparison of Antioxidant Effects of Taşköprü Garlic with Its Stalks and Clove Shells

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Abstract: Plant leaves are the primary components that best reflects the state of physiological nutrients in plant bodies. Garlic is also a functional food material that should be evaluated with its stalk. Head of garlic is collected during the harvest period but the stalks and clove shells are discarded. The processing of these sections that constitute 10% of the total weight of garlic is of great importance in terms of reducing the amount of solid waste about 9,000 tons and contributing to national economy. It is known that the bioactive components in garlic have antioxidant properties. Natural antioxidants are components present in plant and animal tissues and that can be extracted or released during processing. There is an effort to extract new antioxidants from natural plant sources. These sources have to be cheap, renewable and abundant. Using agricultural and industrial waste as natural antioxidant sources is particularly attractive due to their low cost. Garlic is rich in selenium and organosulfur compounds. These compounds are active antioxidants. The antioxidant potential of garlic has been proven in vivo and in-vitro.

DPPH, and ABTS termination activities and FRAP values were determined in 20 garlic, garlic stalk and garlic clove shell samples obtained from Taşköprü market and harvested from different fields. In our study, DPPH% inhibition value (17 µg / ml wet sample weight) was lowest in garlic, garlic stalk and garlic clove shell samples, respectively, 41.62; 14.83; 31.64, highest 52.84; 29.86; 45.80 and a mean of 48.32; 24.94; 34.89 ABTS% inhibition value (5µg / ml wet sample weight) was lowest in garlic, garlic stalk and garlic clove shell, respectively, 18.36; 0.00; 2.09, the highest 52.70; 0.72; 6.68 and a mean of 36.36; 0.14; respectively. According to these results, the ABTS% inhibition value was found to be insignificant in the garlic stalk samples. FRAP value (mM FeSO₄.7H₂O / ml extract) was lowest in garlic, garlic stalk and garlic clove shell samples, respectively, at 0.3608; 0.1018; 0.2019, highest 0.5667; 0.2158; 0.3680 and an average of 0.4516; 0.1336; was found to be 0.2656. In all antioxidant activity tests, garlic samples showed the highest value. This is followed by garlic clove shell and garlic stalk.

Keywords: Taşköprü, Garlic, Stalk, Clove Shell, Antioxidant

Comparative Analysis of Antibiotic and Corticosteroid Therapy on Testicular Injury Induced by Experimental Sepsis Model in Rats

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Abstract: In this study, it was aimed to comparatively analyze the therapeutic effects of antibiotic (imipenem) and corticosteroid (methylprednisolone) on the possible damage in the testis of rats formed sepsis by applying the cecal ligation and puncture (CLP) model.

Fifty Sprague-Dawley male rats were assigned to 5 groups as Sham, Sepsis (S), Sepsis+Imipenem (S+I), Sepsis+Methylprednisolone (S+MP) and Sepsis+Imipenem+Methylprednisolone (S+I+MP) groups. All rats were anesthetized with a combination of xylazine (0.5 mg/kg intramuscularly) and ketamine (2.5 mg/kg intramuscularly). Then, sepsis was created in rats according to the CLP technique described by Singleton and Wischmeyer. The abdomens of the animals in the sham group were opened and their bowels were taken out and put in its place again. After created of sepsis in S group animals, no treatment was applied. One hour later the sepsis model was established, the animals in S+I group were given Imipenem at the subcutaneous (s.c) dose of 7.1 mg/kg/12 hours for 3 days, and the animals in the S+MP group were performed methylprednisolone (0.5 mg/kg/12hr) intramusküler (i.m.) for 3 days. The rats of S+I+MP group were applied Imipenem at 7.1 mg/kg/12 hr dose as s.c for 3 days and methylprednisolone at 0.5 mg/kg/12hr dose as i.m during 3 days, one hour after the sepsis model was established. At the end of the seventh day, the rats were sacrificed under anesthesia with cervical dislocation method and their testes were removed. The sections taken from paraffin-embedded blocks were stained with Crossman's modified Mallory triple stain and histological examination was performed. In addition, 50 tubules were examined in each testis and scored according to Johnsen's criteria to assess spermatogenic functions. In the stained sections as immunohistochemically, Bax, Bcl-2, and 8-OHDG immunoreactivity were evaluated semiquantitatively and immunoreactive scoring was performed for each group. Comparisons between groups were made using Kruskal-Wallis Test and Mann-Whitney-U Test. p value equal to/less than 0.05 would be considered to be statistically significant.

In the histopathological examination of the sections of the Sham group, seminiferous tubules had normal structure and numerous spermatocytes were present in the tubules. In S group, degeneration of seminiferous tubules, and disintegration and desquamation of tubule epithelia were observed. There was an improvement in the S+I and S+MP groups compared to the S group. However, the histologic view of S+I+MP was closer to this of Sham group, more regular tubule structure and the cellular organizations were seen. Johnsen's score of S group was low compared to Sham group ($P < 0.05$), and was higher than S+I+MP group ($P < 0.05$). Bax ve 8-OHDG immunopositivity were higher in S group than other four groups, but the scores of Sham and S+I+MP group were significantly lower than S group ($P < 0.05$). When the groups were evaluated for Bcl-2 immunopositivity, the score of S group was lower than Sham and S+I+MP groups ($P < 0.05$), but there was no significant difference between the S and other two groups ($P > 0.05$).

Consequently, it has been concluded that co-administration of antibiotics and corticosteroids may be more effective in the treatment of the testis damage caused by sepsis.

Keywords: Sepsis, Imipenem, Methylprednisolone, Immunohistochemistry



Heterosis and Combining Ability Estimates in Half-Diallel Crosses of Durum Wheat

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Abstract: Heterosis and combining ability are the two most important aspects of any hybrid crop. The heterotic effect is in general more pronounced in cross-pollinated than in self-pollinated crops, however, significant levels of heterosis have been reported in a number of self-pollinated crops. In the study, the heterosis percentages and combining ability effects were determined for heading time (HT), thousand kernels weight (TKW) and plant yield (PY) of 6 durum wheat parents (Landraces Beyaziye, Bagacak and cultivars Kunduru 1149, Cakmak-79, Diyarbakir-81 and Duraking) and their 15 half-diallel crosses. Two local populations (Beyaziye and Bagacak) and four cultivars (Kunduru 1149, Cakmak-79, Diyarbakir-81 and Duraking) of durum wheats were used as parents in the study. Heterosis percentages for high-parent and mid-parent were - 2.16 % and - 0.74 % for heading date; - 1.64 % and 3.78 % for 1000 kernel weight; - 2.24 % and 5.24 % for plant yield, respectively. The highest heterosis percentage for mid-parent was determined at the hybrids of 'Kunduru 1149 x Diyarbakir81' (1.10 %) for heading date; 'Kunduru 1149 x Cakmak 79' (12.86 %) for 1000 kernel weight; 'Beyaziye x Duraking' (37.67 %) combination for plant yield. The general combining ability (GCA) and specific combining ability (SCA) components of variance were significant for three traits studied. The levels of heterosis and general and specific combining abilities of parental lines were sufficient to sustainable production of hybrid breeding and early selection of breeding lines.

Keywords: Heterosis, Durum Wheat, Diallel, General Combining Ability, Specific Combining Ability



Effects of Addition Taşköprü Garlic and Synthetic Antioxidant on Some Properties and Oxidation Stability of Butter

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Abstract: Garlic, which is used in medical plants for more than 5.000 years, is widely consumed as both food and therapeutic. In recent years, antioxidants, hypotensive, antiparasitic, antibacterial, antimycotic, antiviral, hypolipemic, anticarcinogenic, antioxidant, immunological effects of garlic and compounds, which cause these effects, have been intensively investigated. Natural antioxidants that can be used in the food industry for different purposes due to their extensive bioactivity profile are important alternatives. It is revealed that these substances have many positive biological activities such as anticarcinogenic effect in terms of human health. Antioxidant activity of garlic that is natural antioxidant is associated with phenolic compounds in their structure. The antioxidant effect of phenolic compounds is due to their properties such as free radical cleansing, compounding with metal ions and inhibiting or reducing singlet oxygen formation. These compounds can give hydrogen which is in the hydroxyl groups of the aromatic rings in order to prevent the oxidation of lipids and other biomolecules (protein, carbohydrate, nucleic acids) by free radicals. Double bonds in unsaturated fatty acids or unsaturated moieties in hydrocarbon chains react with oxygen and peroxides and hydroperoxides are formed. Thus, the oxidation occurs in fats. The identification of the hydrolyzation and oxidation levels of milk fat is very important in determining the period of storage of butter without losing of the ability to consume. Peroxide value and thiobarbituric acid (TBA) tests are generally used to determine the degree of lipid oxidation in butter. Antioxidants inhibit the formation of rancid taste and odor due to oxidation during storage. These products do not reverse oxidation or remove rancid products. These substances are added to freshly produced fats before the oxidation process is started to delay or prevent oxidation. Recently, discussions have been made on possible teratogenic and carcinogenic effects of these chemicals, which are used as antioxidants. For this reason, the use of natural antioxidants in place of synthetic antioxidants has become widespread. In this study, garlic (2.5%, 5%, 7.5%, 10%) was added to the butter produced by us and compared with the synthetic antioxidant (50 ppm BHT) added to the butter. It is aimed to reduce both the oxidative deterioration that occurs during storage and to increase the shelf life and to create a functional food. The results of the 2nd day analysis of the produced butter samples were found that dry matter (%) 85.81-81.26, fat (%) 85-80.5, pH 6.45-6.11, titration acidity (%) 0.024-0.100, acid value (mg KOH/g fat) 0.88-0.79, TBA value (mg malonaldehyde/kg fat) 0.030-0.021. Peroxide value (meq O₂/kg fat) was not detected in butter samples. While control and BHT supplemented butter taken highest sensory scores, this were followed by 5%, 2.5% and 7.5% garlic supplemented butter samples, respectively. 10% garlic supplemented butter samples were unloved.

Keywords: Butter, Taşköprü, Garlic, Oxidation, Antioxidant



Textile Industry ERP Module for iOS Based Devices

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Abstract: Enterprise Resource Planning (ERP) is an information system in which a company, an institution, an organization or a corporation integrates all its data and processes in a single system. The main aim of the study is to provide a module (solution) which will be utilized in iOS based mobile devices for the organizations using ERP systems in textile industry. In this study, it is aimed to facilitate the process of finding out the textile design features via handheld terminals and an additional computer software used by the employees of textile companies. Current system of one of the textile company operating in Bursa Textile Industry was analysed, inadequacies were detected and also necessary improvements for the system were determined. For the development of the application, Swift, which is created by Apple to develop iOS and Mac applications for iOS and iOS X platforms, run by compiling, a powerful, an easy to use and an object oriented language, was selected. At the end of the tests and analyses, the process of data retrieving and parsing into the application was carried out by converting data into JSON type and retrieving them from a remote server. In order to store the data which were retrieved into the application from a remote server, its design was made considering the incoming data by activating core data feature of Apple devices. Therefore, when the application is run, it can transfer the data only the ones which are updated or newly added by checking the remote server instead of downloading all data related to the application. As a result of adding this feature, the internet use of the application was minimised and the cost of the internet of the application user was decreased. Barcode reading feature was included into this application designed for iOS based devices, therefore, the user can search the data in a more faster and reliable manner by using barcode reading feature instead of searching the data manually. QR codes and stripe barcodes required to identify the textile barcodes, were generated in the computer programme written in accordance with the algorithm constructed with C# and C++ programming languages. After the generated codes were printed out from the printers (Argox 1000-VL barcode printers) of the company, barcodes were adhered into the textiles by the employees. Consequently, the textiles were scanned by the application and the system became ready for the action.

As a result, the processes of data search and result listing carried out via handheld terminals and an additional computer software were realized with QR code or stripe barcode system and an iOS based mobile device. For the future stages of the application, the development of the modifications of the data retrieved by the device and also data updates which can be applied directly on the database are taken into consideration.

Keywords: ERP Module, iOS Based Devices, Swift, JSON, QR Code, Stripe Barcode



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Real-Time Port Analysis in Local Area Networks

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Abstract: Even though a firewall is located in front of the traffic in corporate local networks, some ports of the systems are open, and access and damage attacks can be done to the network. Network administrators can take precautions by performing port analysis with some programs in order to be knowledgeable and effective in ensuring the security of these systems. At this stage, it may be preferable to use software with open source IDS and IPS features.

In this research, a software that performs port analysis in Windows with Nmap application on open source Linux is run at the same time and their performance is compared. As a result, during the real time test, in the 88 operating system with IP between x.x.20.0 and x.x.23.255, the software reported 131 open ports while the open source Nmap application has reported 144 ports.

Keywords: Network Security, Firewall, Port Analysis, Nmap



A Mobile-Based Application for Help and Monitoring in Emergencies

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Abstract: With the rapid growth of the world's population, the growth of cities and the increase in travel opportunities between cities and countries, the need for people's location information is also increasing rapidly. In addition to this, location information is required for the elderly, those with Alzheimer's disease, children in the age of primary education, and mentally disabled individuals. Dangerous situations such as forgotten, kidnapped and lost children in school services have started to be encountered more frequently. Children who are forgotten in the school service can die from airlessness. In addition, individuals with mental disabilities, elderly or Alzheimer's patients can often be lost. In addition, even adult individuals who do not have any illnesses can suffer from reaching each other in crowded environments. In short, we have dealt with the problems that many individuals of society have frequently encountered and developed a mobile application for these problems. The developed mobile application is simple and useful, it has an interface designed to be dynamically changed according to your needs. Two different interfaces are designed for both parents and followers. The application can run as a back-up service and prevents it from being continuously displayed on the screen. It has also been tried to prevent the application from constantly querying the location to save power. For this, location information is detected from GPS satellites at certain periods. By using accelerometer data, it is ensured that GPS position update is not performed if mobility exceeding a certain threshold value is not detected, so that power consumption is reduced in a serious manner. By means of the application, the user's position information and mobility status will be recorded by checking with certain periods. The program will report the status and location information to the parents via SMS by specific periods. Parents will be able to query their relatives' location information whenever they want. Parents will be able to get information about the current status and the position of the person to be followed by sending a message in accordance with a designated form. It is also intended to provide the user with prompt assistance to emergency aid units such as hospitals, fire brigades, police in a possible emergency situation.

Keywords: Mobile, Emergency, Danger, Disabled, Child, SMS



4-Axis Robotic Arm Design that Can Learn Motion with Joystick and Detect Colored Objects

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Abstract: As a result of the rapidly increasing industrialization in the last century, automation systems in production have started to be used in all factories and enterprises.

The need for robot arms integrated with these automation systems is also increasing rapidly.

There are generally defined tasks of robot arm mechanisms used in factory automation systems.

In order to intervene in these systems, the software must be programmed from the beginning. In general, robot arm movement is taught once, and then the robot arm continuously repeats this movement. This saves time and money from the work force. In our work, a robotic arm with 4-axis, low cost prototype has been developed to teach this robot arm movement.

By using a joystick control from the outside, it is ensured that robot arm movements are performed and that the desired job is performed manually. In addition, in addition to the existing systems, the robot arm is controlled to check whether it is in the starting position when it is commanded to do one of the registered movements, and to go to the starting position if it is not in the starting position. Attempts have been made to develop a mechanism for color sensors to recognize the objects to be moved, to detect the object with the distance sensor against the possible deviation during taking and replacing the object, and to correct the errors and deviations that may occur over time. Control and data exchange can be achieved by providing wireless access to the robot cell via Bluetooth. The intelligence level of the system has been increased thanks to Bluetooth and communication with android devices. The robotic arm is able to hold data on how many objects it carries and in which colors it carries objects, and these data are followed.

Keywords: Robot Arm, Bluetooth, Color Sensor, Learning Movement, Joystick



Prediction of the Lower Calorific Value on the Lignite Coal by Using Decision Trees

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Abstract: The Determination of the lower heat value (LCV) of lignite coals used in thermal power plants is very important for energy production. The determination of this thermal value is carried out in a laboratory environment and this process effects as time and labor cost to the enterprises. The model was designed based on data obtained from the laboratory analyses of raw coals from the pits of Garp Lignite Enterprise operating under the General Directorate of Turkish Coals and raw coals extracted from the mining areas of Celikler Seyitomer Lignite Company. In this study, it is aimed to reduce the costs of enterprises through the software developed using decision trees. Using Weka package program, models are created by using LCV value of coal, J48, Random Forest, Random Tree, REP Tree, M5P decision trees and Naive Bayes classification techniques. It is found that the most suitable decision tree model is constructed with J48 (correct classification rate 67.48%). The tree codes created with J48 are written using the Java programming language. As a result, the model is developed that can be efficiently used to find the LCV value of a coal without requiring laboratory analysis.

Keywords: Garp Lignite Enterprises, Coal Analysis, Tunçbilek Coal, Seyitömer Coal, Decision Trees

**Determination of Water Quality of Yumurtacılar Pond (Daday –Kastamonu, Turkey)****Ekrem MUTLU¹, Arzu AYDIN UNCUMUSAOĞLU^{2*}**¹Kastamonu Üniversitesi Fisheries Faculty, Kastamonu-TURKEY²Giresun University, Engineering Faculty, Environmental Engineering Department, Giresun-TURKEY***Corresponding Author:** arzu.auncumusaoglu@gmail.com

Abstract: In this study, we analyzed the monthly and seasonal changes of the water quality parameters, determined the water quality characteristics and pollution problems, and ascertained the suitability for aquatic life and the classification of water quality according to Surface Water Quality Control Regulation and WHO guidelines in Yumurtacılar Pond.

In this context, analyses of water samples were carried in three stations between May 2015 and April 2016. The study area is located in the northwest part of the Central district in Kastamonu province. Twenty-one physicochemical parameters and seven heavy metal concentrations have been analyzed in the water samples. Among the physical parameters of water quality, the water temperature (WT), dissolved oxygen (DO), salinity, and electrical conductivity (EC) were measured on-site using YSI 556 MPS model multi-meter. Other water quality parameters were analyzed in laboratory using standard method (APHA, AWWA, 1995; Anonymous, 1998). The analyses of heavy metals of water samples were conducted by Perkin Elmer's Optima 2000 DV ICP-OES device in laboratory. We found that Yumurtacılar Pond, which is a suitable environment for aquatic life, is important in terms of preservation of existing water quality, continuity of ecological balance and irrigation of agricultural land in the surrounding area. According to results, mean of parameters were found as DO=11.26±0.85 mgL⁻¹, salinity=0.36±0.25 ‰, pH=8.20±0.24, WT=11.64±7.11°C, EC=244.35±49.28 µScm⁻¹, SS=5.28±2.84 mg L⁻¹, COD=2.55±1.54 mgL⁻¹, BOD₅=1.05±0.57 mgL⁻¹, [Cl⁻]=3.76±1.31 mg L⁻¹, [PO₄³⁻]=0.22±0.16 mgL⁻¹, [SO₄²⁻]=55.98±10.15 mgL⁻¹, [SO₃²⁻]=1.24±0.51 mgL⁻¹, [Na⁺]= 42.14±13.52 mgL⁻¹, [K⁺]=5.98±3.57 mgL⁻¹, TH=222.87±33.78 mgL⁻¹, TA= 222.26±35.85 mgL⁻¹, [Mg²⁺]=36.44±10.64 mgL⁻¹, [Ca²⁺]=36.14±15.38 mgL⁻¹, [NO₂⁻]=0.003±0.002 mgL⁻¹, [NO₃⁻]=3.96±3.059 mgL⁻¹, [NH₄⁺]=0.00036±0.0003 mgL⁻¹, [Fe²⁺]=0.0006±0.0009 mgL⁻¹, [Pb²⁺]=0.197±0.33 µgL⁻¹, [Cu²⁺]=1.917±2.623 µgL⁻¹, [Cd²⁺]=0.158±0.10 µgL⁻¹, [Hg²⁺]=0.0027±0.002 µgL⁻¹, [Ni²⁺]=1.81±1.45 µgL⁻¹ and [Zn²⁺]=6.86±6.29 µgL⁻¹. In this study, statistically significant difference was found between the mean of seasonal values (P>0.05) but not sites. The water quality of this pond was found as Class I-II-II, which means is very high quality, slightly polluted and polluted water respectively.

Keywords: Fresh Water, Water Quality, Monitoring, Pond, Heavy Metal



The Investigation of By-catch and Discard Rates in Bottom Trawl in the Ordu-Samsun Region

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Abstract: This study was conducted aiming the determination of the discards and incidental catch rates of bottom trawl vessels fishing in Ordu-Samsun region during 2016-2017 fishing season in Turkey. During 8 months research period about 74 days of fishing operations were done. As a result of the 217 bottom trawling operations, pontic shad (*Alosa immaculata*), gobies (*Gobius* sp.), turbot (*Psetta maxima*), bluefish (*Pomatomus saltatrix*), horse mackerel (*Trachurus mediterraneus*), picarel (*Spicara smaris*) and scorpion fish (*Scorpeana porcus*) were caught as a by-catch together with the main targets as whiting and red mullet. Whiting (*Merlangus merlangus euxinus*), red mullet (*Mullus barbatus*), turbot (*Psetta maxima*), thornback (*Raja clavata*), halibut (*Platichthys flesus luscus*), dogfish (*Squalis acanthias*), sole (*Solea lascaris*) and greater weever (*Trachinus draco*) were caught as a discard. A total of 28040 kg fish were caught during the survey and 77% of the fish were found as target species, 7.87% as incidental catch and 15.13% as discards. In terms of the species composition (%47.41) and fishing quantity (%83.367) the fish species caught in the highest rate in all period was whiting.

Keywords: Bottom Trawl, Black Sea, Catch Composition, Discard, By-Catch



Impact of Artificial Water Level Changes on the Limnological Characteristics of Alpsarı Pond (Çankırı-Korgun)

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Abstract: Ponds are stagnant water bodies, which are smaller than lakes or dams providing habitats rich in biodiversity are accumulated by artificial or natural barriers. In spite of many ponds covering 15000 ha surface area in Turkey; there were not enough limnological data or survey about the ponds in Turkey. Ponds are threatened by eutrophication and decreasing in water level as well as in lakes.

Determining limnological characteristics of ponds must be the first step for sustainable management of these aquatic systems. This study was conducted to determine the seasonal and monthly changes of limnological characteristics of the Alpsarı pond, which was used for recreational, and irrigation purposes. Water samples were collected monthly from the deepest point of pond, inflow and outflow of the pond between January and December 2017. In total, 14 physicochemical parameters were investigated to determine the water quality. Decrease in water level (from 12 meter to 7 meter depth) due to water abstraction deteriorated the water quality (eutrophic and deoxygenated conditions).

In conclusion, our study revealed that comprehensive regulations for water abstraction are very crucial to maintain the sustainable management of the pond.

Keywords: Water Quality, Limnology, Chlorophyll-a, Çankırı, Trophic State, Water Level

**Assessment of Heavy Metal Concentrations in Surface Water of Saraydüzü Dam Lake*****Serkan KÜKRER^{1*}, Ekrem MUTLU²****¹Ardahan University Faculty of Social Science and Humanities Ardahan-TURKEY**²Kastamonu University Fisheries Faculty, Kastamonu-TURKEY***Corresponding Author: kukrerserkan@gmail.com*

Abstract: In this study heavy metal levels (Pb, Cu, Cd, Hg, Ni, Zn) were studied to prove their effect to human and ecosystem health in Saraydüzü Dam Lake where domestic and agricultural wastes from settlements and croplands are discharged directly in to the lake. Surface water samples collected from six stations representing the lake for a year. The heavy metal concentrations in the samples were determined by ICP-OES. Average concentrations of measured elements in the surface water were, in descending order, Zn>Cu>Ni>Pb>Cd>Hg respectively. The water quality index (WQI) and metal index (MI) were calculated to determine effects of heavy metals to human health based on World Health Organization (WHO) criteria. WQI values were found to be between 0.351- 3.94. The minimum WQI value was detected in January while the maximum was in May. WQI values indicate excellent water level. MI values were found to be between 0.04-0.30. As MI indices were <1 surface water of lake is considered to be unpolluted. In addition to these indices, measured values were compared to Surface Water Quality Regulations of the Ministry of Forestry and Water Affairs of the Republic of Turkey. Accordingly, it has been found that the annual mean values for Cu and Zn are exceeded while the critical values for Pb, Cd, Hg and Ni were not. Factor analysis was applied to the data set to determine the sources and transport processes of heavy metals. Two factors with eigenvalues greater than 1 were identified. While all metals except Hg were included in the first factor, Hg was included in the second factor. This shows that these five metals have similar sources and migration processes.

Keywords: Saraydüzü Dam Lake, Surface Water, Heavy Metal, Water quality Index, Metal Index



The Effects of Different Ph Semen Extender of *Capoeta Trutta* on Post-Thaw Motility Rate

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Abstract: In this study, the semen of *Capoeta trutta* (Heckel, 1843) which is widespread distribution in Turkey, Iran, Iraq and Syria, and consumed as food plentiful is frozen. The changes in post-thaw motility rate of frozen *C. trutta* sperm using 4 different pH diluents and 2 different cryoprotectant combinations were investigated. The DMSO gave the best results ($88.75 \pm 1.25\%$) when frozen with glucose diluent at pH 8.2, but the best result of glucose diluent at 7.6 pH with methylglucol ($70.00 \pm 7.90\%$). When we wanted to freeze the *C. trutta* sperm in the light of these results, all the cryoprotectant types and glucose diluent pHs used in our study gave acceptable results. However, if the *C. trutta* sperm is frozen the DMSO at pH 7.2 can be considered as the best option for the highest spermatozoa motility rate.

Keywords: Sperm Freezing, Osmolality, Extender, Cryoprotectant, Sperm Quality



The Accumulation of Heavy Metal Levels in Some Rainbow Trout Tissues from Karkamış Dam Lake, Şanlıurfa, Turkey

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Abstract: Organic substances, industrial wastes, petroleum derivatives, artificial agricultural fertilizers, detergents, radioactivity, pesticides, inorganic salts, artificial organic chemicals are specified as pollutants of rivers. Even when toxic substances are present in low concentrations in water (eg 1 mg / L), they can cause toxic effects by damaging human health. Cr, Cu, Zn, Pb, Fe, and Ni are heavy metals that can carry toxic effects and have risk for human and animal health. This study was conducted to determine some heavy metal (Cr, Cu, Zn, Pb, Fe ve Ni) levels in muscle, gills and livers of rainbow trout. In the study, the muscle, gill and liver (n=95; in µg/g wet weight) heavy metal concentration of rainbow trout were Cr (0.11±0.02), (0.11±0.01) and (0.07±0.01); Cu (1.28±0.08), (3.26±1.07) and (5.81±3.69); Zn(6.39±2.64), (39.62±2.64) and (21.12±1.26); Pb (0.03±0.00), (0.01±0.00) and (0.03±0.00); Fe (9.17±3.92), (23.69±1.18) ve (45.35±2.68) and Ni (0.07±0.01), (0.08±0.00) and (0.05±0.00) respectively. The results indicate that slightly polluted this damlake might have no negative impact on fish populations that inhabit this damlake.

Keywords: Heavy metal, Accumulation, Tissue, Trout, Türkiye



A Preliminary Study on the Feeding Habits of European Conger *Conger conger* (Linnaeus, 1758) from Aegean Sea of Turkey

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Abstract: The objective of this study was to determine the feeding habits of European conger *Conger conger* and to improve our understanding in the seasonality of prey choice. The European conger, is a demersal species found in the esatern Atlantic also in the Mediterranean and Black Sea. The specimens were collected on a seasonally basis from angling in Candarlı Bay, Aegean Sea coast of Turkey from October 2015 to November 2017. All samples were either preserved in 10% formaldehyde after capture or immediately frozen to stop enzymatic activity in the digestive tract. The specimens were then weighed to the nearest gram and total length was measured to the nearest 0.1 cm in the laboratory. The contribution of the different categories of food items to the diet of *C. conger* were determined by: frequency of occurrence (%F) numerical occurrence (%N) and weight (%W), and the index of relative importance (IRI and %IRI) calculated. In order to assess feding intensity, vacuity index was employed (%VI: empty stomachs/total number of stomachs*100). A total of 95 stomachs were analyzed. The total lengths of the fish examined ranged between 36-165.3 cm. Of 95 stomachs, 30 (31.6%) contained food and 65 (68.4%) were empty. The season having the highest percentage of stomach fullness (54.5%) was winter. The overall diet composition revealed that the European conger feeds mostly on crustaceans, molluscs and teleosts. Feeding occurs daily for most fish and may be the most frequent voluntary activity. It is generally stated that the feeding intensity in fish decreases during the spawning season. Our findings were consistent with this statement. The European conger spawns in the summer months in the Mediterranean. In line with this, we observed the largest number of empty stomachs in the summer.

Keywords: European Eel, *Conger conger*, Feeding, Diet Composition, Aegean Sea



Evolution of the Water Quality of Tuzaklı Pond (Kastamonu/Turkey)

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Abstract: In this study, through water samples taken for a year from 3 stations on Tuzaklı Pond located in Kastamonu city, it was aimed to observe the monthly (May 2015 and April 2016) and seasonal changes, to determine the water quality properties, to reveal the pollution problems, to determine the suitability level in terms of aquatic life, and to classify the quality of water in accordance with World Health Organization and Turkey's Surface Water Quality Management Regulation's Inland Surface Water Classes, criteria too. Chemical oxygen demand (COD), biological oxygen demand (BOD), total hardness, nitrite, nitrate, ammonium nitrogen, total alkalinity, phosphate, sulfite, sulfate chloride, calcium, magnesium, sodium, potassium were analyzed in laboratory using standard method (APHA, AWWA, 1995; Anonymous, 1998). Among the physical parameters of water quality, the water temperature, dissolved oxygen, salinity, and electrical conductivity (EC) were measured on-site using YSI 556 MPS model multi-meter. SPSS statistical package software was utilized for the statistical analysis (One-way ANOVA, Pearson's correlation (r), Hierarchical Cluster Analysis (HCA) of water analysis results. In this study, statistically significant difference was found between the mean of seasonal values ($P > 0.05$) but not sites. The nitrate value according to the classification criteria is class III, ie "polluted water". Water temperature and phosphorus levels of class II "slightly polluted water" is advisory. Other parameters are high-quality water feature.

Keywords: Fresh Water, Water Quality, Pearson's Correlation (r), Hierarchical Cluster Analysis (HCA)



Longline Fishing in Antalya City

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Abstract: This research was carried out to determine the technical and structural characteristics of the longline sets used in the fishing boats in Kaş and Kalkan provinces in Antalya city. Survey was conducted with 12 fishermen and technical and structural features of the longlines, operations, species caught and technical specifications of fishing vessels were given in tables as an evaluation of questionnaires. The overall length of the boats which are using bottom longline with a length ranging from 1000 to 4000 m, varies between 6.5 and 8.9 m in length with 9-85 Hp in engine power. The number of staff varies between 1 or 2 people and fishing is carried out at 40-150 m depth of water. Fish having economic value caught by bottom longline in the region and discarded have been identified as red porgy, dusky grouper, black tip grouper, leervis, two-banded sea bream, white sea bream, common dentex, pink dentex, Mediterranean horse mackerel, Atlantic black skipjack, bullet tuna, bogue, filefish and African threadfish having high economic value and oceanic puffer, lionfish, moray eel, shark, sea turtle, thornback, squirrel fish as discards, respectively. Bottom longline sets are used intensively from January-May and September-December. Particularly tuna and bullet tuna are also intensively caught from March to May. Fishermen set the longlines in the sea at the evening hours and collect 2-3 hours later. Longlines used two and three times per day. It was observed that longline fishermen also use gill nets at the same time.

Keywords: Longline, Fishing, Fishing Shelter, Kaş, Antalya



General Overview of Amateur Fisheries in the Province of Tunceli

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Abstract: Amateur Fisheries is defined as a fisheries activity which is performed not only for recreation or sports but also does not have any commercial earning goal and in which the fish caught is not sold. As amateur fisheries is performed as a pastime activity, it can be done with the participation of individuals from all sections of a society irrespective of income, education or statute. Accordingly, it is observed that amateur fisheries has been improving in the regions on the coast in particular recently. This study has been conducted to establish the current state of amateur fisheries performed in the province of Tunceli (Pulumur and Munzur). 95 individuals who were engaged in amateur fisheries in the period of January 2018 – March 2018 in the research zone were chosen randomly and the original data were obtained ensuring their voluntary participation in the 38-item survey. In the specification of the survey magnitude, as there is no record as to the amateur fisheries rate in the population of our country, 4,8% value determined for Europe is used due to its geographical proximity. As a result of the survey carried out with amateur anglers, the distribution of the variables regarding whether they have information about fishing height and numbers were established through the chi-square test and fallacy probability was determined as $\alpha = 0,05$. The survey results were assessed using SPSS and EXCEL programs. As a result, a statistically significant difference was observed in the education variable ($\chi^2:9,434$; $p:0,009$), monthly income ($\chi^2:12,525$; $p: 0,006$), time spent for fisheries ($\chi^2:11,935$; $p:0,03$), target types the fishermen prefer ($\chi^2:14,903$; $p:0,001$) and increase or decrease in the quantity of fish ($\chi^2:11,248$; $p:0,04$), whereas there is significant difference in the other variables when those having information or not about the fishing height and numbers. The research in which the general overview of amateur fisheries is established in the province of Tunceli has been carried out for the first time in the region and is pioneer for the future studies. Amateur fisheries is a kind of activity performed to obtain the fisheries, the most beneficial nutritional source, for free and performed widely as it provides an opportunity to spend time enjoyably. So, those engaged in amateur fisheries be informed about the issue and it should be performed without harming nature to ensure sustainable fisheries.

Keywords: Amateur Fisheries, Target Species, Fishing Line, Tunceli



The Investigation of the VAN Region Seismicity

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Abstract: The Van region is located in the north-south direction of compression and contraction zone, which affects a wide area the result of the Arab plate's northward movement towards the Eurasian plate. This compression causes the east-west extending thrust faults, northwest-southeast right lateral and northeast-southwest left lateral strike-slip faults. The Van earthquake of $M_w=7.2$ (23th October 2011) caused the loss of life and property, which occurred in this compression zone. Therefore, the region has to be investigated in detail since it has a high potential to produce destructive earthquakes.

In this study, the a and b parameters of the region were calculated according to Gutenberg - Richter relations by using the earthquakes $M_s \geq 3.0$, which occurred between 1900 and 2017 in Van region. From the calculated parameters, the future potential of earthquake occurrence ($M_s \geq 5.0$) was examined for the region by Poisson and Exponential distribution models. According to Poisson distribution model results; the probability of an earthquake $M_s \geq 5.0$ was estimated as 91% the next 10 years, and the recurrence period was 4 years, and also the probability of an earthquake $M_s \geq 7.0$ was as 7% and the recurrence period was 132 years. The probability of an earthquake $M_s \geq 5.0$ according to the exponential distribution model was 10% and the recurrence period was 10 year. Also the region peak ground acceleration (PGA) were estimated according to a scenario earthquake ($M=7.0$) occurred in region by using attenuation relations and the PGA maps were constituted with geographic information systems (GIS).

Keywords: Poisson Distribution Model, Exponential Distribution Model, Peak Ground Acceleration (PGA), Van Region, Earthquakes



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Geological Criterias for Searching of Podiform Chromites

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Abstract: Podiform type chromitite deposits develop in the Alpine type peridotites extending from Spain to Indonesia. Alpine-type peridotite massives and numerous chromite deposit in Turkey were examined geologically. Detections of chromite deposits in these peridotites are extremely difficult due to alteration, tectonism and young geological covers of the massives. In this study, significant geological criterias, such as mineralogical, petrological and tectonic, have been find out for investigation of the chromitite deposits in the altered peridotite which do not outcrop on the surfaces.

Keywords: Podiform Chromitite, Investigation Criterias, Turkey



Effect of Fly Ash Stabilization on Strength Behavior of Clayey Soils

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Abstract: The soil on which the building is to be constructed may not be suitable for the construction. For example, soft clayey soils have high settlement potential and its bearing capacity is very poor. The studies to improve the mechanical properties of the soil is called soil improvement or soil stabilization. Clayey soils are one of the important topics investigated in geotechnical engineering. Different methods are being used to improve such soils. In recent years, improvement of clayey soils with marble powder, rubber chip and fly ash has been an important research topic in geotechnical engineering. This study investigated the improvement of clayey soils with fly ashes as waste material from Çatalağzı Thermal Power Plants. The clay samples mixed with different amounts of fly ash were subjected to soil classification tests primarily. In the next step, the optimum water content and maximum dry density of the samples were determined by the Standard Proctor Test. According to the test results, the amount of fly ash added up to 10% to the clayey soils reduces the optimum water content and increases the maximum dry density. On the other hand, the addition of more than 10% fly ash to clayey soil increases the optimum water content and reduces the maximum dry density. In the last stage of the experimental part of the study, the samples prepared according to all the experimental data to be obtained were stored in the cure (1-8-16-32 days). The California Bearing Ratio (CBR) and Unconfined Compression Test were carried out on the cured samples to investigate the change in mechanical properties of the clayey soils due to different fly ash ratios. From the results obtained, the determined the CBR and unconfined compressive strength showed similar tendency to cure time for all fly ash percentages added between 5% and 20% to clayey soils. Accordingly, as the curing time increases the CBR and unconfined compressive strength increase. In addition to this, maximum CBR and unconfined compressive strength were obtained by adding 10% fly ash to clayey soils for all curing times.

Keywords: Soil Improvement, Fly Ash, The Mechanical Properties Of Clayey Soils, The CBR And Unconfined Compressive Strength Of Clayey Soils, Maximum Dry Density



Experimental Study on Soil Stabilization of Clayey Soil using Fly Ash

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Abstract: The safety strength of soil is important for infrastructure works such as stream improvement, pipelines, sewer lines or foundations where structures are located. Soil stabilization is a technique aimed at increasing the stability to enhance their engineering properties. The fly ash used as a stabilizing material in the stabilization of clayey soils is approximately produced at a rate of 15 million ton / year in Turkey. This waste material comes out in the thermal power plants where about half of the electricity production in our country is provided. The storage of these wastes leads to contamination of surface and groundwater through long term leachate accumulation from the disposal sites and ultimately disturbs the ecological and environmental balance. The aim of this work is to evaluate the effect of the fly ash derived from combustion of sub-bituminous coal at electric power plants during the stabilization of clayey soils. In the first phase of this work, the grain size distribution, the properties of plasticity and the density of particles were determined with wet sieve analysis, atterberg limits tests, hydrometer analysis and pycnometer tests on the Bartın clay mixed with the fly ash obtained from Çatalağzı Thermal Power Plants located in the West Black Sea Region. In the next step, the optimum water content and maximum dry density of the fly ash-clay mixtures were specified with the Standard Proctor Test. These mixtures compacted in optimum water contents were stored in the cure (1-8-16-32 days) for the triaxial pressure test. The changes of the shear strength parameters of the clayey soils were investigated by triaxial pressure test on soil samples prepared by adding fly ash. According to the experimental results obtained, addition of fly ash resulted in appreciable increases in the CBR of the soil. Moreover, improvement of triaxial shear strength parameters of clayey soils were observed according to triaxial pressure test results of mixtures prepared by adding fly ash. For water contents 18% wet of optimum, maximum CBR and unconfined compressive strength were obtained by adding 10% fly ash to clayey soils for all curing times. However, the maximum cohesion value was obtained by adding 15% fly ash to clayey soils. The curing time significantly increases the cohesion value of the fly ash-clay mixtures. Also, the test result reveals that no significant change was observed in terms of internal friction angle of the mixtures.

Keywords: Mechanical Stabilization, Engineering Performance, Triaxial Shear Strength, Experimental Study, Clayey Soil



GIS Data Collection Applications Supported with GNSS; The Case of Hatay Municipality Traffic Information System

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Abstract: Geographical Information System (GIS) is a system that is frequently used in institutions and organizations, academic studies and daily life. This system can be used in the fields of many areas (archeology, health, tourism, urban planning, education, disaster management, transportation planning, banking, land mapping, mining, etc.) respond to the needs of many sectors. It basically allows the collection, storage, interrogation and analysis of the information needed. Thus, it is aimed to prevent information duplication and repetition of information, to manage information and to make it more sustainable.

The GIS is expressed in different titles (Urban Information System, The Land Registry Cadastre Information System, The Central Civil Registration System, Address Registration System, etc.) according to the needs of the disciplines that are applied. Local governments are trying to solve the city's daily and long-term needs under the title of Urban Information System. A traffic information system is needed in the management of data components such as traffic regulation, signaling and plate design in urban information system. The Traffic Information System is very important in meeting the needs of the groups that have difficulty in accessing urban areas such as disabled, elderly and children in this way. This system is integrated with the urban information system and provides support for cost, work force and planning issues in the investment and management of traffic services for local administrations.

In this study, "Traffic Information System Project", which was integrated by Hatay Metropolitan Municipality into the Urban Information System, was evaluated. Problems arising in the production of the project are addressed and the results are discussed.

Keywords: Geographical Information System (GIS), Traffic Information System, Urban Planning, Transportation, Local Management



Profitability of Bozalan Dam in Terms of Effective Use of Natural Structural Materials

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Abstract: Food demand and irrigation problems are brought forward due to the rapidly growing population and intense immigration issues. To overcome these problems many dams and small dams in our country are being built to recover the agricultural economy in terms of irrigation purposes.

Natural structural materials used in dams, especially intended for agricultural irrigation purposes, are sometimes constructed using arable land and agricultural lands can be destroyed. For this reason the environmental justice is frequently emphasized as a conception by many earth and environmental scientist.

In this study natural structural materials are investigated for Bozalan Dam in terms of engineering properties and rentability. Parameters such as the distance to the axis location, the material thickness of the material area, the costs of expropriation, and the conditions of the existing transportation roads should be well considered while determining the natural construction material areas in the earth fill projected dams for their profitability and usability.

In order to minimize environmental damages and effective use, an objective investigation of natural structural materials is strictly required. For this reason, in this research, which consist of office, field and laboratory works, employability of natural structural materials planned to utilize in earth fill dam body is determined and considering the distance to the axis location, the material thickness, the costs of expropriation, the conditions of the existing transportation roads, the dam body type is specified. , it is deduced with different engineering approaches and evaluations that engineering properties of natural structural materials which will be used in a dam is one of a most important parameter for the optimization of body type especially for earth fill dams

Keywords: Bozalan Dam, Natural Structural Materials, Environmental Justice, Profitability of Dam, Agricultural Irrigation



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Natural Red Clay as a New Adsorbent to Remove Malachite Green from Aqueous Solutions: (Part I) Studies on Adsorption Capacity

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Abstract: The present study was carried out to analyse the capacity adsorption of malachite green (MG) dye onto natural red clay (NRC) by batch-adsorption technique. The effects of process parameters such as adsorbent dosage, pH, contact time, temperature and initial concentration were investigated. The adsorbent was characterized by XRD, SEM, DTA-TG and BET-BJH analysis. Results indicated that the NRC was shown to be a promising adsorbent for the removal of dyes from aqueous solutions.

Keywords: Adsorption, Malachite Green, Clay

**IoT Based Real Time Occupancy Rate Calculator Using SSIM and PSNR*****Yunus ÇELİK¹, M. Fatih ASLAN¹, Mahit GÜNEŞ², Kadir SABANCI^{1*}****¹Karamanoğlu Mehmetbey Üniversitesi Department of Electrical and Electronics Engineering,
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Abstract: Computers and electronic sensors are an inevitable part of technology. Especially in industry, most of the machines work with sensors. On the other hand, with recent developments in image processing and computer-human interaction technology, cameras started to use a sensor which can recognize moving objects, humans, cars. Camera-based autonomous systems are used commonly for medical purposes and the military. In this project, an image processing method and Internet of Things system used to design a system which informs the occupancy rate of car parking area. The system was implemented in the car park area of Engineering Faculty of Karamanoğlu Mehmet Bey University. The occupancy rate was calculated with the help of a camera over the building. The system works by comparing current frame with the first frame. The first frame is the frame that doesn't include any car. The system updates current frame in every 15 seconds. The software evaluates the similarity rate of the first frame and current frame until the acquisition of next frame. Evaluating the occupancy rate was done with two different methods. The first method is Structural Similarity Index (SSIM) which is known as a measuring method for image quality and image similarity. The second method is Peak Signal to Noise Ratio (PSNR) which also look for image quality. The combination of these values, the software determines the similarity index of two images. That means the occupancy rate of the car park area. The value of the similarity index sent to the internet via Matlab ThingSpeak Toolbox. The users can track the number of people from their computer and mobile applications.

Keywords: Occupant Rate, PSNR, SSIM, Internet of Things, ThingSpeak



Investigation of Using the Earth Air Heat Exchanger Systems in Greenhouse Heating

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Abstract: Greenhouse is an application where required climatic conditions to grow plants are controlled. These places have an important share in agricultural work. These applications allow the products to be grown year-round, not just in a short period of the year.

One of the most important parameters in terms of cost is greenhouse heating. Especially in low temperatures, the heating system used to ensure that products in the greenhouse are not damaged has a great importance. However these systems also cause a great financial problem in the greenhouses.

Earth-Air Heat Exchanger (EAHX) are low cost systems which have heating and ventilation potentials in the greenhouses. These systems which are based on the use of energy that the soil has, can be used in greenhouses and similar agricultural applications in terms of easy installation, practical structure that does not require any maintenance and very low energy consumption. EAHX consist of pipe systems in which air passes and a fan for air flow. In this study, using the Earth Air Heat Exchanger Systems in Greenhouse heating is explained. The theoretical analysis of a greenhouse heating with the EAHX system is carried out for Şanlıurfa climatic conditions. EAHX system are made of galvanized pipes with 13 cm diameter and 16 m length at 2 m depth. The heat losses of greenhouse are calculated according to different methods. The heat supplied to greenhouse were determined experimentally.

As results of this study, the required pipe lengths in meters per kW of heating were obtained. It is seen that the EAHX systems can be used for greenhouse heating. The results also show that EAHX systems is really an important alternative for renewable and sustainable energy saving strategies for greenhouse systems.

Keywords: Greenhouse, Heating, EAHX, Renewable Energy, Soil Energy



Permeability Problems Encountered in Bozalan Dam Project and Construction of Grout Curtain to Extend the Flow Path

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Abstract: In last decade, agricultural irrigation dams are constructed in Turkey based on the demand of food considering the rapidly increasing population. Apart from its contribution to the economy, many dams returned profit in terms of providing employment opportunities in many sub-sector of construction industry such as drilling and grouting.

Permeability problem in a dam project is one of the main subject to overcome for design engineers. Many grouting techniques are utilized in dams for many purposes such as stabilization, strengthening and sealing. Grout curtain is the most demanded technique for providing an impermeable zone along dam axis in order to extend the flow path with the prevention of potential leakages.

This study aimed at examining grout curtain performance of Bozalan Dam considering with rock core characteristics that are pertinent to permeability, such as RQD, joint spacing, joint characteristics, broken core, flush fluid loss and core loss. Besides, the grout composition plays also an essential role to prevent the leakage problems along dam axis.

In this context, drilling and in-situ testing is performed in order to predict potential leakage problems and a grout curtain is designed for Bozalan Dam. For ground investigation 5 boreholes (160 m depth in total) are drilled along dam axis 1 borehole (15 m depth) is drilled on spillway location and 2 boreholes (40 m depth in total) are drilled on the cofferdam. In all boreholes water pressure test is implemented for every 2 meter of test zone.

Within the context of designing the grout curtain the water pressure test results performed in the boreholes are considered. However, on behalf of to stay in safe side grout curtain depth of thalweg is projected deeper considering the hydraulic head which would be exerted.

Keywords: Bozalan Dam, Permeability Problems, Grouting, Drilling, Water Pressure Tests

**Establishing the Expropriation Information System, The Case of Gökbel Dam in Aydın**

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Abstract: Expropriation is an application that is made officially by state or public corporation. In the context of this application, in situations that the public interest is observed, some or all of the real estate in private property can be seized or servitude established. In expropriation applications, the prices of the real estate are paid in cash or divided by equal installments in some cases foreseen of law. In the expropriation process, many documents and information are encountered. There is a need for information systems where information is transferred to digital media and information is easily accessible.

Expropriation Information System is created to save time, reduce of workload and increase the ability to make the right decision about the work done for personnel working in expropriation work. The software used to build this system is Geographic Information Systems (GIS). GIS is an information system that enables the collection, storage, processing, interrogation, analysis, visualization, presentation and updating of graphical and textual data. Thanks to the Expropriation Information System established by using GIS software, scattered and mixed information has been systematized and meaningful information has been obtained. With the reduction of workload, the quality of service has been increased and also time and cost have been obtained income in the institution that makes expropriation operation. Due to the technical and legal dimension of the expropriation, it is ensured that the required database can be easily accessed, the problem can be determined and the solution can be made in a short time in the transactions arising with the objection of the citizen. By registering the address and contact information of the real estate owners, it is possible to communicate with the owners quickly and easily in order to reach conciliation for expropriation.

The aim of this study is to manage the expropriation works for Gökbel Dam easily and efficiently. Thus, time and cost are saved thanks to Expropriation Information System and users easily enable access desired information. This study for the Gökbel Dam will form a base for future expropriation studies.

Keywords: Geographic Information Systems, Expropriation, Consensus, Land Management, Sustainability



IoT Based Real Time People Counter System using Face Detection

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Abstract: Computer-human interaction is a quite popular technological area in these days. Google translator can be an example of computer-human interaction. It enables the users to improve the translation quality and accuracy. In this paper, a real-time people counter system was designed and implemented to the entrance of a building. The importance of the work is that in some government buildings and museums directors wants a system that informs the number of people inside of the building to determine the heavy demand days. The system consists of 2 cameras and computer. There are two important phases of the project. The first stage is about image acquisition and image processing. There are many different techniques exist to recognize human. These methods can be listed as shape detection, background subtracting and face detection. In this work, face detection method was used to detect humans. Skin detection algorithm also was used to increase the accuracy of the system. A counter which counts the number of people face was used to count the number of people who enter the building. The second stage is about sending the counter information to the internet. It is aimed to inform a user about the current number of people in the building via the Internet of Things (IoT). IoT is a tool that enables to track data over the internet. That means the user can track their data from their mobile phones, computers, and tablets. Matlab programming was used to count the number of face and counter. Matlab also has a toolbox named ThingSpeak support toolbox. Thanks to the ThingSpeak, it is quite easy to send data to the cloud. It is also possible to set an alarm to a limit and in case of the situation like exceeding the limit, it is possible to inform the user via direct message or twitter.

Keywords: Face Detection, Image Processing, People Counter, Internet of Things, ThingSpeak



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Natural Red Clay as a New Adsorbent to Remove Malachite Green from Aqueous Solutions: (Part II) Studies on Equilibrium Isotherm, Kinetics and Thermodynamics

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Abstract: The present study was carried out to analyse the capability adsorption of MG dye onto NRC by batch-adsorption technique. The adsorption isotherm, kinetics and thermodynamics studies were performed. The pseudo second order kinetic model and Freundlich isotherm model were found to be in good agreement with the experimental values obtained. Thermodynamic studies revealed that the adsorption processes is spontaneous, endothermic and physical nature of MG adsorption onto NRC. Results indicated that the NRC was shown to be a promising adsorbent for the removal of dyes from aqueous solutions.

Keywords: Adsorption, Malachite Green, Clay, Isotherm, Kinetic



The Removal of Malachite Green with Synthesized NZVI / CMP Adsorbent

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Abstract: The use of synthetic dyes in industrial areas such as leather, paint, textile, plastics, paper and cosmetics is increasing with developing technology and as a result of this, waste waters of these industries are contained to high levels of dye. There are chemical (sedimentation, oxidation, coagulation), physical (ozonation, electrochemical degradation, adsorption and filtration) and biological (aerobic, anaerobic processes) methods in the literature for removal of dyes. Many adsorbents were used purification of dye from wastewater with adsorption. Natural adsorbents have begun to be preferred for reasons such as their low cost, effective performance and not harmful to nature. In this study, carbonized mandarin peel supported NZVI adsorbent synthesized by liquid phase chemical reduction was used for the removal of malachite green. The NZVI/CMP adsorbent was characterized by FTIR, BET, SEM and pHzpc. The maximum adsorption capacity of the adsorbent was found to be 909.1 mg/g. The effects of parameters such as temperature, initial concentration, pH, contact time, adsorbent dose on adsorption were investigated. The obtained data were applied to Langmuir, Freundlich, Temkin, Dubinin-Radushkevich and Redlich-Peterson isotherms. The most suitable isotherm was found as Freundlich isotherm with $R^2=0.999$.

Keywords: Mandarin Peel, Isotherm, Adsorption, Malachite Green, NZVI/CPP



Current Supply and Demand Conditions in Turkey Sustainable Energy Policies

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Abstract: Energy is the building block of development. That is why the countries determine their policies on the axis of providing continuous and secure access to energy resources. Turkey, as in the production of energy resources and geopolitical point of intersection is in a position to transmit. This situation makes it a destination country as much as it strengthens the countries with which it is in competition. But around with Turkey does not have a powerful source of energy to meet its own energy needs considerable potential. Therefore, Turkey is an important part of the resources spent on energy imports. This leads to the transfer of energy imports to the industrial and other issues in the country.

Turkey, especially in the last twenty years, energy security and sustainable energy sources in order to close the gap gave a great importance to planning. Within this scope, the legal arrangements giving serious incentives to renewable energy production (wind, hydropower, solar, geothermal, biomass, marine, etc.) On the other hand the same period, Turkey's energy efficient and has given momentum to work towards effectively consumed, determining the potential for developing renewable energy policies at the national and international level in order to benefit more from renewable energy sources.

In studies conducted in this context, at least in the context of Turkey's renewable energy potential, economic power capacity of 160,000 GWh / year, 48,000 MW of wind capacity, average global solar radiation of 1,520 kWh / m². year, biomass potential of 8.6 MTEP, biogas potential of 1.5-2 MTEP, geothermal capacity of 31.500 MWt.

In 2017, Turkey's total energy consumption is 97 056 ktoe. 50.9% of consumption consists of natural gas, 26.3% electricity, 17.2% motor, 2.4% gasoline and 3.3% lignite consumption. imported fossil fuels to meet the energy deficit, meets an important part of Turkey's energy needs. The country's 2023 energy targets based on the use and recovery rates for Turkey, except for hydro and geothermal, reveals the targeted progress towards the use of renewable energy is too far behind. The main reasons for this are high energy demand, increased dependence on imported natural gas and petroleum, and low use of renewable energy. From the renewable energy source potentials in our country; solar energy, hydraulic systems, geothermal energy, biomass energy and especially wind energy are becoming increasingly widespread. Although the use of conventional sources can not be completely abandoned at present, it is estimated that 10-15% of the total electricity generated within 15 years will be covered by renewable energy sources. For this reason, policies should be developed that do not deviate from efficiency targets in consumption by maximizing renewable energy sources to achieve 2023 targets and ensure long-term self-sufficiency.

In this context; Things to efficient use of energy at work and outside of the vital importance of energy efficiency in terms of reduction of dependence, especially after 2000, growth in Turkey will be discussed, made for energy efficiency and return of investment in transformation period with the cost analysis will be done.

Keywords: Energy Policies, Renewable Energy, Energy Efficiency, Sustainability



Experimental and Numerical Investigation of Lateral Torsional Buckling Behavior of IPE and UPE Steel Beam

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Abstract: Beam-columns are structural members subjected to a combination of axial and bending forces. Lateral-torsional buckling is one of the main failure modes. Beam-columns that are bent about its strong axis may buckle out of the plane by deflecting laterally and twisting as the values of the applied loads reach a limiting state. Lateral-torsional buckling failure occurs suddenly in beam-column elements with a much greater in-plane bending stiffness than torsional or lateral bending stiffness. Beam-columns are structural members that combine the beam function of transmitting transverse forces or moments with the compression (or tension) member function of transmitting axial forces. Beam-columns are mostly loaded in the plane of the weak axis so that bending occurs about their strong axis. First order bending moments and in-plane deformations are produced by the end moments and transverse loadings of the beam-column, while axial force will produce second order moments and additional in-plane deformations. When the values of the loads on the beam-column reach a limiting state, the member will experience out of plane bending and twisting. At this limiting state, the compression flange of the member becomes unstable and bends laterally while the remainder of the cross section, which is stable, tends to restrain the lateral flexure of the compression flange. The net effect is that the whole section rotates and moves laterally. Lateral-torsional buckling (LTB) failure occurs suddenly in slender beam-columns with a much greater in-plane bending stiffness than their lateral bending or torsional stiffnesses. LTB is often the main failure mode controlling the strength of thin-walled structures and should be considered in design of slender beam-columns with insufficient lateral bracing due to it may occur long before the bending stress at the extreme fiber of the section reaches to yield point. As summarized above, the lateral torsional buckling failure mechanism in delicate steel beam members is a disruption of stability which is undesirably suddenly formed. Experimental studies on this subject are extremely limited. The literature review shows that there is no experimental stability study for lateral torsional buckling stability deterioration for IPE and UPE profiles which are commonly used in steel structures. For this reason, an experimental investigation of the lateral torsional buckling of the IPE160 and UPE80 steel beam test elements. In the scope of this study, four test elements, two IPE160 and UPE80 were tested total. In order to compare with the experimental results, computer simulations of steel beams which have been implemented with nonlinear finite elements. The results obtained by using ABAQUS software in numerical analysis are compared with the experimental results. With this comparison, it is discussed how successful the analysis results are.

Keywords: IPE Steel Beam, UPE Steel Beam, Lateral Torsional Buckling, Finite Element Analysis, ABAQUS



Copper-Zinc Based Bifunctional Catalysts Containing Zirconia and Alumina Promoters for Methanol Synthesis

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Methanol is considered as the most valuable product which is a raw material for several important chemicals such as dimethyl ether (DME), acetic acid and a wide variety of other products. It can be used as a fuel additive and as a clean burning fuel. In this study, methanol was produced over Cu–Zn based catalysts. Several promoters as alumina and zirconia were incorporated to Cu–Zn containing co-precipitated catalyst and they were characterized by X-ray diffraction (XRD), N₂ adsorption-desorption analysis and diffuse reflectance infrared fourier transform spectroscopy (DRIFTS) of pyridine adsorption. X-Ray diffraction patterns of catalysts demonstrated that addition of promoters to the methanol synthesis catalysts decreased the intensity of copper peaks, resulting in more amorphous structure. Nitrogen physisorption results of catalysts showed that high surface area value is recorded at high Cu/Zn ratio and zirconia containing catalysts as 103m²/g (for the ratio of Cu/Zn/Zr of 6/3/1). DRIFTS analysis results indicated that catalysts did not exhibit peaks in the wave number in the range of 1400 cm⁻¹-1600 cm⁻¹ due to absence of acidic sites. Alternative fuel source, methanol, were produced at 5.0 MPa and 275 °C in the presence of synthesized catalysts in this study. Cu/Zn/Al catalysts were found to be superior to Cu/Zn/Zr catalysts in terms of activity and stability. Zirconia promoted CZZr (6/3/1) and aluminum promoted CZA(6/3/1) gave 3% and 5 % carbon monoxide conversion, respectively. The selectivity to methanol decreased as the Cu/Zn molar ratio decreased in the presence of all of catalysts and the maximum selectivity to methanol was achieved %87 for the Cu/Zn/Al molar ratio of 6/3/1. Major side product was carbon dioxide for all catalysts. Formation of carbon dioxide could follow water gas shift reaction. Moreover results of synthesized catalyst compared with commercial catalyst (HifuelR-120). CO conversion of synthesized catalyst was lower but methanol selectivity is higher than commercial one.

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Keywords: Methanol, Copper, Zirconia, Alumina, HifuelR-120



Experimental Study of the Effect of Thermal Insulation on the Use of Air Curtain in an Open Room on Both Sides

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Abstract: The air curtain is a device that provides heat insulation by preventing heat exchange between an environment and a surrounding area. The air curtain prevents cold air in winter and hot air in summer. They also prevent air from dust, humidity, stench, smoke, toxic gases. They have an important role in ensuring the comfort conditions of the work environment as well as in protecting the hygienic conditions of the environment. Because of these features, air curtains have a lot of applications in many places today. They serve as a door that provides insulation in spaces where the use of the door is limited, or where the doors are constantly opening and closing for human circulation. Air curtains are most commonly used in hotels, shops, hospitals, grocery stores, restaurants, cafes, doorways and openings in passages, health centers, shopping malls, airports, bus terminals, cold rooms, pharmacies and many other places. Air curtains are basically formed by placing a radial fan inside the case. They are designed and produced to produce high-flow and thin-form airflow. There are different types depending on the place to be applied. The most widely used and the most efficient varieties are the above-door models. Vertical air curtains and latent ceiling models are used where installation of door-top models is not possible or is not preferred in terms of architecture. There are also models of air curtains with electric heaters and water serpentine for the heating room. In this study, the effect of thermal insulation on the use of air curtains in a room with two sides open to the exterior is experimentally investigated. The room dimensions are 1x1x1 m and the walls are made of polystyrene foam material with a thickness of 7 cm. The room is designed to be heated from the floor and the water pipes pass through the floor at a temperature of 60°C. Air curtains are placed on the tops of the open sides, each with 75 watts of power. The air velocity of the air curtain blowing air downwards is 5.8 m/s and the nozzle range is 1 cm. In the experimental study, the measurements were taken primarily before the curtains were off. For the outdoor temperature of 21 °C, the average temperature in the room was measured as 24.48 °C. Experimental results revealed that the use of air curtain provides significant increment in thermal insulation

Keywords: Air curtain, Insulation, Air, Airflow, Heat



Improving the Formability of Al (Aluminum) Reinforced Epoxy Polymer Matrix Based Composites

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Abstract: Composite materials are made by combining two or more materials with different properties. It aims to form a new material with superior properties than the properties of the materials constituting the composite material components. The main areas where composite materials are frequently used are defense industry, space technology and aviation industry, construction sector, automotive and transportation sector, medical sector.

In the industry, one of the most commonly used matrix material is epoxy resin. There are many composite works whose properties have been improved by making various reinforcements in the epoxy resin matrix. Epoxy resin is also a powerful adhesive that can be found cheaply and easily at the same time. It hardens in the bonding process and forms a glassy transparent structure. However, one of the most important problems of epoxy adhesives is that they are not suitable for forming applications.

In this study, new composites were obtained by adding metal powders to epoxy matrix at different mass ratios. After hardening, the formability of the epoxy was investigated. At different mass ratios, Al (aluminum) powders were mixed magnetically with epoxy in ethyl alcohol for 30 minutes and then ultrasonically mixed for 10 minutes. Also, the epoxy polymer matrix was reinforced using Mowital B 30 H as binder. After mixing, the alcohol in the mixture was evaporated standing overnight at a temperature of 70-90 ° C. The prepared mixture was poured into molds with dimensions of 60x60 mm² by adding hardener. The solidified samples were subjected to the Erichsen test to compare the deformation depth. The Erichsen test is a fast and easily applicable test used to determine the formability of the materials. In this test, 60 x 60 mm² specimens is compressed between the cylindrical die and the blank holder to prevent slipping of the specimen. The specimens deformed with a spherical punch and the deformation depth was measured.

As a result, it has been observed that the reinforced epoxy has a high formability than pure epoxy. Mass proportions of metal aluminum powders have been shown to have an effect on the formability of the epoxy. In this way, the formability of the composites have been improved for the cheaper and more flexible bonding.

Keywords: Epoxy Polymer Matrix, Al (aluminum) Powders, Erichsen test, Epoxy Adhesives, Mowital B30 H



Modeling The Stability of Nanofluids with Artificial Neural Networks

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Abstract: In recent years, there have been significant developments in the field of heat and energy with nanofluids. The researchers have succeeded in improving the thermophysical properties of conventional heat transfer fluids with nanofluids produced by them. There are some problems that have to be overcome when nanofluids become an industrial product. One of the most important problems is the stability of the nanofluids. There are many parameters in the nanofluids that affect stability. These include the ratio of nanoparticles, the amount of surfactant, the amount of pH for water-based nanofluids, the zeta potential value, and the duration of ultrasonic mixing. Nanofluid studies are usually carried out by experimental methods. Much experimentation is required to determine the optimum conditions for the change of many parameters. Much time and money is spent on experimental measurements. Many theoretical models have been developed to determine the thermophysical properties of nanofluids, such as viscosity and heat transfer coefficient. However, it is difficult to apply theoretical models in the development of models that are complex and many factors, such as stability. This has prompted researchers to focus on a different category of models, called system theoretical models. There are many methods used for numerical modeling in the literature. The Artificial Neural Networks (ANN) method, which has become popular today, is a modeling method applicable to almost all engineering systems. Having many different models and learning algorithms ensures that they can be applied to different systems.

In this study, SiO₂ and Al₂O₃ nanoparticles were produced in pure water at different pH values. Stability was measured by sedimentation method. These sedimentation values are modeled on artificial neural networks. It is expected that the absolute value of the zeta potential in the samples with the least sedimentation over time is the highest. Zeta potential values were estimated by modeling the sedimentation values of SiO₂ and Al₂O₃ nanoparticles produced at different pH values and mass ratios. The results were compared with Malvern Zetasizer measurement results. Modeling of the stability of artificial neural networks and nanofluids has been shown.

Keywords: Nanofluids, Artificial Neural Networks, Zeta Potential, Stability



Improvement of Formability of Epoxy Polymer Matrix Used in Bonding Processes

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Abstract: Epoxy polymers are used in many fields such as composite material production, surface coating and bonding. Epoxy resins have a plastic appearance when mixed with the curing agent (catalyst) or when they are hardened after baking (70-90 ° C). There are many studies aimed at improving the properties such as hardness, abrasion resistance, chemical resistance and adhesion by reinforcing epoxy matrix with different particles. Although the epoxy resin is a good adhesive, it forms an inelastic layer between the bonded layers after bonding. This limits the formability of the bonded materials.

In this study, epoxy matrix was reinforced with nanoparticles at different mass ratios to investigate the formability of the epoxy after solidification. SiO₂ nanoparticles were mixed mechanically and ultrasonically into epoxy at different mass ratios. Mowital B 30 H was used as a binder in the reinforced epoxy polymer matrix. The prepared mixture was poured into molds with dimensions of 60x60 mm² by adding hardener. The solidified samples were subjected to the Erichsen test to compare the deformation depth. The Erichsen test is a fast and easily applicable test used to determine the formability of the materials. In this test, 60 x 60 mm² specimens is compressed between the cylindrical die and the blank holder to prevent slipping of the specimen. The specimens deformed with a spherical punch and the deformation depth was measured.

As a result, it has been observed that the SiO₂ reinforced epoxy is more flexible than pure epoxy. The formability of the epoxy was found to be influenced by the mass ratios of the nanoparticles.

Keywords: Epoxy Polymer Matrix, SiO₂ Nanoparticles, Erichsen Test, Epoxy Adhesive, Mowital B 30 H



Numerical Examination of Heat Transfer Performance Using MgO Nanofluid in Body Pipe Type Heat Exchanger

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Abstract: One of the most common processes in many engineering applications today is the transfer of heat between two or more fluids with different temperatures. For this purpose, devices that provide heat transfer are called heat exchangers. Heat exchangers are widely used in many fields such as process, power generation, chemical industry, electronic devices, transportation, air conditioning and cooling. Different types of heat exchangers are used in the industry. The heat exchangers most commonly used in the industry are mainly body-pipe types because of their high thermal performances and more suitable construction. Body pipe heat exchangers are mainly formed by inserting circular tubes into a body with a certain distribution. In these heat exchangers, one of the fluids is passed through the pipes, and the other passes through the body, and heat transfer occurs. If two fluids are in the same direction, they are called parallel flow and the opposite flow is called cross flow. In this study, the effect of heat transfer on the nanofluid prepared with MgO nanoparticle and water in a body pipe type heat exchanger was analyzed numerically by CFD program. Dimensions of heat exchanger designed from aluminum material and inner pipes and copper material; outer body diameter is 12cm, the length is 50 cm and the number of pipes inside is 19. Seven diverter are installed to provide more uniform flow in the body. For analysis the temperature of the hot fluid is 90 °C and the inlet temperature of the cold fluid is 10 °C. The volume flow rate is 6 lt / min in both fluids. Calculations are performed primarily of pure water in both hot and cold fluid. Later calculations were performed for MgO nanofluid with 2% volumetric concentration. As a result of analysis, nanofluid, hot fluid outlet temperature is lower than pure water. This demonstrates that nano-fluid heat transfer performance is better than pure water. The results of the calculations the heat transfer increase was found approximately 25%.

Keywords: Heat Transfer, Heat Exchanger, Body Pipe, Nanofluid, Volumetric Concentration



The Effect of Nano-Lubricants on Deep Drawing

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Abstract: Deep drawing is a process of drawing sheet metals into a die with a metallic punch and forming the desired shape. This method is widely used in the automotive industry and manufacturing of surgical equipment, kitchen utensils. In deep drawing process, metal-metal contact, which results tearing damage, is one of the most important problems that should be overcome. For this reason, the operator tries to prevent tearing of the sheet metal by using a lubricant. Lubricants used in deep drawing process are generally animal-based oils, special mold lubricants and petrochemical plastics. In addition to reducing friction, lubricants help to distribute the instantaneous heat generated in a homogeneous and reduce heat accumulation.

The production of materials in nano-sizes have led to innovations in the lubrication science. Nanoparticles with very high surface area / mass ratios mean increased heat transfer area for heat transfer fluids. Instead of traditional heat transfer fluids, nanofluids have superior properties. Nano-lubricants are produced by using nanoparticles in certain processes and lubricants. It improves lubricant properties as well as increases heat resistance.

In this study, it was aimed to produce a cheap and effective nano-lubricant for deep drawing process. For this reason, solid cooking oil (margarine) which is the cheapest and easily found as a lubricant has been used. The nanoparticles, which are additive materials, were selected SiO₂ (Silicon Oxide) at about 40-80 nm. SiO₂ (Silicon Oxide) at different mass ratios is mixed with the oil after certain processes. Homogeneity was achieved by dispersing the nanoparticle in ethyl alcohol. It was then mixed with the melted oil and subjected to magnetic and ultrasonic mixing. The prepared samples were kept at 60-80 ° C for a certain period. Then, the nano-lubricants were used for deep drawing after solidification.

AISI 430 ferritic stainless steel (0.5 mm) specimens were prepared for deep drawing. The nano-lubricants prepared at different mass ratios were subjected to deep drawing using the same amount. The Erichsen test is used to determine the effectiveness of lubricant. The Erichsen test is a fast and easily applicable test used to determine the formability of the materials. In this test, 60 x 60 mm² specimens is compressed between the cylindrical die and the blank holder to prevent slipping of the specimen. The specimens deformed with a spherical punch and the deformation depth was measured and compared.

As a result, thanks to nano-lubricants, considerable improvements have been achieved compared to deep drawing process with and without pure oil. The lubrication properties of nano-lubricants have been shown to be directly related to the mass ratios of SiO₂ (Silicon Oxide) nanoparticles. It was observed that the lubrication properties were increased by increasing the mass ratio.

Keywords: Nano-lubricants, Deep Drawing, Erichsen Test, SiO₂ (Silicon Oxide), Ferritic Stainless Steel



Investigation of the Effect of Force and Material on the Adhesion of Double Layer Sheets

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Abstract: Nowadays, there is a growing need for lightweight materials and lightweight construction for energy saving in industries. For this reason, interest in double-layer sheet metals has increased in the last decade. The fact that the double layer materials are light compared to the single layer materials of the same thickness and that they can have different properties together is the reason for this increase. Double layer sheet metal is obtained by combining two metallic sheets with various methods such as cold rolling, pressure welding, hot rolling or adhesive bonding. These sheets are used to provide properties that can not be achieved with a single metal. The desired electrical and thermal characteristics, lightness, corrosion resistance and shock absorbing structure can be achieved with the developed double layered metallic sheets. In this study, a double layered structure was obtained by using a polychloroprene based adhesive and combining sheet metals of different thicknesses and different materials under different forces. The obtained double-layered sheets were subjected to peeling test to determine adhesion properties and parameters (force, sheet metal) affecting these properties. All the experiments were made according to the full factorial experiment design and the results were examined. As a result of the study, it is seen that the sheet type is the most important factor in the adhesion of the double layer sheets.

Keywords: Sheet Metal, Double Layered Sheets, Peeling Test, Bonding, Polikropren



Determination of the Electrical Resistances of Flame Sprayed Coatings by Different Measurement Methods

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Abstract: In this study, an experimental study has been carried out to investigate the electrical resistance of the flame sprayed coatings on aluminum substrate. Cr₂O₃ powders were deposited onto substrate with and without Ni-5wt. % Al as bond coating layer using a flame-spray technique. Electrical resistance values of Cr₂O₃ specimens coated in three different thicknesses, with or without binder were measured by different electrical resistance measurement methods. Before the coating process substrate specimens manufactured by a lathe from Al 6082 aluminum rods were sand blasted to obtain a better bonding surface. Cr₂O₃ powders were sprayed on Al 6082 aluminum substrate in certain spray parameters. Six different groups were formed. Thermal spraying offers coating processes for parts with many different coating materials in order to yield wear and corrosion-resistant coatings as well as thermal-barrier coatings, or to produce the desired electrical or magnetic properties, etc. Bond coatings are already used widely in many industrial thermal spray applications. They have specific functions; because the substrate and the main coating have different coefficients of thermal expansion, bond coating layer should be used to provide a good thermal expansion match between these two different layers; on the other hand, bond coating layers are always thinner than the main coatings. The produced layers were characterized by optical microscope, scanning electron microscope and microhardness tester. Electrical resistance values of specimens were measured by using zero measurement method, two point measurement method, four point measurement method and four point probe method. Although the measured values for the same samples are close to each other, measurement method related errors are noteworthy. In the end of this study, accuracy of measurement methods were interpreted by considering the obtained data.

Keywords: Flame Spray Method, Coating, Bond Coat, Electrical Resistance, Electrical Resistance Measurement Methods



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A real Options Approach to Renewable Electricity from Hydropower in Turkey

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Abstract: Growing populations and modern technologies require vast amounts of electricity for creating, building, and expanding. Hydroelectric power is the most clean, reliable, efficient and economical of all renewable energy sources. Hydropower is energy derived from falling or moving water. Hydropower sources include impounded water sources, natural river elevation changes, river flows, tides, ocean currents, and waves. Suitable Turkish sites for large dams have been used. Smaller impoundments are now under consideration. Analysts estimate that new hydropower in Turkey could provide around 20% of current electricity production. Turkey has a total gross hydropower potential of 433 GWh/year, but only 125 GWh/year of the total hydroelectric potential of Turkey can be economically used. By the commissioning of new hydropower plants, which are under construction, 36% of the economically usable potential of the country would be tapped. This paper discusses the hydropower situation in Turkey.

Keywords: Hydropower; Renewable Electricity; Electric Generation; Turkey



Major and Trace Element Geochemistry of Olivine and Spinel in the Mantle Peridotite of Divriği Ophiolite from the Ulaş District (Mid-Anatolian, Turkey)

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Abstract: In this study, it is aimed to investigate the reflections of petrological processes on olivine and chromian spinel mineral chemistry which are effective in the development of mantle peridotites belonging to the Divriği ophiolite in the vicinity of Ulaş (Sivas). The samples were analyzed using electron probe microanalysis (EPMA) and laser-ablation inductively coupled plasma-mass spectrometry (LA-ICP-MS). According to the major and trace element analysis results obtained from olivines, the Fo values of olivines show close similarity in the harzburgite (90.34-91.82) and dunite (90.42-91.90), but there is a slight increasing towards the dunite. Olivines in the harzburgite are generally richer in Ga, Zn and V and lower in terms of Co and Ti contents than in the dunite. Chondrite-normalized rare earth element (REE) patterns of olivines in the harzburgites exhibit more depletion of light-REE and olivines in the dunite show significant enrichment in terms of heavy-REE. Similarly, primitive mantle-normalized multi element patterns of olivines display slightly enrichment from the harzburgite towards the dunite.

The Cr# and Mg# values of chromian spinels in the harzburgite (Cr# 0.46-0.62, Mg# 0.51-0.70) and dunite (Cr# 0.54-0.67, Mg# 0.44-0.57) are similar to those from fore-arc peridotites. The relatively high-Cr#, high-Al and low-Ti contents of chromian spinels in the harzburgite signify that they belong to a supra-subduction environment. However, the Cr#-TiO₂ relationships of chromian spinels in the dunite favor a melt-rock interaction model in which the dunite with relatively high-Al and some high-Ti chromian spinels were probably produced by non-boninitic SSZ-type melt interaction. The trace element concentrations of these spinels show that Ni, V, Zn, Co contents decrease, and Sc and Mn contents increase from the harzburgite to the dunite. Therefore, chondrite and primitive mantle normalized trace element patterns of chromian spinels exhibit close affinity in both two lithology. However, it is seem that a slightly enrichment from the harzburgite to the dunite controlling by the partial melting.

Consequently, these findings contribute to a better understanding of the petrogenetic evolution of the mantle peridotites from the Divriği ophiolite. These peridotites might be interpreted as refractory residues whose primitive compositions were replaced by mantle metasomatism in the mantle wedge above a supra-subduction zone.

Keywords: Peridotite, Olivine, Chromian Spinel, Subduction Zone, Mid-Anatolian, Turkey



An Overview of Biologically Inspired Engineering on Wing Design

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Abstract: Biologically inspired engineering means to develop systems or devices by taking inspiration from nature, in other words, by providing analogies with systems in nature. Scientists and engineers explore into the biological systems and the livings, and they leverage this knowledge to develop new technologies and products in different engineering branches such as biomedical engineering, mechanical engineering, electrical engineering, robotics, materials science, and nanotechnology.

Imitation of birds in wing designs goes to the first flight trials. Recently, bio-inspired wing design has attracted the attention of researchers due to increasing interest in micro air vehicles and renewable energy sources. This is plausible, because it is very important to establish novel airfoil designs for wind turbines and micro air vehicles applications in order to achieve better aerodynamic performances. The wings of some insects including locusts, dragonflies and butterflies, which occasionally spend time for gliding during flight, are not smooth or simple cambered surfaces. The cross-sections of these wings have well-defined corrugated configurations with V-shape grooves. The corrugation decreases gradually towards the wing tip, where the wing more or less flattens out. A number experimental and numerical works have been performed to determine flow patterns and characteristics around the corrugated airfoil and the effects of corrugation on the aerodynamic performance of the wing. These researches reveal the potential aerodynamic performances (i.e., higher lift and bigger lift-to-drag ratio) of corrugated airfoil compared with conventional smooth surfaced airfoil at low Reynolds number regime. It is concluded that the corrugation allow an increase in lift coefficient compared with traditional airfoils, without influencing importantly the drag coefficient even at high angles of attack. It was elucidated that the vortices that develop in the grooves, are responsible for the aerodynamic advantages of corrugated airfoils. The fluid flowing over the corrugated airfoil would be trapped between the corrugation grooves where it either becomes stagnant or rotates slowly, resulting in the corrugated airfoil functioning as a streamlined airfoil. The corrugated configuration was also found to provide stiffening against spanwise bending, while allowing for torsion. The flapping motion that provides greater maneuverability and precision to flying animals was also investigated. The results show that there is a strong potential on the design of efficient bio-inspired nano air vehicles in terms of reducing the required aerodynamic power and increasing the thrust. Another bio-inspired wing design mimics the humpback whale which is quite maneuverable especially during hunting. A striking feature of the humpback whale is that there are protuberances on the leading edge of the pectoral flippers. Experiments on the leading edge protuberances of a wing showed that the protuberances delay the stall angle while increasing the lift and decreasing the drag.

In this study, a detailed review of the researches on the bio inspired wing designed is presented. A new airfoil design is proposed and future perspectives are discussed.

Keywords: Bio-inspired Design, Wing Shape, Corrugated Airfoil, Biological Fluid Mechanics, Lift and Drag Coefficient



Comparison of Microwave Heated System to Conventional Heated System via Ammonia Decomposition Reaction to Produce CO_x free Hydrogen

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Abstract: Nowadays, microwave energy is used as an alternative heating method to enhance heterogeneous chemical reactions. Unlike conventional heating methods, which are based on heat transfer from the source mainly by means of conduction and convection modes, heat is generated by direct conversion of electromagnetic energy where it is needed in microwave system. Due to selective, volumetric and non-contact heating occur in microwave focused reaction systems, rate enhancement, higher yields and improved selectivities can be obtained in a shorter time interval.

Recent years, ammonia has been considered as an important raw material for hydrogen production. Well-known conventional routes to synthesize hydrogen generally use hydrocarbons as feedstock and the formation of CO_x components which cause a decrease the fuel cell performance, is inevitable. Application of microwave reactors for the ammonia decomposition reaction is a new subject and our studies are the pioneer work in this field, even though different studies were reported for the utilization of this technology in hydrogen production from hydrocarbons.

Carbonaceous materials are known as being strong absorbers of microwave and they could convert microwave energy to thermal energy resulting in an increase in temperature. For this reason, carbonaceous materials such as mesoporous carbon and carbon fiber were selected as support materials for the catalysts synthesis.

Activities of the carbon supported iron or molybdenum incorporated catalysts were found to be very low at reaction temperatures of 500°C or below in conventionally heated reaction system (GHSV NH₃: 36,000ml/hg_{cat}). On the contrary, when these catalysts were tested in microwave reaction system, total conversion was achieved even at 400°C. Direct transfer of energy to the active sites, formation of hot spots as well as formation of carbide species are main reason of getting higher activity from the catalyst in microwave assisted ammonia decomposition reaction in comparison to conventional system.

Acknowledgement: This study was financially supported by TUBITAK 214M148 project which was gratefully acknowledged.

Keywords: Microwave System, Conventional System, Hydrogen, Ammonia, Carbon, Iron, Molybdenum



Preliminary Estimates Part 1: Statistical Analysis of Earthquake Catalogue with the Geographic Information Systems (CBS) in the Aegean Sea and Surrounding, Western Turkey

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Abstract: The aim of this study, we investigated statistical analysis to Kriging method compliance of earthquake catalogue with the Geographic Information Systems (CBS) in the Aegean Sea and surrounding. So, earthquake occurrences and depth information at catalogue used. First of all, the Aegean Sea divided into 10 different seismic zone based on tectonic, fault, epicenter distribution etc. All analysis estimated for $M_s \geq 3.0$ earthquake occurrences taking into account variables of cutoff magnitudes (M_c) of the catalogue. After that, we investigated changes at graphs of Histogram (standart deviation, skewness, kurtosis variables etc.), Normal QQ plot (normal distribution suitability), Voronoi maps (when viewing the Voronoi map, check whether at any vicinity there are polygons with the colors symbolizing very different categories of values), Trend analysis (it tool provided a three-dimensional perspective of the data), Semivariogram/Covariance Clouds (it tool showed the empirical semivariogram and covariance values for all pairs of locations within a dataset and plots them as a function of the distance that separates the two locations) for magnitudes and depth distributions. Then, the map of Buffer analysis of faults plotted at 10 km to investigated coincide with faults of earthquake occurrences. The earthquake occurrences and depths showed normal distribution. As a result, The database can be used to Kriging method in the Aegean Sea and surrounding.

Keywords: Geographic Information Systems (CBS), The Aegean Sea and Surrounding, Kriging Method



The Freezing-Thawing Behavior of Clayey (Red Clay) Soils Reinforced with Waste Pine Tree Sawdust

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Abstract: In cold climatic regions where seasonal freezing-thawing is frequently experienced engineering constructions (such as roads, railways, foundations, sub-bases and pipelines) are adversely affected. A wide variety of studies have been carried out to reduce this effect with fine grained soils with a wide variety of residual materials. In this study, the changes in strength of clayey soil (red clay) reinforced with pine tree sawdust was investigated under freezing-thawing conditions. Experiments were conducted on clay samples prepared by compression under standard proctor energy. Unconfined compressive strength values of clayey soil sample with 0.5%, 1% and 1.5% addition of pine tree sawdust were determined at studied temperature (+21 °C) on days 1, 7, 28 and 90. The highest strength values were obtained with 28 and 90 days of curing and 1% pine tree sawdust. The results showed that 14.81% of 28 days curing and 10.54% of 90 days curing increased in the unconfined compressive strength of clay sample reinforced with pine tree sawdust. These samples (-21 °C, +21 °C) and 12 cycles were frozen-thawed. The results showed that 11.01% of 28 days curing and 7.7% of 90 days curing increased in the unconfined compressive strength of clay sample reinforced with pine tree sawdust. From the results obtained, it was concluded that pine tree sawdust can potentially strengthen clayey soil alone or together with other wastes.

Keywords: Pine Tree Sawdust, Clay, Unconfined Compressive Strength, Freeze-Thawing



Wear and Corrosion Properties of MgAl-CNT Composites Produced by Using Hot Pressing Method

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Abstract: Magnesium and its alloys are now considered to be an important material for modern lightweight structures and therefore have a wide range of applications, especially in the electronics, aircraft and automotive industries. Its popularity is further increased when it is produced as a composite material. In this study, MgAl matrix carbon nanotube (CNT) reinforced composite materials were produced by hot pressing method. Composites designed by matrix addition of CNT at ratios of 0.25%, 0.50, 0.75 and 1.00% were produced by hot pressing at 550 ° C. The effects of CNT amount on the wear, microstructure and corrosion properties of composites were investigated. Microstructure and phase composition of the materials were investigated by optical microscope (OM), scanning electron microscopy (SEM), X-ray diffractogram (XRD), X-ray energy spectrometry (EDS). The stiffness of the composites is measured in Brinell. The relative intensities of the materials have been determined according to the Archimedes principle. A structure with dense and very small porosity was obtained according to both SEM photographs and density measurements. An increase in the hardness of the composites was observed with the increase of the CNT addition. The highest hardness value was measured as 88.45 HB10 at 1.00% by weight of CNT addition. This increase in hardness was caused by the free distribution of CNT in the matrix. Wear properties of composites have been tried to be determined in ball on disc wear method and linear mode. MgAl-CNT composites have a pH of 3 for the potentiostatic and corrosion rate. Immersed in 3.5% NaCl solution. Surfaces of worn and corroded samples were analyzed by SEM-EDS. It has been found that the wear resistance of MgAl matrix composites produced by CNT addition is significantly higher than the MgAl matrix without additive. There are differences in corrosion resistance depending on the amount of CNT in the composite.

Acknowledgements: We would like to thank to Kastamonu University Scientific Research Projects (KÜBAP) unit, which provided financial support with the project number KÜBAP 01/2014-10 about the issues related to conducting and concluding this study.

Keywords: Wear, Corrosion, MgAl, CNT, MMCs



Final Estimates Part 2: Probability Models of Earthquake Occurrences using Kriging Method with the Geographic Information Systems (CBS) in the Aegean Sea and Surrounding, Western Turkey

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Abstract: In this study, Kriging method from Geostatistical techniques used to probability models of earthquake occurrences using Kriging method with the Geographic Information Systems (CBS) in the Aegean Sea and surrounding, Western Turkey. Geostatistical techniques not only had the capability of producing a prediction surface but also provide some measure of the certainty or accuracy of the predictions. Kriging was an advanced geostatistical procedure that generates an estimated surface from a scattered set of earthquakes. Also, Kriging assumes that the distance or direction between sample points reflected a spatial correlation that can be used to explain variation in the surface. The Kriging method fitted a mathematical function to a specified number of earthquakes, or all earthquakes within a specified radius, to determine the output value for each region. We have used $Z(s) = \mu(s) + \varepsilon(s)$ basis formula for all the different types of Kriging method. We applied cell declustering method for the database. We used probability Kriging type for estimations of probability output surface. We selected Multiplicative Skewing type with base distributions Log Empirical and Gamma for approximations methods and Exponential method for covariance variable to determined probability models. Consequently, maps of probability models plotted with Kriging method. The high and low probability estimates of earthquakes for 10 different seismic zones determined with Kriging method and compared different distributions for $M_s \geq 3.0$ earthquakes in the next 100 year. Kriging was most appropriate when knowing a spatially correlated distance or directional bias in the data. It can be used often for earthquake occurrences in seismology. Also, this study, the scientists will be lead for investigated earthquake estimates.

Keywords: Kriging Method, The Aegean Sea and Surrounding



The Planning in terms of Natural Hazard Sensitivity of Tekirdag City

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Abstract: Nearly half of the world's population lives in urban areas. This situation has added a global dimension to the concept city. The rapid urbanization across the world, however, has caused many problems in the natural environment. As cities continuously consume natural resources, urban development trends all over the world are centered on the idea of sustainable cities. These trends in urban development have demonstrated that it is important to plan urban spaces predominantly full of man-made elements considering natural disaster risk. Indeed, natural disasters play a significant role in settlement area selection and subsequent enlargement of cities and are thus considered an important factor in the development and management of cities. Under today's conditions, particular emphasis should be placed on the determination of the spatial sensitivity of cities to do urban planning in line with their dominant natural disaster pattern or patterns. This study on the case of Tekirdag aimed to carry out a sensitivity analysis for potential natural disasters. Thus, areas sensitive to natural disasters that are likely to affect the city were identified. What natural disasters occurred in the area? How is the spatial sensitivity of these disasters distributed? What are the factors that affect this distribution? In order to answer the research questions, the domestic and foreign literature were reviewed and relevant research was interpreted on the basis of critical and analytical thinking. The study employed Geographic Information System (GIS) techniques for map analysis and thematic mapping. The study results demonstrated that disasters including earthquakes, landslides, floods, flash floods and tsunami are likely to occur in Tekirdag. The results also showed that the coastal areas of the city are the most sensitive areas to these kinds of disasters. Thus, urban planning should consider natural disasters for resilient and sustainable urbanization. Especially local authorities should undertake relevant work on urban planning. Thus, they can achieve the most efficient use of land, which is the basic philosophy of urban planning.

Keywords: Tekirdag, Natural Hazards, Spatial Sensitivity, Analysis Multi-Criteria Weights, GIS



ORAL PRESENTATION

INTERNATIONAL CONGRESS ON ENGINEERING AND LIFE SCIENCE
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Lateral Geotechnical Changes within the Southeast Anatolia Crust

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Abstract: The tectonics discontinuous and crustal properties will change the seismic velocity and absorption of the near upper crust. These changes in seismic velocity and absorption are related to thickness, stress and dilatational forces of the lithosphere. These parameters give important information about the geotechnical structures within the near upper crust. This study examines the changes in the seismic velocity and the coefficient of absorption for three selected regional areas in southeastern Anatolia crust.

Keywords: Seismic Velocities and Attenuation, Geotechnical Properties, Upper Crust



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Dynamic Performance of Historic Bayburt Ulu Mosque Minaret According to Turkish Earthquake Code (2007)

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Abstract: In this study, the dynamic performance of the Historical Ulu Mosque minaret built in the 12th century in Bayburt is investigated according to Turkish Earthquake Code (2007). Macro modeling of historical minaret is done in the SAP2000 program for dynamic analysis. In addition, the ground features of the historic minaret and the earthquake zone information are included into the program. In the literature survey, it is seen that the historical minaret located in Bayburt having geometric properties are different from the other historical minarets built in its period. In addition, this minaret is square on the base, eight on the body and circular on the top. The minaret has 60 steps and its total height is 29 m. The historic minaret is modeled with 7156 solid elements in the SAP2000 program. According to TEC2007, the soil group is class C and the local site class is Z2. Extreme stress values of the minaret are determined in the dynamic analyses carried out according to the earthquake specifications. Accordingly, it is aimed to determine the areas where the risk of damage on the historical minaret.

Keywords: Bayburt Ulu Mosque Minaret, Dynamic Performance, Finite Element Model, Macro Modeling, Turkish Earthquake Code (TEC) 2007



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Dynamic Performance of Historic Bayburt Yeni (Yakutiye) Mosque According to Turkish Earthquake Code (2007)

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Abstract: The dynamic performance of of the Bayburt New (Yakutiye) Mosque built in the 19th century at about 30 m distance to Çoruh river in center of Bayburt is investigated according to Turkish Earthquake Code (TEC) 2007. The historical mosque was built with regional white and yellow stones. The information needed to prepare macro model of the structure using a computer program was obtained from Erzurum Regional Directorate for Foundations and onsite measurements. The height of the dome is 15 m and the height of the minaret is 28 m. In the SAP2000 program, the historical mosque model is prepared with 4738 shell elements and 24789 solid elements. The dynamic analyses are carried out by entered structural features of the foundation of the mosque and the earthquake zone into the computer program. As a result of these analyses, according to Turkish Earthquake Code 2007 specifications, the most unfavorable stress values and locations that could occur in the historic mosque and minaret are determined.

Keywords: Bayburt Yeni (Yakutiye) Mosque, Dynamic Performance, Finite Element Model, Macro Modeling, Turkish Earthquake Code (TEC) 2007



Investigation of Elastomeric Bearings' Behaviour under Fatigue Loading

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Abstract: Elastomeric bearings, which are generally made of rubber and lamine steel, have been used actively for about 60 years. These bearings have evolved with technology and become an important subject in civil engineering by providing significant improvements in the earthquake performance of structures.

This study's goal is to investigate the behaviour of elastomeric bearings under continuously impacted fatigue loads. The first thing to do to reach that goal is to determine of shear modulus. The process of determination of shear modulus is clarified with ASTM D4014 standard. This norm was used to determine shear modulus in this study. Secondly, elastomeric bearings were continuously forced to make displacement equal to half of their thickness to get information about their behavior.

Dimensions of elastomeric bearings that were used for experiments are 100 mm x 100 mm, and their thickness is 60 mm. Bearings have 4 steel and 3 rubber layers. The total thickness of rubber layers is 42 mm.

As a start, the shear modulus of elastomeric bearings was calculated according to ASTM D4014 norm. Six successive loading and release cycles were carried out during the experiment with a deformation equal to the bearing thickness. After result data were obtained, shear modulus was determined from the extension curve that occurred after the sixth cycle.

In the continuation of the study, these bearings were forced to a deformation equal to half of their thickness. 1000 cycles were carried out under 0.5 Hz frequency. As a result of these deformations, the force-displacement hysteresis loops were obtained. This shows whether the lateral stiffness of the bearings was affected by this scenario. Axial loads were not applied to the bearings in this scenario.

The results data that were obtained shows that the stiffness of the elastomeric bearings under repeated loading is reduced over time and the shear modulus is not stable. As a result of this study, the softening curves in the elastomeric bearings, which depend on the number of cycles, were obtained.

Keywords: Earthquake, Civil Engineering, Bridge, Elastomeric Isolator, Fatigue Loading



Estimation of Uniaxial Compressive Strength of Eastern Blacksea Carbonate Rocks using Simple Test Methods

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Abstract: Uniaxial compressive strength (UCS) is one of the widely used parameters in most of rock mechanics and engineering geology applications. However, in some cases preparing and testing samples for this experiment is expensive and time consuming. As an alternative, analytical and experimental relationships between various mechanical and physical properties can be used in predicting important engineering properties of rocks. For this reason, the use of simple test methods such as porosity and ultrasonic velocity is very common in order to estimate the uniaxial compressive strength. These simple test methods are fast, easy, portable and cheap. They may also not require sample preparation.

The aim of this study is to establish statistical relationships between rocks' uniaxial compressive strength results and simple experimental results by applying simple test methods and uniaxial compressive strength tests on rocks. In the study, simple and multiple regression analyzes were applied to predict the UCS, and as a result, 16 different equations for predicting uniaxial compressive strengths of the carbonate rocks (travertine, onyx and limestone) in the eastern black sea region were summarized using ultrasonic velocity and porosity data. Equations obtained were compared with those proposed by other researchers and consequently it was revealed that the equations proposed in this study have high accuracy.

Keywords: Index Properties, Uniaxial Compressive Strength, Statistical Relation



Ground Characterization of Çanakkale Province from Acceleration Data Set

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Abstract: In addition to microtremors, strong motion data is also used to estimate the ground resonance period. HVSR (Horizontal Vertical Spectral Ratio) technique is the ratio of the average of horizontal components to the vertical component of acceleration in the frequency domain. The aim of this study is to investigate the ground characteristics of Çanakkale Province by means of HVSR and strong motion data. For the study, acceleration data sets are provided by 17 of 23 stations located at Çanakkale Province, which are owned to Republic of Turkey Prime Ministry Disaster and Emergency Management Presidency (AFAD)-Strong Ground Motion Database of Turkey. The data set of 2423 digital three-component acceleration seismograms from 707 events, occurring in date range from 1998 to 2018, magnitude range from 3.0 to 7.4, distance range from 20km to 550km, are used in the scope of the study. Of sampling interval is 0.01sec. Statistically, min number of events is 30, max number of is 304 and average of is 143 for the stations. The S-wave coda, pre of the S-wave coda, post of the S-wave coda or all long of records are used to process the data set. All long of them are assessed in the study. According to maximum recording time, all long of are equalized and united in a file at any station. The program GEOPSY is used during data processing steps. These data processing steps are to apply of trend removing, FFT (Fast Fourier Transform), 5% cosine windowing, band-pass filtering between 0.2 and 20 Hz, 40% H/V spectrum amplitude-rounding with Konno-Ohmachi. According to the SESAME criteria, the reliability of the H/V curves and the reliability of the dominant peaks are tested. The sites are classified by NEHRP (National Earthquake Hazard Reduction Program) criteria. Most of the stations are mostly located on the geological formation of the Quaternary Undifferentiated and Miocene Terrigenous-Clastics. A few of them are positioned on Neogene Volcanites, Eocene Clastics-Carbonates, Miocene Neritic-Limestone, Lower-Middle Miocene Pyroclastics. As a result, the ground classification of the stations sites by the NEHRP criteria are predominantly type C, D and E. The ground resonance periods range from 0.16 to 1.18sec and the magnifications range from 1 to 3.5 in Çanakkale Province. It is also shown that the site characterization is mostly formed with soft clay, hard soil and partly with soft rock limited around locations of the stations.

Keywords: Acceleration, HVSR, FFT, GEOPSY, SESAME, NEHRP



Ground Characterization of COMU Campus from Microtremor Data Set

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Abstract: The use of microtremors to estimate the ground resonance period at the regional scale has many advantages in terms of time, labor-force and money saving. For these reasons, three-component microtremor data sets are widely preferred to estimate the ground resonance period in geotechnical studies. HVSR(Horizontal Vertical Spectral Ratio) method, which is called the ratio of the average of horizontal components to the vertical component of microtremors in the frequency domain, is often used in the analysis of the collected data sets. The aim of this study is to investigate the ground characteristics of the Terzioğlu Campus area of the COMU (Çanakkale Onsekiz Mart University) using HVSR and microtremor measurements from a few graduation projects. For this purpose, the data set is collected at 40 points in the study area. The measurement system consists of three-component broad-band GEOSPACE seismometer, REFTEK-130 digitizer and GPS instrument. As much as possible to avoid from ambient noise, the process was performed between 24 a.m. and 6 a.m. as the data acquisition system installed in a small pit at each point. The average length of records and of the sampling interval are about 30 minutes and 0.02 sec, respectively. The program GEOPSY is used to data processing. These are to apply of FFT(Fast Fourier Transform), 5% cosine windowing, band-pass filtering between 0.2 and 20 Hz, 40% H/V amplitude spectrum-rounding with Konno-Ohmachi. According to the SESAME criteria the reliability of the H/V curves and the reliability of the dominant peaks are tested. The sites are classified by the NEHRP (National Earthquake Hazard Reduction Program) criteria. It is used to evaluate the H/V curves obtained from 18 points providing the SESAME criteria among to 40 points. As a result, the ground classification of the campus area is predominantly type E. The ground resonance periods range from 0.2 to 2.5sec and the magnifications range from 1 to 4 in the area. The Campus is located on the geological formation of the Quaternary Undifferentiated and Miocene Terrigenous-Clastics. It is also shown that the ground characterization of COMU Terzioğlu Campus is mostly formed with soft clay, hard soil and partly with soft rock limited at the measuring points.

Keywords: Microtremors, HVSR, FFT, GEOPSY, SESAME, NEHRP

**A Study on Karasu Stream (Sinop): Macroenthic Fauna**

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Abstract: Karasu Stream is an important source of drinking water in this region. Most of the drinking water requirement of Sinop province is provided from Erfelek Dam on the stream.

Karasu stream where the study was done, located at Erfelek City, Sinop Province (Northern Turkey) Sampling was carried out monthly between 2013 February and 2014 January from 10 stations. Samples were collected by Kick-sampling method. Benthic samplings were done from 1, 25 m² area with a 5-minute duration by a hand-net. Among the measured environmental parameters of water (temperature, dissolved oxygen and pH), temperature and dissolved oxygen are the most effective factors on biodiversity of stations

18945 individuals of 179 taxa belonging to 5 Phylum were recorded in this study: Oligochaeta (38 taxa, 1157 individuals), Mollusca (12 taxa, 860 individuals), Chironomidae (48 taxa, 5956 individuals), Ostracoda (7 taxa, 65 individuals), Trichoptera (20 taxa, 151 individuals), Malacostraca (11 taxa, 10568 individuals), Nematoda (156 individuals), Planariidae (484 individuals), Pseudoscorpionida (1 taxa, 1 individual), Hexapoda (27 taxa, 2481 individuals) and other Diptera (13 taxa, 2427 individuals)

According to frequency index of Soyer (1970); the most dominant taxa in studied area are: *Gammarus komarek*, *G. uludagi*, *Simulium* sp., *Beatis* sp., *Bezzia* sp., *Heptagenia* sp., *Planaria* spp., *Pisidium casertanum*, *Tipula* sp., *Leptophlebia* sp. ve *Limnodrilus hoffmeisteri* respectively. In the present study about 170 taxa were recorded for the first time from Karasu stream.

Keywords: Karasu Stream, Taxa, Macro Fauna, Water Quality, Benthic



Mortalities and Exploitation Rate of Mediterranean Horse Mackerel, *Trachurus mediterraneus* (Steindachner, 1868) in the Central Black Sea

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Abstract: This study provides some actual information about length, weight, age and mortality rates of Mediterranean horse mackerel (*Trachurus mediterraneus*) population in the central Black Sea in order to detect whether fishing pressure or not. A total of 1467 specimens were monthly collected from commercial purse-seiners, which especially landed to Sinop fishing port between September 2016 and March 2017. A total of 109 otoliths were used for age reading. Total length and weight of *T. mediterraneus* specimens were ranged from 7.1 cm to 20.3 cm (average: 14.02 ±0.04 cm) and 3.2 g to 67.7 g (average: 23.8 ±0.19 g). The samples were grouped densely between 12 and 15 cm and about 84% of samples in this study were within the legal size. Length-weight relationship was calculated as $W = 0.0067 \times TL^{3.0848}$ ($r^2 = 0.94$). Age groups of whiting in the Central Black Sea were between I and III. Mean lengths according to age groups were 9.9 ±0.36, 14.1 ±0.11 and 16.7 ±0.13, respectively. Also, von Bertalanffy Growth Parameters were $L_{\infty} = 19.14 \pm 0.46$ cm, $K = 0.65 \pm 0.03$ year⁻¹, $t_0 = -0.08 \pm 0.007$ year⁻¹. Mortalities (M, F and Z) and exploitation rate (E) of *T. mediterraneus* from the Central Black Sea were 0.84 year⁻¹, 0.87 year⁻¹, 1.712 year⁻¹ and 0.51 year⁻¹, respectively. The rates of exploitation and minimum landing size indicate that there is no overfishing on *T. mediterraneus* population in the area for the time being.

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Keywords: Atlantic Horse Mackerel, *Trachurus mediterraneus*, Length, Weight, Exploitation, Black Sea.



Some Population Parameters of Garfish, *Belone euxini* Günther, 1866 in the Central Black Sea, Turkey

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Abstract: A total of 268 tons garfish, *Belone euxini* were caught in Turkish waters in 2016, and more than 52% were from the Black Sea, especially the eastern part. Garfish production fluctuated from 661 tons in 2010 to 205 tons in 2013 (average for 2000-2016: 396 tons). However, total production tends to declining in the last six years (average: 278 tons). It is seen that there is an intensive fishing on garfish stocks. This study provides some actual information such as length, weight, condition factor, age and mortality rates of garfish population in the southern Black Sea in order to detect whether fishing pressure or not. A total of 986 garfish were collected from commercial fisheries, using encircling nets between October 2016 and December 2017 in Sinop, Central Black Sea. The length and weight distribution of all garfish samples ranged from 28.8 to 51.6 cm TL and from 26.6 to 177.2 g, respectively. Female: male ratio was 0.3:1. The LWR parameters (a , b , r^2) were computed as 0.0009 ± 0.50 , 3.040 ± 0.32 and 0.902 ± 0.40 , respectively. The age of garfish was between I and IV. The estimated von Bertalanffy growth parameters with standard errors were $L_{\infty} = 55.74 \pm 26.75$ cm, $K = 0.28 \pm 0.42$, and $t_0 = -1.68 \pm 2.02$. Natural, fishing and total mortality of the garfish were 0.47, 0.69 and 1.16, respectively. In this study, about 68% of fish is under first maturity length. Exploitation rate ($E=0.59$) also proved that. On the other words, there is a fishing pressure on the garfish stock in the Black Sea due to absence minimum landing size (MLS) of the garfish. Therefore, MLS should be regulated owing to first maturity length at least 38 cm for sustainable garfish fishery.

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Keywords: Garfish, *Belone euxini*, Age, Growth, Fishing, Black Sea.



A Comparison Study of Nutritional and Productive Aspects of Common Carp (*Cyprinus carpio* L.) Reared in Earthen Ponds in Ranya (North of Iraq)

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Abstract: The increasing necessity on fish meat at Northern Iraqs' cities particularly in Sulaimaniya and Erbil Governorates due to the increasing population with suitable economic situation especially after 2010; also brought about excessive demand on various types of fish meats obtained from natural growing fishes in lakes. Due to the overloaded fishing activities in Dukan Lake, the production amount is not sufficient and sustainable for fish market. Ranya Zone (north of Iraq) which is located in north of Dukan Lake have fine freshwater sources and a good reputation with multifarious natural fish meals. In this region, water temperature values are optimum about 5-6 months during the year for growing of subtropical climate Cyprinids. For this reason, a rapid increasing has seen on earthen ponds establishment.

In this study, it was aimed to determine the productivity aspects of common carp (*Cyprinus carpio* L.) in Ranya Zone (Raparin Administration), with comparing ponds statics of selected six farms in different locations. The study was carried out during the five months period (between May and September) between the farming period and the harvesting season. The mean values of moisture ratio (74.42% to 64.92%), fat ratio (13.36% to 6.33%), protein ratio (21.79% to 10.40%) and ash ratio (2.35% to 1.01%) of fish meat samples, which were taken from different fish ponds, were found significantly different ($P < 0.05$). The organoleptic tests that were conducted to evaluate the quality of fish's meat, showed significant differences ($P < 0.05$) in tenderness (4.8 to 3.0 on 5) and overall acceptability (4.8 to 3.6 on 5), and no significant differences ($P > 0.05$) in each of juiciness (4.2 to 3.4 on 5) and flavor (4.6 to 3.6 on 5). The weight gain and food consumption ratio (FCR) during 5-7 months of farming season were calculated 1-5 kg per individual and 2-3.5 kg respectively.

Keywords: Ranya, Carp, *Cyprinus carpio*, Meat Quality, Water Quality, Earthen Pond, Organoleptic Evaluation



Effects of Different Live Feed Regimes on Growth, Survival and Trypsin Activity of Penaeid Shrimps *Marsupenaeus japonicus* and *Penaeus semisulcatus* During Larval Development

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Abstract: Studies on digestive enzymes during larval development, provide a better understanding of the digestive ability of organisms that undergo metamorphosis frequently. Depending on the results, formulated feeds may be developed to meet the requirements of different species. Trypsin is one of the most important enzymes that represents over 80% of proteolytic activity during the larval stages of Penaeid shrimps. Penaeid larvae show high trypsin activity responses during the protozoal stages, reaching the maximum level of trypsin at the Mysis I (M_I) stage, and with metamorphoses, these levels begin to decrease. *Marsupenaeus japonicus* and *Penaeus semisulcatus* are also lessepsian species on the Mediterranean coasts and are among the species that are routinely aquacultured.

In this study, trypsin enzyme responses, growth and survival rates, depended on different live feed regimes, of *Marsupenaeus japonicus* and *Penaeus semisulcatus* were compared during the period that starts with M_I stage when the animal protein sources begin to be consumed firstly in meroplanktonic phases and lasts with the 5th day of postlarval stage (PL₅) when the active movement ability is gained. Larvae at M_I stage were divided into three different groups (500 individuals in each group, a total of 3,000 individuals for two species) and were fed with *Artemia* A₁ metanauplii enriched with Culture Selco (CS), prebiotic (PB) and phytoplankton mixture (PM) (*Nannochloropsis oculata* and *Isochrysis galbana*). At the end of the study, survival rates were found 100%, 100% and 99.4% for *M. japonicus* and 99.4%, 99.8% and 99.6% for *P. semisulcatus* in CS, PB and PM groups respectively. *M. japonicus* larvae with mean total length (TL) of 3.042 mm and mean dry weight (DW) of 47.1 µg at M_I stage; reached to 5.0671, 5.1285 and 5.1022 mm TL (P>0.05) and 118.7, 124.8 and 121.6 µg DW (P>0.05) at PL₁ stage, and 6.2243, 6.2331 and 6.2681 mm TL (P>0.05) and 410.1, 426.3 and 418.2 µg DW (P>0.05) at PL₅ stage in CS, PB and PM groups respectively. *P. semisulcatus* larvae with mean TL of 3.3927 mm and mean DW of 52.1 µg at M_I stage; reached to 5.3652, 5.0496 and 5.3126 mm TL (P>0.05) and 149.2, 152.4 and 150.8 µg DW (P>0.05) at PL₁ stage, and 6.6802, 6.6188 and 6.5311 mm TL (P>0.05) and 598.2, 620.4 and 595.1 µg DW (P>0.05) at PL₅ stage in CS, PB and PM groups respectively. *M. japonicus* larvae with mean trypsin activity (TA) of 30.85 x10⁻⁵ IU µg⁻¹ DW at M_I stage; showed 4.94^a, 1.82^b and 5.29^a x10⁻⁵ IU µg⁻¹ DW (P<0.05) TA at PL₁ stage, and 3.2^a, 1.43^b and 2.53^{ab} x10⁻⁵ IU µg⁻¹ DW (P<0.05) TA at PL₅ stage in CS, PB and PM groups respectively. *P. semisulcatus* larvae with mean TA of 23.69 x10⁻⁵ IU µg⁻¹ DW at M_I stage; showed 6.24^a, 2.9^b and 5.38^a x10⁻⁵ IU µg⁻¹ DW (P<0.05) TA at PL₁ stage, and 3.12, 2.8 and 2.7 x10⁻⁵ IU µg⁻¹ DW (P>0.05) TA at PL₅ stage in CS, PB and PM groups respectively.

Keywords: Penaeid, Shrimp, Trypsin, Larvae, Digestion, Aquaculture, Live Feed



Determining Anesthesia and Sedation Concentrations on Angelfish (*Pterophyllum Scalare*) an Aquarium Fish

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Abstract: In this study, anesthesia and sedation experiments were performed on immature angelfish (*Pterophyllum scalare*) individuals, an important aquarium ornamental fish species and especially has some difficulties during its live transportation. For this purpose, clove oil as an organic anesthetic and 2-Phenoxyethanol as a synthetic anesthetic which are commonly used in our country have been preferred and anesthesia and sedation experiments were made to determine the ideal sedation doses that applied during hand treatment and transfers.

Five different concentrations were used to the determine the induction-recovery times for both anesthetics and four different doses were used to determine the ideal sedation doses. All experiments were carried out at $23.5 \pm 0.2^\circ\text{C}$ water temperature. Including the control group, a total of 245 individuals were used with an average fork length of 4.09 ± 0.42 cm and an average weight of 1.64 ± 0.55 g (N= 100). Each fish in the experimental groups was exposed to the anesthetic agent only once.

At the end of the study; although it was estimated that the anesthesia dosages would relatively lower because of the angelfish is a sensitive species, it has been determined that angelfish was extremely resistant to used anesthetic agents and also its behaviors during the induction and recovery period were very different from the literature. It is inferred that for anesthesia 700 and 800 $\mu\text{L/L}$ doses with 2-Phenoxyethanol and 60, 80 and 100 $\mu\text{L/L}$ doses with clove oil; for 24 hours of sedations, between 80 – 120 $\mu\text{L/L}$ doses with 2-Phenoxyethanol and between 6 – 8 $\mu\text{L/L}$ doses with clove oil were suitable.

Keywords: Anesthesia, Angelfish, Clove oil, 2-Phenoxyethanol, *Pterophyllum scalare*, Sedation, Transportation



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Morphological Characteristics of Blue Crab (*Callinectes sapidus* Rathbun, 1896) and Relationship with Their Fishery in the Aegean Sea

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Abstract: This study aimed at examining fishing method used for the catching blue crab (*Callinectes sapidus* Rathbun, 1896) in Aegean Sea. Blue crab is a crab species of primary commercial value in Turkey with increasing importance and consumption among the inhabitants Aegean and Mediterranean regions, particularly. Until 1980s, there were no commercial catching methods for this species. This species was usually discarded by the fishermen.

Minimum catch size ratio were found 39% in trammel net and 27% in without escape vent traps, respectively. When the traps modification made, this ratio decreased to 6%. Average length was found 16,3 cm in traps with escape vent while this average length was 15 cm in regular traps. Because of trammel nets were not selective for this species we did focused on traps for the sustainable crab fisheries. Escape vents were prepared based on carapace length (CL) of blue crab and was used in length 6 cm as soft escape vent.

The aim of the study is to examine actual situation of the blue crab fishery in the Turkish water of the Aegean Sea by the different fishing methods to better understand the catch amount by the fishermen and to propose some recommendations for sustainable blue crab fishing activities in the Aegean Sea.

Keywords: Blue Crab, *Callinectes sapidus*, Trap, Morphology, Aegean Sea



Morphological Characteristics of Mackerel Species (*Trachurus trachurus* and *Trachurus mediterraneus*) and Relationship between Mesh Openness for Selectivity

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Abstract: This study aimed at predicting basic selectivity parameters using specification net mesh and also studied species. Hence the selectivity estimation can be challenging in many different types of fisheries without to need full-scale experiments to estimate gear selectivity which are extremely resource demanding.

The studies were carried out in three basic steps at sea, laboratory and computer simulations, respectively. Fish samples were collected during 2013 covering a whole year. 50 individual for each species were collected and transported to the laboratory for the cross-section measurements and also fall through experiments. Data obtained from laboratory studies were integrated to the computer using by Fishselect model for the simulation of the data. At the end of the simulation isobar diagrams which shows selection of the two investigated species versus mesh sizes and openness degree

As a result of this study, it was observed that the results obtained from simulations are quite well agree with full-scale selectivity results for *T. trachurus* and *T. mediterraneus*. Both CS's model CS1 and CS2 are found as ellipse for *T. trachurus* while CS1 is flexdrope and CS2 is ellipse for *T. mediterraneus*.

In conclusion, estimation of fishing gear selection parameters by fishselect model is advised as cheap and realistic method for improvement of fishing gear selectivity

Keywords: Mackerel, *Trachurus trachurus*, *Trachurus mediterraneus*, Selectivity, Morphology, Simulation



Blood Cells in Fish as Biomarker for Early-Warning Tool for the Environmental Pollutants

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Abstract: The aquatic environment is generally the end-recipient of most toxic substances provoked directly or indirectly by the anthropogenic activities. The productivity of the aquatic organisms is declining due to poisoning of these organisms, thus, resulting in serious problems of natural ecosystems and threatening the aquatic biodiversity. New trends in the adverse impacts on freshwater ecosystems are related to their complexity making impossible analysis and predictions of bio-risks basing on chemical analysis. Multi-component mixtures of pollutants can provoke a deleterious effect even in low concentration of the individual pollutant. Investigation of the effects of toxicants of aquatic organisms requires a multi-disciplinary approach including on-site environmental investigation of inputs and toxicology. Most eco-toxicological studies and chemicals regulation focus on hazard and exposure assessment of individual substances only, the problem of complex adverse effect in the environment is neglected to a large extent. The absence of environmental realism is clear in the current methods of assessment. The knowledge on using the concepts as tools for the predictive complex adverse effect assessment is insufficient. This gap seriously hampers the application of scientific approaches in fishery. Fish blood cells represents a suitable biomarker of environmental health and provides a tool for biomonitoring water quality. Hematological biomarkers has the advantage of specialty for potential widespread use in early warning. Particularly, differential leucocyte counts have a number of features that make them useful sentinels for biomonitoring of water quality; the persistence of a stress condition may lead to the suppression of the leukopoietic centers, disrupting the leucopoiesis. Decrease in erythrocyte counts, haemoglobin concentration and hematocrit ratio, and increased thrombocytes, nuclear abnormalities in erythrocytes and increased frequency of micronuclei, lobed and bi-nucleated cells can represent the environmental problems. With precise interpretation, fish blood cells have the potential as early-warning biomarker for environmental pollution surveillance and can be integrated to the ecological studies.

Keywords: Fish Blood Cell, Biomarker, Pollutants



Real-Time Port Analysis in Local Area Networks

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Abstract: Even though a firewall is located in front of the traffic in corporate local networks, some ports of the systems are open, and access and damage attacks can be done to the network. Network administrators can take precautions by performing port analysis with some programs in order to be knowledgeable and effective in ensuring the security of these systems. At this stage, it may be preferable to use software with open source IDS and IPS features.

In this research, a software that performs port analysis in Windows with Nmap application on open source Linux is run at the same time and their performance is compared. As a result, during the real time test, in the 88 operating system with IP between x.x.20.0 and x.x.23.255, the software reported 131 open ports while the open source Nmap application has reported 144 ports.

Keywords: Network security, Firewall, Port Analysis, Nmap



A Mobile-Based Application for Help and Monitoring in Emergencies

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Abstract: With the rapid growth of the world's population, the growth of cities and the increase in travel opportunities between cities and countries, the need for people's location information is also increasing rapidly. In addition to this, location information is required for the elderly, those with Alzheimer's disease, children in the age of primary education, and mentally disabled individuals. Dangerous situations such as forgotten, kidnapped and lost children in school services have started to be encountered more frequently. Children who are forgotten in the school service can die from airlessness. In addition, individuals with mental disabilities, elderly or Alzheimer's patients can often be lost. In addition, even adult individuals who do not have any illnesses can suffer from reaching each other in crowded environments. In short, we have dealt with the problems that many individuals of society have frequently encountered and developed a mobile application for these problems. The developed mobile application is simple and useful, it has an interface designed to be dynamically changed according to your needs. Two different interfaces are designed for both parents and followers. The application can run as a back-up service and prevents it from being continuously displayed on the screen. It has also been tried to prevent the application from constantly querying the location to save power. For this, location information is detected from GPS satellites at certain periods. By using accelerometer data, it is ensured that GPS position update is not performed if mobility exceeding a certain threshold value is not detected, so that power consumption is reduced in a serious manner. By means of the application, the user's position information and mobility status will be recorded by checking with certain periods. The program will report the status and location information to the parents via SMS by specific periods. Parents will be able to query their relatives' location information whenever they want. Parents will be able to get information about the current status and the position of the person to be followed by sending a message in accordance with a designated form. It is also intended to provide the user with prompt assistance to emergency aid units such as hospitals, fire brigades, police in a possible emergency situation.

Keywords: Mobile, emergency, danger, disabled, child, SMS.



Digenean Species Diversity in four Labrid Fish (Labridae: *Symphodus*) from the Sinop Coasts of the Black Sea, Turkey

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Abstract: This research study was conducted to determine the digenean parasite diversity in four labrid fish species belonging to *Symphodus* (*S. tinca*, *S. cinereus*, *S. rossali* and *S. ocellatus*) from the Sinop coasts of the Black Sea.

A total of 52 fish specimens were collected in the period between May 2015 and April 2017. Labrid fish were subsequently examined for digenean parasites under a dissecting microscope. The examination included the skin, fins, gills and internal organs. Parasites recovered were fixed and preserved using methods commonly applied. Infection prevalence and mean intensity values were calculated for each digenean species on their respective hosts.

Seven digenean species were found in the digestive tract of four labrid fish. These digenean parasites are *Helicometra fasciata* (Looss, 1901), *Gaevskajatrema perezii* (Mathias, 1926) Gibson & Bray, 1982), *Proctoeces maculatus* (Looss, 1901), *Phyllodistomum crenilabris* Dolgikh & Naidenova, 1968), *Galactosomum lacteum* (Jägerskiöld, 1896), *Condylocotyla pilodora* Pearson & Prévot, 1985) and *Metadena* sp. *Symphodus tinca* has the most diverse digenean fauna with six species. The fauna of *S. tinca* was dominated by *P. crenilabris* and secondly by *H. fasciata*. *Symphodus ocellatus* showed a lower diversity with 2 digenean species (*P. crenilabris* and *Metadena* sp.). *Proctoeces maculatus* and *Gaevskajatrema perezii* was detected to be dominant species and the previous species had its highest prevalence (42.86%) in *S. roissali* while the latter species had its highest prevalence (22.22%) in *S. tinca*.

This investigation is the first on the digenean parasites of Labrid fish in Turkish Black Sea coasts. *Proctoeces maculatus* and *Phyllodistomum crenilabris* are new parasite record for Turkey.

Keywords: Labrid Fish, *Symphodus* spp. Digenean Parasites, Black Sea



Determination of Accumulation, Elimination and Ion Release Rates in *Artemia Salina* Organisms Exposed to Cu (60-80 nm) and CuO (40 nm) Nanoparticles

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Abstract: In this study, *Artemia salina*, one of the primary consumer zooplankton species that can survive in different salinity environments, was exposed to nanoparticles (NPs) in copper (Cu 60-80 nm) and copper oxide (CuO 40 nm) and tested for nano-toxicity immobilization tests at different concentrations (0.2, 1, 5, 10, 25 and 50 mg / L), in accordance with Economic Cooperation and Development Organization OECD's test guidelines. Determination of possible accumulation and elimination rates related to NPs in organisms and metal ion distribution ratios in the environment where NPs were present were determined by ICP-MS analysis. When organism accumulation and elimination results were examined; both NPs were found to differ in accumulation and elimination rates at each application time and in parallel with the increase in concentration. As the concentration rate increased, the accumulation amounts increased exponentially. We have determined that the accumulation rates in Cu NPs had a tendency to increase at 48 h and to decrease at 72 hours in concentrations of 0, 2 and 1 mg / L respectively, while in all other concentrations, there was an upward trend in parallel with the increase in time. In the case of CuO (40 nm) NPs, there was a decrease trend at 48th hour and an increase trend at 72th hour except 10mg / L concentration and it was determined that there was an increase trend at 10mg/L in parallel to the increase of application period. At the end of the experiment, for Cu NPs with 24-hour elimination (liquid medium with the same physical properties without NP); in the other groups except for 0,2 and 1 mg/L concentrations, an average of 10-15 % Cu metal was found to be released by the organism. On the other hand, in CuO NPs, Cu metal release occurred in all groups. The Cu ion quantities released by Cu and CuO NPs were; in applications which were performed for seawater, the amount of ions released into the atmosphere in general at each application time is clearly increased in a folding manner in parallel with the increase in concentration. When the amounts of release between the two NPs were compared, the highest values were during 72 hours. During this period of time, Cu was obtained at a rate of 2.38 mg/L for Cu NPs and 0.16 mg/ L for Cu NPs. As a result, while CuO NPs tend to accumulate more in organisms, Cu release rates of Cu NPs are 10 times higher than CuO NPs.

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Keywords: *Artemia salina*, Copper, Copper Oxide, Nanoparticle, Accumulation, Elimination, Ion Release



Effects of Different Light Wavelength on Feed Evaluation and Growth Performance of Seabream Juveniles (*Sparus aurata*)

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Abstract: In this study, the effects of different visible light wavelength of the rearing tank on feed conversion ratio and growth performance in sea bream (*Sparus aurata*) juveniles were examined. With this aim, rearing tank inside color were changed to red, blue and green. In those tanks, the fish (average weight of 1.5 ± 0.21 gr) were fed during 45 days ad-libitum in triplicate. During the study, the water temperature was ranged between 23-30 °C. At the end of the study, growth performance was affected significantly on red tanks group compared to other groups. Feed conversion ratio was decreased on red tank group compared to control. The results of the study suggest that the red color can effective on sea bream juvenile growth performance.

Keywords: Aquaculture, Seabream, Growth, Juvenile, Fish, Visible Light Wavelength



Effects of Marshmallow (*Althaea officinalis*) Methanolic Extracts on Growth Performance and Antioxidant Enzyme Activities of Rainbow Trout (*Oncorhynchus mykiss*)

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Abstract: In this study, growth performance and antioxidant enzyme effects of marshmallow (*Althaea officinalis*) in rainbow trout were investigated. With this aim, three different concentration of methanolic extract of marshmallow (0.1, 0.5 and 1 g kg⁻¹) were prepared and sprayed to the feed. Fish were fed with the diets (control, M0.1, M0.5 and M1) for 75 days. The tissue samples (liver and white muscle) were taken from each experimental groups at every 15th, 45th and 75th day of the study. From all samples, to determine antioxidant activity, SOD, CAT, GPX, G6PDH and lipid peroxidation were investigated. Results showed that final fish weight, specific growth rates (SGR) and feed conversion ratio (FCR) were all experimental groups than the control group (C) (P > 0.05). SOD activity was significantly increased in the M1 group. Compared with the control group, CAT activity was the highest in the M0.5 group (P < 0.05). GPX activity showed no differences on the 15th day of the study compared to control. There was an increasing activity in M1 group, and decreasing activity in M0.1 group compared to control (P < 0.05). G6PDH was increased in plant groups compared to control on the study. All the other sampling time, G6PDH was significantly decreased compared to control. Lipid peroxidation in marshmallow groups was significant increasing at the end of the study. The results of the study showed that marshmallow was effected antioxidant enzyme activities in rainbow trout and increased the fish growth performance.

Keywords: Rainbow Trout, *Althaea officinalis*, Growth Performance, Antioxidant Enzyme



Direct Analyze of Different Sorting Grids Effects on Shrimp Trawl Selectivity; an Experimental Assessment with a Flow Channel

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Abstract: Shrimp trawl fishery is an essential topic for fisheries management with characterized by low selectivity ratio. Trawl fishery is an intensive fishery method especially for shrimp species with high economic value. Different sorting grid methods are widely used in the world to increase shrimp trawl selectivity. In this study, sorting grid model, bar spacing and sorting grid angle were investigated experimentally for shrimp trawl fishery in the Iskenderun Bay. For this purpose, *Metapenaeus monoceros* individuals, provided live from nature, were used. These individuals were stocked in the Fish Behaviour Laboratory of Iskenderun Technical University. After, selectivity simulation experiments were conducted in this laboratory discharge from the open channel formed by a flow. In each bar spacing, about 10 replicate experiments were made with about 50 individuals. In the experiments, individuals, which can go behind the sorting grid, were named as selected catch, individuals, which accumulate on sorting grid, were named as escaped catch and individuals, which are at the bottom of the sorting grid, were named as unselected catch. The values were directly evaluated in a ratio-proportional manner. The selectivity curves obtained with carapace lengths were estimated by the logic model. These selectivity experiments conducted in the laboratory environment were applied for the first time and provide useful data for fisheries management.

Keywords: Flow Channel, Selectivity, Sorting Grid, Trawl, Shrimp



Notes on the Hematology of a Surviving Endemic Cyprinid, *Barbodes tumba*, in the Lanao Plateau, Mindanao Island, Philippines

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Abstract: In the 1920's, Lake Lanao, an ancient lake in Mindanao Island, Philippines, gained wide attention because of its endemic cyprinid species flock that was regarded as a classic example of explosive evolution. Sadly, most of the original 18 endemic species, except two, are now believed to be extinct, and in recent surveys, only *Barbodes tumba*, a food of the natives, could be found. The fish is currently listed as vulnerable by the IUCN, yet relatively little is known about its biology. Blood samples taken from 30 live adult samples (15 males and 15 females) that were freshly caught through opportunistic sampling in the outlet of the lake, Agus River, were analyzed using routine laboratory procedures to obtain basic knowledge about the blood composition, cytomorphometry of the cellular elements, and the effect of sex on the variation of eight hematological parameters in said species. The cellular elements included relatively large, oval, nucleated red blood cells; round lymphocytes; large monocytes with abundant cytoplasm and vacuoles; large, round, granular heterophils; and oval to ellipsoidal thrombocytes. Basophils were not detected. The morphology and sizes of RAPI-stained blood cells were the same in both sexes, except the monocytes that were statistically larger in males. Data on white blood cell count, red blood cell count; thrombocyte count, hematocrit, hemoglobin concentration, mean corpuscular volume, mean corpuscular hemoglobin, and mean corpuscular hemoglobin concentration did not reveal any intersexual variation. The hematologic data suggest that *B. tumba* has a relatively high respiratory competence and high reproductive potential. Therefore, its dwindling numbers might not be mainly due to inherently weak physiology, but to other threats to its survival such as overexploitation and degradation of its environment. The results of the study are relevant to studies of sexual dimorphism, physiology, and behavior of *B. tumba*, and provide insights that can be of use in the conservation of this evolutionarily interesting and economically useful species.

Keywords: *Barbodes tumba*, cyprinid, blood, Lake Lanao, Mindanao



Use of Phytoplankton for the Estimation of Ecological Status in Lake Abant

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Abstract: Lake Abant is one of the most important recreational lakes in Turkey. The lake and its surroundings were declared a nature park in 1983. Due to the large number of touristic facilities and the number of visitors, it is important to protect and monitor the existing ecological conditions of the lake.

This study was carried out seasonally from a pelagial station in Lake Abant between April 2015 and December 2015. Phytoplankton were identified, counted, and biomass was calculated. Ecological status of the lake was estimated by Phytoplankton Trophic Index (PTI) and Q index. Secchi depth, water temperature, dissolved oxygen, oxygen saturation, pH and conductivity were measured *in situ*. The concentrations of ammonia, nitrate, nitrite, orthophosphate, total phosphorus, chlorophyll *a* and alkalinity were also analysed.

In the study, a total of 65 taxa were identified (19 from Bacillariophyta, 19 from Chlorophyta, 8 from Cyanobacteria, 5 from Cryptophyta, 2 from Euglenozoa, 7 from Miozoa and 5 from Ochrophyta). *Asterionella formosa*, *Cyclotella meneghiniana*, *Pantocsekiella ocellata*, *Elakatothrix gelatinosa*, *Monoraphidium minutum*, *Plagioselmis nannoplanctica*, *Aphanocapsa planctonica* and *Anathece clathrata* were frequently found in the samples. Also, ammonia, nitrate, orthophosphate and total phosphorus were found to be effective on the phytoplankton distribution according to CCA. The Ecological status of Lake Abant was estimated as **good** (Class II) by Q and PTI indexes.

Keywords: Phytoplankton, Water Framework Directive, PTI, Q index, Ecological Status



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Effect of Using Different Hypotonic Solution for Chromosome Preparation from Embryonic Tissues of Rainbow Trout (*Oncorhynchus mykiss*) Larvae

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Abstract: The most effective preparation technique developed in this study has provided an excellent chromosome metaphase spread from fin tissues and whole body of larvae of the rainbow trout (*Oncorhynchus mykiss*).

This study investigated the dependency of chromosome preparation parameters including colchicine exposure duration (5, 7 h), three different hypotonic solution (distilled water, 0.075 M KCl solution and 1.1% Sodium citrate) to rainbow trout at 6 dph (days post-hatch) larval ages. The yolk sac and debris of the larvae were carefully removed using a sharp scalpel after colchicine treatment. After this, tissues were hypotonized in hypotonic solutions to find out the most effective hypotonic treatment. The best treatment parameters for preparing good chromosome spreads from rainbow trout were optimized as 0.05% concentration of colchicine for 7h, hypotonic treatment 40 minutes with 1.1% sodium citrate, fixation with carnoy solution at 3:1 ratio and a concentration of 4% Giemsa for 20 minutes.

Keywords: Rainbow trout, Chromosome, Hypotonic solution, Karyotype, Colchicine



Determination of Ideal Stock Rate for Rice-Crayfish Cultivation in Controlled Environment

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Abstract: The growth characteristics and survival rates of juvenile freshwater crayfish (*Pontastacus leptodactylus*) species at different stock density (25 species/m², 50 species/m², and 100 species/m²) were investigated by the perspective of assessment rice field areas for field fisheries in Turkey.

Juvenile species obtained in the laboratory condition from 97 female freshwater crayfish collected from Hanoğlu Pond (Tekirdağ) were placed into rice-planted artificial concrete pond.

Results showed that the best growth in terms of length and weight for juvenile freshwater crayfish has been observed at the stock density of 25 species/m². Statistically significant difference has been found between this stock density and the other stock densities ($p < 0.05$). The maximum survival rate was observed as 72% at the stock density of 25 species/m².

The results of this study are significantly different when compared with other feeding researches on juvenile freshwater crayfish in Turkey.

Acknowledgement: This study was supported by Çanakkale Onsekiz Mart University Scientific Research Projects Coordination Unit (Project ID: FBA-2015-563).

Keywords: Freshwater Crayfish, Rice, Production, Growth, Optimum Stock Rate



Investigation of Deacetylation Degree and Viscosity of Chitosan Extracted from Different Crustacea Shells

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Abstract: Chitin and chitosan have been of interest in the past few decades due to their potential broad range of industrial applications. Due to its biodegradability, biocompatibility, nontoxic and wound healing properties and hemostatic activity, chitosan has received increased attention as one of the promising renewable polymeric materials for various applications. Because of those valuable specifications of chitosan are commonly uses in different sectors including especially food, chemistry, biotechnology, agriculture, veterinary, cosmetic, medicine, dentistry, environmental protection, textile, paper making and packaging. In this study, crustacea shells deepsea pink shrimp (*Parapenaeus longirostris*), blue crab (*Callinectes sapidus*), Pavurya crab (*Eriphia verrucosa*), and Crayfish (*Astacus leptodactylus*) were obtained from Aegean Sea, Mediterranean, Blacksea, and freshwater species which is from Germeçtepe Dam Lake Kastamonu-Daday region. Shells were completely separated from meat, organs and other discards, washed with tap water and dried at room temperature for 12 hours. For the extraction of chitosan deproteinization, demineralization and decolorization steps were carried out with 2.5N NaOH at 65 °C; 1.7 N HCl at 25 °C, and 1:9 hydrogenperoxide: shells threatened and then dried at 90 °C for 2h, respectively. End of that processes prepared two different type of deacetylation degree of chitosan (low and high) and compared with physicochemical parameters. In order to determine basic physicochemical analysis of the chitosan; degree of deacetylation, density, and viscosity, were measured with using potentiometric titration methods, Automated Micro Viscometer (AVMn). The results of the physicochemical parameters (deacetylation degree and viscosity) of chitosan extracted from deepsea pink shrimp, blue crab, Pavurya crab, and Crayfish shells are given as below. Low degree of deacetylation were founded as 72.19 ± 4.95^a , 74.72 ± 5.18^a , 76.49 ± 4.22^a and 76.98 ± 3.76^a , high degree of deacetylation were founded as 93.96 ± 3.20^a , 96.17 ± 3.54^a , 94.68 ± 4.57^a , and 94.98 ± 3.99^a , low degree of deacetylation apparent viscosities were founded as 66.96 ± 2.99^d , 21.48 ± 4.31^b , 48.04 ± 1.93^c , and 16.82 ± 0.31^a cP, high degree of deacetylation apparent viscosities were founded as $54.80 \pm 1.73^{c*}$, $9.16 \pm 0.18^{a*}$, $37.76 \pm 1.37^{b*}$, and $9.63 \pm 0.54^{a*}$ cP, respectively.

Keywords: Chitosan, Pysichochemical Chracterization, Crustacea Shell



Effect of Water Quality Parameters on Reproduction of Strawberry Conch Snail (*Conomurex luhuanus*) in Marine Aquarium Conditions

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Abstract: Conch snails are large, fast-growing marine grazers that feed on detritus and film algae on rocks and soft sea bottoms. They are most easily found in shallow beaches just below the low-tide line. Though adapted to a life beneath the soft substratum like sand and silt, these gastropods have very strong crawling extremities, with which they can cling to hard surfaces. The evermore growth of the undesirable algae in marine aquariums, is one of the most annoying problem for aquarists. Conch snails are effective organisms for use in fighting with algae growing.

This study was conducted to observe the reproductive activities of same species conch snails stocked in two different aquariums and to determine the effect of water parameters in this process. Water samples were taken from both aquariums weekly to measure temperature, salinity, magnesium (Mg), calcium (Ca) and hardness. Mean values of these parameters of first and second aquariums were 1320±75 mg/L and 1020±75 mg/L Mg; 388±25 mg/L and 310±20 mg/L Ca; 9.7±0.5 and 7.9±0.5 kH; 27±1 and 29±1 ppt salinity; 26±0.5 and 26±0.5 °C temperature respectively. It was observed that, the conch snails were well fed and buried themselves in the sand close to the surface for several hours for laying their eggs in the first aquarium. Egg tubes fixed in sand particles in yarn-like shape, were observed in the first aquarium whereas not in the second aquarium. The diameter of yarn-like tube was measured 0.5 mm and the diameter of eggs were between 80 to 100 µm. The eggs hatched 6 days after spawning and it was observed that larvae were in meroplanktonic phase. 20 days after hatching, firstly settling on rocks as a benthic form was observed.

Keywords: Strawberry Conch, *Conomurex luhuanus*, Water Quality, Marine Aquarium

**Investigation of Physicochemical Parameters of Chitosan Extracted from Blue Crab**

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Abstract: In this current study, its aimed to produce a biopolymer chitosan derived unevaluable waste shell of blue crab (*Callinectes sapidus*) which can be used in different sector due to its biodegradability, biocompatibility, nontoxic and wound healing properties and hemostatic activity, chitosan has received increased attention as one of the promising renewable polymeric materials for various applications. With this aim, firstly, by chemical method, chitin synthesis was made from shell of shrimp which was obtained from wastes in Mediterranean region. In order to determine basic physicochemical analysis of the chitosan; moisture and ash content, water and fat binding capacities, degree of deacetylation, molecular weight determination and viscosity, were measured with using AOAC, (1990), Wang and Kinsella, (1976), potentiometric titration methods, Wang et al., (2006), Automated Micro Viscometer (AVMn), respectively. Then, different deacetylation degree and different deacetylation time periods of chitosan were synthesized. At the end of the production, with 1,5-2% efficiency rate, two different types (low and high deacetylation degree) of refined chitosan, 74.72±5.18^a percent and 96.17±3.54^a percent in deacetylation degree, were obtained. The results of the other physicochemical parameters (moisture and ash contents, water and fat binding capacities, molecular weight, viscosity) of chitosan extracted from blue crab (*Callinectes sapidus*) shells are given as below. The moisture contents were founded 3.27±0.11^b and 0.27±0.03^{a*}, the ash contents were 0.87±0.07^c and 0.43±0.02^{b*}, water binding capacities were 452.93±9.37^a and 514.08±33.54^{b*} percent, fat binding capacity were 363.93±13.91^b and 317.72±15.86^{a*} percent, molecular weights were 664.99±34.37^b and 171.35±20.23^{a*} kDa, apparent viscosities were 21.48±4.31^b and 9.16±0.18^{a*} cP, respectively.

Keywords: Chitosan, Pysicochemical Chracterization, Blue Crab, *Callinectes sapidus*



Seasonal Determination of Heavy Metal Levels in Some Economically Important Fish Species Captured from Western Black Sea Region

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Abstract: In this study, seasonal accumulation of cadmium (Cd), zinc (Zn), copper (Cu), iron (Fe), nickel (Ni) and lead (Pb) heavy metal levels were evaluated in *Pomatomus saltatrix*, *Sarda sarda* and *Merlangius euxmus* fish species caught from Sinop, Kastamonu and Zonguldak coastlines. Sampling was carried out for a year from December 2016 to December 2017. 25-30 Numbers of fish samples from each species were caught with proper fishing gears and transported to the laboratory. Minimum of 5 grams of muscle tissue were obtained from every fish. Heavy metal contents of samples were evaluated by reading values in ICP/MS spectrophotometer (Inductively Couple Plasma spectrophotometer) after samples treated with nitric acid-hydrogen peroxide (2:3) in 3 different steps under 40 bar pressure resistant wet decomposition unit.

According to results of the present study all of the heavy metals have shown seasonal variation. Differences between stations were statistically significant. In general terms heavy metal levels measured from edible muscle of fish were in the appropriate limits determined by Turkish Food Codex, World Health Organization and European Union with the exception of Pb and Zn. As a result, hazardous heavy metal levels for human health were not established from four widely consumed fish species caught from Western Black Sea Region.

Keywords: Heavy metal, *Pomatomus saltatrix*, *Sarda sarda*, *Merlangius euxmus*, Kastamonu, Sinop, Zonguldak



Immune Response and Growth Performance of Common Mallow (*Malva sylvestris*) in Sea Bass (*Dicentrarchus labrax*)

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Abstract: In the study, effects of common mallow (*Malva sylvestris*) (CM) aqueous methanolic extract on immune response and growth performance in sea bass (average weight of 18.66±0.86 g) (*Dicentrarchus labrax*) were investigated. With this purpose, three different experimental groups (control (0 mg/kg), 500 mg/kg and 1000 mg/kg) were designed. The fish were fed the diet supplemented with CM during 60 days and blood samples were taken the 30th and 60th days of the study. Immunological parameters such as intracellular respiratory burst, phagocytic, lysozyme and myeloperoxidase activities were determined. Intracellular, lysozyme and myeloperoxidase activity were significantly increased on CM groups compared with the control (P < 0.05). Although no differences were observed on phagocytic activity on 30th day of the study, it was significantly increased on all experimental groups compared with the control (P < 0.05). Final weight of the experimental groups was significantly increased compared with control (P < 0.05). No differences were observed on FCR in any experimental groups (P > 0.05).

According to these results, it can be said that the common mallow has positive effects on the growth performance and also adaptive immune responses.

Keywords: *Malva sylvestris*, Aqueous Methanolic Extract, *Dicentrarchus labrax*, Immune Responses, Growth Performance



Immune Response and Growth Performance of Tetra (*Cotinus coggygria*) in Sea Bream (*Sparus aurata*)

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Abstract: In the study, effects of tetra (*Cotinus coggygria*) (T) aqueous methanolic extract on immune response and growth performance in sea bream (average weight of 19.92±0.40 g) (*Sparus aurata*) were investigated. The experiment was designed to be three groups (control (0 mg/kg), 500 mg/kg and 1000 mg/kg). The fish were fed the diet supplemented with tetra during 60 days and blood samples were taken the 30th and 60th days of the study. Immunological parameters such as intracellular respiratory burst, phagocytic, lysozyme and myeloperoxidase activities were determined. Oxidative radical production was significantly increased on T500 group on 30th day of the study. No differences were observed compared to control at the end of the study. Phagocytic activity was significantly increased in all experimental groups at any sampling time compared to control. Similar results were determined on the lysozyme and myeloperoxidase activity. Final weights of the experimental groups were 77.58±0.94 g, 78.94±0.14 g, 80.12±0.12 g respectively. Growth performance was not affected significantly in any experimental group compared to control. No differences were observed on FCR on any experimental groups (P > 0.05). According to these results, it can be said that the tetra has positive effects on the immune responses but not effective on growth performance.

Keywords: *Cotinus coggygria*, Aqueous Methanolic Extract, *Sparus aurata*, Immune Responses, Growth Performance.



Heavy Metal Levels and Associated Risks in Three Freshwater Fish Species from Borcka Dam Lake

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Abstract: The effect of anthropogenic activities on the aquatic environment leads to public concern due to the pollutants accumulate through the food chain and potential carcinogenicity risk to human. Mining activities is one of the point source of this pollution. Borcka Dam Lake (Turkey) is a good example of this notion due to its exposure to mining practices for decades. In the present study, therefore, Cu, Pb, Zn, and Cd concentrations in muscle (edible tissue), gill, and liver tissues of *Cyprinus carpio*, *Oncorhynchus mykiss* and *Silurus glanis* sampled from the lake were analyzed pertains to heavy metals accumulation and potential human health risk through fish consumption. The lowest heavy metal concentrations for all fish species were detected in edible tissues and these were found lower than the permissible limits for human consumption. Target Hazard Quotient (THQ) and Hazard Index (HI) used to disclosure long-term non-carcinogenic exposure presumptions were lower than 1. In light of Cu, Pb, Zn, and Cd concentrations in the edible tissues, the consumption of these fish caught from the Borcka Dam Lake might not pose a risk for human health.

Keywords: Fish consumption, Heavy Metal, Target Hazard Quotient, Hazard Index, Human Health



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Cu, Cd, As and Hg Resistance in *Escherichia coli* in Coastal Marine Environment of Eastern Black Sea, Turkey

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Abstract: Marine environment is polluted by anthropogenic pollutant including heavy metal and antibiotics. Bacterial resistance to these pollutant is a major problem all over the world. In this study, fifty-four isolates of *Escherichia coli* (thirty-five from mediterranean mussel and nineteen from sea snail) were isolated from *Mytilus galloprovincialis* and *Rapana venosa* collected from the coast of Artvin, Rize, Trabzon and Giresun, Turkey. The bacteria were tested for their ability to tolerate copper, cadmium, arsenic and mercury. For this purpose, minimum inhibitory concentration (MIC) tests for all cultures to the four different metal ions were surveyed by using the broth dilution method to determine bacterial heavy metal resistance. MIC concentration for copper, cadmium, arsenic and mercury ranged between 100-400 mg/l, 100-200 mg/l, 25/400 mg/l and 3.125-25 mg/l, respectively. All of the strains were resistant to Cu, but sensitive to As. Resistance to Hg was determined as 7.4 %. Tolerance or resistance of the bacteria to toxic pollutants, for example the bacterial resistance to heavy metals, are of significant ecological importance. These organisms may be used for indicating and controlling environmental pollution. They also could play an important role in the reservoir and dissemination of antimicrobial resistance in aquatic environment.

Keywords: Heavy Metal, Resistance, Mediterranean Mussel, Sea Snail, Black Sea



Innate Immune and Hematological Responses to *Tilia tomentosa* Methanolic Extract in Common Carp (*Cyprinus carpio*) Juveniles

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Abstract: This study was conducted to determine the effect of a dietary supplementation of *Tilia tomentosa* on blood parameters and non-specific immune responses in common carp (*Cyprinus carpio*). With this aim, common carp (4.35 ± 0.16 g) were fed with an average weight at the beginning of the experiment of 4.35 ± 0.16 g, were supplemented with a celery (*Tilia tomentosa*) aqueous methanolic extract at a dose of 0% (control), 0.01%, 0.05% or 0.1% during 45 days. Every 15 days of the study, blood indices (WBC, RBC, Hb, Hct, MCV, MCH, and MCHC), and immune parameters such as lysozyme, respiratory burst, and myeloperoxidase activities were investigated. The results indicated that fish fed diet supplemented with 0.01%, 0.05%, and 0.1% *T. tomentosa* extract had no significant differences compared with the control on the 15th, 30th, and 45th days of the experiment ($P > 0.05$) except MCV of 0.1% on the 30th day of the experiment which had highest recorded value compared with other groups ($P < 0.05$). MCHC of the control on the 30th day of the experiment also had highest recorded result compared with other groups. ($P < 0.05$).

Lysozyme activity was highest in the 0.01% and 0.1% experimental groups ($P < 0.05$). At the end of the study, respiratory burst activity decreased on the 15th day and 30th day of the study on 0.01% and 0.1% groups ($P < 0.05$). Myeloperoxidase activity was not affected in all experimental groups compared to control ($P > 0.05$). These results suggested that *Tilia tomentosa* has some immunomodulatory effects in common carp.

Keywords: *T. tomentosa*, Common Carp, Hematology, Immune Response



Variation of Seedling Morphogenetic in Mediterranean Hackberry (*Celtis australis* L.) Provenances

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Abstract: *Celtis* is a taxon that is used for many purposes such as fodder, fuel, medicine, fibre, timber in forest land and around agricultural fields. The genus plays a vital role in socioeconomic structure of people by supplying highly palatable, nutritious and tannin-free green fodder particularly during the period of scarcity of green fodder to livestock. Its timber is excellent and also used for making agroforestry systems. And also, tiny, round, dark purple fruits of the species and are extremely popular with birds and other wildlife.

Use of wild fruit species in reforestation, reduced in nature, has been a growing importance in Turkey's forestry policy in recent years. Therefore; in this study it was focused on Mediterranean hackberry (*Celtis australis* L.). This study was carried out on 2+0 bare root seedlings of Mediterranean hackberry which was an one of the most important species of Turkish flora to determine morphological variations among seven provenances of the species based on seedling height, root-collar diameter, fresh/dry weights of stem and root.

Large and significant differences ($0.05 > p$) among provenances and within provenance were found for seedling morphogenetic parameters based on results of variance analysis, and collected data. There were positive and significant ($0.05 > p$, $r > 0.4$) relations among the characters according to results of correlation analysis. Sinop-Duragan provenance showed better growth performance than other provenances. It is possible that the variation in morphological characters between provenances is due to resource availability at the time of fruiting and so to seed size.

Keywords: *Celtis*, Height, Diameter, Seedling, Nursery, Quality, Provenances



Biomass Conversion Factors, Expansion Factors and Leaf Dry Matter Content for Pinus Species

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Abstract: There are two generally accepted approaches to the calculation of woody biomass. First, allometric equations that allow estimation of tree biomass using easily measured tree properties (diameter, tree height etc.), the second is the use of biomass conversion factors (BCEF) and biomass expansion factors (BEF) in biomass determination. Biomass accounts with BCEF and BEF based on forest inventory data are rather frequently used for large-scale estimations. BCEFs was calculated from the ratio of considered biomass component [ton] and total stem volume of trees (m³) (BCEF=W/V). BEF is calculated from the ratio of the considered biomass component and stem biomass (BEF=W/V_{stem}). Leaf dry matter content (LDMC) is the ratio of leaf dry mass to fresh mass.

In this study, BEF and BCEF of three pine species were calculated. *Pinus brutia* (Ten.), *Pinus nigra* (Arnold.) and *Pinus sylvestris* (L.) are spread in 45% of forest area in Turkey. Sample trees were taken for *Pinus nigra*, 34 trees from Kızılcahamam, 40 from Zonguldak and for *Pinus sylvestris* (L.), 40 trees from Çerkeş, 36 from Erzurum and for *Pinus brutia* (Ten.) 40 trees from Adana. BEF, BCEF and LDMC values were given as total when there were belowground data in Kızılcahamam and Çerkeş samples.

As seen the table, *Pinus sylvestris* (planted) has the highest BCEF ratio and the *Pinus nigra* has the lowest. All LDMC values outside of *Pinus brutia* have similar values. It is understood that the higher dry matter content of *P. brutia* leaves may be due to the presence of a more arid growth environment.

Keywords: BEF, BCEF, LDMC, *Pinus nigra*, *Pinus sylvestris*, *Pinus brutia*



Global Warming and Eco-friendly Strategies to Fight with the Pine Processionary Moth, *Thaumetopoea pityocampa*

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Abstract: Global warming is the current increase in temperature of the Earth's surface both land and water. Both land and oceans are warmer now than record-keeping began in 1880. Average temperatures around the world have risen by 0.75°C (1.4°F) over the last 100 years about two thirds of this increase has occurred since 1975. This global warming affects all living things including human and ecosystems. For example, a rise in the Earth's temperature could lead to an increase in the number of insects worldwide.

Insects are among the groups of organism most likely to be affected by climate change because climate has a strong direct influence on their development, reproduction and survival. Moreover, insects have short generations times and high reproductive rates, so they can more like to respond quicker to climate change than long-lived other organisms, such as plants and vertebrates.

Thaumetopoea pityocampa, also known as the pine processionary moth is a good example for this issue. *Thaumetopoea pityocampa*, is a model insect indicator of global warming. It has been reported that the northwards and upwards range expansion of this Mediterranean species being directly associated with the recent warming up. Scientists in order to get necessary precautions try to get knowledge about the future drivers of this moth expansion from Western Europe to Turkey and then other countries.

As for the pest insects, the first come to mind is the chemical struggle. But it has long been known that this method affects not only the target harmful insect but also all living things in ecosystem, including man. For this reason, the use of eco-friendly methods of fighting the pine processionary moth is becoming widespread.

The purpose of this study is to explain the eco-friendly fighting methods used against this pest in the Mediterranean Region and discuss their effects.

Keywords: Global Warming, Pine Processionary Moth, *Thaumetopoea pityocampa*, Eco-friendly Strategies



The Viewpoint of Society to Forest Crimes and Punishment (Case of Küre Forestry Enterprise Directorate)

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Abstract: The protection of forests and forest resources in terms of sustainable forestry is very important. Society also needs legal rules for the protection and development of forests. The rules of law are available to everyone and should be known. Not knowing the rules does not reduce or remove the legal liability. Moreover, it is not enough that these rules exist only at the level of competence, it is also necessary to know and obey these rules of society. This depends on a durable and strong authority. Criminal law is a wide range of law area enacted and enforced for social order, those who do not comply with the rules of law and sanctions for their acts that would be considered criminal.

Legal rules that including forest crimes and punishments are occur an important legal field in Turkey of covered with forest 28,6%. Particularly, it is very important in terms of the people living in the forest to know the legal rules regulating the relationship with the forest and to know the sanctions they will face if they do not comply with these rules. In this context, it is very important that people must have knowledge of the forest crimes and punishments and to stay away from crime.

The aim of the study is to determine peoples' point of view of forestry crimes and penalties in the forest legislation in given region (living people in the villages of Küre Forestry Enterprise Directorate) via a questionnaire. If the society has enough knowledge about forest crimes and are followed by the rules, the effectiveness of the law will be high. This will be important in terms of reducing forest crime, preserving forests and transferring them to the generations to come, which means also that the purpose of the rules of law have been met. However, although the society is well informed about forest crime and if the forest crime is high in the selected area, it will be accepted as the effectiveness of the law is low.

There are 106 villages connected to 6 unit including Şenlik, Köşreli Ağı, Devrekhani, Küre and Uzunözü of Küre Forest Management Directorate selected as the study area. Survey work were made total of 355 people by through random sampling in proportion to the village population. In addition, in the study, these results were compared with the crime record and rates archived on the basis of the regional directorate, and it was aimed to determine the positive and negative differences between them.

At the end of the study, the public view of the forest crime and sanctions, which play an important role in the destruction of forests will be determined. Furthermore, awareness will be created by contributing to the adequacy of public awareness for the forest crimes and the effectiveness of the law during the updating of legal legislation. In addition results are thought to be able to guide in public awareness to forest enterprise directorates and educational institutions.

Keywords: Kastamonu, Küre, Forest Crimes, Forest Law, Community Awareness



Determination of Forest Management Purposes and Forest Functions in Accordance with the Participation and Multipurpose Utilization Principles

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Abstract: The aim of this study conducted is to determine the forest management purposes, which effect the forest management plans and therefore and the forestry works in all aspects, and the forest functions with a participatory approach. In this way, it is aimed to make the forest management plans made to be in compliance with the multi-purpose utilization and participation principles which are the main principles of sustainable forestry.

Drahna Forest Sub-District Directorate, which is affiliated to Ulus Forestry Operation Directorate of Zonguldak Regional Directorate of Forestry was selected as the planning unit. The forest villagers, which are the most important of the participatory groups, which have been living inside and around the forest area during both winter and summer for many years and therefore are a natural part of the forest ecosystem, were taken into consideration. A questionnaire form was prepared for the housings including questions of the participants in relation with their views on forests and forest resources, their ways of utilization and requests. The questionnaire forms were applied to each household head living in total of 185 houses in 11 forest villages located within the boundaries of the relevant sub-district directorate and in the case that the household head was not available, to people over 18. The data entry was performed by coding the data obtained from the questionnaire forms in SPSS version 22 program which is one of the statistical package programs. The management purposes and forest functions were determined with participatory approach by using the obtained data in explanatory factor analysis. 16 variables, which were the most suitable for factor analysis and had the highest correlation strength, were gathered under 6 factors of which the eigenvalues were higher than 1 and described 61.96% of the total variance together. The variables with low common variance (below 0.50) were excluded from the analysis in order to increase the accuracy of the analysis and to increase the value of the explained variance. The Rotated Factor Matrix was used in order to present the 16 variables with a more meaningful and actual expression based on the correlation strength between them and the factors were named based on their meanings. According to the factor analysis results, 2 main management purposes and 5 general management purposes, 3 main functions and 3 general forest functions emerged for the concerning plan unit based on the participatory approach. The main management purposes for the plan unit were determined as production and protection; the general management purposes as nature conservation, production of non-wood forest products, tourism and recreation, vegetative and animal production with wood production; the main forest functions as ecological, economic and sociocultural; the general forest functions as forest products production, nature conservation, ecotourism and recreation.

As the questionnaire studies and analyses contributed to the determination of the forest management purposes and functions with a participatory approach, they also contribute to the identification of the views of forest villagers and villagers on the forest ecosystem, demands, and suggestions and to reveal their socio-economic and cultural aspects.

Keywords: Bartın, Factor Analysis, Forest Management Plans, Multi-Purpose Utilization, Participation



The Impact of Silvicultural Applications and Environmental Cleaning Conditions on Landscape and Usage Values Highlands

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Abstract: Highlands are natural spaces where the individuals that appear beyond the tree limit and survive through the war zone continue to exist with their degraded crown and stem qualities. These areas, which exist right above the Alps forest boundary, are of great importance and invaluable in terms of grazing, recreation and natural landscape. Recently, the natural forms of these areas have been dramatically destroyed due to the overgrazing activities and unauthorized settlements. In this regard, silvicultural applications in the forests near the highlands appearing as glades and gaps in upper forest areas also have direct and indirect impacts on the landscape and usage values of these highlands. This study based on the original research results was carried out on 3 highlands (Uluyayla, Gezen and Zoni) in a forest area within the administrative boundaries of Bartın and Ulus districts. The altitude of these investigated highlands range from 1300 to 1470m. The size of them range from 10-120ha. The dominant stands on these highlands are generally comprised of mixed forest structures such as 'Scotch Pine + Fir' and 'Scotch Pine + Beech + Fir'. These stands are of generally multi-storied and also partly single-storied even-aged forms. These investigated forest forms were generally at the age of tending, and subjected to moderate and heavy high thinning interventions. On these highlands in the research area are carried out 80% grazing, 100% hunting and picnic and 45% camping activities. Accesses to highlands are, to a great extent, sufficient and the road density averagely ranges from 15-25 m/ha. A total of 250 persons from different levels of education were interviewed in the evaluations by the help of questionnaires. When the forest forms where tended areas were promoted through their photos were evaluated by the visitors, 'Scotch Pine + Beech + Fir' forest form where a 85.6% of moderate thinning treatments are made was preferred. It is followed by the form of 'Black Pine + Sessile Oak' with 14.4%. On the other hand, it was determined that road construction, intensive forest grazing and illegal construction and consequently environmental pollution (domestic and agricultural wastes) destroy natural structure, reduce their landscape and usage values considerably on these highlands and adjacent natural forest forms. The data obtained from the questionnaires was evaluated via the Dynamic Analytic Hierarchy Method and it was found that the following factors are effective on the landscape and usage values of highlands: **1.** Environmental pollution, **2.** False choice of recreation areas, **3.** Unplanned Exploitation, **4.** Lack of infrastructure, **5.** Improper Road Construction, **6.** Irregular utilization.

Keywords: Highland, Silviculture, Landscape, Recreation, Environmental Pollution, Stand Structure



Use of Lidar-Based Digital Terrain Model for Forest Road Planning

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Abstract: Light Detection and Ranging (LiDAR) is a relatively new technology that has brought forestry operation to a new level. This technology could be applied in terrain topography determination; vegetation structure measurement and stand-level attribute prediction. Digital elevation model (DEM) is a 3D representation of terrain's surface. Serving as a base for measurement, it is an essential component of terrain-related applications. Traditional methods relied on field survey and optical imagery which were time-consuming and labour-intensive, therefore restrained in forestry operation. LiDAR interpolation approaches was able to provide finer vertical elevation resolution where provincial DEMs were incapable of site level characterization. In this study, point cloud data and simultaneous aerial images were obtained by using Lidar Sensor (YellowScan Surveyor), which was placed on drone for first time in Turkey. This study tests the accuracy of forest road characteristics mapped using LiDAR in Istanbul University Research and Practice Forest. Comprehensive statistical and visual evaluations were completed for forest roads. The position, gradient, and total length of a simple forest road were accurately extracted using a 0.5 m DEM. In comparison to a field-surveyed centerline, the LiDAR-derived road exhibited a positional situation; the road grade difference and total road length difference of the field-surveyed were investigated for this simple road. Airborne LiDAR can provide thorough and accurate road inventory data to support forest management and watershed assessment activities.

Keywords: Aerial Lidar, UAV, Forest Road, YellowScan Surveyor, GIS.



Estimation of Forest Stand Volume using Drone Based Laser Scanner: Case study of Istanbul University Research and Practice Forest

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Abstract: Drone based laser scanning (DALS) is rapidly turning into a popular method for operational forest assessment. In this study, point cloud data and simultaneous aerial images were obtained by using Lidar Sensor (YellowScan Surveyor), which was placed on drone for first time in Turkey. About 20 hectares forested area was selected as test area in Istanbul University Research and Practice Forest (Figure 1: a). Comprehensive statistical and visual evaluations were completed for forest stands. The field data were collected in summer in 2017. 45 plots measured randomly in May (leaf on period) and 25 plots measured in October (leaf off period). Sampling in May is traditional forest management measurements and only diameter, height and species measured. Additional work has been done in October because the crown diameter and the number of trees in the plot are required for this study. Oak stands cover 95% of study area. Topcon GRS1 DGPS system was used to collect the coordinates at center of the plot. Sampling areas were taken in 300 m². In this study, statistical relations between crown diameter, DBH and height were investigated using plot survey data to determine forest volume from the DALS. Because crown diameter ($R^2 = 0.849$) and tree height ($R^2 = 0.732$) can be obtained using Lidar data with high accuracy (Figure 1: b). As a result, it is possible to estimate the dendrometric parameters of forest stands with high accuracy by using drone based lidar data alone or with a combination of different remote sensing data.

Keywords: Aerial Lidar, UAV, Stand Parameters, YellowScan Surveyor, Forestry



Revision Suggestions for Landscape Design of Bartın City Square

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Abstract: Squares are the most used areas among public outdoor spaces for socializing by people without any class distinction for gathering, meeting and transition areas from past to present. They are open spaces for those who live in or do not live in that cities, those who has come as visitor or just a passenger. Almost every city has a square. The squares are important corner stones that make a city be a city. It is expected that an urban square will have the characteristics of being accessible, secure, identifiable and legible for all.

When it is evaluated in terms of landscape architecture discipline, it is seen that Bartın Cumhuriyet Square does not fully meet the concept of square. In this study, it is aimed to identify the design deficiencies of the field in the functional-aesthetic direction and to offer suggestions.

The study area is located in the province of Bartın of West Black Sea Region. Bartın is a developing small city with a population of 193,577 according to TURKSTAT (2017) data. The city center which is located around the Bartın River has old and new settlements, historic buildings, symbolic elements and public open spaces. The Cumhuriyet Square, which has an area of approximately 6000 m², is an important area preferred by users in the urban public open spaces of Bartın. In spite of lack of spatial organization, lack of diversity of activities, of urban equipments and of plant materials are also striking. The area is surrounded by roads on east, west and south directions. In the north, there is an ordered and adjacent structure block. There are food and beverage places, shopping malls and buffets on the ground floors of these buildings which are related to the square. The west side is used as a open market place/ parking area; right behind them are public service buildings and hotels. The adjacent structures on the west and north facades give the area a semi-enclosed square. Some important spots such as the local market (*Galla Pazari* in local dialect), the Municipality Park, the Courthouse and the Revenue Office and historical buildings such as Hammam (Turkish bath), Arab Mosque and Fountain are located near the area. The existing square and common usage areas of public service buildings (the Courthouse and the Revenue Office) in the east have been evaluated jointly in terms of spatial organization.

As a result, 3 different landscape designs of this area, which is located in the center of Bartın, have been made to bring the square into the forefront. The principles of being "Accessible, Secure, Identity, and Legible" during the design phase are kept on the frontline. These designs are expected to contribute to the city in terms of aesthetic and functionality, as well as to and create a space for user gathering-meeting-transition including urban symbols.

Keywords: Bartın, Urban Space, Public Space, Square, Landscape Design



Assesment of the Cultural Heritage of Amasra in terms of Landscape Architecture

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Abstract: Cultural heritage is defined as elements which are passed down from past generations and which have universal value. According to the Convention Concerning the Protection of the World Cultural and Natural Heritage accepted in 1972, cultural heritage is composed of three elements which are monuments, groups of buildings and sites. Throughout history, such factors as natural disasters and wars have caused to the destruction of natural and cultural heritage while today, such factors as the increase in population, migration, rapid urbanization causes to this destruction. Spatial planning is an effective tool for the protection of natural and cultural heritage. In addition, it contributes to the development of socio-economic and community life quality.

In 2013, Amasra was added to the UNESCO Temporary World Heritage List as a result of the application of Ukraine with the settlements dating back to Genoese period. This was an important factor in choosing Amasra as the field of study. Amasra, a town of Bartın province in Western Black Sea Region, bears the traces of different civilizations. Increasing urbanization pressures and tourism density which pushes the capacity of Amasra especially during summer time increase the threat on cultural heritage.

The purpose of this study was to determine the cultural heritage of Amasra and to evaluate them from the viewpoint of landscape architecture. In this scope, answers to the following research questions were sought for: “What are the cultural heritage elements in the area? What can be done regarding landscape management in terms of protecting the cultural heritage of Amasra and ensuring its sustainability?”. The study was completed in three phases. In the data collection phase, documents and information on the cultural heritage of Amasra were collected and studies carried out on the topic and the area were examined. In the analysis phase, data which could be spatially analysed were mapped. Finally, in the evaluation phase, landscape management suggestions on the protection and sustainability of Amasra’s cultural heritage were given.

It is known that Amasra has tangible and intangible cultural heritage including registered city walls and building ruins, registered civic architecture, religious buildings belonging to different beliefs in the Kaleiçi area, traditional manufacturing and handicrafts etc. Protection and sustainability of this heritage is only possible through a holistic spatial planning. In this context, urbanization should be under control and traditional texture should be reflected in the new buildings. Measures should be taken towards preventing cultural heritage towards damage that could be caused by unforeseen natural disasters and foreseen human effect or minimizing their impact. Priority should be given to the reconstruction of heritage that should be enhanced. In order to sustain intangible cultural heritage, traditional life style, folk culture and handicrafts should be popularized. In this scope, using the registered architectural buildings for cultural and arts activities will enable sustaining the cultural heritage. Finally, involving all stakeholders and particularly, the people in Amasra in the strategic decisions taken by the management mechanism regarding the protection and sustainability of cultural heritage will increase success in management.

Keywords: Spatial Planning, Landscape Management, Cultural Landscape, Sustainability, Bartın.



The Paris Agreement: A New Hope for Forest?

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Abstract: The Paris Agreement, which is considered to have put an end to the stationary period of international climate policies, signed by 195 countries and the EU on December 12, 2015, at COP 21 the most successful climate change parties conference. Turkey became a party to the agreement on April 22, 2016 but not included in the national law yet. While this situation has various political and legal grounds for the parties, the most important obstacle for Turkey is that it is placed in developed countries category in the Paris Agreement as a member of the OECD. Because, all parties to the agreement will effort on CO₂ reduction and harmonization and developing countries will be supported by the green fund, which will cost \$ 100 billion / year by 2020 to the developed countries. Finance, technology transfer and capacity building of that fund is needed for Turkey to fulfill the responsibilities arising from the agreement. Therefore, Turkey has requested a special status as such in the Kyoto Protocol for Paris Agreement. But it has not been concluded yet. In other words, the situation that whether Turkey is a developed country in Paris Agreement have a remarkable significance.

The main goal of the Paris Agreement, an important step in the mitigating with global climate change, is to hold the increase in temperature at a level of 2 °C and is even limited to 1,5 °C until 2030. The realization of this goal depends on reducing CO₂ emissions, which is why countries need to reduce greenhouse gas emissions from fossil fuel use, land use change and deforestation. When Turkey became a party to the Paris Agreement, it will be obliged to fulfill commitments after 2020. It will be necessary for Turkey to protect and increase its forest areas with together other measures.

The aim of the study in terms of the responsibilities of the Paris Agreement is to determine the adequacy level of forest legislation on the protection and enhancement of forest areas. In this context, the provisions of the Paris Agreement will be compared with the provisions of national legislation in Turkey and the contribution to be made in the protection of the forests will be revealed.

Keywords: Forest, Law, Paris Agreement, Climate change, Turkey



The Effect of Chip Size on the Particleboard Properties

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Abstract: The geometry of chips used in particleboard production is one of the important factors affecting board properties. In this research, effects of chip size change on particleboard properties were investigated. In the production of test boards, 40% softwood, 45% hardwood chips and 15% mixed sawdust was used. Three layered test boards were produced using 12% urea formaldehyde (UF) resin in the surface layers and 8% in the middle layer. According to the obtained results, it was found that the mechanical properties improved with increasing the surface and middle layer chip sizes, especially the screw withdrawal strength increased by 5.3%. However, it was determined that water uptake and thickness swelling values were adversely affected by an average of 5.5%. It has been found that as the middle layer chip sizes remain constant while the top layer chip sizes increase, the surface soundness improves, whereas as the middle layer chip sizes increase, the surface hardness decreases

Keywords: Wood Based Boards, Particleboard, Chip Size, Particle Geometry Physical and Mechanical Properties



Effect of Sanding Process on Board Properties in Particleboard Production

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Abstract: One of the factors that affect the properties of wood based boards is the working techniques and features of the machines and equipment used in production. There are significant differences in efficiency and quality between continuous press technologies and multi storey press technologies used in the production of wood based panels. In the production with multi storey press technology, sanding process causes significant loss of raw materials and some properties are adversely affected. In this study, changes in the properties of particleboards produced after sanding in multi storey press were examined. According to the results obtained, it was determined that the sanding process caused the board thicknesses to fall between 5% and 8%, thus causing raw material loss. The board density tended to decline and it was found that it is decreased by 0.5% to 1.7% on average. Other features did not change significantly.

Keywords: Wood Based Boards, Particleboard; Sanding, Physical and Mechanical Properties, Multi Storey Press



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Karabük Urban Forest Carbon Capture Potential

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Abstract: Urban forests are important in terms of landscape, as well as in community health and fresh air production. The Karabük urban forest selected as a study area was planted from the species of black pine and red pine. The diameter of the trees was measured in 27 samples area taken from the urban forest. The amount of biomass present in the area is calculated. Biomass is important for determining the carbon that trees attach to the atmosphere. Using the allometric biomass equations, it was estimated that the area contained 111.43 tons / ha biomass in the field and 56.83 tons / ha carbon. If the trees increase their diameter by 0.5 cm, it is determined that they produce 6.38 ton / ha biomass production and 3.25 ton / ha / year carbon. At this time, 7.66 tons / ha / year of oxygen production was calculated.

Keywords: Biomass, Carbon Capture, Oxygen Production, Karabük Urban Forest

**Rehabilitated Streets and Tourism Relation in Historic Towns: Bartın Çeşmeyanı Street**

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Abstract: Historical environments in general are spaces which have the traces that belong to the socio-cultural structure of the user as well as physical elements such as monumental constructions, traditional houses, and archaeological sites. Depending on the scale, historical environments can be subdivided into three groups: textures formed by one or several streets, urban settlements formed by textures, and the regions including several cities that integrate historical, architectural, archaeological and monumental values. To protect historical sites is aimed for reasons such as maintaining historical and cultural continuity, preserving silhouette and landscape values, and creating a source of income for tourism. Today, not only the physical space, but also the sense of protection of the social texture is at the forefront. In this context, it is aimed to rehabilitate the historical environment which is kind of building structure in line with the contemporary living conditions, as well as to protect the urban identity. Street rehabilitation projects are also one of the protection works. It will be possible with street rehabilitation projects to protect street-side gardens of the buildings, garden walls, urban equipment elements and all other architectural elements along with the original street texture, to sustain streets with rehabilitation, and to add rehabilitated ones into everyday life.

In connection with conservation of historic surroundings such works as street rehabilitation and building restoration have been carried out in Bartın, which has been a member of the Association of Historical Towns since 2000. Çeşmeyanı Street of Bartın City, located in the Western Black Sea Region, has been selected as a study area because of the intense examples of traditional civil architecture. The aim of the study is to evaluate Çeşmeyanı Street with tourism-oriented street rehabilitation. In this context, we sought for an answer to these questions: “What is the importance of street rehabilitation activities to tourism in historical environment? What can be done?” The research has been carried out in four stages as data collection, field study, SWOT analysis, results and recommendations.

As a result of the research, preservation principles and suggestions have been developed for historic buildings, new buildings built and to-be-built in historical surroundings, urban equipment elements, and historical buildings that changed their functions in Çeşmeyanı Street, which is evaluated in terms of tourism. For example, the facades, roofs, masses and length of structures to be built should not distort the street silhouette. Urban equipment elements such as lighting elements, benches, directional signs et cetera should be in harmony with street texture. Some of the historical buildings on the street can be used as restaurants where local cuisine can be eaten or as a workshop and culture centre where traditional handicrafts can be done. The streets can be enriched with photo-taking places and places where incoming tourists can take a rest.

As a result, it has been determined that Çeşmeyanı Street, which reflects the identity of Bartın with its historical texture, has the potential to create new resource values in terms of tourism when evaluated in line with these suggestions.

Keywords: Landscape Design, Historical Environment, Street Rehabilitation, Tourism, Protection, Bartın



Effects of Ejector Outlet and Exhaust Inlet Angles on a Fuel Ejector Performance for Solid Oxide Fuel Cells

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Abstract: The anode exhaust of Solid Oxide Fuel Cell (SOFC) contains some amounts of unused hydrogen and steam depending on the fuel utilization efficiency. The ejector systems are capable of the recirculation of the unused hydrogen and steam. The steam is not only necessary for preventing from the carbon depositions and initiation of the reactions in the reformer, but the removal of the external water vapor generator from the system is also possible. In addition, the overall system efficiency can be improved by recirculation of the unused hydrogen in the anode exhaust gas. The steam to carbon ratio (STCR) and entrainment ratio, which can be maximized by modifying the ejector geometric dimensions, are the main parameters for the determination of the performance of an ejector for the SOFC systems. In this study, 20 different design points related with exhaust inlet angle (α : 0°, 15°, 30° and 45°) and second nozzle diverging angle (β : 1°, 3°, 5°, 7° and 9°) are investigated to determine the maximum STCR and entrainment ratio via the numerical analyses for a micro combined heat and power systems based on 4 kW SOFC, using methane as fuel. The results show that the second nozzle diverging angle, β , is more effective than exhaust inlet angle, α , on the performance of the ejector. Both STCR and the entrainment ratio are found to increase slightly with increasing α . Similarly, STCR and entrainment ratio are found to increase to some extent with increasing β up to 5°. A further increase in β , on the other hand, leads to a sharp decrease in both STCR and the entrainment. The entrainment ratio and STCR are determined as 8.36 and 2.95, respectively for a specific design point created in the study.

Keywords: Ejector, SOFC, Geometrical Design, Entrainment Ratio, Steam To Carbon Ratio



Influence of Anode Exhaust Gas Flow Direction on the Performance of a Fuel Ejector Performance for Solid Oxide Fuel Cells

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Abstract: The anode exhaust gas of solid oxide fuel cell running on hydrocarbon fuels includes some amounts of unused hydrogen and steam produced as a result of electrochemical reactions, depending on the fuel utilization efficiency as well as operating conditions. The recirculation of this exhaust gas by means of a fuel ejector can improve the overall system efficiency due to recirculating unused hydrogen fuel. The system cost and sizes can be also reduced since an additional steam generator unit for the reforming reaction is not required. As a result, compact and efficient SOFC systems can be designed. In this study, numerical investigations on the performance of a fuel ejector for a solid oxide fuel cell system fed by methane as a function of anode exhaust gas flow direction are presented. For a SOFC ejector, steam to carbon ratio and entrainment ratio are two significant ejector parameters. It is essential to obtain adequate amount of water vapor for the reforming reaction without any additional unit. Moreover, high steam to carbon ratio is required for carbon free operation. The amount of hydrogen entrained is also important since it directly affects the system efficiency. Therefore, the ejector performance is evaluated mainly by considering entrainment and steam to carbon ratio. The effects of the anode exhaust gas flow direction on the pressure, velocity, temperature and species distributions in the ejector are also numerically investigated together with some other ejector geometric parameters. The results reveal that this flow direction is one of the critical ejector design parameters since it affects significantly both the entrainment and steam to carbon ratio.

Keywords: Ejector, SOFC, Flow Direction, Steam To Carbon Ratio, Entrainment Ratio



Corrosion Properties of Coatings Produced on Surface of Weldox 700 Steel

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Abstract: In this study, it is aimed to improve the surface properties of Weldox 700 steel. Three different coatings were coated on the Weldox 700 steel surface using high speed oxyfuel (HVOF) spray method. The coating powder used was Diamalloy 2001, Sulzer Metco 5810 and Diamalloy 4454 commercial powders. The powders used contain NiCrBSi, WCCo and CoNiCrAlY, respectively. Constant parameters are used as overlay parameters. Microstructure, hardness and corrosion properties of the produced coatings have been examined in detail. Microstructure and phase composition of coatings were investigated by optical microscope (OM), scanning electron microscopy (SEM), X-ray diffractogram (XRD), energy dispersive spectroscopy (EDS). Hardness measurements were made only on the upper surfaces of the coatings using a microhardness equipment. Coatings were immersed in an aqueous solution of 3.5 wt.-percent NaCl at pH 3 for potentiodynamic and corrosion rate measurements. NiCrBSi, WCCo and CoNiCrAlY based coatings have been successfully produced on the Weldox 700 steel surface with HVOF. SEM and optical photographs show that coatings have a generally homogeneous structure. It is also seen that the manufactured coatings have a lamellar structure positioned parallel to each other. Microstructure was determined by XRD analysis of double and triple carbides and hard phases. The mean hardness values of the coatings varied from 285 HV_{0.5} to 740 HV_{0.5}, respectively. There was a 2.8 times increase in hardness of the coatings to the lower layer (265 HV_{0.5}). This increase in hardness is related to the hard-metallographic phases occurring in the coating layer. Depending on the type of coating, there are differences in the corrosion resistance of the coatings.

Keywords: Weldox 700 steel, HVOF, Surface Coating, Corrosion, Hardness, Microstructure



A Stand-alone PV Systems Sizing to Supply the Energy Demand of a House in Kastamonu, Turkey

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Abstract: A stand-alone photovoltaic (PV) systems supply the energy demand in far regions from the electrical grid. These systems generate electricity (direct current, DC) from PV modules during the daylight and then, store it in the batteries. On the other hand, the energy demand is supplied from the batteries by charge controller, when the daylight is not effective. This control unit, which is used to prevent the damage of the battery in the event of overcharging and discharging, cuts off the current supplied by the PV modules or the current drawn by loads according to the capacity of the batteries. DC power in this system is converted to sine wave by the adding an inverter to the system, when there is the demand of the alternative current (AC) power which is required for the electrical devices. This work presents a step by step procedure about mathematical analysing for a design of a stand-alone PV systems sizing on the supplying energy demand of a house in order to determine the PV systems equipment's for instance battery sizing, PV array sizing, inverter, etc. The system design includes the important parameters as PV module guaranteed power output at Standard Test Condition (AM1.5, 25°C, 1000W/m²) and the operating temperature in a specific location, i.e. Kastamonu, Turkey. Finally, the analysing results demonstrate the effectiveness of the proposed system on the supplying the energy demand of a house by a stand-alone PV system.

Keywords: A Stand-alone PV Systems, the PV Systems Equipment's, PV Modules, Sizing, Kastamonu-Turkey.



Synthesis, Characterization and Activity Comparison of Alumina Supported Ni-Ce Catalysts for Methane Dry Reforming

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Abstract: In this study, alumina supported Ni-Ce catalysts were prepared and activity tests were performed in dry reforming of methane. The support alumina (SGA) was synthesized by using a new sol-gel method in an inert N₂ environment. Alumina supported Ni-Ce catalysts which includes Ni (5% by weight) and Ce (3% by weight) were synthesized by impregnation (Ni-Ce@SGA) and one-pot methods (Ni-Ce-SGA). The physical and structural properties of the catalysts were determined by using some characterization methods such as N₂ adsorption-desorption, XRD, XPS, ICP-MS, TGA, SEM and TPR analyzes. Both Ni-Ce@SGA and Ni-Ce-SGA are consistent with type IV according to IUPAC classification, which are typical for mesoporous materials with ordered pore structure. The characteristic peaks of elemental nickel and γ -Al₂O₃ with amorphous structure were observed in the XRD pattern of Ni-Ce@SGA. On the other hand, only the elemental nickel crystalline structure was determined in Ni-Ce-SGA. However, no peak corresponding to Ce was observed in the XRD patterns of the synthesized catalysts. The XPS analysis of the catalysts showed that elemental Ni, NiO and NiAl₂O₄ were formed. The Ni-Ce@SGA catalyst, prepared following impregnation method, showed stable activity during 4 h methane dry reforming activity test. However, Ni-Ce-SGA catalysts, prepared following one-pot sol-gel method, lost its activity after 90 minutes due to having higher Ni crystal size. The results showed that synthesis procedure has a significant effect on activity of the catalysts. Fast gel formation during the one-pot synthesis of the Ni-Ce-SGA is one of the possible explanation of this deactivation. TGA analysis and SEM images of the catalysts are consistent with each other, indicating coke deposition over the Ni-Ce-SGA catalyst.

Acknowledgment: Gazi University Research Funds (Grant BAP 06/2017-10) are gratefully acknowledged

Keywords: Dry Reforming, Ni-Ce, Alumina, Sol-Gel, Catalyst



Gene Regulation Network behind Micronutrient Toxicity Tolerance in Poplar

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Abstract: Boron (B) is an essential nutrient for normal growth of plants. Despite its low abundance in soils, it could be highly toxic to plants in especially arid and semi-arid environments. Poplars are known to be tolerant species to B toxicity and accumulation. However, physiological and gene regulation responses of these trees to B toxicity have not been investigated yet. Here, B accumulation and tolerance level of black poplar clones were firstly tested in the current study. Rooted cutting of these clones were treated with elevated B toxicity to select the most B accumulator and tolerant genotype. Then we carried out a microarray based transcriptome experiment on the leaves and roots of this genotype to find out transcriptional networks, genes and molecular mechanisms behind B toxicity tolerance. The results of the study indicated that black poplar is quite suitable for phytoremediation of B pollution. It could resist 15 ppm soil B content and >1500 ppm B accumulation in leaves, which are highly toxic concentrations for almost all agricultural plants. Transcriptomics results of study revealed totally 1625 and 1419 altered probe sets under 15 ppm B toxicity in leaf and root tissues, respectively. The highest induction were recorded for the probes sets annotated to tyrosine aminotransferase, ATP binding cassette transporters, glutathione S transferases and metalochaperone proteins. Strong up regulation of these genes attributed to internal excretion of B into the cell vacuole and existence of B detoxification processes in black poplar. Many other candidate genes functional in signalling, gene regulation, antioxidation, B uptake and transport processes were also identified in this hyper B accumulator plant for the first time with the current study.

Keywords: Poplar, Boron Toxicity, Microarray, Transcriptome

**Environmental Genotoxic Effects in Aquatic Organisms, Iskenderun Gulf Example*****Sükran ÇAKIR ARICA^{1*}, Ayşe ÖZYILMAZ¹, Sevil DEMİRCİ¹, Dilşat BOZDOĞAN KONUŞKAN²****¹Iskenderun Technical University, Faculty of Marine Science and Technology, Iskenderun- Hatay, TURKEY**²Mustafa Kemal University, Department of Food Engineering, Faculty of Agriculture, Hatay, TURKEY***Corresponding Author: sukran.cakir@iste.edu.tr*

Abstract: The increase in urbanization, demography and industrial activity, along with growing human needs have exponentially intensified pollution. In particular, the discharge of heavy metals into the marine ecosystem is a problem of global magnitude due to their toxicity, genotoxicity and bioaccumulation. Some aquatic organisms are indicators of the living conditions and genotoxicity. The accumulation of heavy metals such as lead (Pb), iron (Fe), zinc (Zn), cadmium (Cd) and chromium (Cr) has been extensively investigated in organisms usually in the first stage of the aquatic nutritional chain, such as crabs, shrimp or algae. This exposure of aquatic organisms to a variety of genotoxic chemicals raises the question about the potential effects of exposure on the health status of both current and future aquatic populations. Therefore, there are many studies on the genotoxic effect of these harmful wastes in the cells of aquatic organisms.

In this context, there are studies on heavy metal pollution and antibiotic resistance and genotoxicity in aquatic living specimens from the Iskenderun Gulf. In this study, a broad summary of the genotoxicity studies carried out with samples from the Gulf of Iskenderun will be given and the genotoxic effects of environmental pollution will be highlighted. It is important to note that this genotoxicity have also negative effects on the sustainability of aquatic biodiversity. In addition, we should not ignore the negative effect of these aquatic products on human health.

Keywords: Genotoxicity, Aquatic Organisms, Iskenderun Gulf, Pollution, Sustainability, Human Health



Basic Helix-Loop-Helix Protein Characterization in Rainbow Trout Genome at Bioinformatics Level

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Abstract: Basic helix-loop-helix (bHLH) is a dimeric structured transcription factor found in almost all eukaryotes. Due to the diversity and variety of their functions, they have been the subject of many kinds of studies in plants, animals and fungi. Rainbow trout (*Oncorhynchus mykiss*) is a fish species that lives in sweet waters and more preferred than other trout species because of fast growing. Although its genome research has been published, the study of bHLH protein characterization for this fish has not been done before. The NCBI database was used to identify protein fragments of rainbow trout. Obtained protein data were screened in the PFAM database to check for the presence of the corresponding bHLH domains. Similar sequences to the previously described bHLH protein were identified. The exon-intron structures of these proteins, named according to their chromosome location, were detected by GSDS software. ExPASy ProtParam web tool revealed the biochemical functions of these proteins. With Phyre2 software, possible 3-dimensional structures were estimated. Protected motifs of OmybHLH proteins were identified using Meme Suit software. Gene ontology analysis was performed with Blast2GO software. The molecular functions, biological process and cellular localization of *OmybHLH* genes were determined. Finally, using the MEGA7 program with Maximum Likelihood method, the evolutionary relationship between OmybHLH proteins was revealed. A total of 441 *OmybHLH* genes were detected in the rainbow trout genome and distributed between 1 to 29 chromosomes. With 29 *OmybHLH* genes, the highest number of genes were carried on the 7th chromosome. Eleven *OmybHLH* genes with no genomic location were collected under scaffold level. According to result of 3-D structure estimation, protein-specific alpha helix motif was observed in almost all of the proteins. Twelve different motif templates were identified in the OmybHLH proteins. When the exon-intron structure analysis was examined, it was seen that the intron regions of 29 *OmybHLH* genes were not found. It has been found that *OmybHLH* genes were located in different parts of the cell and played an important role in transcriptional factor analysis. In this study, *OmybHLH* genes in the rainbow trout genome were identified and functions of these genes were tried to be detected. Members of the *bHLH* gene family play an important role in cell renewal and differentiation, stem cell formation and the formation and development of nerve cells. Along with the sequencing of the new genomes, new family members including *bHLH* gene will be identified and will have more information about the functions of these mechanisms.

Keywords: bHLHs, *Oncorhynchus mykiss*, Genome Wide Analysis, Molecular Characterization



Identification and Characterization of *CSP* Genes in *Oncorhynchus mykiss* Genome

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Abstract: Temperature is an important environmental stress and rapid decreases in water temperature may result in a number of physiological, behavioral and fitness consequences for fishes termed as ‘cold shock’. Fishes require adaptive responses for cold shock, such as to synthesize ‘Cold Shock Proteins (CSPs)’. Cold shock proteins are a protein family which has function on membrane composition, cell division and protein synthesis. Beside of that, the full function and response mechanism of CSPs have not been well known. Rainbow trout (*Oncorhynchus mykiss*) is one of the most economically important aquaculture species, with lethal temperatures below 0 °C and above 29.4 °C. In this study, 60 Cold Shock Protein family members were detected in *Oncorhynchus mykiss* genome. The lengths of ClaHsp60 proteins were ranged between 158 and 1862 amino acids and their molecular weights varied between 6 and 178 kDa. *OmyCSP* genes were mapped on 11 chromosomes of rainbow trout. The most of *OmyCSP* genes were located on Chromosome 9 with the number of 23 and Chromosome 16 with the number of 21. The phylogenetic tree of *OmyCSP* proteins displayed 5 district classes which were compatible with their motif compositions and gene structure. Predominantly, 3 motif patterns and 5 gene structure patterns were observed. Based on Gene Ontology analysis, the predicted molecular function was binding activity and they had roles on regulation of biological, metabolic and cellular processes. According to miRNA-target analysis, 25 of *OmyCSP* transcripts were targeted by 90 different miRNAs. This kind of gene identification studies open new perspectives to analyze functions of Cold Shock Protein family members in fishes.

Keywords: Rainbow Trout, Cold Shock Proteins, Genome-wide Identification, Molecular Characterization



Bioinformatics Analysis of *CSP* Genes in Genome of Atlantic Salmon

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Abstract: This study is aimed to characterize the *CSP* (Cold-shock proteins) genes in genome of Atlantic salmon (*Salmo salar*). *CSPs* are primary genes which are responsible for overcoming the deleterious effects of cold shock. In addition, they have roles in regulation of osmotic, oxidative, starvation, pH and ethanol stress tolerance. The Atlantic salmon is an indicator and iconic species in the north Atlantic Ocean. This species indicates general environmental health of its surroundings. Whole genome sequence of Atlantic salmon is public available whereas there is no study about *CSP* genes in this fish. Protein sequences of *CSPs* was found from NCBI database and domains were screened by Pfam database. Gene Structure Display Server database was used for defining of exon-intron structures of salmon *CSP* genes. Conserved motifs in the *CSPs* were also identified by using Meme-Suite software. The Phyre2 program was utilized to determine the predicted three-dimensional structures of salmon *CSP* proteins. Blast2GO program was employed to analyze of gene ontology such as biological process, molecular function and cellular emplacement of salmon *CSPs*. psRNA Server Target database was operated for determination of miRNAs that target Atlantic salmon *CSP* transcripts. Sequence alignments were performed using ClustalW software before revealing the evolutionary relationships of *CSPs*. Afterwards, phylogenetic tree was constructed by MEGA7 program. According to the results, 86 of salmon *CSP* genes (called as *SsaCSP*) were identified in the salmon genome. The 15th chromosome of salmon contained the highest number of *CSP* with 23 genes. Surprisingly, all of the *SsaCSP* genes had introns. A total of 5 different motif patterns were detected in the *SsaCSPs*. The predicted three-dimensional structure of *SsaCSPs* showed that the alpha helix structural motif was predominant which was consistent with the literature. This group of proteins had mainly function in biological regulation processes. In addition, *SsaCSP* transcripts were targeted by 116 different miRNAs. According to the phylogenetic tree, *SsaCSPs* were divided into 9 different clusters. Determination of *SsaCSPs* could offer new opportunities for the researchers to understand the effect of these proteins in cold tolerance in Atlantic salmon.

Keywords: *CSP* Gene, *Salmo salar*, Molecular Characterization, Bioinformatics, Gene Analysis



Molecular Characterization of bHLH Proteins in *Salmo salar* Genome

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Abstract: The basic helix-loop-helix (bHLH) proteins are a large family of eukaryotic transcription factors and play a central role in the metabolic, physiological and developmental processes. bHLH protein has a special structural motif that characterizes a transcription factor family. The motif has two alpha-helices which connected by a loop. Atlantic salmon belongs to Salmonidae family and one of the most aqua-cultured marine fishes. Genome sequence of Atlantic salmon was published in 2016. However, bHLH proteins have not been characterized. NCBI database was used for the source of the protein sequences of Atlantic salmon. bHLH domains were screened by using Pfam database. Conserved motifs in the defined salmon bHLH proteins were elucidated by Meme-Suite software. The Phyre2 and MEGA7 programs were utilized for determination of the predicated three-dimensional structures of salmon bHLH proteins and phylogenetic relationships between these proteins, respectively. Gene ontology analysis were conducted by Blast2GO program. miRNAs for salmon bHLH transcripts were elucidated by psRNA Server Target database. The highest number of salmon *SsabHLH* genes were defined in the salmon genome in which 546 individual *bHLH* genes were identified. The amino acid content of the *SsabHLH* proteins were between 81 and 3409 aa in length. Five variable motif patterns were found in the *SsabHLH* proteins. Alpha helices were dominant structures in the *SsabHLH* proteins. This group of proteins in salmon were group into 5 different classes based on the phylogenetic tree. Dominant biological function of *SsabHLH* proteins were in biological process regulation. In addition, they were mainly located in the organelles and cell. A total of 320 different miRNAs targeted *SsabHLH* gene transcripts. Identification of *SsabHLH* proteins in salmon may be enable to elucidate metabolic, physiological and developmental processes in the fish.

Keywords: *bHLH* Gene, Atlantic Salmon, Genome-wide Identification, Phylogenetic Tree, miRNA

**Genome-wide Identification of *bHLH* Genes in Common Carp (*Cyprinus carpio*)**

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Abstract: Basic helix-loop-helix proteins (bHLH) comprise of super family of transcription factor regulators which are included in sex determination, muscle and neural development processes. Common carp (*Cyprinus carpio L.*) has been extensively produced in fish breeding. Up to date, *bHLH* genes have not been characterized in genome of common carp yet. NCBI database was utilized to retrieve of carp protein data. After that, Pfam accession numbers of bHLH domain were searched in this data. Proteins including bHLH domain were arranged by their chromosomal location. GSDS (Gene Structure Display Server) software was used for determination of exon-intron structure. Biochemical features of determined proteins were evaluated by ExPASy ProtParam tool. Meme Suit and Phyre2 software were used to define conserved motifs and 3D structures of the proteins, respectively. miRNAs for carp *bHLH* transcripts were found out by psRNATarget software. Gene ontology analysis was carried out by Blast2GO program. A total of 319 carp *CcabHLH* genes were identified and their amino acid lengths were ranged between 63 and 2068 aa. A total of 19 *CcabHLH* genes have no introns and alpha helices were dominant form in predicated 3D structure of the proteins. More than 14 different motifs were determined in *CcabHLH* proteins. Besides, 291 different miRNAs were targeted to *CcabHLH* transcripts. This group of proteins had roles in regulation and metabolic processes and were especially in organelles and other parts of the cell. In addition, their mode of action was based on nucleic acid binding and transcription factor activity. Determination and characterization of bHLH proteins in common carp may provide useful data for future cloning and functional studies for these genes to elucidate their roles.

Keywords: bHLH Genes, *Cyprinus carpio*, Genome Wide Identification, Gene Ontology, miRNA



Genome Wide Characterization of Cold-Shock Proteins in Common Carp

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Abstract: Cold-shock protein (CSP) family is one of the transcriptional regulators and determined firstly in *E. coli*. This group of proteins are known to help cells to survive in the cold temperatures. Carps (*Cyprinus carpio* L.) are widely distributed around the world and in Turkey. They are an economically valuable species for fish breeding. In our knowledge, *CSP* gene family members have not been characterized in common carp genome yet. Protein sequence data belonging to carp were retrieved from NCBI database and checked for CSP domain in Pfam database. Exon and intron organization of *CSP* genes were evaluated by GSDS (Gene Structure Display Server) software. Conserved motifs of these proteins were determined by MEME software. PHYRE2 was utilized to verify 3D structure of the proteins. miRNAs which targeted to carp CSP transcripts were determined by psRNATarget software. Evolutionary relations between carp CSPs and their gene ontology analysis were conducted by using MEGA7 and Blast2GO programs, respectively. As a result, 31 carp *CcaCSP* genes were detected and all of them have introns. Their amino acid lengths and molecular weights were varied from 101 to 846 aa and from 1.0 to 9.9 kDa, respectively. *CcaCSP* genes were targeted by 39 different miRNAs. *CcaCSP-31* gene were the most targeted gene among *CcaCSP* genes by 13 different miRNAs. *CcaCSP*s were divided into 8 phylogenetic groups based on the evolutionary tree. These group of proteins were mainly located in the organelles and played important roles in metabolic processes and biological regulation. They acted as nucleic acid binding property based on Blast2GO analysis. Determination and characterization of CSPs in common carp genome will provide valuable information when considering about their roles in cold stress response in the organisms.

Keywords: CSPs, *Cyprinus carpio*, Gene Ontology, Phylogenetic Tree, Bioinformatics



Determination of Yield and Agricultural Characteristics of Chickpea (*Cicer arietinum* L.) Genotypes Yozgat Ecological Conditions

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Abstract: This study was conducted to grain yield and some agriculture characteristics of chickpea genotypes (*Cicer arietinum* L.) in Yozgat ecological conditions during 2010 and 2011 years. The experiment was arranged in randomized complete block design with three replications. Twenty five genotypes (55-C, 63-C, 18-C, Işık-05, Sarı-98, Gökçe, Aziziye-94, Uzunlu-99, Gülümser, Taek-Sagel, Hisar, İnci, Yaşa-05, Küsmen-99, Canitez-87, Azkan, İzmir-92, Çağatay, Menemen-92, Akçin-91, Damla-89, Aksu, Cevdet bey ve Diyar-95 and local genotypes) were used in present study. In this study; duration to emergence, duration to flowering, pod period, duration to maturity, plant height, number of main brunch, first pod height, number of pod per plant, number of grains per plant, thousand grain weight, biomass yield, grain yield and straw yield were investigated. According to combined results, duration to emergence and duration to maturity were ranged 16-20 and 94-97 day, respectively. The highest biomass yield, grain yield and straw yield was obtained from cultivars Azkan (308.3, 149.0, and 159.3 kg/da, respectively), Çağatay (274.4, 112.7, 161.6 kg/da, respectively) and Diyar-95 (252.8, 112.9, 139.9 kg/da, respectively.. thousand grain weight was ranged 282.4 to 464.0 g. The lowest first pod height was determined 21.10 cm (local genotype), while the highest was measured 28.45 cm (cultivar Cevdet bey).

According to two years results, cultivars Azkan, Çağatay, Diyar-95 and Cevdet Bey can be recommended in Yozgat ecological conditions for grain yield.

Keywords: Chickpea, Genotype, Grain Yield, Biomass Yield, Yozgat



Agricultural Potential of Bilecik Province

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Abstract: Bilecik which is include of Marmara, Black Sea, Central Anatolia and Aegean Region and it is only province in Turkey which is the territory in four geographical regions. Although, Bilecik industry is being developed, the place of agriculture in employment is undeniable. The proportion of people living in rural areas is 20% in Bilecik province.

Bilecik province is in the 66th place in terms of agricultural areas in Turkey. The total agricultural area is about 125 thousand hectares while 75 thousand hectares and of these areas are planted, 50 thousand hectares of are fallow area. In Bilecik, 25% of total agricultural land has been irrigated. 52 thousand hectares of cultivated area have been covered by field crops, and 13.4 thousand hectares are used in vegetable or fruit production and 1.6 thousand hectares are used in poplar trees area. The rate of field crops commonly planted are as follows; 88% are cereals, 4.8% are industrial plants, 2.8% are edible legumes and 3.6% are forage crops. In terms of planting area the most important species in field crops; wheat (31.5 thousand hectares) in cereals, sunflower (2.1 thousand hectares) in industrial crops, chickpea (9 thousand ha) in pulses and alfalfa (1.7 thousand hectares) in forages. When viewed on a vegetable and fruit production, the highest vegetable production was obtained tomato (1.3 thousand ha), while the highest fruit production was walnut (3 thousand ha). In Bilecik province where small-scale farms common, number of cattle was 33 thousand, a number of sheep and goat was 116 thousand and a number of poultry was 5.3 million.

With this review, detailed information about agricultural production of Bilecik province will be given and, potential of agriculture in development of Bilecik economy will be revealed.

Keywords: Economy, Agriculture, Production, Bilecik



Immunostimulant and Digestive Enzyme Activity of Pomegranate Peel (*Punica granatum*) Aqueous Methanolic Extract in Rainbow Trout Fingerlings (*Oncorhynchus mykiss*)

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Abstract: In the study, effects of pomegranate peel (*Punica granatum*) aqueous methanolic extract on digestive enzyme activity and immune responses in rainbow trout fingerlings (*Oncorhynchus mykiss*) were determined. With this aim, rainbow trout were fed diet containing 0 (Control), 250, 500 and 1000 mg kg⁻¹ aqueous methanolic extract of pomegranate peel during 60 days. Every 20th day of the study to determine the immune responses, blood samples were collected from each experimental groups. Also, at the end of the study, stomach and intestine samples were collected for determining the digestive enzyme activity. According to study results, amylase was significantly decreased in all experimental groups compared to control. Pepsin was increased 250 mg kg⁻¹ group but not in the other experimental groups. Trypsin activity was also decreased in group 250 mg kg⁻¹ and the other groups showed no differences compared to control. Respiratory burst was significantly decreased in group 500 and 1000 mg kg⁻¹ compared with the control (P < 0.05). On 40th day of the study respiratory burst was significantly increased in group 250 mg kg⁻¹. At the end of the study the highest value of respiratory burst was observed in 500 mg kg⁻¹ group. Myeloperoxidase activity (MPO) was increased in group 250 mg kg⁻¹ on 20th day of the study. At the end of the study, all experimental groups MPO activity was significantly decreased compared with the control. Lysozyme activity was increased in all experimental group compared with the control.

Keywords: Rainbow trout, Pomegranate Peel, Aqueous Methanolic Extract, Digestive Enzyme Activity, Immune Responses

**Antioxidant Enzyme Activity of Pomegranate Peel (*Punica granatum*) Aqueous Methanolic Extract in Rainbow Trout (*Oncorhynchus mykiss*)**

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Abstract: In this study, antioxidant enzyme activity of effects of pomegranate peel (*Punica granatum*) aqueous methanolic extract in rainbow trout (*Oncorhynchus mykiss*) were evaluated. Four different concentrations of pomegranate peel (0 (Control), 250 (N250), 500(N500) and 1000 mg kg⁻¹ (N1000)) were added to the basal diet and the fish were fed the diet during 60 days. Every 20th day of the study, antioxidant enzyme activity of fish were determined from liver tissue. In the study catalase was showed not any differences at any sampling time on any experimental groups compared to control (P > 0.05). SOD activity was increased on group N250 and N500, and significantly decreased on N1000 group compared with the control on 20th day of the study. Similar result were observed 40th day of the study. However at the end of the study, no significant differences determined among groups. GHPx activity was significantly diminished all experimental groups compared with the control at the 20th day of the study (P < 0.05). Similar results were observed on 40th day of the study. No differences observed at the end of the study. G6PDH activity was decreased on 20th and 40th day sampling time in all experimental groups compared with the control. Lipid peroxidation was not showed any difference on any experimental group compared to control. WBC count was significantly decreased in N1000 group. HGB was increased in 250 mg kg⁻¹ group. Generally no differences was observed in all the other group's hematological values. FCR was decreased in group N500 but SGR was also significantly decreased compared to control.

Keywords: Rainbow Trout, Pomegranate Peel, Aqueous Methanolic Extract, Antioxidant Activity, Growth Performance



Immunostimulant and Digestive Enzyme Activity of Veratrum (*Veratrum album*) Aqueous Methanolic Extract in Rainbow Trout Fingerlings (*Oncorhynchus mykiss*)

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Abstract: In the study, effects of veratrum (*Veratrum album*) aqueous methanolic extract on digestive enzyme activity and immune responses in rainbow trout fingerlings (*Oncorhynchus mykiss*) were investigated. With this aim, rainbow trout were fed diet containing 4 different doses of veratrum (0 (Control), 250, 500 and 1000 mg kg⁻¹) aqueous methanolic extract during 60 days. Every 20th day of the study to determine the immune responses, blood samples were collected from each experimental groups. Also, at the end of the study, stomach and intestine samples were collected for determining the digestive enzyme activity. At the end of the, Amylase was significantly decreased in all experimental groups compared to control (P < 0.05). Pepsin was decreased in 250 mg kg⁻¹ group and no differences was observed in 500 and 1000 mg kg⁻¹ group. Lipase was showed no differences. Trypsin was significantly decreased in 500 and 1000 mg kg⁻¹ and no differences was determined in 250 mg kg⁻¹ group. Superoxide radical releasing was showed no differences in group 250 mg kg⁻¹ (P > 0.05) but other group's was significantly decreased on 20 th day of the study (P < 0.05). At the end of the study, superoxide radical releasing was determined higher than control and 500 mg kg⁻¹ group in 250 and 1000 mg kg⁻¹ groups (P < 0.05). Myeloperoxidase activity was significantly increased in all experimental groups especially in 40th and 60th day of the study compared to control (P < 0.05). Lysozyme activity was significantly increased in all experimental groups and the highest value was determined in the 250 mg kg⁻¹ group. In the other sampling time lysozyme activity was increased in 250 and 500 mg kg⁻¹ groups (P < 0.05).

Keywords: Rainbow Trout, Veratrum, Aqueous Methanolic Extract, Digestive Enzyme Activity, Immune Responses



Antioxidant Enzyme Activity of Veratrum (*Veratrum album*) Aqueous Methanolic Extract in Rainbow Trout (*Oncorhynchus mykiss*)

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Abstract: In this study, antioxidant enzyme activity of effects of veratrum (*Veratrum album*) aqueous methanolic extract in rainbow trout (*Oncorhynchus mykiss*) were evaluated. Four different concentrations of pomegranate peel (0 (Control), 250, 500 and 1000 mg kg⁻¹) were added to the basal diet and the fish were fed the diet during 60 days. Every 20th day of the study, antioxidant enzyme activity of fish were determined from liver tissue. In the study catalase was showed not any differences at any sampling time on any experimental groups compared to control (P > 0.05). SOD activity was increased on group 250 and 1000 mg kg⁻¹ group compared with the control at the end of the study (P < 0.05). 20th day of the study, GPx activity was significantly increased in 1000 mg kg⁻¹ group (P < 0.05). No differences found between control and 500 mg kg⁻¹ group (P > 0.05). 40th day of the study, GPx activity significantly decreased in 1000 mg kg⁻¹. G6PDH activity, 20th day of the study, showed no significant differences on any experimental groups compared to control. 40th day, it was decreased in all experimental group compared with the control (P < 0.05). Lipid peroxidation was not showed any difference on any experimental group compared to control. In all experimental group SGR was negatively affected and decreased compared to control. All these result showed an increased humoral immune results. Growth was significantly decreased in experimental groups.

Keywords: Rainbow Trout, Veratrum, Aqueous Methanolic Extract, Antioxidant Activity, Growth Pefromance



Aquaculture Sustainability

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Abstract: Aquaculture is the farming of aquatic organisms in both coastal and inland areas involving interventions in the rearing process to enhance production. Eating fish is part of the cultural tradition of many people and in terms of health benefits; it has an excellent nutritional profile. Growth of aquaculture is absolutely necessary for meeting future demands for food. However, like any other sector of agriculture, it has its limitations. One of the biggest impacts of aquaculture is its environmental impacts. Some aquaculture practices that do not maintain standards and follow sustainable aquaculture practices, negatively impact the environment and also put pressure on wild fish growth by habitat modification and using wild caught fish as fish feed. Aquaculture is among the most sustainable of animal protein production systems. Growing aquaculture is needed to meet employment and food security targets in developing countries. Investment risk co-varies with environmental risk to influence sustainability. Sustainable aquaculture is a dynamic concept and the sustainability of an aquaculture system will vary with species, location, societal norms and the state of knowledge and technology. Several certification programs have made progress in defining key characteristics of sustainable aquaculture.

Keyword: Aquaculture, Sustainability, Fish



Breeding Tubercles in Fishes

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Abstract: Secondary sex characteristics are phenotypic specifications in living organisms morphologically distinguishable and available for sex discrimination. Breeding tubercles that white nodules because of epidermic cells differentiation head, dorsal and caudal sections and fins are one of these properties. Breeding tubercles have considered to consist of some reasons such as communicating with females or stimulating reproduction, and territoriality throughout the breeding period. Especially tubercles occur in male fishes at breeding period are triggered off pituitary and sex hormones and then disappeared. These tubercles are formed in lots of fish species in breeding period were reported and these fishes have got tubercles consist of 4 orders and 15 families: Salmoniformes, Gonorynchiformes, Cypriniformes ve Perciformes. Breeding tubercles are also observed in males of *Cyprinus carpio* live in the Van Lake Basin and males of *Alburnus tarichi* ve *Capoeta kosswigi* are endemic for the Van Lake Basin in breeding session. Breeding tubercles firstly are formed on head of the fishes in middle of May afterwards on dorsal and caudal sections with ventral, pectoral and anal fins in June. However, small amount of tubercles were observed in August. At the different water resources in the Van Lake Basin, there are some differences in the way of forming times according to water temperature for the same species. In this study, structures, shapes, occurring on fish sections of tubercles and fish species with tubercles were focused.

Keywords: Secondary Sex Characteristics, Breeding Tubercles, Cyprinidae



Innate Immune and Hematological Responses to *Chenopodium album* Methanolic Extract in Common Carp (*Cyprinus carpio*) Juveniles

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Abstract: The present study was conducted to investigate the efficacy of *Chenopodium album* methanolic extract supplemented with fish diet on non-specific immune activity and hematological parameters of Common carp (*Cyprinus carpio*) juveniles. Common carp (2.4 ± 0.1 g) were divided into four main groups in triplicate (twelve aquariums, 40 fish per aquarium) fed diet containing three doses of *C. album* extract, CA 0, CA 0.01%, CA 0.05% and CA 0.1% kg diet individually for 45 days. The samples were collected every 15 days. The results indicated that Nitroblue tetrazolium (NBT) activity was significantly increased in all experimental groups at 15 and 30 days, lysozyme activity was significantly increased in all the experimental groups at 15 days. While, Myeloperoxidase (MPO) activity was significantly improved ($P < 0.05$) in all experimental groups at all experimental periods, 15, 30 and 45 days compared to the control groups. Regarding hematological parameters, a significantly decreased in WBC and insignificantly changes in (RBC, Hb, HCT, MCH, MCV and MCHC in all experimental groups compared with the control. The results indicated that the supplementation of methanolic extract of *Chenopodium album* to carp diet was beneficial because it increases innate immune response.

Keywords: *Chenopodium album*, Common Carp (*Cyprinus carpio*), Innate Immunity and Hematological Responses



Use of Wetlands in Aquaculture

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Abstract: Aquaculture is at the heart to meeting the food and drinking water needs of growing population. It is very important to ensure the protection of the water resource while production is being carried out in order to achieve these needs in a sustainable way. Although aquaculture has all natural inputs and outputs, it has significant environmental impact due to intensive production on a limited area. The biggest inputs and outputs in fish farming are fish meal and fish meal-based wastes. The fish entering the system is dispersed to the water environment in particulate and dissolved state as uneaten feed and metabolic waste and creates environmental load. Fish feed contains significant levels of nitrogen, phosphorus and carbon. 72% of the nitrogen, %79 of the carbon and %82 of the phosphorus contained in fish feed entering the system is distributed in the water environment (White, 2013). Intensive production is carried out on a limited area and the quantity of the inputs and outputs mentioned is taken into consideration, the environmental load can reach high dimensions. Highly nutrient inputs into the system have many negative effects, from degradation of water quality to eutrophication (Alvarado, 1997). The use of wetlands is the most economical and natural way to reduce environmental impact to a minimum. Wetlands are the most beneficial and least costly method of eliminating suspended solids in waste water, biochemical oxygen demand (BOD), nitrogen, phosphorus and heavy metals and fulfilling these functions. In the studies carried out, it has been determined that wetlands reduce biological oxygen demand decreased by 24%, suspended solid decreased by 71%, chlorophyll-a decreased by 88%, total ammonium decreased by 57%, nitrite decreased by 90% and nitrate decreased by 68% in the aquaculture discharge waters. Especially in our country, in recent years the confrontation need for drinking water resources and of fish farms on these resources indicate that the solution to the existing problem is very necessary. With the possible methods and technologies to be used, sustainability should be ensured both in the provision of drinking-water and in the production of healthy food. In this study, the use of wetlands in aquaculture and the effect on wastewater treatment were investigated.

Keywords: Wetlands, Aquaculture, Natural filtration in Aquaculture

The Effects of Bentonite and Copper Application on Water Quality Criteria of Rainbow Trout (*Oncorhynchus mykiss*)

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Abstract: In this study, bentonite (B), which is widely used as detox product, and copper material mixed in water were added to rainbow trout diets and a 4-month feeding program was applied. For this aim, we evaluated water quality criteria as well as behavioral and physiological changes during this examination.

900 rainbow trout with average weights of 15 ± 2 gr were distributed to random tanks. 4-month feeding program was applied with rations formed with different levels of bentonite and copper added to the food. The rations are respectively A1 (0 mg Cu/kg + %0 B), A2 (0 mg Cu/kg + %1 B), A3 (0 mg Cu/kg + %2 B), A4 (500 mg Cu/ kg + %0 B), A5 (500 mg Cu/ kg + %1 B), A6 (500 mg Cu/ kg + %2 B), A7 (1000 Cu/ kg + %0 B), A8 (1000 Cu/ kg + %1 B) and A9 (1000 Cu/ kg + %2 B). Water quality criteria analyzes were conducted every 15 days throughout the implementation period. Daily temperature, oxygen, and pH values were routinely measured during the experiment. The copper value was measured at atomic absorption spectrophotometer by applying 0.5% HNO₃ (trace-metal grade acid) acid solution to 5 ml of water. Ammonia-nitrogen concentration in the water was determined by the colorimetric silicate-hypochlorite method. The urea-nitrogen technique was analyzed by colorimetric diacetyl monooxy method. The data obtained in the study were analyzed in the SPSS package program and subjected to Duncan test between the groups and the significance levels were determined at $P < 0.05$.

In this study, samples of ammonia-nitrogen from water quality parameters were taken every two weeks for trout fed on 8 different doses of feed containing copper and / or bentonite. The lowest NH₃-N value was found to be in the control group 115-130 days, with the highest NH₃-N value 0.08 ± 0.01 mg / It was detected at 45 days, at the end of the study. During the study, pH, temperature and dissolved oxygen value were measured daily. The change of all three parameters according to groups, and days was statistically insignificant ($P > 0.05$). In the samples taken from the experiment, the lowest value of copper concentration was measured as 0.00 ± 0.00 ppb in the first and second months in all groups. The highest values were 0.59 ± 0.02 ppb for A1 group, 1.37 ± 0.041 ppb for A2 group, 0.65 ± 0.05 ppb for A3 group, 1.50 ± 0.04 ppb for A4 group, 0.81 ± 0.03 ppb for group A5, 2.19 ± 0.05 ppb for group A6, 2.16 ± 0.05 ppb for group A7, 1.92 ± 0.04 ppb for group A8 and group A9 and 0.94 ± 0.01 ppb for 120 days.

During the study, while the NH₃-N value did not differ among the groups, the difference between the values in different days in the same group was statistically significant ($P < 0.05$). The mean NH₃-N values of the groups (A1, A2, A3, A4, A5, A6, A7, A8, A9) were 0.25 mg / L, 0.27 mg / L, 0.21 mg / / L, 0.23 mg / L, 0.19 mg / L, 0.19 mg / L and 0.20 mg / L, respectively. These values were above the limit values (0.1 mg / L) given for trout cultivation. It has been reported that the high value of ammonia value in cultivation may be due to the intensive stocking of fish or feeding of protein contents with high feed. During the trial, the NH₃-N value between 0-30 was detected high and decreased after 45 days. This can be explained by the decrease in stock density. In this study, the copper value was measured once a month. While the copper value did not differ between the groups, it was statistically significant ($P < 0.05$) between the monthly samples. At the beginning of the experiment and at the end of the first coin no copper element was found in the water. It was detected in all groups at the end of the third month. The copper value was determined to be below the limit value (0.006 mg/L) for trout cultivation.

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Keywords: Bentonite, Copper, Rainbow Trout, Water Quality



A comparative Assessment of Holstein, Simmental, Holstein-Crossbred, and Turkish Grey Steppe Bulls Slaughtered in Turkey for Final Weight and Carcass Traits

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Abstract: Demand for red meat has gradually increased with the population growth rate and the economic dynamics. Beef is a significant source of Turkey red meat supply. The importance of carcass traits to beef cattle industry is increasing, especially with the determination of more detailed carcass evaluation procedures. However, genetic variation in both quantity and quality of beef is evident through differences between purebreds and crossbreeds and even among different populations within a same breed. Hence, obtaining estimates of carcass traits for different cattle breeds, which comprise economic importance at the selection process through meat yield, is a crucial way of achieving better sustainability in meat industry. Therefore, the aim of this study was to compare the final weights and carcass traits of Holstein bulls and crosses with Simmental and Turkish Grey Steppe bulls.

Data from 1,002 bulls presented for slaughter at three abattoirs in the South Marmara region of Turkey was used to determine the final weights and carcass traits. The analysis included 812 purebred Holsteins, 29 Holstein-crosses, 135 Simmentals, and 26 Turkish Grey Steppes. Final weight, hot and chilled carcass weight, dressing percentage, and chilling loss were recorded. The data were analyzed using analysis of variance procedure of Minitab and the mean values for group were contrasted using Tukey's test.

Results revealed that final weight and carcass weights showed highly significant effects of breed ($P < 0.001$) and Simmental bulls had higher means compared to other breeds. Moreover, the greatest dressing percentage and chilling loss values were observed in Simmental bulls. Dressing percentages, in accordance with the carcass weight results, were similar for purebred Holsteins and Holstein crosses, whereas the lowest values for final weight, carcass weights, and dressing percentage were determined in Turkish Grey Steppe bulls. However, results for chilling loss were similar for Holstein crosses and Turkish Grey bulls and were lower than other two breeds. The higher means for final weight and carcass traits observed in Simmental bulls could be attributed to the dual-purpose ability and the higher fattening performance of Simmentals.

In the current study, a comparison of final weight and carcass weights was conducted on a large sample size. Results indicated that Simmental bulls had better results for all traits analyzed, except for chilling loss. On the other hand, Holsteins had satisfactory results regarding carcass traits. Taken together, the present results may be indicative and useful for future studies and evaluation of present situation in Turkish beef sector.

Keywords: Beef, Cattle, Final Weight, Carcass Traits, Meat Production



Subjective versus Instrumental Meat Colour: Evaluations in Holstein Bull Carcasses

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Abstract: Undoubtedly, visual appearance of meat ascertains how consumers perceive quality and significantly influences purchasing decisions. In the case of beef, colour is one of the most striking meat quality parameters and several studies have documented that consumer preferences for beef are based on colour evaluation, especially the redness of meat, because consumers use discoloration as an indicator of freshness and wholesomeness. In this context, strategies for achieving high quality meat and meat products with respect to optimum colour parameters may play a major role in profitable and sustainable beef production systems. Recently, many methods for the determination of meat colour including meat colour score (according to visual appreciation of meat samples), computer vision, myoglobin redox forms, and instrumental measurement systems (Hunter, CIE, and tristimulus). Economic improvements associated with product that achieves its potential indicators of the quality depend on our knowledge of effective and adequate meat colour evaluation. Therefore, the objective of the present study was to perform a comparison between two common methods for beef colour evaluation and to assess their effectiveness or unsatisfactoriness in comparative perspectives.

In this study, data from 509 bull carcasses were used to determine meat colour parameters. Subjective colour evaluation, scoring from 1 (pale) to 5 (dark) meat colour score, and instrumental colour evaluation, CIE system that uses the coordinates of L^* (lightness), a^* (redness) and b^* (yellowness), were used in order to perform a prospective comparison. Measurements were performed with a spectrophotometer (CM508D, Konica–Minolta). In addition, chroma value (C^*) was calculated as $(a^{*2}+b^{*2})^{1/2}$ and hue angle (h^*) as $\arctan(b^*/a^*)$. The data were analyzed by Pearson correlation using Minitab software.

The mean value was determined 1.439 ± 0.023 for meat colour score, and in addition, the mean values of L^* , a^* , b^* , C^* , and h^* were determined 34.881 ± 0.183 , 12.131 ± 0.153 , 9.783 ± 0.127 , 15.923 ± 0.136 and 0.684 ± 0.009 , respectively for instrumental colour measurement. Results indicated that, subjective meat colour evaluation values showed statistically significant correlations with instrumental method with respect to b^* ($P < 0.1$) and h^* ($P < 0.05$). However, L^* , a^* and C^* values did not significantly correlate with colour scoring ($P > 0.05$).

Consequently, an exhaustive evaluation of meat colour, comprising both subjective and objective methods, was performed in Holstein bull carcasses has a significant impact on Turkish red meat sector. Although there were some significant correlations between two methods, it was not substantiated for L^* and a^* values. Nevertheless, the present results may be useful for future studies in respect to meat colour evaluation.

Keywords: Beef, Meat Colour, Subjective Meat Colour Score, CIE System



Alterations in the Metabolites Levels and Oxidative Stress Parameters of the Brown Trout (*Salmo Trutta Fario*) Exposed to Deltamethrin

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Abstract: In this study, we investigated the effects of different concentrations of deltamethrin on the malondialdehyde (MDA), catalase (CAT) levels and the serum metabolites of brown trout (*Salmo trutta fario*). 15 fish used for each groups and they were subjected to two different concentrations (1.0 µg/L and 2.0 µg/L) of deltamethrin respectively (LC50=4.7 µg/L). In this study, we analysed serum aspartate aminotransferase (AST), alanine aminotransferase (ALT), albumin, total protein levels, malondialdehyde (MDA) levels, which is an oxidative stress marker and catalase (CAT) levels. 1.0 and 2.0 µg/L of deltamethrin caused a significant increase in AST and ALT levels. But, levels of total protein and albumin significantly decreased when compared with the control group (P < 0.05). While different concentrations of deltamethrin (1.0 and 2.0 µg/L) caused a significant increase in MDA levels compared to the control group, it caused a significant decrease in catalase levels in the gill and liver tissues (P < 0.05). Finally, deltamethrin caused the change of the malondialdehyde levels, the catalase levels and the serum metabolites in brown trout.

Keywords: Brown Trout, Deltamethrin, Oxidative Stress, Biochemical Parameters



Feed Alternatives for Ornamental Fish

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Abstract: Aquarium fish breeding has spread all over the world as well as in our country. Thanks to its high adaptability, fish grown almost everywhere have quickly become the focus of people's attention. After economic development, people have begun to grow aquarium fish for stress, for interior design, or other reasons such as responsibility awareness for children. Ornamental fish whose homeland is not our country. They come as imports goods and we pay severely according to fish species. Especially the fish which are rare or have different qualities are sold at high prices. So much so that the museum-shaped aquarium complexes were built in the big cities and they were seen.

It is also important to feed the aquarium fish, which is part of our life. Particularly suitable for mouth structure and high protein value feeds should be preferred for growing offspring. Nutrient elements that are necessary for coloration, health status, development of immune systems, and good reproductive performance should not be forgotten. Large amounts are paid to these imported goods and cause economic losses.

In this research, some of the affordable and high nutrient alternative live baits (especially the cultivation is easy and feasible) that can be used in the feeding of aquarium fish will be explained. These nutrient sources are both cheap and easily obtainable species. Such as *daphnia magna*, white worm, *artemia salina*, sea monkey fresh water mussels, some crustaceans etc.

Keywords: Ornamental Fish, Fish Feed, Live Feed, Crustacea, Aquarium



Mushroom Cultivation Facilities in Aquaponics System

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Abstract: Aquaponic systems are based on the co-existence of fish, plant and nitrification bacteria in the same system, in other words on the production of animal and vegetable products that people can consume via these three live things to benefit from each other in a way. Aquaponic systems that allow intensive production by integrating hydroponics agriculture crops into fish breeding, provide fish production, an important part of human nutrition, and the production of organic vegetable food at high quality at the same time. In this way, these systems also contribute to the reduction / rehabilitation of nutrient waste and / or waste as well as providing more efficiency from the unit area.

On the other side, mushrooms in plant group with high nutritional value are also very important in human nutrition. Natural medicine mushrooms are excellent sources of nutrients, including vitamins (B complex), minerals (copper, potassium), enzymes, antibiotics, hormones and antioxidants as well as protein.

For this reason, in this study, it is aimed to obtain information about the production of oyster mushroom (*Pleurotus ostreatus*) and king mushroom (*Pleurotus eryngii*) in aquaponics system. In trial, tilapia was used as fish source. The mushroom mycelium were inoculated on hydraton bed and covered over. Mycelium growth was very rapid in both mushrooms species in the experiment and their winding the bed material hydraton took quite a short time. Oyster mushrooms and king mushrooms achieved harvest size in 13 days and in 15 days respectively. Nevertheless, in the later period green mould or olive colour mould on the mycelium took place and the growth of mycelium was observed to halt. This disease was estimated to be contaminated by water in fish tanks.

Keywords: Aquaponics Systems, Mushrooms, Myceliums, Green Mould, Nitrification Bacteria



An Assessment on Spatial Distribution of Commercial Units: The Case of Kastamonu

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Abstract: Contemporary cities are developing and transforming due to the complex relationships mainly caused by technological advances in the transportation and communication sectors. Changes and transformations in the spatial organization of cities also cause changes in the locational choices of urban services. It is known that central place theory, one of the basic approaches developed to analyze spatial organizational forms, provides advantages for both consumers and service suppliers with a space-service area relationship defined by hierarchical order. It can be argued that this approach provides economic sustainability by leading to positive results in terms of time, cost and transportation, and ecological sustainability by avoiding urban sprawl and unnecessary land use. However, today, it is seen that new spatial organizational forms differ from the approach of central places theory and different dynamics that affect the spatial system appear. In this context, the aim of the study is to examine the current spatial organization of commercial functions in the framework of central places theory.

The study has been carried out in the Central District of Kastamonu city. Within the scope of the study, commercial units were classified and locational choices of these commercial units were investigated depending on the land use data. Locations of commercial units were evaluated in terms of low-range services that were frequently requested (food, clothing, stationery, etc.) and high-range services (automotive, construction, etc.) that required consumers to travel further distances. While it was expected that frequently requested basic services were located in the neighborhoods and high-range services that required expertise were located in the city center, different tendencies were discovered in the study area. While in some low-range neighborhoods, high-range services were located, in some others even some basic services did not locate. Some of the services, which required expertise, were located in the Central Business District (CBD) consisting of Hepkebirler, Atabeygazi, Yavuzselim, Gabriel, Aktekke, Topçuoğlu and Isfendiyar Neighbourhoods. In addition, Honsalar, Aqmescit, Hisarardı, Esentepe Neighbourhoods in the west of the CBD, and Kırkçeşme Neighbourhood in the east, were providing basic services from the CBD. Commercial functions such as furniture and appliances that required more space preferred to locate not only in the CBD, defined as high-range center, but also in Kuzeykent, İnönü and Mehmet Akif Ersoy neighborhoods, which was new developing area. On the other hand, the neighborhoods on the southern axis showing similar developments to Kuzeykent were found to be inadequate even in terms of commercial services including basic needs.

As a result, it is thought that the study will be a guide in the spatial organization of services by considering economic efficiency and acceptable ranges for consumers in the context of analysis of locational choices of commercial units.

Keywords: Commercial Units, Central Place Theory, Commercial Development, Spatial Planning, Kastamonu



Artificial Neural Network Structures to Forecast Physical Attributes of Different Agricultural Products

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Abstract: Artificial neural networks (ANNs) have quite high operational speeds, robustness and generalization capabilities. ANN structures have been employed worldwide in various scientific disciplines including agriculture. ANNs are known to be a powerful tool for data analyses such as prediction, classification, data association, conceptualization and filtering. Various ANN structures, such as single layer feed-forward network, back-propagation network (BPN), radial basis function network (RBF), adaptive neuro-fuzzy inference system (ANFIS), have been widely used in biological and agricultural researches. ANN structures are widely used to inquire the relationships between the physical attributes of agricultural products and to estimate particular attributes from the easily measured ones. Physical properties of the agricultural products play significant roles in design and optimization of harvest and postharvest processes. Knowledge on these features provide great contributions to design of the equipment used in harvest, processing, sizing, classification, conveyance, storage, packaging and marketing of agricultural products. ANNs are much faster and more accurate estimation tools for these features like, projected area, arithmetic mean diameter, geometric mean diameter, sphericity, surface area, volume, shape index, elongation, aspect ratio, hue angle, chroma, color index and mass. In this study, physical properties of different agricultural products were predicted with different ANN structures. Present findings revealed that a well-trained ANN structure was capable of providing a reliable model for agricultural applications.

Keywords: Artificial Neural Network, Sorting, Fruit Size, Physical Properties, Estimation



Usage of *Agaricus* and *Pleurotus* Spent Mushroom Composts as Growth Medium in Tomato Seedling Production

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Abstract: The influence of growth media prepared by adding of *Agaricus bisporus* (A) and *Pleurotus ostreatus* (P) spent mushroom compost into peat (PE) at different rates (%25, 50, 75 and 100) on tomato seedling growth and quality was examined in this study. In the study where peat is used as standard or control medium, seedling growth and quality parameters such as seedling length (cm), stem diameter (mm), root length (cm), leaf chlorophyll content (CCI), leaf area (cm²), total seedling dry weight (g), net assimilation rate (g cm⁻² day⁻¹) and relative growth rate (g g⁻¹ day⁻¹) were determined. Significant differences were found among seedling growth media for tomato seedling quality parameters. The highest seedling length (25.5 cm), leaf chlorophyll content (11.13 CCI) and root length (15 cm) were obtained from control (peat) medium. The highest total seedling dry matter (0.24 g) was obtained from 25A+75PE medium, while the highest leaf area (42.97 cm²), net assimilation rate (44.33 g cm⁻² day⁻¹) and relative growth rate (6.14 g g⁻¹ day⁻¹) were determined in 75A+25PE growth medium. It was determined that tomato seedlings growth better in *Agaricus bisporus* (A) spent mushroom compost added medium than that in *Pleurotus* spent mushroom compost added media.

Keywords: *Agaricus bisporus*, *Pleurotus ostreatus*, Spent Mushroom Compost, Seedling Quality, Tomato



Determination of Stem Rust (*Puccinia graminis* f. sp. *tritici*) Reactions on Some Winter Bread Wheat Landraces Genotypes

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Abstract: Turkey is one of the origin centers of wheat and bread landraces wheat grown in Turkey, and showing important variations. Stem rust (*Puccinia graminis* f. sp. *tritici*, (*Pgt*)) occurs at higher altitudes and coastal areas in Turkey and it is a problem for wheat production to susceptible cultivars. The goal of this study was to determine the reactions of 200 winter bread wheat landraces genotypes to stem rust disease in adult plant stage. The test materials were screened under natural epidemic condition for *Pgt* (virulent on: *Sr5*, *6*, *7b*, *8a*, *8b*, *9b*, *9g*, *10*, *30*, *Tmp* and *Mcn* resistance genes) in Seydiler/Kastamonu location. Materials were sown in a one-meter row with 2 replications. Stem rust developments on each entry were scored using the modified Cobb scale (Susceptible control Little Club had reached 80-100S) in June-August 2015. Coefficients of infections were calculated and values below 20 were considered to be resistant. Twenty-eight (14%) genotypes were resistant to *Pgt*. The resistance genotypes which can be used in breeding programs.

Acknowledgement: This study was financed by TÜBİTAK 1001 programme (111O255).

Keywords: Landraces Bread Wheat, Stem Rust (*Puccinia graminis* f. sp. *tritici*), Reaction Test



Determination of Feed Values of Different Physical Processed Common Vetch Seed (*Vicia sativa*) by *in vitro* Gas Production Technique

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Abstract: In this study, *in vitro* gas production values, gas production parameters (a, b, a+b and c) and organic matter digestibilities (OMD), metabolizable energy (ME), net energy lactation (NEL) contents, chemical compositions and feed values of different physical processed (raw, soaked, boiled and roasted) common vetch seeds (*Vicia sativa*) were determined by *in vitro* gas production technique. Rumen fluid, used in this study, was obtained by probe from one Holstein bull (seven years old, average live weight= 650 kg) raised at Research and Application Farm of Agricultural Faculty Atatürk University. Raw and treated common vetch seeds were incubated for 2, 4, 6, 8, 12, 24, 48, 72 ve 96 hours for the determination of *in vitro* gas production values and gas production parameters in rumen fluid. It was observed significant differences among all of the common vetch seeds in terms of chemical composition (DM, CA, OM, CP, EE, ADF, NDF, Selulos) values ($P < 0.05$). The differences in the chemical composition values affected *in vitro* gas production values and gas production parameters of raw and treated common vetch seeds. OMD, ME and NL values of common vetch seeds were determined as 63.50-83.10%, 11.23-14.55 MJ/ kgDM and 5.81-7.99 MJ/ kg DM, respectively. In conclusion, it was found that soaked treatment applied to common vetch seed was preferable rather than other physically treated seeds.

Keywords: Common Vetch Seed (*Vicia sativa*), Physical Treatment, Chemical Composition, *in vitro* Gas Production, Feed Value



How Effect of Shading Levels on Marketable Fruit Quality of ‘Granny Smith Challenger’ Apple Cultivar

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Abstract: Environmental factors such as light levels and temperatures can cause some negative effect on fruit quality. High temperatures and higher light levels can cause sunburn and insufficient colorations which reduces the quality of the marketable fruit quality in some apple varieties. This situation can be more evident in apple cultivars with a green fruit skin coloring such as ‘Granny Smith’. Insufficient coloration and sunburn damage can decrease with hail nets, provide water via raised sprinklers, kaolin particle film treatments. Therefore, this study was carried out to determine the influence of shading treatments with black shading material with different light transmittance [control (0%), 15%, 20%, 35% and 55%] on marketable fruit quality of ‘Granny Smith Challenger’ apple cultivar (*Malus domestica* Borkh.) in Samsun, Turkey, ecological conditions during 2015 and 2016 years. The shading nets had significant effects on fruit quality classification, skin color characteristics, black spot (*Venturia inaequalis*) ratio, discoloring fruit ratio and marketable fruit quality in comparison to the control. The highest fruit weight and fruit diameter were obtained from 35% shading while the lowest in the control in the both experiment year. In terms of experimental years, fruit weight, fruit diameter and extra quality fruit ratio had been higher in 2015 than in 2016. In terms of fruit diameter classification, the highest first class fruit ratio (96.8%) was found in the 35% shading treatment while II., III and IV. class fruit ratio were lowest in the same shading treatment. In the control treatment, the highest II., III and IV class fruit ratio were found while the first class was the lowest. According to the Turkish Standard Institute (TSE), extra quality fruit ratio was the highest in 35% shade (81.0%) and lowest in control (49.5%). The cull fruit ratio was the highest at 55% shading (13.0%) and the lowest at 15% shading treatment (5.5%). L and Chroma value were the highest in the control while the lowest in the 55% shading. Hue⁰ value was the highest in 35% and 55% shading treatment and lowest in the control. The increase in the shading ratio has increased the ratio of black spotted fruit and reduced the discoloring fruit ratio. The highest black spotted fruit ratio was observed in the 55% shading while lowest in the control. The discoloring fruit ratio was higher in the control than the shading treatments. The marketable fruit rate was higher in 35% shading than in other treatments. The highest marketable fruit rate was obtained in 35% shading (81.4%) and lowest in control (51.2%). As a result of this study, it can be recommended to apply the 35% shading treatment, which achieves better results with respect to fruit quality and marketable fruit ratio, in the production of ‘Granny Smith Challenger’ apple cultivar under similar ecological conditions.

Keywords: Fruit Quality Classes, Shading, Coloring, Fruit Diameter, Fruit Weight



Effects of Green Manure Treatments and Grafting on Quality Properties and Bioactive Compounds of Tomato During Cold Storage

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Abstract: The study was conducted to determine the effects of green manure treatments [in two stage: flower stage and stage after harvest of faba bean (*Vicia faba* L. cv. Seher)] and grafting (grafted and non-grafted) on weight loss, respiration rate, firmness, color properties (L*, chroma and hue angle), soluble solids content (SSC), titratable acidity, ripening index, vitamin C, total phenolics, total flavonoids and antioxidant activity (both ABTS and DPPH) of tomato fruits (*Solanum lycopersicum* L. cv. Depar F1) throughout cold storage. Fruits were stored inside MAP (Xtend[®], StePac, Turkey) at 8±0.5 °C and 90±5% RH for 21 days. At the end of storage, weight loss and softening of flesh delayed with green manure treatments for non-grafted. Also lower respiration rate, chroma for skin, hue angle for flesh and vitamin C were measured. But weight loss, respiration rate and total flavonoids and antioxidant activity according to DPPH assay were increased with green manure treatments in grafted fruits. According to means of treatments, weight loss, respiration rate, acidity, vitamin C and total flavonoids of non-grafted fruits reduced with green manure treatment, whereas firmness, L* value of flesh and ripening index increased. In measurement periods, as general weight loss, L* and hue angle value of flesh of non-grafted fruits was lower than grafted fruits, whereas respiration rate, firmness, SSC, acidity, vitamin C and total phenolics were higher. As a result, it was revealed that weight loss was increased and flesh firmness was maintained by green manure treatments in grafted fruits.

Keywords: Antioxidant, Firmness, Phenolics, Respiration Rate, Ripening Index, Weight Loss

**Determination of Leaf Rust Reactions in Turkish Bread Wheat Landraces Pure Lines*****Kadir AKAN^{1*}, Mevlüt AKÇURA², Onur HOCAOĞLU²***¹*Ahi Evran University, Agriculture Faculty, Plant Protection Department, Kırşehir, TURKEY*²*Çanakkale Onsekiz Mart University, Agriculture Faculty, Field Crops Department, Çanakkale, TURKEY *Corresponding**Author: kadir.akan@ahievran.edu.tr*

Abstract: Bread wheat in Turkey like in many countries is also an important field crops. Turkey is one of the world's centers for bread wheat genetic resources. Leaf rust, (caused by *Puccinia triticina* (*Pt*)), is an important fungal disease of bread wheat. The aim of this search was to screen leaf rust seedling stage reactions on the winter bread wheat landraces in greenhouse conditions and to determine suitable material for leaf rust resistance breeding programs.

In this study, 200 bread landraces materials were tested. The test materials were evaluated for seedling stage reaction to leaf rust in at Central Research Institute for Field Crops in Ankara /Turkey in March 2014. Materials were planted in pots (7x7x9 cm) and plants were grown at 20±3oC. Materials were inoculated with suspension of urediniospores of leaf rust population (avirulent on Lr9, Lr19 and Lr24) in mineral oil (Soltrol 170®) at Zadoks growth stage 11 or 12. Following inoculation, seedlings were placed in a dew chamber overnight at 16±1oC and then transferred to greenhouse adjusted at 20±3oC. Disease was scored according to 0-4 scale after 14 days.

Seven (4%) of bread landraces pure lines materials were determined resistant to leaf rust population in seedling stage. Leaf rust resistant landrace pure lines will be incorporated into the Turkish leaf rust resistance breeding program as potential sources of resistance.

Acknowledgement: This study was financed by TÜBİTAK 1001 programme (111O255).

Keywords: Landrace Bread Wheat, Leaf Rust (*Puccinia triticina*), Reaction Test, Selection



The Effect of Rosehip Seed Supplementation into Laying Hens Diets on Performance, Egg Quality Traits and Blood Parameters

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Abstract: This study was carried out to determine the effect of dietary rosehip seed supplementation into layer diet at different levels on performance, egg quality traits and some important blood parameters in layers. A total of 72 Lohmann layers, 46 weeks old, were divided into three treatment groups, each of which included six cages, each of which housed four hens. The control group was fed with commercial layers basal diet (K) and other groups basal diet + ground rosehip seeds 10% (K1), basal diet + ground rosehip seeds 15% (K2) were fed for 12 weeks. The water and feed were provided as ad-libitum during the trial. The rosehip seed supplementation level at 15% into layer diets increased the feed consumption and egg yield ($P < 0.05$) and decreased the damaged egg ratio. It is found that some egg quality traits such as the yolk colour, shell thickness and shell weight increased ($P < 0.05$) in eggs obtained from K2 group, there were no significant differences ($P > 0.05$) between the groups in respect to other egg quality traits such as shape index, shell strength, albumen and yolk indexes and Haugh unit values. Total cholesterol, cholesterol esters, free fatty acids and triglyceride contents in the egg yolks obtained from treatment groups were not affected by dietary treatments ($P > 0.05$). Serum parameters such as albumin, total cholesterol, VLDL, triglyceride and ALT values increased ($P < 0.05$) with the rosehip seed supplementation at level of 15% into layer diet. Results obtained from present study showed that supplementation rosehip seed into layers can be beneficial to improve egg quality traits especially such as shell thickness and to decreased damaged egg ratio. We also believe that further investigation is needed to clarify the use of rosehip seed in layer diets and its effects on performance, egg quality, and blood parameters.

Keywords: Laying Hens, Rosehip Seed, Performance, Egg Quality, Cholesterol



Influence of Shading Nets on Some Fruit Quality and Yield and Leaf Characteristics of 'Granny Smith Challenger' Apple Cultivar

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Abstract: In apples, certain environmental (mainly temperature and light levels) and physiological factors affect the color development. High temperatures and light levels leads to discoloration in the apple. A shade nets have a good protection of apple trees against damage by hail, discoloration, strong wind, and birds. This study was carried out to investigate the effect of shading nets with black shading material with different light transmittance [control (0%), 15%, 20%, 35% and 55%] on some fruit quality and yield and leaf characteristics of 'Granny Smith Challenger' apple cultivar (*Malus domestica* Borkh.) in Samsun, Turkey, ecological conditions during 2015 and 2016 year. In the study, fruit characteristics such as fruit weight (g), fruit length and width (mm), flesh firmness (kg), fruit number (number plant⁻¹), soluble solid content (SSC) (%), titratable acidity (%), pH and yield characteristics such as yield (kg plant⁻¹), yield per trunk cross-sectional area (production efficiency, kg cm⁻²), yield per canopy volume (kg m⁻³) and yield per hectare (kg ha⁻¹) and leaf characteristics such as leaf width and length (cm), petiole length (cm), petiole thickness (mm) and leaf area (cm²) were examined. The shading nets had significant effects on fruit quality and leaf characteristics in comparison to the control, except for fruit firmness and pH and SSC and yield per canopy volume. Fruit weight, fruit length and width, fruit number, titratable acidity, yield per plant, yield per trunk cross-sectional area, yield per hectare, leaf width, leaf length, petiole length, petiole thickness and leaf area were found to be higher in the shading treatments than the control. The highest fruit weight and fruit width and length were determined in 35% shading treatment (256.8 g, 75.31 mm, 91.42 mm) while the lowest in control (216.1g, 68.12 mm, 81.07 mm). The amount of titratable acid increased by shading while SSC decreased. The highest SSC was obtained from control (14.9%) while the lowest in the 55% shading (11.9%). The highest titratable acidity were found 55% shading (0.65%) while the lowest in control (0.55%). The highest yield per plant and yield per cross-sectional area and yield per canopy volume and yield per hectare were obtained from 35% shading. The highest leaf dimensions were determined in the 55% shading treatments. Petiole length and petiole thickness were higher in the %55 shading than the others. The highest leaf area was found in the 55% shading (42.61 cm²) the lowest in the control (21.22 cm²). The higher results were obtained from 35% shading within the other shading treatments by the examined parameters. As a result of this study, it is advisable to apply the 35% shading treatment, which achieves better results in terms of some fruit quality and yield and leaf characteristics, in the production of 'Granny Smith Challenger' apple cultivar under similar ecological conditions.

Keywords: Apple, Leaf Area, Shading Nets, Production Efficiency, Soluble Solid Content, Yield



Utilizing the Animal and Plant Wastes

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Abstract: Along with the increase in animal and plant production in our country, the amount of both animal product wastes, harvest wastes and agro-industrial wastes have been increasing annually. Besides these animal and plant originated wastes are important organic matter sources, they have a significant potential for nutrients they contain. Wastes from the animal production is the dropping sand the innards remaining after the slaughter process. Droppings are used as oil (turf) and fertilizers. It is possible touse the wastes from the innards as compost fertilizers and catand dog food. Wastes from the plant production are regarded as plant massive wastes which are not described as products as a result of plant productions in cultivated areas, forests, fallow fields, fruit and vegetable cultivated areas. These wastes can be grouped as straws, stems, cornhubs, hulls, core sand pruning wastes. These plant-originated wastes can be utilized as feed, cushion, etc. in animal production. However, the wastes which occur after processing the agricultural products are the ones which occur as a result of the privious processes (grinding, eliminating, drying) that the products are directly used. These are unused wastes such as stems, strawsandcores. Agro-industrial wastes are the products such as cottongin wastes, seed oil industries, olive oil industries, rice industries, corn industries, wine and fruit and vegetable pulp sand core wastes. These wastes are significant organic matters ources especially forthes oil of our country which is poor in organic matter. In addition, these wastes can be utilized as plantation plat forms with appropriate mixtures today. In this review, the possibilitytouse animal production wastes which are burned and wasted and harvest wastes and agricultural production wastes which cause environmental pollutionin different areas (as biogas, biochar, etc.) has been discussed and recommendations have been made forth ecurrent situation and the future.

Keywords: Animal Waste, Vegetative Waste, Agricultural Industry Waste



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Occupational Health and Safety Practices and Risks in the Workplace

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Abstract: The concept of Occupational Health and Safety has become increasingly important as a result of increased industrialization and the development of new technologies all over the world. The basic philosophy of Occupational Health and Safety is to reduce the number of work accidents and to provide a healthier work environment for employees. The most risky sectors in the world are designated as mining, agriculture, forestry and construction.

Rapid technological developments, on the one hand, serve human well-being and on the other hand bring danger for human life. A significant part of human life passes through the working environment. The importance of working environment conditions is very important in terms of providing the desired and productivity in the enterprises in terms of worker health and safety.

The purpose of this study is; by analyzing the hazards and risks that may arise in the work environment in terms of work safety, to determine the measures to be taken to keep them at acceptable levels.

Keywords: Occupational Health Safety, Risk Management, Working Environments and Conditions



The General Situation of Mulberry Cultivation in Uşak and Determining the Potential of Silkworm Growing

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Abstract: Mulberry cultivation, which is located in fruit-growing berries is mostly grown for leaf. Mulberry is one of the important fruit species in terms of both human health and contribution to the country's economy. Almost every country produces mulberries in our country. Mulberry leaves are the most important factor in the production of silkworms because silkworm is the only food source.

Silkworm, which is an activity that starts with the provision of the mulberry leaf which is the only food source of the Silkworm and continues until the silk is obtained; Is an auxiliary agricultural activity having historical, cultural, economical and traditional features which are 1500 years old history in Anatolia, which is a center of silk exchange for a period. The rural population, which was 40 % in the 2000 census, was 29.5 % in 2007 and 91.8 % in 2014, which rose to 92.1 % in 2015 and 7.9 % in towns and villages. Employment-based agricultural activities such as silkworm production play an important role in slowing the rapid migration of our population in developed countries to developed industrial regions in our country. Both silkworm breeding, flattening, bending, dyeing and silk carpet exports, with an annual foreign exchange input of around 3 million dollars, have made a significant contribution to our economics.

In this study; When Uşak province climate and geographical position were evaluated, a questionnaire study was carried out in order to determine the current situation of mulberry cultivation, to determine silkworm breeding and potential problems. According to the survey results; It has been determined that Uşak Ilin is suitable for mulberry cultivation. Our producers, whose main livelihood is different, intend to supplement with mulberry farming.

A large majority (79 %) of our participants did not have information on silkworm breeding, and 35 % wanted to receive information on this subject. It has been determined that about 18 % unstable producers can raise awareness of more than half of the participants to increase their awareness on this subject, to make training activities, potentially participate in unstable (25 %) and make 50-55 % silkworm breeding and contribute to their families.

Keywords: Silkworm, Mulberry, Cultivation, Production



Analysis of Criteria Used in the Assessment of Sustainability in the Neighborhood Scale

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Abstract: Sustainability is a term that has emerged in order to transfer the resources that can not be renewed in the world to future generations. The dynamic nature of urban areas requires some measures in order to be able to sustain its current state. It is required that precautions should be taken to deal with the problems that may arise and we should get input to spatial planning. The latest method for this is the "Sustainability Assessment". After the studies conducted in recent years, it has been determined that the neighborhood scale is the most reasonable one in evaluating urban sustainability. In the literature, the studies on which criteria are taken into consideration are very little. In this context, it is aimed to emphasize in the study which categories are widely used by analyzing studies that make evaluations with measurable criteria.

In this study, firstly sustainable planning approaches were examined. As a result of these approaches and recent studies, it was determined that the principle of locality in the assessment of urban sustainability was emphasized and the most appropriate level was neighborhood scale. LEED, BREEAM and CASBEE tools, which are the most widely used and have different evaluation criteria in the neighborhood scale were chosen. Then the criteria used in the empirical studies in the related article were determined. All of the criteria obtained were analyzed in 8 categories: 'Economic Structure and Minimum Cost', 'Sustainable Building', 'Urban Design', 'Neighborhood Life and Satisfaction', 'Natural Environment', 'Sustainable Transportation', 'Social Interaction and Participation'. When the criteria used in the tools and studies examined were evaluated, 24% of the total criteria are in the category of 'Natural Environment', 18% 'Urban Design' and 17% 'Sustainable Building'. LEED-one of the Sustainability Assessment tools- had more criteria in the category of 'Sustainable Building', BREEAM and CASBEE have in the 'Natural Environment' category. On the other hand, it was seen to be quite inadequate in the studies examined that 4% of 'Neighborhood Life and Satisfaction' categorization and 9% of 'Sustainable Transportation' category.

A single type of assessment method cannot be defined for cities as the different approaches of presented techniques. In addition to different level of development of each country, each city has its own unique qualities, problems and possibilities even in the same country. Therefore, own local components of the study area should be considered while an assessment is being made. Although the concept of sustainability has firstly begun to be discussed with environmental concerns followed by economic concerns, while criteria are defined, it is necessary to extend the inadequate social criteria and 'Neighborhood Life and Satisfaction' should be taken part in the assessment. In addition, sustainable transport, which is both economic and environmental positive returns, should not be overlooked.

Keywords: Urban Sustainability, Sustainability Assessment, Sustainability Assessment Tools, Sustainable Planning Approaches, Criteria



Surface Characteristics and Skid Resistance Testing of Road Pavements

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Abstract: The construction works of highways has changed from the new constructions to maintenance, preserving and rehabilitation of highway assets. To decide right application technique at the right time surface characteristics data of the pavement should be measured consistently. Pavement roughness, distress, deflections and skid resistance are essential parameters for highway pavements. In this study, importance of skid resistance and current skid resistance test methods are studied and explained briefly.

Skid resistance are used to evaluate and detect highway areas with low value of skid resistance, to improve rehabilitation priorities. The principle methods of skid resistance testing are Locked-wheel trailers, Yaw model trailers and British Portable tester.

Some of most popular friction measuring devices are California Portable Skid Tester (CTM 343), British Pendulum Tester (BPT), Drag Tester, Locked Wheel Skid Tester (LWST), Automobile Method, Grip Tester (GT), Mu Meter, Dynamic Friction Tester (DFT), Sideways-force Coefficient Routine Investigation Machine (SCRIM), Norsemeter Road Analyzer and Recorder. CTM 343 is by spinning a rubber tire up to 80 km/h of the road and bringing it down to the asphalt surface then saving the distance it travels against spring resistance before it stops. BPT is a tester of a dynamic pendulum impact. When a rubber foot is released over a surface, it gives a value of the energy loss. It can be used both in laboratories or sites. Rather than macrotexture, it determines the skid resistance in terms of microtexture because of operated under low speed (10 km/h). Drag tester is a hand carried device. It slides a rubber shoe along the surface and the skid resistance measured by this rubber is measured through a hydraulic gauge. With a locked wheel, LWST determines the force of friction as it is dragged under a predetermined load in the speed of 64 km/h on a wet asphalt pavement. In Automobile Method a moving automobile on the wet pavement section with a 64 km/h speed apply the brakes, and then the wheels are locked until to stop. The measured stopping distance gives the non-steady skid resistance. In GT, the wheel makes a rotation with a steady slip, the wheel is highly braked to provide a velocity difference between the speed of tester and the test wheel. It can operate up to a speed of 130 km/h. Mu meter generally used in airports. The devices speed is constant of 64 km/h over a wet surface and the test wheels remain under constant static load. DFT is composed of a spinning disc placed with three amounts of rubber sliders that are composed of certain materials as friction tires. The disc rotates tangentially at a speed of 90 km/h and then is lowered into a wet pavement surface. SCRIM is tested wet and the vehicle is mounted with large water track. The speed is typically at 50 km/h. A freely rotated test wheel is inclined to 20 degree to the direction of motion of the test vehicle. Norsemeter measures the friction and texture. As a brief, these test have typical technique to measured surface friction and gives a specific data. Depending on the surface layer, length of the road network and allowed test time, engineers need to select one or several test methods which are mentioned above.

Keywords: Highway Surface, Skid Resistance, Friction Tests



Determination of Optimum Insulation Thickness According to Different Insulation Materials for Bilecik

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Abstract: Energy is one of the indispensable elements of living life. The consumption of energy resources on the world is increasing rapidly. As is known, most of the energy in our country is used for heating purposes in the houses. With proper insulation application, operating costs can be reduced by achieving desired energy saving values. This need has led to the production of insulation materials in a more varied and better quality than the intended use and location.

This study was carried out in order to determine the most appropriate insulation thickness considering the economic parameters. The calculations were limited for Bilecik (Turkey) province and analyzes were carried out assuming that different wall models were used. In the calculations, interest rate and inflation rates and present value factor determined according to 10 years life span were used. The calculations were performed on 2 different wall models (brick and gas fire wall) for two different insulation materials (XPS and EPS). Natural gas was selected as an energy source in the study. As a result, the optimum insulation thickness values calculated as the result of application of XPS to the brick and gasket wall model are 0.046 m and 0.039 m, respectively. For EPS, these values were determined as 0.059 m and 0.051 m, respectively. While the amount of energy saving ranged from 14.1 TL / m² to 26.1 TL / m², the highest profit was obtained in EPS and brick wall insulation system. Repayment periods vary between 0.47 years and 0.77 years. As a result, it has been determined that insulation is of great importance in terms of energy saving.

Keywords: Energy, Insulation Materials, Optimum Insulation Thickness, Bilecik, Turkey

**Climate Change Effects on Streamflow of Büyük Menderes River (Turkey)*****Semih KALE^{1*}, Adem Yavuz SÖNMEZ², Fatih MUTLU³, Walter Leal FILHO⁴***¹*Çanakkale Onsekiz Mart University, Faculty of Marine Sciences and Technology, Çanakkale-TURKEY*²*Kastamonu University, Fisheries Faculty, Kastamonu-TURKEY*³*Turkish State Meteorological Service, General Directorate of Meteorology, Ministry of Forestry and Water Affairs, Ankara-TURKEY*⁴*Centre for International Business and Sustainability LMBS, London Metropolitan University, London-UNITED KINGDOM***Corresponding Author: semihkale@comu.edu.tr*

Abstract: The assessment of possible climate change effects on the streamflow of Büyük Menderes River is aimed in this study.

Dataset covering the streamflow of Büyük Menderes River and climatic parameters such as temperature, evaporation and precipitation was used for the assessment of possible climate change effects on the river streamflow. Temporal changes in the streamflow and climatic parameters were monitored by time series analyses. Change-point analysis was carried out to detect the distinct change time in dataset. Trend analysis was carried out to forecast the forthcoming trends in the streamflow.

Change-point analysis result detected the change-year as 1997 for the streamflow of Büyük Menderes River. According to the results of trend analyses, there was a decreasing trend in the river streamflow. Notwithstanding that statistically insignificant correlation was found between climatic parameters and the streamflow.

The streamflow tended to decrease and that this tendency was associated with the changes in climate. Present study suggests precious information to support future management of water resource in Büyük Menderes River. So that it can be used to manage water resources and take decision about management appropriately in the future to minimize climate change effects.

Keywords: Climate Change, Streamflow, Change-Point Analysis, Trend Analysis, Büyük Menderes River



Climate Change Effects on Annual Streamflow of Filyos River (Turkey)

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Abstract: The main purpose of this study was to estimate the possible climate change effects on the annual streamflow of Filyos River (Turkey).

Data for annual streamflow and climatic parameters were obtained from streamflow gauging stations on the river and Bartın, Karabük, Zonguldak meteorological observation stations. Time series analysis was performed on 46 years of annual streamflow data and 57 years of annual mean climatic data from 3 monitoring stations to understand the trends. Pettitt change point analysis was applied to determine the change time and trend analysis was performed to forecast the trends. To reveal the relationship between climatic parameters and the streamflow correlation tests namely Spearman's rho and Kendall's tau were applied.

The results of Pettitt change point analysis pointed to 2000 as the change year for streamflow. Change years for temperature and precipitation were detected as 1997 and 2000, respectively. Trend analysis results indicated that there were decreasing trends in the streamflow and precipitation, and increasing trend in temperature. These changes were found statistically significant for streamflow ($P < 0.05$) and temperature ($P < 0.01$).

In conclusion, decreasing precipitation and increasing temperature as a result of the climate change initiated a decrease in the river streamflow.

Keywords: Climate Change, Streamflow, Trend Analysis, Pettitt Change-Point Analysis, Filyos River



Digestive Enzyme Activity and Growth Performance of Common Carp (*Cyprinus carpio*) Fed Diet Supplemented with Celery (*Apium graveolens*) Extract

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Abstract: In this study, the effect of a dietary supplementation of *Apium graveolens* on digestive enzyme activities and growth performance of juvenile common carp (*Cyprinus carpio*) were evaluated.

C. carpio, with an average weight at the beginning of the experiment of 6.5 ± 0.07 g, were supplemented with a celery (*Apium graveolens*) aqueous methanolic extract at a dose of 0% (control), 0.01%, 0.05% or 0.1% over 45 d. At the end of the study, digestive enzyme activity and growth performance were investigated.

Results of this study showed that the final weight, weight gain and specific growth rate were significantly increased ($P < 0.05$) in the 0.01% group compared with the other groups. The feed concentration ratio was decreased in the 0.01% and 1% groups compared with the control ($P < 0.05$). Digestive enzyme activity (trypsin, amylase and lipase) in all experimental groups was significantly elevated compared with the control ($P < 0.05$).

These results indicated growth-promoting effect and increasing digestive enzyme activity of *C. carpio* supplemented with an *A. graveolens* aqueous methanolic extract.

Keywords: *A. graveolens*, Common Carp, Growth, Digestive Enzymes Activity, Fish



The Methanolic Extract of *Chenopodium album* and its Effect on Digestive Enzymes Activity and the Growth Performance Response in Common carp (*Cyprinus carpio*) Juveniles

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Abstract: The digestive enzymes activity and the growth performance effect to the methanolic extract of *Chenopodium album* supplementation were examined in common carp (*Cyprinus carpio*) juveniles. Common carp (2.4 ± 0.1 g) were fed diets containing three doses of *Chenopodium album* extract (CA 0, CA 0.01%, CA 0.05% and CA 0.1% / kg of feed) individually for 45 days. The results indicated that trypsin and lipase activities were a significantly increased in 0.5% and 1% treated groups. While, amylase activity was significantly improved in all treated groups compared to the control. Final weight and weight gain were significantly enhanced in 0.01% and 0.1% treated groups. FCR and SR were insignificant changes in all experimental groups. While, SGR was significantly increased in all treated groups compared to the control. The results concluded that the supplementation of methanolic extract of *Chenopodium album* to carp diet could stimulate the digestive enzymes secretion and some growth performance parameters.

Keywords: *Chenopodium album*, Common Carp (*Cyprinus carpio*), Digestive Enzymes Activity and Growth Performance Parameters



Effect of Grape *Vitis vinifera* Seed Oil Supplements on Rainbow Trout *Oncorhynchus mykiss* Fry Growth, Viability, Fatty Acid Profiles, Antioxidant Enzyme Levels, and Blood Parameters

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Abstract: In this study, the effect of supplementing rainbow trout *Oncorhynchus mykiss* fry with grape *Vitis vinifera* seed oil at 250, 500, or 1000 mg/kg was investigated over 60 d. Changes in growth performance, antioxidant enzyme activities, blood parameters, and fatty acid composition were documented. The average final fish weights were not different between the control group and the 500 mg/kg group ($P > 0.05$), but the 250 mg/kg group was lower than that of the control group, and the 1000 mg/kg group was higher than that of the control group. Similar results were obtained for live weight gain. Although the SFA ratio of the control group was higher than that of the other groups, no statistical difference was found. MUFA and n3 ratios were similar to SFA ratios, and there was no difference between the groups. The highest fatty acids in the fish were palmitic acid C 16: 0 in the SFA group and C 18: 1n-9 and docosahexaenoic acid C 22: 6n-3 in the PUFA group. The EPA ratio was significantly increased in all groups compared with the control group. The DHA ratio was significantly higher in the control group than in the experimental groups, and there was no difference between the experimental groups. Creatine, lactate dehydrogenase, sodium, potassium, chlorine, triglycerides, calcium, and phosphorus did not differ between the groups. Urea was significantly lower in the 250 mg/kg group. Total protein and aspartate aminotransferase was significantly increased in the 1000 mg/kg group. Only the 1000 mg/kg group showed an increase in antioxidant activities, and this concentration also yielded positive results in terms of growth performance, survival rates, fatty acid composition, and antioxidant enzyme activities in rainbow trout fry and can be used as a natural feed additive.

Keywords: Trout, Grape Seed Oil, Growth, Antioxidant, Fatty Acid, Blood



Immune and Haematological Responses of Common Carp (*Cyprinus carpio*) Fed Diet Supplemented with Celery (*Apium graveolens*) Extract

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Abstract: In this study, the effect of a dietary supplementation of *Apium graveolens* on immune and haematological responses of juvenile common carp (*Cyprinus carpio*) were evaluated.

C. carpio, with an average weight at the beginning of the experiment of 6.5 ± 0.07 g, were supplemented with a celery (*Apium graveolens*) aqueous methanolic extract at a dose of 0% (control), 0.01%, 0.05% or 0.1% over 45 d. Every 15 d, respiratory burst, lysozyme and myeloperoxidase activity were measured, and at the end of the study, haematological responses were investigated.

The result showed that respiratory burst and myeloperoxidase activity was significantly improved in all treated groups compared with the control group ($P < 0.05$). Lysozyme activity was highest in the 0.01% and 0.1% extract groups. Haematological parameters were affected by *A. graveolens* extract intake ($P < 0.05$). The total white and red blood counts, haemoglobin content and haematocrit value were highest in the 0.1% extract group ($P < 0.05$). However, the mean cell volume, mean cell haemoglobin and mean cell haemoglobin concentration were decreased in the 0.05% group ($P < 0.05$).

These results indicated an immunostimulatory effect of *A. graveolens* aqueous methanolic extract for common carp.

Keywords: *A. graveolens*, Common Carp, Immune Response, Haematology, Fish



Determination and Comparison of Textural Characteristics of Cullural Changes in Myocino Heavy Chain After Death of Rainbow Trout (*Oncorhynchus Mykiss* W., 1972), Brook Trout (*Salmo trutta forma fario* L., 1758) And Spring Trout (*Salvelinus fontinalis*)

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Abstract: In this study, post mortem myofibril proteins changes in myosin heavy chain mass using SDS-PAGE and texture specialties such as hardness, adhesiveness, cohesiveness, resilienceness, chewiness, gumminess, Fmax, Fmin and Fmax-Fmin, was determined and compared on the days 0., 3., 6. and 9. in three different trout species (*Oncorhynchus mykiss*, *Salmo trutta fario* ve *Salvelinus fontinalis*).

According to texture specialties, post mortem hardness, cohesiveness, resilienceness, chewiness and gumminess were decreased day by day, and springiness, Fmax, Fmin and Fmax-Fmin were significantly increased ($P > 0.05$). According to SDS-PAGE results, a decreased value on myosin heay chain was determined ($P > 0.05$). Texture specialties and SDS-PAGE result were found different among groups ($P > 0.05$). Correation among hardness, chewiness, gumminess, MHC, between chewiness, gumminess, between Fmax and Fmin, Fmax-Fmin and also Fmin and Famx-Fmin were significant.

As a result of the study, it was determined that SDS-PAGE results and texture specialties promote each other.

Keywords: Myofibril Protein, SDS-PAGE, Texture, MHC, Rainbow Trout



Blood Type Identification Algorithm by Using Image Processing and Gel Test Method

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Abstract: Rapid and accurate identification of blood type of a person is a vital issue in blood transfusion requiring a mandatory test to examine the compatibility between the blood types of donor and recipient. The objective of this study is to develop a blood type identification algorithm with high identification accuracy that is suitable for use especially in emergent situations. The proposed blood type identification algorithm is based on digital image processing and gel test method using 6-column gel card for a blood sample. The image processing part consists of the following steps: extracting subimages containing tubes holding blood samples, applying color segmentation to each tube, feature extraction from the segmented tubes and classification. Since physical dimensions of the gel card and tubes are fixed and known, subimages containing tubes are easily extracted from a given test image. The pixels where sedimentation occurs are identified in each tube by using reference sedimentation colors guided segmentation. Then, center of mass of the pixels determined in the segmentation step is used as the distinguishing characteristic of each tube. The centers of mass of the all tubes constitute the feature vector for the test image. Finally, rules learnt beforehand from the sedimentation locations for each blood type are used to identify the blood type from the computed feature vector. The average identification accuracy of the proposed algorithm was found to be 99.8% in tests conducted on more than 100 blood image samples. Furthermore, identification results obtained by the proposed algorithm are in harmony with those obtained by a qualified blood type analyzer.

Keywords: ABO Blood Group Type, Agglutination, Image Processing, Color Segmentation, Gel Card



System Diversification in Brackishwater Aquaculture of India: Research Support on Fish Culture Options for Sundarban Producers

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Abstract: In Indian context, brackishwater (0.5-30 ppt salinity) aquaculture is regarded as the 'sunrise sector' that is yet to grow and cover the vast 1.2 million ha coastal and 8 million ha inland salt affected areas, and has a potential to contribute significantly to overall aquaculture production. These natural resources offer immense opportunities for the development of brackishwater aquaculture in the country; which can be substantiated by the fact that the sector has grown at an average annual rate of 10% since 1984. Although, traditional brackishwater aquaculture involving multi-species of shrimp and fish is an age-old practice in coastal states like West Bengal (*bheries*), Odisha (*gheries*), Kerala (*pokkali*), Karnataka (*kharlands*) and Goa (*khazans*), commercial farming has been centred involving a single commodity, shrimp. Scientific brackishwater aquaculture started in India with the farming of tiger shrimp (*Penaeus monodon*) during early 1990s. With the introduction of Pacific whiteleg shrimp (*Penaeus vannamei*) in 2009, Indian aquaculture industry has grown rapidly. In addition, certain marine/brackishwater fishes, such as Asian seabass (*Lates calcarifer*), grey mullet (*Mugil cephalus*), milkfish (*Chanos chanos*), long whiskers catfish (*Mystus gulio*) and pearlspot (*Etroplus suratensis*) have demonstrated substantial results. Therefore, to ensure sustainability with enhancement of production in brackishwater aquaculture, diversification of culture systems involving various fish and shrimp species could be a practical alternative.

The Sundarban mangrove ecosystem covering about one million ha in the deltaic complex of the Rivers Ganga, Brahmaputra and Meghna is shared between Bangladesh (62%) and India (38%), and is the world's largest coastal wetland. The Indian Sundarban that covers a mangrove forest area of 9630 sq. km. was declared as a UNESCO world heritage site in 1997. At present, out of 108 islands of the Sundarban region, 54 are inhabited with a population of about 4.5 million. Sundarban ecosystem based major livelihoods are fishing, and collection of honey and fuelwood/ timber. Although, Sundarban has over 30000 ha of brackishwater area, almost 70-80% of which is not utilized through scientific practices. In this context, through concerted research efforts for almost three decades, ICAR- Central Institute of Brackishwater Aquaculture (CIBA) has now handful cost-effective fish culture technologies suitable for Sundarban aqua climatic conditions. These culture systems include Asian seabass culture with 2-4 ton/ha production, polyculture of fish and shrimp with different stocking patterns with a productivity of 3 ton/ha, milkfish farming in periphyton system with 2-3 ton/ha production, long whiskers catfish culture with 1.5-2 ton/ ha production, environmentally sustainable integrated multi-trophic aquaculture (IMTA) models with 1.5-2 ton/ha production, feed replacement (up to 30%) in polyculture using periphyton biomass, and organic input based seed rearing methods of grey mullet and milkfish. By implementing these, a profit level of INR 50000-200000 from one acre of water area could be obtained annually. Therefore, in the circumstances of ensuring environmental sustainability of Sundarban, the research supports from CIBA with its eco-friendly and lucrative brackishwater farming technologies would bring much needed culture system diversification, and increase the production and income of Sundarban producers at a significantly high level.

Keywords: Brackishwater Aquaculture, Culture System Diversification, Sundarban, Sustainable Aquaculture, Livelihood



Presence of *Branchiobdella sp.* in Crayfish (*Astacus leptodactylus*) Sampled from Germeçtepe Dam Lake (Kastamonu): A Case Report

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Abstract: Crayfish, one of Crustacea species, is widely distributed in freshwater bodies and has considerably high economic value. There has been a significant decrease in crayfish production in comparison to the past years in Turkey. Diseases are determinative at this decrease and revealing causative agents of these diseases has importance. In this study, presence of *Branchiobdella sp.* on Crayfish sampled from Germeçtepe Dam Lake was revealed. Specimens were caught with trammel net, brought to the laboratory and examined. Total number of eight specimens were collected from the lake. *Branchiobdella sp.* was found in three of these eight specimens. It was observed that parasites were localized on the carapace and antenna of crayfish. Prevalence value of the parasite was calculated as 37%. This is the first study to reveal presence of *Branchiobdella sp.* in Western Black Sea Region.

Keywords: Leechlike, Daday Stream, Kızılırmak River



Investigation of Microbiological Water Quality of Beyler Dam Lake

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Abstract: This study was conducted in 2017 to assess microbiological water contamination of Beyler Dam Lake in Kastamonu, Turkey. Water samples were taken from four locations designated on the lake. Samplings were carried out both in winter and summer seasons. All samples were analyzed at the laboratory in Faculty of Aquaculture of Kastamonu University, approximately one hour after they were taken. The average microorganism quantities of water samples in the winter and summer were 2.1×10^3 , 9.2×10^4 cfu/ml for Total plate count, 3.7×10^2 , 7.6×10^2 cfu/ml for Total coliform, 1.1×10^2 , 1.2×10^2 cfu/ml for Fecal coliform, 3.6×10^3 , 7.7×10^3 cfu/ml for Mesophilic, 1.4×10^4 , 5.2×10^4 cfu/ml for Psychrotrophic, 1.4×10^2 , 3.1×10^2 cfu/ml for *Staphylococcus aureus* and 1.0×10^2 , 2.8×10^2 cfu/ml for *Enterococci*, respectively. The study showed that there were significant differences in the Total plate count of bacteria, which was less in the winter than it was in the summer, where in the summer it was an average of 10^4 cfu/ml and the winter was an average of 10^3 cfu/ml. The results of this study indicate that percentage of microbiological contamination is low in Beyler Dam Lake as it was within the limits allowed both in Turkish and international standards.

Keywords: Beyler Dam Lake, Microbiological, Water Quality



Bottlenose (*Tursiops truncatus*) Dolphin Interaction with Bottom-Gillnets and Economic Review of Acoustic Deterrent Devices (Pingers)

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Abstract: The study was performed in Sinop between September 2015 – January 2017 to investigate whether it is a profitable application to attach pinger devices to bottom-gillnets used in coastal fisheries which target fishes such as red mullet (*Mullus barbatus*), whiting (*Merlangius merlangus*), horse mackerel (*Trachurus mediterraneus*), picarel (*Spicara maena*), bluefish (*Pomatomus saltatrix*).

Each month, quantitative survey information was obtained from the group of fishermen who use (experimental group) and do not use (control group) the pinger device. Gear specifications of both fishermen group were same as follows; mesh size: 17 mm, length: app. 1.1 km soak time were nearly 12 hours. Fishermen in control group used DDD 03N (Weight: 905 g, Length: 210 mm) pinger device. The frequency range of the device is 1–500 kHz. The most important distinctive feature of those devices which are durable up to 30 meters deep is having a built-in rechargeable 1.6 Ah NiMH battery pack but limited (1000-1500h) lifetime.

In experimental group; average fish catch in the first periods (September – December 2015) was 15.34 ± 1.22 kg and it decreased by 56 % to 6.83 ± 0.31 kg between January 2016 – 2017. During the same period, the average amount of caught fish dropped from 11.33 ± 0.85 kg to 7.37 ± 0.41 kg, representing a 36% decreasing in control group.

According to results obtained from both control and experimental group, Catch per Unit Effort (CPUE) was calculated as 0.63 ± 0.02 kg.kms⁻¹ and 0.67 ± 0.02 kg.kms⁻¹, respectively. Total incomes from the sale of fish were 20.880,90 TL and 22.259,65 TL for control and experimental groups. In the study, it was determined that the damage caused by bottlenose dolphins in control group was 25 % higher than the experimental group. The fishermen in control group spent 4.000,0 TL to repair nets damaged due to dolphin presence while other fishermen spent 3.400,0 TL to repair nets. Considering the device expenses for the experimental group (2 x 1.500,0 TL), total cost was calculated as 6.400,0 TL for experimental group and 4.000,0 TL for control group. Therefore, net income was calculated as 16.879,90 TL in control group while it decreased to 15.859,65 TL in experimental group, representing 6 % decline.

Keywords: Sinop, Dolphin, Fisheries, Interaction, Pinger

**Fish Fauna of Germeçtepe Dam Lake (Kastamonu-TURKEY)**

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Abstract: The aim of this study was to determine the biodiversity of fish species distributed in Germeçtepe Dam Lake in Kastamonu. Germeçtepe Dam Lake was constructed for the purpose of irrigation and put into service in 1986. It is built on Şadibey Stream which is a headwater of Daday Stream. Daday Stream is located in Kızılırmak Basin. Germeçtepe Dam Lake is being used for aquaculture and amateur fishing beside irrigation. The collected fish specimens were fixed in 4% formaldehyde and stored in 70% ethanol. Measurements were recorded using a dial calliper. All measurements were made point-to-point, never by projections. Measurements and countings related to taxonomic characters of fixed specimens were made and various indexes were calculated. As a result of measurements, countings and calculations, it was determined that *Capoeta baliki*, *Squalius pursakensis*, *Alburnus chalcoides*, *Cyprinus carpio*, *Perca fluviatilis* ve *Oncorhynchus mykiss* species are distributed in the dam lake. It was also determined that hybrids of *Squalius pursakensis* and *Alburnus chalcoides* species are present in the dam lake.

Keywords: Fish Biodiversity, Fish Taxonomy, Fish Systematics, Kastamonu Water Resources



The Effects of *Tilia tomentosa* on the Growth Performances and Digestive Enzyme Activity in Common Carp (*Cyprinus carpio*)

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Abstract: In this study, the effect of a dietary supplementation of *Tilia tomentosa* on growth performance and digestive enzyme activities in juvenile common carp (*Cyprinus carpio*) were evaluated. *C. carpio*, with an average weight of 4.35 ± 0.16 g, were fed diet with supplemented with a celery (*Tilia tomentosa*) aqueous methanolic extract at the dose of 0 mg kg^{-1} (control), 100 mg kg^{-1} , 500 mg kg^{-1} and 1000 mg kg^{-1} during 45 days. At the end of the study, the final weight was significantly increased in the 100 mg kg^{-1} , and 1 mg kg^{-1} compared with the control group ($P < 0.05$). The weight gain rate was also significantly increased in the experimental groups' compared with the control ($P < 0.05$). The feed conversion ratio was significantly decreased in the 500 mg kg^{-1} and 1000 mg kg^{-1} groups compared with the control ($P < 0.05$). The specific growth rate was significantly increased in the 500 mg kg^{-1} and 1000 mg kg^{-1} groups compared with control group ($P < 0.05$). The digestive enzymes activity (Amylase, lipase and trypsin) was also measured and no significant differences in the enzymes activities were determined at the end of the study compared to control ($P > 0.05$).

Keywords: *T. tomentosa*, Common Carp, Growth, Digestive Enzymes Activity



Fuzzy Linear Regression Use in Livestock

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Abstract: This study is aimed to give a new perspective to fuzzy linear regression analysis applied to many fields for many years. In cases where the assumptions of applying the classical linear regression method can not be met, it is considered more appropriate to apply the fuzzy linear regression method. However, there are situations in which is not appropriate to use the probabilistic model due to certain restrictions. When we work at such times, it is suggested that the variables can be blurred and the Fuzzy LRM model can be used. This study also includes that the results of various meta-independent performance measurement criteria to measure how effective the proposed technique. It was determined that the fuzzy linear regression model gave better results than the classical linear regression model when we considered 6 performance criterions (Adjusted R^2 , R^2 , Mean Absolute Error, Mean Absolute Percentage Error, Mean Square Error and Root Mean Square Error) as a result of our study.

Keywords: Fuzzy Systems, Linear Regression, Fuzzy Linear Regression



Investigation of Short-term and Long-term Memory Behavior of Three-Cell Motifs in Biological Neural Networks

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Abstract: The human brain and nervous system are extremely complex systems. Important work related to the brain's learning is done. Brain maps were obtained from biological studies on some experimental animals. Examination of brain cells in solution and in vivo, as well as imaging studies under an electron microscope, revealed important findings. The obtained data showed that many nerve cells in the brain formed complex connections. Repeated sections have been observed in this large neural network environment. These sections, called motifs, are being studied. It is thought that in order to understand the behavior of this nerve network in the brain, it is necessary to know the behavior of the motifs.

In this study, we investigated the effect of motif shapes, stimulation patterns and synaptic region parameters on short - and long - term memory behavior. Using the Hodgkin-Huxley model, the nerve cell was modeled as a single compartment from the soma part. All possible three-cell motif patterns seen in the biological network environment have been developed in the Matlab software environment. From all these motifs, long- and short-term memory behaviors have been identified. By focusing on a few of these motifs in our work, we have searched for a motif showing memory behavior. Motifs have been investigated for various values of many current types, connection types and synaptic connection parameters. In short- and long-term memory behavior, it has been shown that motif connectivity, various current applications, excitatory inhibitory synaptic stimulus, maximum value of synaptic conductivity and time constant of synaptic conductivity are effective.

Keywords: Hodgkin-Huxley Cell Model, Biological Network Motif, Long-Term Memory, Short-Term Memory, Synaptic Communication, Stimulating and Inhibiting Alert



The Role of P-Gp in Drug-Drug Interactions

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Abstract: Where simultaneously two or more drugs are used or where of multiple drug use is the cases, the result of interactions that may occur through different mechanisms among drugs, significant changes can be observed in the absorption, distribution, metabolism and excretion of drugs. These changes may be increased form of the drug effect as well as decreased drug efficacy or increased frequency and severity of unwanted side effects.

If one from mechanisms that play a significant role in drug-drug interactions is P-gp that located in many tissues and organs (blood-brain barrier, liver, kidney, intestine etc.), responsible for the elimination of many xenobiotics taken in body and, plays a key role in drug pharmacokinetics.

If is P-gp inhibitor, inductor or substrat of one or more from simultaneously used drugs, in drug efficacy can lead to serious changes that can result death.

The aim of this study is to investigate drug-drug interactions at level P-gp and is to create an awareness of this issue by showing the importance in terms of live health of multiple or simultaneous drug use.

Keywords: Simultaneous Drug Use, Multiple Drug Use, Drug-Drug Interactions, P-gp



Determination of Flavonoids and Antimicrobial Behavior of Non-Wood Forest Product Extracts

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Abstract: In this study, seeds of *Juniperus oxycedrus*, *Linum usitatissimum*, *Coriandrum sativum*, and leaves of *Buxus sempervirens* were extracted using 65% ethanol. After that, antimicrobial activities of these extracts, against 15 microorganisms, were investigated by the disk diffusion test, minimum inhibitory concentration (MIC) test, minimum bactericidal concentration test, and minimal fungicidal concentration test. Different types of flavonoids of extractives was analyzed with using high-performance liquid chromatography. It was found that extracts of *J. oxycedrus*, *L. usitatissimum*, *C. sativum*, and *B. sempervirens* showed antibacterial activity against the tested microorganisms at different levels. *J. oxycedrus* extract is especially active against the three microorganisms (*Enterococcus faecalis*, *Klebsiella pneumoniae*, and *Salmonella enteritidis*). MIC values of *J. oxycedrus* extract were found 52.03, 104.06, and 13.01 µg/mL respectively. However, *L. usitatissimum* and *C. sativum* extracts were observed to be active against only *S. enteritidis*, and *B. sempervirens* extract was active against *Candida albicans* and *E. faecium*. Finally result, It can be said that notable activities against *C. albicans* and *S. enteritidis* were identified and the extracts contain different levels of flavonoids.

Keywords: *J. oxycedrus*, *L. usitatissimum*, *C. sativum*, *B. sempervirens*, Antimicrobial Activity, Flavonoids

**Scorpions of Sinop Province, Turkey (Arachnida: Scorpiones)*****Halil KOÇ^{1*}, Ersen Aydın YAĞMUR²***¹*Sinop University, Science and Art Faculty, Biology Department, Sinop, Turkey*²*Celal Bayar University, Alaşehir Vocational School, Alaşehir, Manisa, Turkey****Corresponding Author: koc.halil@hotmail.com**

Abstract: This study was conducted to determine the biological richness of spiders from Sinop province, Turkey. The studies were carried out on between 41° 12' and 42° 6' northern latitudes and 34° 14' and 35° 26' east longitudes within the Sinop province borders. Scorpions were collected from 2009 to 2015 using two collection methods: using active searching and pitfall trapping. A total of 86 specimens were collected that represented by 2 families, 2 genera and 3 species; *Euscorpius tauricus* (C.L. Koch, 1837), *Euscorpius mingrelicus* (Kessler, 1874) (Euscorpiidae) and *Mesobuthus gibbosus* (Brullé, 1832) (Buthidae), of which *Euscorpius tauricus* and *Mesobuthus gibbosus* species are recorded for the first time for Sinop Province. Here, we provide information about these species and ecological notes.

Keywords: Species Richness, Sinop, Scorpiones, Fauna, New Records



The Impact of Protein G Layer on 11-Mercaptoundecanoic Acid Coated Gold Surface for Antibody Immobilization

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Abstract: The 11-Mercaptoundecanoic acid (MUA) forms a self assembled monolayer on gold surface and modified with N-Ethyl-N'-(3-dimethylaminopropyl) carbodiimide hydrochloride (EDC) / N-hydroxysulfosuccinimide (NHS) cross-linker for antibody immobilization. MUA+EDC/NHS have been applied to various biosensing scenarios. The orientation of the antibody on the sensor surface directly affects the capture efficiency. Protein G has a binding site for the heavy chain of the antibody and positions the antibody upright position thus increasing the binding efficiency. In this study the impact of protein G layer on MUA+EDC/NHS coated gold surface was investigated by testing MUA+EDC/NHS layer with and without protein G for immobilizing CD19 antibody and capturing leukemia cells.

The binding kinetics were measured using a quartz crystal microbalance. The MUA layer caused 22 Hz frequency shift and EDC/NHS layer caused 10 Hz frequency shift. Without protein G CD19 antibody resulted in 11 Hz frequency shift, whereas with protein G CD19 antibody resulted in lower (8.8 Hz) frequency shift. However, when 10^4 cells/ml solution introduced to the sensor 17 Hz frequency shift was measured with protein G scenario and 4 Hz frequency shift was measured without protein G scenario. The significant differences in the frequency shifts indicate that protein G layer has significant impact on the cell capture efficiency by orienting the CD19 antibody.

The experimental results reveal that even though the amount of CD19 antibody on EDC/NHS layer was more than the CD19 antibody on protein G layer, more cells were captured when protein G was used.

Keywords: MUA, Protein G, CD19 Antibody, Leukemia Cell, Surface Functionalization



Selection of Reliable Reference Genes for qRT-PCR Analysis of Medicarpin-treated HNSCC Cells

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Abstract: Analysis of gene expression using quantitative real time reverse transcriptase-PCR (qRT-PCR) require selection of reliable reference genes for correct normalization of the data. The objective of this study was to evaluate a set of housekeeping genes (HKGs) to be used in the normalization of gene expression in HNSCC cell line (SCCL-MT1) treated with Medicarpin.

Medicarpin treated and untreated cell samples were collected from cell cultures and total RNA was extracted. A total of 9 HKGs were used to evaluate in the normalization for expression profile of the genes including actin beta (ACTB), glyceraldehyde-3-phosphate dehydrogenase (GAPDH), tyrosine 3-monooxygenase/tryptophan 5-monooxygenase activation protein (YWHAZ), succinate dehydrogenase complex, subunit A (SDHA), hydroxymethylbilane synthase (HMBS), ribosomal protein L13a (RLP13A), beta-2-microglobulin (B2M), phosphoglycerate kinase 1 (PGK1) and cyclophilin A (CycA). Results were compared with widely used software including BestKeeper, geNorm and NormFinder.

geNorm findings indicated that average expression stability values (M) of all HKGs were smaller than 1.5, indicating that all the evaluated genes can be used as reference gene. RLP13A (M=0.014) and B2M (M=0.015) were determined to be the most stable genes. Similarly, NormFinder results agree with geNorm's results. As a conclusion, B2M and RLP13A seems to be the most suitable HKGs to evaluate gene expression studies of the medicarpin treated HNSCC cell line.

Keywords: Medicarpin; HNSCC, qRT-PCR Housekeeping Gene, BestKeeper, geNorm, NormFinder



Cytotoxic Effect of Hydrazinecarbothioamide-based Compounds on Hepatocellular Carcinoma Cells and Activity of Xanthine Oxidase Enzyme Inhibition

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Abstract: The morbidity and mortality of liver cancer increases by about 3% every year in recent years. The chances of getting rid of liver cancer are as low as 18%; which is specific to the cancer stage and is due to liver transplantation. Reactive oxygen species (ROS) that occur in our body because of various causes and cannot be removed from the body play a major role in the development of cancer, leading to uncontrolled cellular and molecular changes. It is said that the xanthine oxidase (XOD) enzyme causes free radicals by causing ROS production. Anti-cancer drugs activate oxidative stress pathways, leading to cytotoxicity with apoptosis. Platinum (II) (Pt (II)) compounds are preferred clinically as anticancer drugs. However, some studies have shown that Palladium II (Pd (II)) compounds are 105 times more soluble than Pt (II) complexes. These high solubilities of Pd(II) compounds and additionally their low toxicity are the sought after properties of anticancer drugs. It was aimed to understand XOD inhibition and cytotoxicity effects of five of new Pd(II) complexes (1-5) obtained from hydrazinecarbothioamide as starting material and cisplatin as a control on human hepatocarcinoma cells (HepG2 and Hep3B) and 3T3 (normal mouse fibroblasts) in this study. XOD enzyme inhibition test of the Pd (II)s were done. Stock solutions of the complexes were arranged like 5mg/ml in (Dimethyl sulfoxide) DMSO and implemented with different concentrations (10, 7, 5 and 3.5 µg/ml) for assessment of concentration that inhibited 50% cells (IC₅₀). MTT was used for determination of cytotoxicity. Cell morphology was evaluated in inverted microscopy. As a result, all of Pd (II) compounds exhibited the property of XOD inhibition. They lead to decrease in cell viability of HepG2 and Hep3B cells at fewer µM concentrations. Contrary to these, 3T3 did not show significant decline. IC₅₀ levels were found more effective than cisplatin. But they were exhibited higher cytotoxicity on Hep3B cells than HepG2 cells. In HepG2 cells treated with the Pd (II)s, especially increase in granulation and round shaped cells, loss of typical cell morphology, with the collapse of cell colonies were seen. Hep3B cells were observed overgrowth and Pd (II) residues are predominant in those cells which seem like small islets. The accumulation of palladium compound and cell death in 3T3 fibroblast cells treated with the Pd (II)s is not remarkable.

The effectiveness of the Pd (II) compounds at low doses in tumorigenic cells (Hep3B) and at high doses in non-tumorigenic cells (HepG2) may be of therapeutic value so they are less likely to affect relative normal cells (3T3). These selective and protective effects are significant in cancer treatment. The enzyme inhibition with palladium compounds is provided at very small concentrations, the toxic effect occurs at higher concentrations. Probably, inhibition of XOD enzyme in this toxic effect also has a significant role. Since it is known that Pd (II) and its compounds are hepatotoxic, the dose differences between the two cell lines are even more noteworthy.

Keywords: Hydrazinecarbothioamide, HepG2, Hep3B, Hepatocellular Carcinoma, Liver Cancer, Anticancer, Xanthine Oxidase Inhibition



Comparative Evaluation of the Effect of *Teucrium Orientale L.* Extract on the Cell Proliferation by Using HCT116 and HUVEC Cells

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Abstract: For centuries, plants have been used for illness treatment. So that, it has been found that more than 300 plant species have anticancer properties. In this context *Teucrium* family, which its species have so far been identified as having many biological activities, but no evidence about anti-cancer activity of *T.orientale L.* in literature. There are also used in the treatment of hemorrhoids between local people in the Samsun province in Turkey. Therefore, goal of the study was evaluation of the anti-cancer effect of the *T.orientale L.* on human colorectal cancer cells (HCT116) without any harmful effect on the healthy cells. So we also aimed that detection of its proliferative activity on the Human Umbilical Vein Endothelial Cells (HUVEC) in relation to hemorrhoids therapeutic feature.

Plant extract was prepared by using Soxhlet extraction method in the distillate water. Stock solution of the extract was arranged as 5mg/ml in Dimethyl sulfoxide at different concentrations for determination of inhibitory concentration %50 (IC₅₀) value. HCT116 and HUVEC were seeded in 96 multi-well culture plates as 10⁴cells/well concentration and incubated at 37°C in 5%CO₂ for 72 hours. The MTT cell-viability colorimetric-assay test kit was used to observe cytotoxic effect of *T.orientale L.* extract. IC₅₀ values were calculated from dose-response curve. Cell morphologies were evaluated by inverted microscope. Cisplatin (anticancer drug) was also performed as positive control. In HCT116 cells treated *T.orientale L.*, cell-viability was found 44% and contrary to their normal morphology, only round-shaped cells were observed. However, HUVEC cells treated *T.orientale L.* was showed high confluence on plate surface.

As a result, *T.orientale L.* extract kills carcinogenic cells without affecting cell viability of healthy cells, but we do not know the reasons for this different mechanism. The more detailed studies are needed in the future. Despite all this, we can suggest that *T.orientale L. plant* may be a clinically benefit, because it has no toxic effect on healthy endothelial cells, contrary to that exhibited cytotoxic effect on colorectal cancer cells.

Keywords: Cytotoxicity, HCT116, HUVEC, *T.orientale L.*, Anticancer



Design and Implementation of Image Processing Based System for Diagnosis of Vitiligo Disease

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Abstract: Vitiligo is a dermatologic skin disease that results in the damage of melanocyte cells producing the color pigments in the deep. Vitiligo disease has a symptom of white lesions in limited contours in certain parts of the body. These lesions are small enough to be invisible in the initial phase of the disease, and they are spreading to other parts of the body as well as extending the surface of the disease in later stages of the disease. Dermatologists specializing in the diagnosis of vitiligo use a Wood lamp operating at 400 nm wavelength to examine the skin surface of the lesions. In this diagnostic method, different rashes and stains on the face are visually categorized by dermatolytic expertise. It is important, however, to keep image recordings to compare the progress of the disease or to compare the results of the treatment and to establish numerical data on the images in order to follow the disease. In this study, the illumination unit that emits light in the UV-A band of the imaging unit and spectrum required for real-time video processing has been established. The system's construction components were manufactured by FDM (Fused Deposition Modeling) 3D printer and assembled. Images of the UV illuminated zone were analyzed with image processing algorithm. the boundary areas of the lesions were viewed on monitor. Using image processing algorithms on real-time video images were determined characteristic parameters such as position, area and color saturation of the lesions. In this study, a system has been realized in which numerical data and documentation are prepared for the diagnosis of vitiligo disease and examination of the treatment process. Thus, vitiligo disease; it is aimed to reduce human dysfunctions and possible examination mistakes to a minimum level in dermatological examinations.

Keywords: Wood Lamp, Vitiligo, Dermatological Examination, Video Processing, Diagnostic Device



Development of High Frequency Adventitious Shoot Regeneration System for Efficient Genetic Transformation of Potato

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Abstract: Potato (*Solanum tuberosum* L.) with its rich nutritional composition is the world's fourth most important food crop and can respond to the growing food hunger problem and balanced nutritional needs in the world. Many potato cultivars were grown commercially in Turkey. The goal of the study was to develop high frequency adventitious shoot regeneration system for efficient genetic transformation of potato.

Four different domestic and foreign origin potato cultivars (Tokat 6/24, Tokat 10/1, Innovator and Marabel) were used in the study. 4-weeks old leaves of the genotypes were cut into strips and pretreated on MS (Murashige and Skoog, 1962) medium containing 10 mg/L Zeatin Riboside (ZR) + 10 mg/L Naphthaleneacetic acid (NAA) at 24 ± C under dark conditions for 3 days. Then, the pretreated explants were transferred in MS medium containing 0.2 mg/L NAA and 0.02 mg / l Gibberellic Acid (GA₃) with 2.00 mg/L ZR. the explants were swollen at the first week and callus were visible on the surface of leave explants after two weeks later.

Different types of callus types were seen obtained in potato varieties 4 weeks after culture initiation. The regenerative calli were transferred to MS medium containing 2.00 mg / l ZR and 0.2 GA₃. Approximately two weeks later shoot formation on callus was obtained in all potato cultivars. Healthy and high frequency shoot regeneration suitable for gene transfer was obtained in all genotypes after 4 weeks later and the best regeneration frequency was 90% for domestic line Tokat 10/1, the lowest shoot regeneration frequency was 30.98% in Marabel cultivar.

Keywords: *Solanum tuberosum* L., Shoot Regeneration, Genetic Transformation, High Frequency



Loss of Apical Dominance Affects the Shoot Architecture in *Phalaenopsis* Orchid

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Abstract: The shoot branching determines the plant architecture, which influences adaptation, survival, and competition. It is inhibited by signals from the apex of the main shoot in some plant species and this phenomenon is called as apical dominance. The underlying regulatory network is complex and involves phytohormones and transcription factors. In the present study, branching was investigated in *Phalaenopsis* orchids.

Phalaenopsis are important ornamental flowering plants with high demand and economic value. These plants are epiphytic monopodials with distinguished reproductive and ecological adaptations. They grow upward, sprouting new leaves from the apex of the plant and sprouting roots and inflorescences from the axillary buds adjacent to the leaves. *Phalaenopsis* have short height with a small distance between the leaves. Their leaf wraps around the base of the preceding leaf, so there appears to be no stem. Monopodial structure of *Phalaenopsis* is genetically defined, but its architecture and branching patterns exhibit phenotypical plasticity. Branching involves two developmental stages: the formation of axillary meristems in the leaf axils and the growth of axillary buds. They are regulated in response to multiple environmental and developmental signals. Apical shoot inhibits branching through the hormone auxin derived from the shoot apex. Numerous signaling elements in addition to IAA are known to be required for bud outgrowth. Recently, it has been shown that, rather than simply auxin supply, strong sugar demand of the shoot tip inhibits axillary bud outgrowth by limiting the amount of sugar translocated to those buds. Strigolactones, which is a carotenoid-derived hormonal signal inhibits shoot branching in plants. Furthermore, the transcription factor *BRANCHED1* plays a central role in the control of axillary bud development. Strong apical dominance in a mini *Phalaenopsis* cultivar was released by decapitation of the shoot apex. Upon decapitation, dormant bud primordia at the leaf axil of *Phalaenopsis* were induced for lateral shoot formation along with accumulation of cytokinin without the suppressing effect of auxin. Therefore, decapitated plant started to sprout new plantlets after 1.5 months. Besides lateral bud induction, decapitation was also resulted in the inhibition of inflorescence stem formation because of the probable modification in auxin (IAA) and sugar fluxes.

Little is known about how architecture of monopodial *Phalaenopsis* is genetically determined. Thus the sequences of the key genes involved in the branching regulatory network were identified in the NCBI database by blasting known protein sequences of branching regulatory network against the annotated genome sequence of *Phalaenopsis equestris*. Differences between the gene regulatory sequences of monopodial and sympodial plants were also analyzed using *Phalaenopsis* as a model organism for the monopodials.

Keywords: Plant Architecture, Apical Dominance, *Phalaenopsis*, Monopodial Branching, Auxin, Cytokinin, Strigolactones, Branching Transcription Factors



Improved Primer Extension Method for Enhanced Detection and Quantification of Small RNAs in Plants

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Abstract: Non-coding small RNA (sRNA) are involved in plant development, reproduction, defense and genome reprogramming. Two main classes of sRNA, the small-interfering RNA (siRNA) and microRNA (miRNA) are well documented and several experimental approaches have been developed for their detection from plant tissues. In the present study, an improved and detailed application of primer extension (PE) analysis was described for enhanced detection and quantification of low-molecular weight RNA species from nucleic acid preparations without subsequent enrichment. PE analysis protocol was optimized for smaller sample volumes, increased efficiency, repeatability and accuracy.

The assay involved the separation of radioactively labeled extended primers (short cDNAs) by sequencing gel electrophoresis, gel drying and autoradiography. *CHLORINA 42* (*CH42*) gene in Arabidopsis was silenced via artificial *trans*-acting siRNA (ata-siRNA)-mediated silencing using miRNA173 as trigger. The expression of miRNA173 and *CH42* siRNA in different transgenic lines was assayed using primer extension method. Primers (16-18 nt) complementary to 3' end of small RNAs were used. When reverse transcriptase extended these primers without interruption to the 5' end of the small RNAs, the product length was 23 nt (with siRNA) or 21 nt (with miRNAs). PE products were resolved on 10% denaturing polyacrylamide gel. Quantification was achieved with a phosphoimager. Sample to sample variation of miRNA expression in Arabidopsis was corrected by β -Tubulin (internal control) normalization. Variations of mature miRNA173 accumulation were observed among the transgenic lines. The expression profile of miRNA173 and *CH42*-targeting siRNA correlated with the expression profile of *CH42* mRNA determined by qRT-PCR. The assay is also capable of discriminating between related small RNAs that differed by subtle sequence differences at 3' ends.

These results strongly suggested that PE is a powerful method to validate the expression and quantify the small RNAs in transgenic lines. Due to consistent and rapid implementation, this method will find use to monitor temporal, spatial and pathological patterns of miRNA expression in plant tissues and in samples derived from experimentally tractable organisms. Moreover, it can be employed to investigate RNA interference of engineered siRNAs in model systems.

Keywords: Small RNA Detection, Primer Extension, sRNA, miRNA, siRNA, Sequencing Gel



Parasitization Preference of *Hyposoter didymator* on the Young Instars of *Helicoverpa armigera*

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Abstract: The young instars (1-3.th instars) of *Helicoverpa armigera* (Hübner) (Lepidoptera: Noctuidae) were used in order to determine parasitization preference of the parasitoid *Hyposoter didymator* (Thun.) (Hymenoptera: Ichneumonidae) which may develop inside *H.armigera*. The experiment designed as randomized plots with 3 replicates that each one containing 20 of each instar [3x(20 of 1st instar, 20 of 2nd instar and 20 of 3rd instar *H.armigera* larvae)] a total of 180 larvae. In the experiments, one of 1st, 2nd and 3rd instar larvae and an experienced *H.didymator* female were inserted into a petri dish and then observed for parasitization. The parasitized larva that *H.didymator* inserted her ovipositor was immediately removed from the petri dish and another larva from the same category (1st, 2nd or 3rd instar larva) was inserted into the petri dish. This procedure was continued until 20 host larvae were parasitized. Parasitized larvae were inserted into transparent cylinders of 100 ml volume with artificial insect diet. The cylinders were stored in the growth chamber at 25±1°C temperature and 65%±5 humidity. The parasitized larvae were dissected at Ringer's solution under a stereomicroscope and the eggs of the parasitoid were searched since the parasitoid eggs could easily be seen after 24 hours later than the parasitization. After dissection and inspection, the larvae with parasitoid egg were accepted as preferred by the parasitoid and the parasitization ratios (%) for 1st, 2nd and 3rd instar *H.armigera* larvae by *H.didymator* were calculated then compared via ANOVA with Tukey's-b multiple comparison test using SPSS software. Results show that the host instar preferences of *H.didymator* females were significantly different ($F_{(2,24)}=38,055$; $P<0,05$) and the most preferred *H.armigera* instar was the 3rd instar (52%), then the 2nd instar (32%). The least preferred *H.armigera* instar was the 1st instar (16%). We believe that these results may be useful in *H.didymator* breeding programs.

Keywords: *Hyposoter didymator*, *Helicoverpa armigera*, Host Instar Preference, Pest, Parasitoid



Production, Characterization and Wash Performance Analysis of Thermostable and Alkaline Protease from a Native *Bacillus* sp.

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Abstract: This study aimed to produce and characterize a thermophilic and an alkaline protease by native *Bacillus* sp. and investigate the biotechnological and industrial areas of usage of this enzyme.

Bacillus sp. strains were isolated from soil samples and screened for protease secretion on skim milk agar (SMA) at 37°C and pH 9.0. The highest alkaline protease producing strain was incubated at different temperatures (30-80°C) and pH values (6.0-13.0) to determine the optimum enzyme production conditions.

The optimal enzyme synthesis occurred at 40°C and pH 10.0 for 40 h. The protease was produced at the determined optimum conditions and the culture supernatant was used as the raw enzyme source for the following experiments. The enzyme exhibited its maximum activity at 60°C and pH 12.0. It was stable between pH 6.0-13.0 and 30-100°C for 24 h with an average of 61% and 88.4%, respectively. In the presence of 1 mM TLCK and phenanthroline, the protease showed 90 and 106% activity, respectively. It exhibited 150% activity with β -mercaptoethanol (5%) and 103 % activity with ZnCl₂ (5mM). The protease was inactivated by 4 M urea (69%). It saved 90 and 97% of its initial activity with 5 mM EDTA and PMSF. The enzyme was found to be stable toward 5% concentration of surface active agents such as SDS, Tween 20, Tween 80, and Triton X-100. H₂O₂ did not affect the enzyme (104%). Furthermore, none of the metal ions used (Mg²⁺, Cu²⁺, Ba²⁺, Mn²⁺, Co²⁺, Zn²⁺, and Ca²⁺) showed an inhibitory effect on enzyme activity. When the enzyme was exposed to 1-15% concentrations of NaCl, the maximum activity was observed at 1% NaCl (92.2%). The end products of casein were detected as tyrosine, histidine, cysteine, and glycine by thin layer chromatography. According to the wash performance tests, the mixture of protease and 1% commercial detergent almost removed all of the stains (egg and human blood).

In conclusion, the protease produced by the native *Bacillus* sp. is an alkaline, a thermostable enzyme and resistant to chelators, ions, inhibitors, and detergents. Because of its thermo-alkaline activity, it may be useful in commercial applications, especially in the detergent industry.

Keywords: *Bacillus* sp., Alkaline Protease, Thermostable, Thin Layer Chromatography, Washing Performance



Characterization of Thermostable and Acidophilic Type II Pullulanase from *Geobacillus thermoleovorans* NP1 and Its Industrial Applications

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Abstract: This research aimed to produce and characterize a thermophilic and an acidic pullulanase and determine the industrial areas of usage of this enzyme.

Pullulanase producing *Geobacillus thermoleovorans* NP1 (NCBI accession number: MF355416) was isolated from soil samples and screened for pullulanase activity on agar medium containing pullulan (pH 7.0) at 55°C. The highest enzyme production occurred at 45°C and pH 7.0 for 12 h. The supernatant enzyme exhibited its maximal activity at 50°C and pH 6.0. It was highly stable between pH 3.0-12.0 for 24 h and 30-100°C for 60 min. The pullulanase was treated with two each concentration of various metal ions, chelators, detergents and inhibitors. The stability of the enzyme was saved at 5 and 10 mM concentrations of Ca²⁺, Mg²⁺, Cu²⁺, Zn²⁺, and Ba²⁺. It showed 145% activity with β-mercaptoethanol (%1). In the presence of 5 mM and 10 mM EDTA, NP1 pullulanase exhibited 92% and 101.3% activities, respectively. Each concentration of PMSF (5 and 10 mM) did not affect the enzyme stability. The enzyme activity was measured as 86.3% with 5% SDS. NP1 pullulanase maintained its initial activity with TritonX-100, Tween20 and Tween80.

The native NP1 pullulanase is composed of two active subunits of 112 and 107 kDa. The hydrolysis products of pullulan and starch determined by thin layer chromatography analysis are glucose, maltose, maltotriose, and maltodextrin. This shows that NP1 pullulanase is a type II pullulanase (amylopullulanase). According to the wash performance tests, the mix of pullulanase and 1% commercial detergent removed nearly all of the stains (food gravy, chocolate, baby food).

In conclusion, type II pullulanase producing by *Geobacillus thermoleovorans* NP1 is an acidic-neutral, a thermostable enzyme and resistant to some ions, chelators and detergents. Because of its thermo-acidic activity, it can be used in starch (liquefaction/saccharification), food and detergent industry.

Acknowledgement: This study was supported by Çukurova University BAP (code: FDK-2014-2393) and TÜBİTAK BİDEB 2211-C.

Keywords: *Geobacillus thermoleovorans* NP1, Pullulanase, Amylopullulanase, Thermostable, Starch Industry, Detergent, Thin Layer Chromatography



Adaptive FOPI^λ Controller Design based on Artificial Neural Network Scheme for Coupled Tank System

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Abstract: To keep the amount or the liquid level in a storage tank at a desired value is one of the most requested features in industrial systems. Coupled tank system is an important plant model used for the representation of the fundamental problems on the liquid level control in the industrial applications.

Moreover, this model is an essential tool for performance analysis of designed control methods. In this study, Adaptive Fractional Order PI^λ (FOPI^λ) Controller is proposed to control the liquid level of coupled tank system at desired level. The fractional calculus has become more important in the research areas due to the development of computer-based systems capable of rapid calculation. A fractional order controller can be defined as a differential equation. The order of the derivative can be any real number between 0 and 1. The aim of the control system is to hold the liquid level in the second tank at desired level by pumping the liquid in the first tank. The nonlinear structure of the coupled tank system makes the control problem more complicated. In this context, tuning parameters of FOPI^λ controller which are proportional (K_p), integral (K_i) and order of the fractional system (λ) are determined by Artificial Neural Network (ANN) scheme with respect to tracking error (e). Proposed method has the advantage that provides online training and adjustment of controller coefficients. Simulation studies are realized on LabVIEW software to show the effectiveness of the proposed method. Moreover, results prove that Adaptive FOPI^λ Controller has more accurate tracking performance against to classical PI controller in cases of disturbance emerging and the change of the desired level.

Acknowledgment: This study is supported by Scientific Research Unit of Balikesir University (Project No: 2016/18)

Keywords: Fractional Order Controller, Coupled Tank System, Artificial Neural Network



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A Comparative Analysis of Speckle Noise in Medical Imaging

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Abstract: Ultrasound imaging is a common tool for the diagnosis of several diseases. The use of radiology is highly correlated with different types of noise in imaging. Ultrasound images are inherently associated with speckle noise. The nature of speckle noise could bring high distortion in flow imaging. Moreover, echocardiography is considered as a robust modality in cardiac imaging where blood stream and anatomical structures are distorted with speckle noise. The contour of inner layers within soft tissues and target organs may not be properly visualized when the noise level is increased. The negative effects of speckle introduce purious structures and lower the image quality through its resolution by masking anatomical features during diagnosis. In this study, two different groups of speckle reduction filters are presented. Wavelet denoising and anisotropic diffusion are described for the implementation on different metrics through the noise level. The application of reduction filters to different datasets and subsequent analysis of decision metrics revealed the quality of noise removal. In conclusion, the edge preservation and contrast improvement are characterized as the most important criteria for both radiologists and medical engineers in ultrasound imaging.

Keywords: Medical Imaging, Ultrasound, Echocardiography



Cytotoxic Effect of Triple-Stranded Iron (III) Helicate on K562 Leukemia Cell Line

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Abstract: Schiff bases are important ligands in coordination chemistry and their metal complexes are subject of important studies especially because of the wide range of biological activities they exhibit such as anti-inflammatory, antifungal, antimicrobial, antiviral, anticancer and antioxidant. Helicates are one of the most well-known examples of self-assembling supramolecular systems. The ultimate goal in supramolecular chemistry is to mimic the achievement of biological systems such as tobacco mosaic virus, polypeptides, and DNA, examples of self-assembly in nature. Design based on supramolecular chemistry has led to numerous applications in the creation of functional biomaterials and therapeutics. The area of drug delivery has also made critical advances as a result of supramolecular systems providing encapsulation and targeted release mechanisms. Although, today imatinib is the most widely used drug in chronic myeloid leukemia treatment, novel synthesized supramolecular compounds that have multifunctional effects are hope in treating cancer.

In this context, triple iron helicate complex was synthesized from the reaction of 2-hydroxybenzaldehyde[(E)-(2-hydroxyphenyl)methylidene]hydrazone, is a schiff base, with an equimolar amount of FeCl₃.6H₂O. Complex was characterized by elemental analysis, IR and single crystal X-ray diffraction. We used MTT method to show the cytotoxic effects of complex. For this purpose, we used K562 cells as a chronic myeloid leukemia cell line. After treatment with complex for 72 hours, we determined the percentage of cell viability. We used concentrations of 5 and 10 µg/mL of complex in cells.

Our study showed that a concentration of 5 µg/mL of the complex reduced cell viability by 50% in the K562 cell line. This result suggests that the complex may be an effective agent in the treatment of leukemias. On the basis of the multiple effects of supramolecular complexes, it will be more potent in cancer when designed as a drug delivery system, in addition to the toxic effects of the complex.

Keywords: Supramolecular Chemistry, Leukemia, Cytotoxicity, Triple-Stranded Iron (III) Helicate, Anticancer Drug



Synthesis, Characterization and Cytotoxic Activities of Nickel (II) Mixed Ligand Complexes of 4-methoxysalicylaldehyde Thiosemicarbazone

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Abstract: Breast cancer, one of the most common female cancers is a major cause of death when compared with lung cancer around the world. The most important problem in the treatment of breast cancer is drug resistance and resistant cell clones that develop after treatment, and resulting in metastases. A successful treatment expectant does not harm normal cells. It is envisaged that new compounds synthesized from organic molecules should be used as anticancer agents in cancer treatment. Thiosemicarbazones have a wide variety of pharmacological activities and their metal complexes have been subject of medicinal studies because of their biological potentials.

In this study, two novel mixed-ligand nickel(II) complexes, [NiLC1] and [NiLC2], were synthesized from the reaction of 4-methoxysalicylaldehyde thiosemicarbazone (L) with N,N-diethylethylenediamine (C1) and N-(2-picolyl)methylamine (C2) in the presence of nickel (II) ion. The properties and structures of ligands and complexes were investigated by elemental analyses, IR, UV-Vis and single crystal X-ray diffraction. Based on spectroscopic and X-ray crystallographic studies, a square planar structure has been proposed for [NiLC1], in which the thiosemicarbazone ligand is coordinated to nickel as binegative tridentate ONS donor. The cytotoxic properties of complexes were tested in MDA-MB-231 cells, a highly invasive and aggressive cell line. The complexes were also tested in 3T3 fibroblast cells as normal cells.

As a result, the breast cancer cells died by treatment with the complexes; however, there was no change in cell viability in normal cells. In the context of the effects of the complexes, significant reductions in cell viability at 30% concentration of C1 complex at 10 µg/mL concentration in MDA-MB-231 breast cancer cells and 50% and 90% decrease at concentrations of 5 and 10 µg/mL of C2 complex were determined, respectively.

In conclusion, we anticipate that these newly synthesized specific complexes may be highly effective in breast cancer treatment.

Keywords: Thiosemicarbazones, N,N-diethylethylenediamine, N-(2-picolyl)methylamine, Breast Cancer, Cytotoxicity, Anticancer Drug



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Habitat Suitability Modelling of Red Deer (*Cervus elaphus*) in Kastamonu Elekdağ Wildlife Development Area

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Abstract: Identifying the daily activities and habitat use of wild animals is one of the fundamental elements of wildlife management and monitoring studies. Identifying wildlife-habitat relationships also helps to anticipate habitat changes and management impacts that may occur in wildlife populations. In order to determine why wild animals prefer certain habitats and various ecological factors in these areas should be also examined. Habitat suitability models are important for predicting potential distributions of wildlife species. Identifying habitats of species and determination of the potential areas of wildlife species have great importance for conservation and management studies in Turkey. In this study, habitat suitability models of red deer (*Cervus elaphus*), which is one of the important ungulate species of Turkey, were created for the research area by using maximum entropy approach (Maxent). This study will determine the relationship between the habitats and species, habitat preferences and also ecological factors (topographical, climatical etc.) in the research area.

Keywords: Habitat Suitability Models, Red Deer (*Cervus elaphus*), Maximum Entropy, Kastamonu



Optimization of Medium and Growth Conditions of Putative Endophytic Bacteria Isolated from Fraser photinia

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Abstract: A new putative endophytic bacterium (PEB) was isolated from long-term *in vitro* tissue culture of Fraser photinia microshoots in GTU Plant Biotechnology Laboratory (Şeker et al.; 2017). Beneficial effects of this bacterium on its host plant (Fraser photinia) *in vitro* proliferation were observed. However, as exponential phase of putative endophytic bacterium was quite long (10-15 days, at 30°C) in its isolation medium, MPYE, its usage as biofertilizer is limited and caused extension of bacterial characterization experiments. Hence, this work was designed for optimization of growth temperature, pH and medium content in order to fasten bacterial growth. For this purpose, different growth temperatures (i.e., 22°C, 30°C and 35 °C) and various pH levels (pH 5.8- 9.0) were tested in MPYE agar medium. Moreover, different growth media containing fresh and dried leaves extracts of Fraser photinia that were separately solved in MPYE, MgSO₄ and PBS were also assessed. Each medium was serially diluted in their solvent to different 6 concentrations (3-100 mg/ml) in sterile 24 well-plate. Fresh putative endophytic bacterium culture was adjusted to 0.5 McFarland in MPYE medium. Then, bacterial suspension were inoculated in 6 different medium with extract mixture dilutions in 24 well plates. Each plate were observed and read by microplaque reader at OD600 during 7 days. According to spectrophotometric measurements, optimum growth rate was obtained from suspensions of MgSO₄ and MPYE with plant extracts. Optimum pH for endophytic bacterium was 7.0 while optimum temperature was 30°C. Our results demonstrated that utilization of host plant extracts has beneficial influence on growth of its endophytic bacterium.

Keywords: MPYE, MgSO₄, Optimization, Growth Rate, Putative Endophytic Bacterium



A Survey on Wintering Losses and Its Probable Causes in Honey Bee Colonies (*Apis mellifera* L) in Ardahan Region

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Abstract: In this study, the result of survey applied to migratory and settled beekeepers in Ardahan were evaluated and their characteristic with respect to, colony management method in autumn, wintering and bee diseases were investigated.

It has been found that most of the beekeepers in the region (90.61 %) have autumn feed, they have used 57.75% sugar syrup in large quantities in feed, and it is not very common to feed with honey syrup. The results of the survey show that Ardahan beekeepers are sensitive to the queen bee control and varroa struggle during the autumn season. In the study, it was determined that 90.20 % of the migratory beekeepers and 93.69 % of the settled beekeepers used Lagstroth type wooden hive, and all beekeepers were found to have a similar tendency in terms of hive preference. While the vast majority of migratory beekeepers in the study area reported that 67.65 % of wintering losses were 10 % or less, settled beekeepers found that 54.95 % of wintering losses were between 10-19 %. In terms of wintering losses, the difference between migratory and stationary beekeepers was statistically significant ($P < 0.01$). It was found that migratory beekeepers began wintering with strong colonies and 79.41 % of them preferred wintering in temperate regions however 48.65 % of settled beekeepers used overwintering indoors. Also it was understood that moisture, queen loss, diseases and parasites, food shortage and abnormal climate were effective on colony losses the duration of wintering in Ardahan. Chalkbrood disease (23.42%) was found to be the most common disease in colonies of settled beekeepers and Nosema (18.63%) was the most common disease in colonies of migratory beekeepers. 49.29 % of the surveyed beekeepers did not report any disease in Ardahan.

Keywords: Colony Management, Wintering, Diseases, Migratory Beekeeper, Settled Beekeeper



Relationships Between *Prl/RsaI* Polymorphism and Some Performance Traits in Holstein Cattle

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Abstract: The aim of this study was to determine the *RsaI* polymorphism of the Prolactin gene by PCR-RFLP method of 186 Holstein cattle grown organically, to reveal population genetic variations and to investigate the relationship between *Prl/RsaI* genotypes and some yield traits. In the study, the genotype frequencies were determined as AA genotype frequency 0.26, BB genotype frequency 0.22 and AB genotype frequency 0.52 on Holstein cattle. A frequency is 0.52, and B frequency is 0.48. According to the Hardy-Weinberg genetic equilibrium test performed, the distribution of genotype frequencies was found to be not significant ($P > 0.05$). Relations between some performance characteristics of Holstein cattle and prolactin genotypes were analyzed by variance analysis. The results showed that the relationships between the *Prl/RsaI* polymorphism and the yield characteristics tested were not significant ($P > 0.05$).

Keywords: Prolactin, PCR-RFLP, Polymorphism, Marker, Cattle



The Relation Between Brain Damage and Gill Lesions

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Abstract: In this study, we aimed to investigate the relation between brain damage and gill lesions in common carp. For this aim brain and gill tissues of common carp. exposed to most common pesticide (chlorpyrifos, cypermethrin, and imidacloprid) were examined.

Routine histopathological tissue process was performed to all gill samples, after staining, histopathological lesions like; necrotic changes in neurons, neuropil loss, reduction of Nissl bodies, inflammatory cell infiltration, intramyelinic edema and hemorrhage in the brain, hyperplasia in lamellar cells, telangiectasia of lamellae and thickening due to cellular infiltrations in gills were observed. For the histopathological scores, in total 10 randomly selected microscopic areas at 20X–40X magnification from gill tissue slides of fish exposed to chemicals were examined. Although known direct neurotoxic effect of chemicals, as a result of statistical analyses, we found that severity of brain lesions was directly proportional to the gills. The task of the gills is to maintain the presence of oxygen in the bloodstream. Lesioned gills mean less oxygen in the bloodstream, decreased oxygen level cause to hypoxia and the brain is the most sensitive tissue for oxygen deficiency. According to our findings, brain necrosis is not only due to toxic effect of chemicals but also induced by severe gill lesions.

Keywords: Common Carp, Pesticide, Hypoxia, Brain, Gill



Use of New Bacteriological Media in the Isolation of Bacterial Fish Pathogens

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Abstract: Along with the developing aquaculture industry and the increasing production rates, it is important to identify the fish diseases accurately and quickly which cause great economic loss during the production cycle. Accurate and quick identification is the most important step for diagnosis of the fish diseases.

Selective media are used in microbiology in recent years but these media were used for the first time for fish pathogens in this study. *Lactococcus garvieae*, *Pseudomonas fluorescens*, *Vibrio anguillarum*, *Yersinia ruckeri* and *Aeromonas hydrophila* were isolated from different rainbow trout farms in the southwest Aegean Region all year long. API identification products (BioMerieux, France) were used to determine the biochemical profiles of the bacteria and molecular identifications were conducted in order to identify for sure. chromID[®] CPS[®] Elite / Columbia CNA +5% sheep blood, chromID[®] CPS[®] Elite, chromID[®] S. aureus Elite, chromID[®] Vibrio from BioMerieux (France) and Pseudomonas Aeromonas Selective Agar acc. to. Kielwein, Glutamate Starch Phenol Red Agar (GSP) agar (Merck), Cetrinide agar (Merck), Yersinia CIN agar (Merck), Thiosulfate Citrate Bile Sucrose (TCBS) agar (Merck) and Waltman-Shotts medium were used for each bacteria and compared with each other.

The selective media which have not been previously used in the isolation of bacterial fish pathogens were tested and concluded that they are suitable for accurate and quick isolation of bacterial strains. At the end of the study, each bacteria's colonial growth and pigmentation were determined differently on each medium. The practical use of these selective media bring easier prediagnosis.

Keywords: Selective Medium, Fish Disease, Fish Pathogen, Rainbow Trout, Fish Health



A Cardioprotective Role of Nerium oleander with the Expression of Hypoxia Inducible Factor 2A mRNA by Increasing Antioxidant Enzymes in Rat Heart Tissue

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Abstract: *Nerium oleander* (NO) distillate is used to either protect heart cells against oxidative stress by regulating the production of reactive oxygen species. Hypoxia-inducible factors (HIFs) regulate cellular antioxidant defense mechanisms under hypoxic conditions in which heart cells survive; however, the key responsible mechanism of NO distillate for cardioprotection remains elusive. The objective was to evaluate the effects on heart tissue at different time intervals after administering NO distillate intraperitoneally (IP) while considering the transcriptional regulation of HIFs and representative antioxidant enzymes.

The NO plant was chopped, and distilled water was added. The mixture was distilled, and the distillate separated and collected into tubes, after which it was lyophilized to obtain dry material. Twenty male Wistar albino rats (2–3 months old, 250–300 g each) were used in the study. The control group ($n = 5$) received IP injections of saline; the remaining 15 rats received IP injections of a single dose of 7.5 mL NO distillate. The NO injected rats were divided into three groups according to the time from injection to harvest the heart tissue samples. The tissues were collected at 0 h (control; $n = 5$), 2 h (group 2; $n = 5$), 4 h (group 3; $n = 5$), and 8 h (group 4; $n = 5$) after injection. qPCR was used to assess the expression profiles in the heart tissues. The expression of *manganese superoxide dismutase (MnSOD)* mRNA was in a steady state level between the control group and group 2 ($P > 0.05$); however, it significantly increased in group 3 and 4 compared with that in the control ($P < 0.05$; Fig. 1A). Expression of *catalase (CAT)* mRNA was significantly higher in group 2 than in the control group ($P < 0.05$) although it was lower in group 3 and 4 than in group 2 ($P < 0.05$); however, it appeared to be similar among the control group, group 3, and group 4 ($P > 0.05$). *Copper (Cu) SOD* mRNA was equally expressed in both the control group and group 2 ($P > 0.05$) but was lower in group 3 and 4 than in group 2 ($P < 0.05$). Expression of *HIF1A* mRNA was in a steady state and did not differ among groups 2, 3, and 4 ($P > 0.05$). Similarly, the expression of *HIF2A* mRNA did not change between the control group and group 2 ($P > 0.05$); however, it was higher in group 3 than in the control ($P < 0.05$) and tended to be higher in group 3 than in group 2. *HIF3A* mRNA expression did not change significantly in the heart tissue of any of the groups ($P > 0.05$).

The increased expression of *HIF2A* mRNA after 4 h in accordance with a rise in *CAT* mRNA after 2 h, and *MnSOD* mRNA after 4 and 8 h might confirm the role of *HIF2A* in oxidative stress defense by regulating antioxidant enzymes; consequently, this study may expand our understanding of uses of NO distillate with respect to molecular pathways.

Keywords: *Nerium oleander*, Hypoxia Inducible Factors, Antioxidant Enzymes, Cardioprotection



Expression Profile of Some Components of Bone Morphogenic Proteins (*BMP3*, *BMP7*, *BMP15*) in the Ovine Corpus Luteum during Prostaglandin F₂ α -induced Luteolysis

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Abstract: The objective was to assess the mRNA expression of some components of bone morphogenic proteins (*BMP3*, *BMP7*, *BMP15*) in the ovine induced luteolysis. BMPs, member of growth factors, exert wide range of cellular events including proliferation, survival, differentiation, and apoptosis. Members of BMP protein and its receptors were shown to be present in the human ovary and expressed in the corpus luteum of some animals; however, little is known about their role in luteolysis.

For the induced luteolysis model, ewes were injected with PGF₂ α on the 12th day of the estrous cycle and CLs were collected at 0 hour (PG0, n = 4), (PG4, n = 4), and 16 h (PG16, n = 4) after injection. Total RNA was extracted followed by cDNA synthesis and mRNA expression levels of *BMP3*, *BMP7*, *BMP15* were detected using qPCR. Tyrosine 3-Monooxygenase/Tryptophan 5-Monooxygenase Activation Protein Zeta (YWHAZ) was used as a reference gene to normalize target genes.

Expression of *BMP7* mRNA was significantly upregulated in PG16 compared to PG0, while there was no change between PG4 and PG0. Expression of *BMP3* and *BMP15* mRNA appeared to have low expression levels and did not differ among all groups investigated.

While, in our previous study, expression of some components of BMPs with corresponding receptors was reported to be discrepantly upregulated in induced luteolysis groups, expression of *BMP7* presented increasing trend in PG16. Overall, our current and previous study investigating expression of some components of BMPs indicated that bone morphogenic proteins may be an effective factor which regulates ovine induced luteolysis.

Keywords: *BMP3*, *BMP7*, *BMP15*, Gene Expression, Ovine, Luteolysis



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Laboratory Animal Diets and Their Significance in Animal Nutrition Science in Turkey

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Abstract: Use of model animals is very significant in the studies held in health sciences, biology and biochemistry in terms of having the most correct results. During research in these branches laboratory animals are preferred due to the advantages of their physiological and genetic features. Having the most correct results in scientific studies not only depends on forming the healthy and correct model but also to the environmental factors (light, diet, sterilization, noise, moisture, heat and staff mobility). For the laboratory animals produced and supplied for scientific research, conventional cages and IVC (individually ventilated cages) are used. While model animals are fed with standard diets in conventional cages, in sheltered systems like IVC cages having hepa filters, the animals are fed with diets sterilized and produced by more improved methods. In Turkey, due to financial concerns, when using IVC (individually ventilated cages) system growing and housing methodology, instead of using sterilized special diets, sterilization of standard diets by autoclave is the most preferred methodology. Another aspect of the problems related to the laboratory animals diets is production quantities. The producers generally prefer to produce in big quantities instead of the required amounts of the required feeds. Because of that, the researchers manipulate the feeds produced as one type standard diets in big quantities and give animals more different than original feeds. Even in the analysis of the feeds regarded as standard diets, inconsistencies in amounts of nutrients are observed. Again due to the financial concerns, in research centers, one type pellet feeds are given to the mice, rats and guinea pigs. In this respect, special needs of the species remain unmet and it is seen that it is one of the reasons of having abnormal and unhealthy models. There are research results related to the incorrect results of especially the studies on metabolism are originated from the deficiencies in determination of phytoestrogens in herbal feed stuff and reflecting in diet reports. Additionally, physical conditions of feed storages and improper disinfection of the materials such as feeders and waterers are also among the problems encountered in the laboratory animal research centers. In this study, potential solution opportunities of the basic problems of laboratory animal diets' production, storage and serving in terms of animal nutrition science, that have not taken enough place in this field, is discussed.

Keywords: Experiment, Diet, IVC, Laboratory Animal, Nutrition



The Effect of Gender on Ultrasound Measurement in Karayaka Lambs

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Abstract: Real-time ultrasound technology is widely used in breeding programs aimed at meat quality; it is a technology that is increasingly used to define meat quality and to obtain estimation parameters. The study was carried out to determine the effect of gender on ultrasound measurements and the relationship between ultrasound measurements and carcass characteristics in Karayaka lambs.

Total of 20 Karayaka lamb was used, 7 females and 13 males aged 6 months, in this study. The lambs were fed dry hay and 150 g of lamb starting feed in addition to mother's milk from 3 months to weaning. The lambs were weaning from the milk at 3 months of age. After weaning, the lambs were grazed in a meadow during daylight hours and fed 200 g of lamb growth feed in the evening.

The ultrasound measurements were performed with a portable real-time ultrasound device with a 3.5-MHz, 12.5-cm linear transducer. Measurements were taken of skin thickness, subcutaneous fat thickness, muscle depth, muscle width, and muscle area between the 12th and 13th thoracic vertebrae using real-time ultrasound in lambs. The lambs were slaughtered after the ultrasound measurements, and then their warm and cold carcass weights, chilling loss and dressing percentage were determined.

In the study, the difference between ultrasonic muscle depth for male and female lambs was statistically significant ($P < 0.05$). In addition, there was high positive correlation relationships between subcutaneous fat thickness, muscle width and live weight, hot and cold carcass weight ($P < 0.05$).

In conclusion, subcutaneous fat thickness and muscle width related with carcass characteristics and the relationship may use in estimation for carcass characteristics in lambs.

Keywords: Carcass Weight, Sheep, Subcutaneous Fat Thickness, Ultrasound Measurements



Using Vinegar Eel (*Turbatrix aceti*) in Studies on Early Life Stage Feeding of Altricial Fish Larvae

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Abstract: The highest losses occur in the first month of life period at larval fish culture. Feeding, diseases and water quality problems are among the primary causes of larval mortality observed in this period. Nevertheless, exogenic feeding stage just after the yolk sac absorption is crucial for mortality. It is absolutely necessary feeding on live prey such as *Artemia sp.* and *Brachionus plicatilis* because of undeveloped digestive system and inadequate enzyme activities of larvae in this stage. So, using live prey constitutes highest one of the cost steps in the commercial sense. However, using some living foods substitute artemia is quite important early life stage feeding procedures of ornamental fish larvae both avocationally and commercially. In this study, vinegar eels (*Turbatrix aceti*) that are nematoda species with easy culture conditions are used as live prey. In feeding study, an altricial ornamental fish called zebra fish (*Danio rerio*) belonging to Cyprinidae family is chosen as a model fish species. Larvae is taken from the same mature group and the same period were distributed into groups with exactly the same physicochemical water conditions. These larvae took into 5 liters glass tank to decrease volume for eating live prey by larvae easily. And then larvae were fed on vinegar eels beginning from 2 days after hatching. Eels frequently added to larvae tank in such a way that existing vinegar eels in whole water column all the time. Feeding trials have been carried on eels to be seen in stomach of larvae under the microscope. This study aims that be an alternative for early stage feeding procedure of ornamental fishes.

Keywords: *Danio rerio*, Ornamental Fishes, Larval Feeding, Live Prey, Vinegar Eels



Voluntary Feed Intake, Feeding Behaviours and Plant Preferences of Grazing Animals

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Abstract: In this paper, the factors affecting voluntary feed intake, feeding behaviours and plant preferences of grazing animals were discussed. Rangelands or grasslands are mainly consisted of legumes, grasses and others species. Effective utilization of these areas by ruminants with grazing behaviour as a nature of their creation is very important for both producers and range managements. Apprehending feeding behaviours, voluntary feed intake and plant preferences of grazing ruminants can provide facilities for nutrition strategies of ruminants and range management systems. However, these behaviours and preferences are not known exactly. Factors affecting voluntary feed intake, feeding behaviours and plant preferences of grazing animals can be ranged as season, rainfall, temperature, time slot within a day, dry matter and subsequently nutrient content of plants, plant height, grazing with or without animals from other species, nutrition histories and physiological states of animals. Nutrient requirements of grazing animals can not be known exactly because of the differences in grazing durations, heat stress, quantity of movement, consumed energy. Meeting the requirements of animals depends on amount of consumed digestible nutrient. Moreover, voluntary feed intake which can be defined by the fact that, which available plants or raw materials are consumed primarily, willingly and with appetite by animals, is related to fullness of the digestive system based on metabolic rate emerging from consumed oxygen. Although it has been stated that all grazing ruminants satisfy 60-88 % of total dry matter requirements from legumes, plant preferences of grazing animals are very complicated. In contrary to expected, dry animals consume more legumes than lactating animals. Based on this review while the pasture composition is being formed, animal species, physiological states of animals and desired production type must be considered. Moreover, the effects of legumes on reproduction system of grazing dry animals need to be investigated.

Keywords: Grassland, Grazing, Preference, Ruminants, Voluntary, Intake



Hatchability Traits and Chick Quality can be Affected by in Ovo Injection of β -Alanine in Broiler Breeder Eggs

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Abstract: In ovo injection of nutrients and additives during incubation affects immunity, the development of muscle and digestive system before and after incubation, because the pre-emergence embryonic period is very critical for nutritional programming in birds. Thus, the use of in ovo feeding in broiler breeding can be a way to increase profitability of broiler chickens. Beta-alanine (β -Ala) is a modified version of the amino acid alanine. It is promote intramuscular concentrations of carnosine, acts as a buffering agent that helps maintain an optimal muscle pH range which delays the onset of muscular failure. We hypothesized that if in ovo administration of β -Ala to poultry hatching eggs could increase levels of carnosine in the brain and muscles, and thus it may improve brain function and increase commercial values of newly-hatched chicks. Therefore, the objective of this research is to evaluate the effects of in ovo injection of β -Ala in broiler breeder eggs on hatching parameters (hatchability, body weight and survival of newly-hatched chicks) and chick quality such as relative asymmetry and chick quality score. Ross 308 breeder eggs (32-week-old) supplied from a commercial company was incubated in an experimental hatchery. On the 17th day of incubation, 120 fertile eggs, on based completely randomized design were divided into four treatments with three replicates per treatment and 10 eggs per replicate. Experimental groups were following: 1) control (without injection, WI), 2) injected with 0.5 ml deionised water (sham control, SC), 3) injected with 0.75 mg (0.75 β -Ala) or 4) 1.50 mg β -Ala (1.50 β -Ala) in 100 μ L deionised water. At day 18 of incubation 0.5 ml on in ovo solution were injected into eggs with 19-mm, 27-ga needles and these eggs were placed in relevant hatching trays. Upon hatch, hatching rate and weight of newly-hatched chicks were measured and transferred to experimental house to determinate the relative asymmetry and chick quality score. The hatching rate did not differ significantly among the treatments. It was determined no significant effect of treatments on the mass of chicks, but the body weight of newly-hatched chicks from 0.75 β -Ala increased relative to egg weight prior to incubation compared to WI birds ($P<0.05$). The relative asymmetry and chick quality score did not differ significantly among treatments. In terms of latency score to explore and eat, the 0.75 β -Ala chicks had lower values than those of other treatments ($P<0.001$). WI chicks had a longer duration of immobility than did 0.75 β -Ala, 1.50 β -Ala and SC chicks ($P<0.001$). These results suggest that in ovo administration of β -Ala (especially 0.75 mg/100 μ L) on day 18 of incubation may be an effective method of increasing the chick weight and improving the feeding behaviour and mobility of newly-hatched chicks without affecting hatching and survival rates. However, further research is needed to determine if changes in carnosine and its related constituents during embryonic development in the brain and breast muscle of broiler chickens from eggs injected with β -Ala impact the posthatch performance of broilers.

Keywords: Beta Alanine, Chick Hatching Traits, Egg, in Ovo Feeding, Poultry



Performance of Zinc Application Methods on Durum Wheat

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Abstract: The trail was carried out to determine the effects of different zinc doses and application methods on grain yield, yield components and plant zinc concentrations of durum wheat (cv. Diyarbakir 81) in Southeastern Anatolia region at two years. The treatments were soil, seed and leaf applications of zinc to wheat. The amounts of 0, 1800, 3600 and 5400 g zinc ton⁻¹ seed⁻¹ for the seed application, 0.0, 2.3, 4.6 and 6.9 kg zinc ha⁻¹ for soil application and 0.0, 110, 330 and 550 g zinc ha⁻¹ for the leaf application were used. The results showed that zinc doses significantly affected all the investigated properties. The highest value for all investigated properties, except protein content, was obtained by the highest zinc doses. Compared to the control, grain yield at third and fourth doses increased 15.0 and 17.4 %, over all application methods, respectively. Yield components, *i.e.*, spike length, spikelet number, grain number per spike and thousand grain weight were increased approximately 10 % upon the addition of third and fourth doses. Application methods significantly affected to grain yield, zinc concentration, protein content of grain and plant height. The highest doses of soil, leaf and seed applications increased grain yield up to 26.9, 12.5 and 12.2 %, respectively. The application of 6.9 kg zinc ha⁻¹ to soil or 5400 g zinc ton⁻¹ seed⁻¹ to seed or 550 g zinc ha⁻¹ solution to the plants may be more efficient in terms of their economically feasibility and yield increases.

Keywords: Durum Wheat, Fertilization, Zinc, Yield, Protein Content



Adaptation of Some Chickpea Genotypes for Yield and Quality Characteristics

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Abstract: In chickpea cultivars grown in winter, there are not exactly antracnose resistant varieties, but the producers can not make the chemical spraying with the diseases as they apply in other products to this plant. Antracnose which occurs in the winter or in the early spring (rainy periods), is a widespread reality that the disease can only be with resistant varieties. In the study, chickpea genotypes were investigated for yield, antracnose disease, cold damage and seed quality traits under Diyarbakir conditions in winter growing seasons of 2015 and 2016. The trail achieved as 4 replications in completely randomized block design. Each parcel is 5 m long and 6 rows and 40 cm row spaces. Total seventeen genotypes including 9 advanced lines, 1 local variety, 3 ICARDA accessions and 5 commercial varieties (Diyar 95, Gökçe, Çağatay, Azkan 95 and Arda), were used in the experiment. Grain yield ranged from 88.4 kg/da to 223.3 kg/da, Arda variety were higher yielding than other genotypes. It was determined Arda and Azkan varieties resistant to antracnose disease, when compared to hybrid lines and local variety sensitive to antracnose. The values for fresh weight, dry weight, fresh volume, dry volume and 100 seed weight values were low in Arda variety, and high in D2-5 hybrid genotype. Cooking time ranged from 43 min. to 59 min., and local variety had high cooking time. In this study, the yield and quality characteristics of chickpea lines and varieties were investigated in Diyarbakir conditions in winter sowing; it was determined that the yield values of the examined lines were affected by antracnose disease. Since lines with lower grain yield values give higher values in terms of grain quality characteristics, it was found that it would be appropriate to try early spring sowing instead of winter sowing.

Keywords: Chickpea, *Cicer arietinum* L. Yield, Seed Quality, Anthracnose, Cold Damage



Evaluation of Some Durum Wheat Genotypes for Yield and Yield Components at Different Environment

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Abstract: Improvement of high yielded and stable durum wheat genotypes is of great importance in South Anatolian environments where drought and heat stress interact each other. Therefore, this study was conducted to investigate heat and drought stress tolerance of advanced durum wheat genotypes under rainfed and irrigated conditions of Dicle University in Diyarbakir and rainfed condition of Çukurova University in Adana. Two commercial durum wheat variety (Firat 93 and Balcalı 2000), one landrace (Sorgül) and twelve advanced lines improved by mutation and classical breeding methods were used as material. Experimental design was completely randomized block design with three replications. Grain yield was changed between 76.1-723.5 kg da⁻¹, 239.5-406.8 kg da⁻¹ and 290.5-519.0 kg da⁻¹ at Adana, Diyarbakir rainfed and irrigated conditions, respectively. Very low grain yield was obtained from landrace and fives advanced lines at Adana conditions. Drought susceptibility index and heat susceptibility index were used to determine heat and drought stress potential of the lines. Drought and heat susceptibility index were changed between 0.00-1.43 and 0.00-2.30, respectively. According to index values, the lines of 7-286 at drought stress and the lines of 8-68, 8-317 and 12-421 at heat stress conditions had high grain yield potential. The line 7-289 was found successful for favorable environments.

Keywords: Adaptation, Drought and Heat Stress, Durum Wheat, Yield, Stress Susceptibility Index



Variability, Heritability and Association of Some Morpho-Agronomic Traits in *Pisum arvense* L. Populations

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Abstract: Field pea (*Pisum arvense* L.) is an important forage crop due to its high nutritive value and cheap and rich protein source. It thrives well in places with cool climate and hence is grown in almost all the temperate regions of the World. Genetic variability is very important to select suitable types among the segregating populations. Observed variability is suitable to be divided into heritable and non-heritable components with the parameters of genotypic coefficient of variation, genetic advance and heritability.

An experiment was conducted to study genetic variability, heritability and trait association in forty eight pea populations and three cultivars of *Pisum arvense* L. based on the characters of plant height, hay weight, pods per plant, pod length, seeds per pod, seed yield per plant, 1000 seed weight, crude protein rate, crude protein yield. The field experiment was conducted in Ordu University Research Field Area during the growing period of 2013-2014 and 2014-2015. In the study, the populations and cultivars were arranged in augmented design. The data were analyzed using the JMP 5.0.1 statistical software program. According to results for all the traits, phenotypic coefficients of variation was close to genotypic coefficients of variation. The estimates of genotypic and phenotypic coefficients of variation were high for seed yield per plant, seeds per pod and crude protein yield. In the study also high heritability associated with high genetic advance was observed for the traits. In the study significant correlations were observed between most traits.

These characters should be given due to priority for selection in breeding of forage pea.

Keywords: Character Association, Forage Pea, Genetic Advance, Heritability, Morphologic Traits

**Effect of Different Isolates of *Beauveria bassiana* on *Blatta orientalis* L. and *Blatta lateralis* Walker (Blattodea: Blattidae)**

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Abstract: Cockroaches are known to have lived on Earth for some 300 million years. It is stated that there are about 4500 species. Cockroaches are the most important pests threatening human health in Turkey and in urban areas in the world. In addition, cockroaches cause asthma and allergic reactions, and are particularly harmful to children due to the substances they secrete and rashes that they cause. Chemical control is usually preferred in the management against these pests. Because of the known hazards of the chemical pest control, alternative methods that are not harmful to the environment and human health are needed. One of the most important alternative methods is microbial control. For this purpose, entomopathogenesis was tested against *Blatta orientalis* and *Blatta lateralis* nymphs in this study. Six different isolates of *Beauveria bassiana* (BB23-1, BB 216, B kür 3a -1, BCE 9, B kür 6b-1, BB 1 a) were used in the experiment at a density of 10^8 cfu ml⁻¹ spore suspension. The study consisted of 4 repetitions with 5 cockroach nymphs for each repetition. The work was carried out in the laboratory at 25±2°C and 70-75% relative humidity in dark conditions. The study was observed for 21 days and the percentages of mortality were recorded. As a result, B kür 3a-1 (40%) isolate showed the highest efficacy against of *Blatta orientalis* nymphs of *Beauveria bassiana*'s various isolates followed by BB 216 (20%), BB 1 a (20%), B kür 6b-1(10%) isolates. BB23-1 and BÇE 9 isolates were found to be ineffective against *Blatta orientalis* nymphs. The highest effect against the *Blatta lateralis* nymphs of *Beauveria bassiana* was found to be B kür 3a -1(50%) isolate followed by BB 1 a (45%), BB 216 (35%), BB 23-1 (20%), B kür 6b-1 (15%) and BÇE 9 (5%) isolates. As a result, different isolates of *Beauveria bassiana* were found to be less effective against *Blatta orientalis* and more effective against *Blatta lateralis*. The use of B kür 3a -1 isolate in the microbial struggle against *Blatta lateralis* was found to be promising.

Keywords: Biological Control, Entomopathogen, *Beauveria bassiana*, *Blatta orientalis*, *Blatta lateralis*.



**The Effect of Some Commercial Plant Oils on the Pine Processionary Moth,
Thaumetopoea pityocampa (Lepidoptera: Thaumetopoidae)**

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Abstract: *Thaumetopoea pityocampa* (Lepidoptera: Thaumetopoidae) is one of the major forest pests in Turkey, and causes serious damage especially in pine trees. Mechanical and chemical control methods are used in the control of this pest in Turkey's forests. In recent years, chemical control is the most preferred method against this pest. Due to chemical control's harmful effects on the environment and human health, alternative methods of control are emphasized today. There are many studies on the use of plant oils against pests in agricultural areas. However, studies on the effect of plant oils against Pine Processionary larvae are very limited. In this study, commercial oils containing 8 different essential oil types (thyme oil, mint oil, poppy oil, garlic oil, rosemary oil, pine oil, sage oil, lavender oil) were applied in 3 different doses (0.1%, 0.5% 1%) and 4 repetitive to the larvae of the Pine Processionary. The study was conducted in sealed 0,5 kg containers and pine needles were used as food. Experiments were conducted at 70 % humidity and 20 ± 2 °C laboratory conditions. The study was observed for five days and the results were evaluated through the mortality rate. On the 5th day of the study, 1 % dose of thyme oil was found to be most effective with 100% mortality followed by poppy (95 %), sage (95 %), garlic (90 %), rosemary (70 %), pine (60 %) and mint (40 %). Lavender oil used in the study was ineffective. As a result of the study, it was determined that thyme, poppy, sage, and garlic were effective against pine processionary larvae and they were found to have the potential to be used in the control of this pest. In addition, rosemary, pine, mint and lavender oils have been found to be less effective.

Keywords: *Thaumetopoea pityocampa*, Pine Processionary, Essential Oil, Effect, Control



The Reactions of Breat Wheat Lines against Stem (Black) Rust (*Puccinia graminis* f. sp. *tritici*) Population

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Abstract: Bread wheat is important field crop in Turkey. In breeding trials, high yield and good quality are important selection criterias. Yellow (stripe) rust, (caused by the fungal pathogen *Puccinia striiformis* f. sp. *tritici* (Pst)) is significant diseases affecting produce yield and quality in cool and humid areas in Turkey. In this study, it was aimed to determine reactions 26 bread wheat genotypes (Zeleny sedimentation 55-66 ml (Bezostaja-1= 58 ml) developed by the Central Research Institute for Field Crops (CRIFC) Department of Quality Assessment and Food to local yellow rust population in the seedling stage and adult plant stage at the research facilities of CRIFC during growing season of 2015 in Ankara.

For seedling stage reactions; the test lines were inoculated with suspension of urediniospores of Pst population (virulent on Yr2, 6, 7, 8, 9, 25, 27, Sd, Su and Avs in Europe/World differential set) in mineral oil (Soltrol 170®) at Zadoks growth stage 11-12. Following inoculation, seedlings were placed in a dew chamber overnight at 9±1oC and then transferred to greenhouse adjusted at 18±3oC. Diseases were scored according to 0-9 scale after 14 days.

For adult plant stage reactions; the test lines were screened under artificial epidemic condition for local Pst populations (virulent on Yr2, 6, 7, 8, 9, 25, 27, Sd, Su and Avs in Europe/World differential set). Stripe rust developments on each entry were scored using the modified Cobb scale. The susceptible check cv. Little Club had reached 80S infection severity in June 2015. Coefficients of infections were calculated and values below 20 were considered to be resistant.

all 26 bread wheat lines were evaluated in terms of stripe rust. Six (23%) genotypes were resistant to seedling stage, fourteen (54%) were resistant to adult plant stage; and six (23%) genotypes were resistant to both seedling stage and adult plant stage.

Acknowledgement: This study was supported by General Directorate of Agricultural Research and Policy of the Ministry of Food, Agriculture and Livestock of Turkey.

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Keywords: Bread Wheat (*Triticum aestivum*), Yellow Rust (*Puccinia striiformis* f. sp. *tritici*), Selection, Reaction



Roles of the Extracts of Urfa Red Pepper and Coriander on Management of *Polyphagotarsonemus latus* on *Phaseolus vulgaris* cv. 'Barbunia'

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Abstract: *Polyphagotarsonemus latus* (Banks) (Trombidiformes: Tarsonemidae) is one of the most important pests worldwide. Its control is still largely based on the use of pesticides in view of their easy of application and rapidity of action. However, the harmful effects of pesticides on nontarget organism, environment and human safety is known. Therefore, there is need to develop nontoxic natural products that have potential to replace synthetic pesticides for controlling this pest. The plant extract is one of these. In this study, the effects of water-based extracts of Urfa red pepper (*Capsicum annuum* L.) (10 %) and coriander (*Coriandrum sativum* L.) seed (10 %) on management of *P. latus* on Barbunia bean (*Phaseolus vulgaris* L. cv. 'Barbunia') were investigated. The experiment was carried out in climatic room at 25°C± 2, 70-80 % RH and a photoperiod of 16L:8D (Light: Dark). There were four treatments; unsprayed control, sprayed control, Urfa red pepper and coriander. Abamectin 18 g l⁻¹ was used on the sprayed control plants. Each treatment included five replicates with one hundred twenty plants per replicate. Samplings were carried out weekly for five weeks by collecting leaves from the top of the plant. When the density of *P. latus* (all stages except egg) was exceed 4 mites per leaf, the spraying was done. The results showed there was no statistical differences in *P. latus* population densities between the extract treatments and Abamectin during the first four weeks of the experiment. However, the pest density on the plants sprayed with the coriander extracts exceed 4 mites per leaf at the 5th week after treatment. When all data were compared, it can be concluded that the water based extracts of Urfa red pepper and coriander at 10 % concentration have potential to be used in the control of *P. latus*. Nevertheless, further investigation is needed to perform the efficacy of the water-based Urfa red pepper and coriander extract under greenhouse and field conditions.

Keywords: Broad Mite, Urfa Red Pepper, Coriander, Pest Control, Extract

**Competitive and Cooperative Behaviors in Mites (Arthropoda: Arachnida: Acari)**

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Abstract: Behavioral studies of the Acari have been hindered by the small size and cryptic habits of most mites. However, an understanding of mite behavior is critical for the development of effective integrated pest management programs focused on preventing pest. In this study, the competition and cooperative behaviors in mites were reviewed in detailed. Competition behavior is generally displayed to obtain some rare sources as food, mate and habitat or any other resource which is required for survival or reproduction due to the extreme increase of population. The two main types of competition among mites are interspecific and intraspecific. Intraspecific competition is a behavior which happens between individuals of the same species for more specific requirements. Female protection against other males and cannibalism shown against the conspecific individuals are some of the intraspecific behaviors. Interspecific competition occurs between two different species whose ecological needs resemble each other. Cooperative behaviors have been also observed in the mites. These behaviors occur in the form of intra-population work sharing. While individuals of some species act as a group during these behaviors, some others play their roles in the habitat on an individual basis. The defence of the habitat and protection of new generations against any problems are some of the cooperative behaviors.

Keywords: Intraspecific, Interspecific, Competition, Cooperation, Behavior, Acari, Pest Management, Mite



The Determination of Some Characteristics in Ecotypes of Balm (*Melisa officinalis* L.) Existing in Middle and East Black Sea Flora

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Abstract: This study was conducted under Samsun ecological conditions in 2005. In this study, 8 balm are different three subspecies (subsp. *officinalis*, subsp. *altimissia*, subsp. *inadora*) accessions collected from Black Sea Region were observed for some phenological observations. Averages, standard and quality characters of plant accessions were found out and some morphological and quality characters of both accessions were also analyzed statistically by simple methods.

Research showed that emergence period was between 15-21 days, emergence rate- 5.3 – 75.5%, blooming period from the beginning of sowing- 108-143 days, 1000 seed weight 0,40-0,65 g between, stem weight 5.37-7.54 mm, plant height 17.30 -23.30 cm between, number of secondary branch 41.36-100.41 cm, between, number of secondary branch 17.65 – 29.26 between, fresh herba yield 164.34 – 481.45 g between and dry herba yield 54.30 -149.65 g between.

Keywords: Balm (*Melissa officinalis* L.), Phenological and Morphological Characters



The Reactions of Some Quality Wheat Lines against Yellow Rust and Stem Rust Reactions

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Abstract: Yield potential, abiotic and biotic stress resistances and quality parameters are very important selection criteria for crop improvement programme. Breeders use different tests to evaluate wheat good quality. These tests (test weight, mixographe, Zeleny sedimentation gluten, rheological parameters) are based on the end-use quality objective of the breeding programmes. On the other hand, rust (*Puccinia* spp.) disease resistances are important selection criteria to improvement programmes. 5 bread wheat genotypes (Zeleny sedimentation (57-65 ml), (Bezostaja-1= 56) in yield trials were developed by the Central Research Institute for Field Crops (CRIFC) Department of Quality Assessment and Food. The aim of this study was to determine the reactions of 5 winter bread wheat lines to yellow rust (YR) and stem rust (SR) diseases in adult plant stage.

The test materials were sown in a one-meter row with 2 replications in İkizce, Ankara (for, YR) and Seydiler, Kastamonu (for SR) locations. These materials were screened for yellow rust artificial epidemic condition with YR (virulent on *Yr2*, 6, 7, 8, 9, 25, 27, *Sd*, *Su* and *Avs* resistance genes in Europe/World differential set) and under natural epidemic condition with SR (virulent on: *Sr5*, 6, 7*b*, 8*a*, 8*b*, 9*b*, 9*g*, 10, 30, *Tmp* and *Mcn* resistance genes). Yellow rust and stem rust developments on each entry were scored using the modified Cobb scale (Susceptible control cv. Little Club 80-100S) in July-August 2015. Coefficients of infections were calculated and the values below 20 were considered as resistant to disease.

One material was resistant to YR and SR in adult plant stage. These resistant genotypes can be used in both quality and yellow rust and stem rust resistance breeding programs to stem rust reactions.

Acknowledgement: This study was supported by General Directorate of Agricultural Research and Policy of the Ministry of Food, Agriculture and Livestock of Turkey

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Keywords: Bread Wheat, Rust (*Puccinia* spp.) Diseases, Reaction Test, Quality



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Path Analysis and Relations between Some Morphological Features in Coriander (*Coriandrum sativum* L.)

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Abstract: This study was carried out for 2 years in order to determine the relationships between different agronomic characteristics and seed yield in different coriander varieties (Gamze and Erbaa) at four different sowing time. Study; plant weight (cm), stem thickness (mm), number of branches (number), number of umbrellas (number), number of umbrella stands (number), number of seeds (g / plant), seed diameter (mm), fruit weight (g) and yield (kg / da) were investigated. There was a positive and very significant relationship between plant height and number of hats, seed yield and seed yield in the plant. There is a negative and very important relationship between the number of branches and seed diameter.

Keywords: Coriander, Correlation Analysis, Path Analysis



Determination of Silicon on Yield, Yield components and Quality of Rice (*Oryza sativa* L.) Varieties

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Abstract: This study was carried out in 2014 in order to determine yield, yield items and their effects on the quality of silicon in several paddy types. The study was carried out as a pot try under greenhouse conditions in the application area of Ordu University. The research was carried out according to factorial arrangements in coincidental plots. 4 different paddy types and 5 different silicon doses were used in the research. In this research number of maturing days, plant height, tillering number, diameter of body, bunch length, number of grains on bunch, harvest index, handle weight, per pot yield, weight of bunch, spikelets sterility, protein ratio, rice length, rice width and yield values were studied. The effect of silicon on panicle grain weight ($P<0.05$) is found important and its effect on the number of tillering, protein content and is found very important ($P<0.01$). Increase of administrated silicon dose led to increase of the number of tillering. The lowest number of tillering is 3.01 total in dose of 50 ppm while the highest number of tillering is 3.60 total in dose of 200 ppm. The lowest value of panicle grain weight silicon applications is 3.01 gr in dose of 200 ppm and the highest value is 3.40 g. in dose of 50 ppm. The protein content is 10.18 % in the lowest control dose and the highest is 11.66 % in dose of 150 ppm.

Keywords: Paddy, Silicon, Yield, Quality, Rice Varieties



A Case Study on Red Meat Consumption Habits and Preference of Imported Red Meat in Erzincan

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Abstract: This study was conducted in order to determine red meat consumption habits and to examine imported meat consumer preferences in Erzincan province. The study was carried out 206 face-to-face surveys with people living in Erzincan. It was found that 5% of the participants consumed red meat at least once per day, 36.7 % at least once per week, 36.2% at least 2-3 times per week, 11.6 % at least once per month, and 10.1 % 2-3 times a month per month. Monthly income affected the red meat consumption of the consumers ($P < 0.05$) but the region where the consumer lives (province and district) did not significantly affect red meat consumption. When import red meat preferences of consumers, only 5.7 % of them prefer imported red meat. It was determined that 47.4% of consumers believed that imported red meat is unsafe, while 33.3 % prefer to support domestic production. In our study, the preference for imported red meat was not affected by education level. Among the participants, 63 % did not prefer sheep meat because of its unpleasant odor, 18 % because of its taste, 10 % were not found at all seasons, and 9 % were fatty.

Keywords: Red Meat, Consumption Habits, Erzincan, Imported Red Meat



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Phenotypic and Genetic Relations between Egg and Chick Quality Characteristics in Japanese Quail Line

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Abstract: Egg is a yielding feature as well as an element of production in poultry. Egg weight, egg shell characteristics and egg content contribute to chick quality and chick's future performance. Egg quality characteristics are generally regarded as essential criteria for chick quality. Therefore, understanding the phenotypic and genetic relationships between egg quality and chick quality characteristics can contribute to the selection of the properties desired to be developed.

In this study, the phenotypic and genetic relationships between quail chick quality characteristics (chick hatching weigh - CHW, daily chick weight - DCW and chick length - CL) were examined by considering some egg quality parameters such as egg yolk weight (EYW), egg yolk density (EYD), albumin weight (AW), albumin density (AD), egg shape index (ESI), egg shell weight (ESW), protein content (PC) as egg quality characteristics. Results indicated that there were very high positive genetic correlation coefficients (between 0.725 and 0.971) between egg quality characteristics such as EW and AW and chick quality characteristics. Negative moderately high genetic correlation coefficients between egg shape index and chick quality characteristics (CHW, DCW, and CL) (-0.334, -0.566 and -0.869, respectively) were identified. A very low genetic correlations were determined between the egg protein content and CHW (0.0287) and DCW (- 0.0124) characteristics.

Keywords: Quail, Egg Quality, Chick Quality, Phenotypic Correlation, Genetic Correlation



***Tenebrio molitor* L. Directly Watered Grown in Control Populations, Estimation of Larval Growth Curve using Gompertz, Logistic and Linear Models**

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Abstract: Insects can be a good alternative to traditional protein sources in fish and poultry feeds depending on their higher quality and higher protein content. Among the insect species, *Tenebrio molitor* L. is promising due to its high protein content as well as the presence of rich fatty acids. In the mass production of *T. molitor*, the water requirements of insects are met by supplemental fresh fruits and vegetables to the growth environment at specific time intervals. This leads to an increase in production costs and bears negative consequences in the nutrient environment. In this study, a method which can be an alternative to the use of fresh vegetable pieces in the food environment was developed to meet the water needs of *T. molitor* larvae. A specifically designed water containers for this study were used to directly meet the water needs of the larvae. In the study groups, the larval growth curves obtained by the water consumption of the larvae and the direct water effect were examined according to three different growth curve models. In the study, the obtained determination coefficients (R^2) were 0.983, 0.985, and 0.981 for Gompertz, the logarithmic and linear growth curves, respectively. It can be concluded that direct supplementation of water is very efficient way of meeting the water requirement of *T. molitor*.

Keywords: Live Feed, *Tenebrio molitor*, Water Consumption, Growth Curve



The Effect of Vermicompost Application on the Aggregation in Soils with Different Textures

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Abstract: Vermicompost is a soil conditioner that improves the physical and chemical properties of the soil thanks to its high content of organic matter. This study investigated the effect of vermicompost on aggregate stability, which is one of the important physical properties of soils. The study was carried out as a pot experiment on two soils with different textures (clay and sandy clay loam). The experiment consisted of two soil types, 5 vermicompost doses (0, 2, 4, 8, 16 t da⁻¹) and 30 pots including 3 parallel pots using a randomized block design. The vermicompost doses were calculated according to dry weight, mixed with 2 mm sieved soil and left to incubate for about 3 months under laboratory conditions. At the end of the experiment, physical and chemical analyses were carried out on the soil samples taken from the pots. The aggregate stability analysis of the soil samples was performed on soil aggregates of 2-1 mm using the wet sieving method. According to the analysis results, vermicomposting led to a statistically significant increase the aggregate stability of loam soils ($P \geq 0.01$). The effect of vermicompost on clay soils was unclear and statistically insignificant. The aggregate stability values rapidly increased in loam soils at low doses, while they did not show the same increase at high doses and decreased. The salt content of the soils was increased about 5 times and the available sodium (Na) content was increased about 20 times in the high dose samples (when the pots drainage holes were closed). It seems that this increase in the salt and Na contents of the soils led to a decrease in the aggregate stability values of the soils at high doses of vermicompost.

Keywords: Vermicompost, Soil Texture, Aggregate Stability, Clayey Soil, Loamy Soil



From Past to the Present Small Ruminant Husbandry in Kastamonu

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Abstract: Kastamonu province, which placed on the historical Northern Anatolian Silk Road, has become an important agricultural and commercial center from the past to the present. It is known as the region where the animal existence is the most after Konya and Erzurum in the pre-Republican Empire period. It is reported that the existence of the small ruminants for Kastamonu in this period is about twice as much as the large animal existence. In the 1909 census of agriculture, the population of Kastamonu was 326 thousand people, while the number of Angora goat was 298 thousand heads, the presence of sheep 150 thousand heads, total milk production 14 thousand tons, mohair production 252 tons and hair production 7 tons.

From the first years of the Turkish Republic until the 1970s, however, the number of small ruminants and the associated production of milk, meat and, above all, wool and mohair production showed a linear increase accordingly. For example, in 1964, the number of Angora and hair goats were 682.500 and 39.000 heads, respectively. So that the total number of goats grown in the province exceeded 720 thousand. In the same year, the production of mohair reached 700 tons and 500 tons of this amount were exported. The remaining 200 tons of mohair was used to meet domestic needs with Tosya woven wadding textile industry. The number of sheep in 1965 reached its highest level and recorded as 340.780 heads. The amount of fleece produced during this period was 230 tons. But the small ruminants production in Kastamonu has deteriorated because of the animals policy implemented especially after the 1980s, and therefore the number of animals, including the production quantity decreased dramatically during this time.

For example, the number of sheep fell to 46 thousand heads in the year 2017. In relation to the Angora goats, the situation was even worse. The number of Angora goats, the almost 700 thousand heads in 1964, was decreased to 3 thousand heads and the mohair production up to 3 tonnes in 2010, mohair exports was completely stopped. It can be said here that the most important factor for this case is the declaration of the forest ministry "The goat is the greatest enemy of the forests. However, based on previous data from the past 40 years, it is obvious that Kastamonu has a very high animal production, especially the production potential of small animals such as sheep and goats. Because of this situation, the policies applied in recent years have been changed a little and incentives and support for small ruminant husbandry has been increased. As a result, an increase in the number of sheep and goats has begun to be observed. According to Turkish Statistical Institute (TSI) 2017 Data, the sheep population of Kastamonu continues to decrease, whereas a slight increase in the number of Angora and hair goats is observed. In this study, the data for over 100 years used and the infrastructure of the small ruminant husbandry, the causes of the decline of production, strength and weakness sides, the main problems and solution proposals and at least how the production values of the past can be achieved, was investigated.

Keywords: Kastamonu, Goat, Sheep, Meat, Milk, Mohair

Bifidogenic Effect of Salep Powder

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Abstract: Recent scientific research has focused on determination of novel probiotic microorganisms and prebiotic components that *beneficially affect* the human health. Probiotics have been defined as viable non-pathogenic microorganisms which demonstrate beneficial health effect on the host when administered in adequate amounts by improving the properties of its indigenous microbiota. Bifidobacterium and Lactobacillus are most commonly probiotic species used in food products.

Bifidobacterium species constitute 95% of the total intestinal microbiota in the colon of breast-fed infants and decline with age and changes in eating habits. Many attempts have been made to stimulate the growth of Bifidobacteria and to increase their population in the intestines of humans and/or animals by foods that supply biologically active components which are called as “bifidogenic factor” or “bifidus factor”. Bifidogenic factors are defined as components, particularly carbohydrates that survive direct metabolism by the host and reach the colon where they are metabolized by Bifidobacteria as source of energy. Currently, these factors may be called as prebiotics which are not only non-digested, non-absorbed and not-hydrolyzed food ingredients in stomach and small intestine but also selectively stimulate the growth and/or activity of bacteria in the colon.

Looking at the ever-increasing demand of prebiotics there *has been* a rapid rise in scientific search for new novel prebiotic sources. Orchids are mostly cultivated because of their beautiful flowers that are widely known for their *economic importance* but less for their medicinal *value*. The “salep powder” is obtained from grinding dried tubers of *Orchis mascula*, *Orchis militaris* and related species of orchids growing naturally in Turkey. Salep powder contains mucilage, moisture, sugar, starch, nitrogenous substance, ash and glucomannan. Glucomannan is a natural neutral water-soluble fiber which is important in normalizing blood sugar, relieving stress on the pancreas and preventing blood sugar abnormalities. Many researches stated that glucomannan also has prebiotic properties, and thus salep powder might be metabolized by Bifidobacteria and demonstrate bifidogenic effect, probably in relevance to the glucomannan content.

The objective of this research was to study the bifidogenic effect of salep powder on some *Bifidobacterium* species, namely *B. lactis*, *B. infantis*, *B. longum* and *B. bifidum*. The growth of the *Bifidobacterium* species was investigated by measuring the pH and optical density during 48 h-fermentation. In order to evaluate the efficiency of the fermentation of salep by the *Bifidobacterium* spp. lactic, acetic, butyric and propionic acids in the growth media were quantified by HPLC. It was observed that the growth of all strains on salep powder was similar to the growth on glucose, whereas the highest OD values were found for the strains *B. lactis* in media containing glucose and *B. infantis* in media containing salep powder. The concentration of lactic, acetic, butyric and propionic acids were comparable to the glucose media. Consequently, the obtained results indicated that all four *Bifidobacterium* species were able to utilize salep, suggesting that salep enhanced the growth and activity of Bifidobacteria and might be conferred as a bifidogenic effect.

Keywords: Bifidobacterium, Bifidogenic Effect, Salep Powder



Recent Developments in Turkish Dairy Goat Farming

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Abstract: There are still 10.63 million goats in Turkey. Hair goats constitute approximately 98% of goat population. Goat farming in Turkey has been performed either within an agricultural facility or in form of village herd or migratory herd. However intensive organizations providing milk for the dairy farms producing cheese have performed their activities for the matter involved also in recent years.

In Turkey, 523,395 tons milk produced from 4.96 million goats milked in 2017. Goat milk products produced generally for family consumption in rural area become wanted today upon the concentration of urbanization and developments in tourism. Firms processing the milks collected from goat farms in the integrated plants produce pasteurized milk, cheese, strained yoghurt and butter and put them into market. Furthermore some firms use goat milk in ice-cream production.

Main purpose of this study is to analyze recent developments in goat milk production and marketing between 2008 and 2017 in Turkey. Statistical data have been obtained from FAOSTAT and TurkStat. Data obtained have been shown in the tables issued by the use of percentage and index calculations.

If problems of farmers are solve by short- and long-term precautions in Turkey, dairy goat farming will make important contributions at regional and national level.

Keywords: Dairy Goat Farming, Small Ruminant, Goat Milk, Goat Milk Marketing, Goat Milk Price



The Lactation Performances of Different Heifer Raising Programs

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Abstract: In dairy cattle, the success of the heifer rearing is to have great importance in terms of return of investment. Heifers for breeding purpose are to ensure that profitability has given birth to her first calving age of 22-24 months. However, for this purpose controlled conditions and some special requirements must be provided. Many literature reported that the different growth pattern for optimal heifer raising performances. But it must be quite technical critical threshold value for the get optimum performances in the future. The ideal value of the first calving of Holstein heifer is to 22-24 months of age. But in the practical result did not show these ideal. Many study results showed big variation from 18 months to 36 months of age. This high first calving age affected the animal future performances. Dairy farms must be considering the critical threshold value for the optimum heifer raising program. For this purpose 2010-2013 year are born between 118 head heifer were monitored and recorded during the 3 year study and status from birth to first lactation were evaluated depending on the growth performances. In this study the results of 118 heifer lactations and reproductive performances were determined. Many studies on the effect of weight and age at first calving on subsequent milk yields have been carried out. There is a wide variation between the results of the researchers. The first lactation milk yield of these study is higher but variations is also higher. First lactation milk yield of low performance group was determined as 7191.95 ± 270.09 kg while high performance group values were 6430.45 ± 151.26 kg. The differences between the groups is to determined statistically significant ($P < 0.01$).

Keywords: Lactation, Performances, Heifer, Raising, Dairy Herd



The Colostrum Quality of Primiparous and Multiparous Holstein Cow

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Abstract: Colostrum management is one of the most important managemental factors in protecting calf health for the first weeks of life. After birth the first secretion from the mammary glands is called colostrum. Colostrum is varied in terms of colour and the composition varies from that of normal milk. Between the second and eighth milkings, the structure of the milk gradually turns normal, and the secretion between these periods is called transit milk. Colostrum quality is also essential for the health of new-born calf health and performances. Colostrum quality depends primarily on the amount of the antibody (IgG) it contains. High quality colostrum is defined as having an IgG concentration of greater than 50mg/ml. Colostrum plays a vital role in providing passive immunisation, thereby contributing to the development of the gastrointestinal tract, affecting the endocrine and metabolic systems and providing a source of energy for young animals to obtain heat generation to protect themselves from hypothermia. In this study, differences between uniparous and multiparous 100 heads Holstein dairy cow colostrum qualities are studied. Colostrum quality are dependent on factors such as density, the amount of milk produced after birth, cow diseases history, cow's age, season, feeding, breed, difficult birth, the live weight after given birth dry period. For this purpose, colostrum quality were determined by using colostrometer and chemical composition were determined by using MilkoScan FT120 (Foss).

Keywords: Dairy Herd, Colostrum, Quality, Variations, Primapour, Multipour, Holstein, Cows



Immunohistochemical Expression of Ghrelin in Capsaicin-Treated Rat Ovaries at Different Developmental Period

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Abstract: In this study we aimed to show *in vivo* the possible changes about ghrelin expression in capsaicin-treated rat ovaries at different developmental periods.

As a material, 60 rats of Sprague Dawley rats for 21 days were used. The animals were divided into three main groups, as puberty, post puberty and adult; and they were also further divided into two sub-groups, as experimental, and control groups. All specimens were fixed in 10% formalin and routinely processed using standard procedures and then stained with immunohistochemical staining method (Streptavidin-Biotin Complex). Immunohistochemical expression of ghrelin was implemented by the evaluation of ovary slides, and by observing reaction densities of the granulosa cells in follicles, interstitial cells, theca follicle cells and corpus luteal cells from all groups and sub-groups. Rats in the main group at puberty were evaluated within the group. Staining densities in interstitial and granulosa cells were found to be similar and at moderate level in control group. In the experimental group, reaction density in granulosa cells was moderate, while in interstitial cells and theca follicles staining was weak. In postpuberty rats; for experimental subgroup the reaction was most intense in luteal cells in corpus luteum, whereas intense reaction was observed in granulosa cells, interstitial cells and theca follicles. In the control group was moderate in corpus luteal cells, where it was denser in granulosa cells. In the same group, in interstitial cells and in theca follicle cells reaction density was similar and weak. At adult period, in the experimental group, intense reaction density was observed in granulosa cells, it was measured weak in corpus luteal cells, interstitial cells and theca follicle cells. Although the reaction density was low in the control group, granulosa cells, corpus luteal cells and theca follicles, it was moderate in interstitial cells.

In conclusion, this study demonstrates *in vivo*, the localization and expression of ghrelin in ovary tissues and analyzes capsaicin-ghrelin interaction. Ghrelin expression in all groups shows that low-dose administration of capsaicin for long periods does not inactivate ghrelin.

Keywords: Capsaicin, Ghrelin, Ovary, Immunohistochemistry, Rat



Creation of New Bone Models using Clay and Polyester Resin for Veterinary Anatomy Education

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Abstract: The use of cadaver is very common in basic veterinary anatomy education. Students examine the anatomical structures macroscopically and their relationships. But, it is generally difficult to find enough cadavers. Also, the cadavers become deformed with time and they can unusable. With this study, it is aimed to develop new course materials for use in student applications.

Clay, mold silicone and polyester resins were used as the material in this study. To be pre-modeled, bones were selected from the anatomy department of veterinary faculty of Ondokuz Mayıs University. Diagrams were prepared from these bone. Clay masses were formed according to diagrams. The outer perimeter of clay mass was cut off by using clay cutting tool. After roughly cut of them, fine cuts were made to constitute the line perfectly. Thus, the external shape of the bone was determined. Then, using a scraper, details of the bone were revealed on the clay mass. The completely dried clay was cooked to reach a temperature of 1020 ° C in 12 hours. After this process, the models became water-resistant and more useful porcelains. Silicone molds were formed using clay models obtained afterwards. Casting material was added into these molds. The molds that formed at the end of casting were cleaned and final shape of models were given. Eventually of this work, ceramic and plastic bone models belonging cattle, horse and dog extremity bones were created.

As a result, new bone models have been developed for use in veterinary anatomy education. It is planned to increase the number and diversity of these models in the future and to include these models in the education process.

Keywords: Anatomy, Bone, Education, New Model



Morphometric Investigation of Fibula in Large Ruminant

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Abstract: Ossa cruris, which is one of the hind limb bones, consists of two bones. The fibula located laterally from these bones, was formed in different sizes among animal species. It is reported that the fibula is a residual form in the large ruminant. We encountered fibula of different lengths in the laboratory of anatomy. For this reason, we aimed to detailed examine morphometrically ossa cruris of large ruminant.

A total of 24 ossa cruris of large ruminants, which were obtained from our department, slaughterhouses and butchers as material, were examined. Macroanatomical photographs of the bones were taken with the Olympus C-5060 digital camera after the maceration procedure. Mitutoya Digital Caliper was used for morphometric measurements. In the animals used in the study, the length of the tibia was measured as approximately $35,68 \pm 2,89$ cm, the width approximately $4,82 \pm 0,60$ cm. While the length of fibula was approximately measured $9,77 \pm 4,94$ cm in four materials, it was determined as 3.48 ± 0.59 cm in five materials. In ten materials, only the caput portion of the fibula was formed and determined to be approximately 1.22 ± 0.53 cm. The remaining five materials, the fibula was small enough to be ignored and fused with tibia. The malleolar bone creating distal part of fibula, was present in all materials. The width and length of this bone was approximately 2.39 ± 0.37 cm and 2.15 ± 0.35 cm, respectively.

In conclusion, it was determined to be different lengths of fibula in this study. These findings should be taken into account in trauma and pathological conditions that may occur in ossa cruris.

Keywords: Anatomy, Fibula, Ruminant



Estimation of the *in vitro* True Digestibility of Alfalfa Hay and Tomato Pulp Combinations

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Abstract: The use of by-products in animal nutrition are common and this is as old as the domestication of animal species by humans. By-products such as forages which contains high level of structural carbohydrate can also be utilized by rumen microorganisms. Tomato is widely cultivated vegetable crop in Turkey as well as Mediterranean countries, and it is a raw material of the food industry for the production of tomato products such as paste, ketchup, sauce etc. for human nutrition. The aim of the study was to determine the *in vitro* true digestibility of alfalfa hay and tomato pulp combinations for ruminants.

Ankom Daisy *in vitro* fermentation system was used for estimation of *in vitro* true dry matter digestibility of alfalfa hay (100%) + tomato pulp (0%), alfalfa hay (75%) + tomato pulp (25%), alfalfa hay (50%) + tomato pulp (50%), alfalfa hay (25%) + tomato pulp (75%) and alfalfa hay (0%) + tomato pulp (100%) combinations. The filter bags, used in *in vitro* fermentation system, were firstly rinsed in acetone for 3 min and allowed to dry and marked. Ground alfalfa hay, tomato pulp and their combinations were weighed into the bags at a total mass of 0,5 g per bag and sealed by heat sealer. A bag without sample was also used for a blank. Rumen content, obtained from cows freshly slaughtered at a local slaughterhouse, was collected and strained in accordance with the procedure. Buffer solutions were prepared and poured into each digestion jar of incubator described by Ankom Daisy *in vitro* fermentation system. After the temperature was set 39 °C, 400 mL rumen fluid and prepared bags were added to each digestion jar. Each digestion jar was purged with CO₂ gas before activating incubator for 48 h. After incubation, the incubation medium inside of jars was removed and bags gently washed until they were completely clean. Thereafter, the bags were placed in the Ankom Fiber Analyzer and neutral detergent fiber procedure was performed. The percentage of *in vitro* true dry matter digestibility of the feed combinations was calculated with equations consisting of difference between the amount of incubated and the residue after neutral detergent fiber analysis.

While *in vitro* true dry matter digestibility of alfalfa hay was the lowest, its digestibility was improved by tomato pulp with the increasing levels. It is concluded that alfalfa hay can be combined with tomato pulp with the increasing levels to improve its digestibility for ruminants.

Keywords: Alfalfa Hay, Tomato Pulp, *In Vitro* True Digestibility, Ruminant



An Overview Some Metabolic Diseases and Fertility Disorders in Organic Dairy Herds

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Abstract: The basis of organic dairy production is the maintenance of animal health and welfare because of organic system minimising the use of chemical inputs including veterinary medicines. Therefore, some metabolic diseases and fertility disorders in organic dairy herds were reviewed in this paper.

Mastitis, fertility problems and milk production may be the common reasons for culling in organic herds. Mastitis, causing losses in milk production and premature culling of dairy cows, is the one of the diseases occurring after inflammation of the mammary glands and routinely treated with antibiotics because bacterial infections play the role in the etiology of mastitis. Generally, mastitis in dairy herds may not be completely prevented, but its severity and economical losses can be decreased. For this reason, it is advised **do everything possible to prevent mastitis and reduce its incidence**. Fertility disorders in organic dairy herd are also important because an appropriate and effective reproductive program is necessary to the financial input of the dairy farms. Milk yield, breeding season and service can affect on reproductive performance of organic dairy herds. Artificial hormones for breeding or solving reproductive problems can not be used in organic dairy farms. Therefore, the good observation of estrus behaviours and signs, and natural alternative treatments to keep the pregnancy rate high must be applied. Infertility affects on productivity and causes culling of cows in organic dairy herds. However, retentio secundinarium, endometritis and abortion can be resulted in fertility disorders. Laminitis is non-infectious inflammation of the foot. Some digestive disorders such as acidosis, changes in the gastrointestinal bacterial flora etc. predisposes cows to laminitis. The effect of a relatively high forage diet may decrease the incidence of hoof problems in organic herds. On the other hand, organic housing and animal welfare such as dry bedding, low stock density, forage-based diet can promote good foot and hoof health. Organic production standards require that the total diets of dairy cows have roughages at least 60%, thus there is a lower risk for laminitis in organic herds. In general, a low milk yields in organic herds compared to conventional herds may not be a risk in early lactation for some metabolic diseases such as milk fever and ketosis because cows may not suffer from energy or nutrient deficiency.

It can be stated that a high animal welfare status and organic production standards in organic production make it possible for prevention from some metabolic diseases such as acidosis, laminitis, milk fever, ketosis.

Keywords: Organic Dairy Production, Metabolic Diseases, Fertility



Determination of Malondialdehyde Levels in Permethrin-Exposed HepG2 Cell Line by High Performance Liquid Chromatography

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Abstract: Permethrin (PER), a synthetic pyrethroid insecticide, is widely used in agriculture, forestry, veterinary medicine and vector control programs, because of its high activity on target organisms and low mammalian toxicity. However, this extensive use of PER causes its residual accumulation in the environment and increased human and animal exposure. Lipids are the most prominent biomolecules among many biological targets of oxidative stress. Lipid oxidation results increasing of a number of secondary products and malondialdehyde (MDA) is one of the final products of polyunsaturated fatty acid peroxidation in the cells. An increased level of free radicals causes overproduction of MDA. This aldehyde is a highly toxic molecule and should be considered as more than just a marker of lipid peroxidation. The aim of this study was to determine the MDA levels in HepG2 cell line that were exposed to synthetic pyrethroid insecticide PER. Three different doses of PER (1 µM, 10 µM and 100 µM) were applied on HepG2 cell line at three different time periods (24, 48 and 72 hours). MDA levels in cell supernatants were analysed with a high performance liquid chromatography with photodiode array detector (HPLC-PDA). As a result, obtained data showed that PER treatment significantly increased the concentration of MDA in HepG2 cells compared to control and DMSO groups (p<0.01). MDA levels remarkably peaked in all doses of PER at 48 h. However, there was a significant decrease in MDA levels at 72 h in all PER doses (p<0.01). These results suggest that lipid peroxidation may be one of the mechanism of permethrin-induced cytotoxicity. Additional *in vitro* and *in vivo* studies with different doses should be performed for a detailed evaluation.

Keywords: Permethrin, Lipid Peroxidation, Malondialdehyde, HepG2, HPLC



Prevalence of Five Enteropathogens and Evaluation of a Commercial Rapid Test Kit for The Detection of Bovine Coronavirus-Rotavirus Using a Reverse Transcriptase Polymerase Chain Reaction (RT-PCR) in Feces of Diarrheic Calves.

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Abstract: Fecal samples from 70 diarrheic calves were examined for the presence of five enteropathogens by a commercial rapid test. 49 (70 %) fecal samples by rapid test were found as positive for five enteropathogens. The individual prevalence was 50, 28.6, 11.4, 12.9 and 4.3% for *Cryptosporidium*, Rotavirus, Coronavirus, *E. coli* K99 and *Giardia Lamblia*, respectively. Mix infections by two agents were 15.7% for Rotavirus+*Cryptosporidium*, 5.7% for Coronavirus+*Cryptosporidium*, 2.9 % for Rotavirus+Coronavirus, 2.9 % *Cryptosporidium*+*E. coli* K99, 1.4% for Rotavirus+*E. coli* K99 and 1.4 % *E. coli* K99 *Giardia Lamblia*. Mix infections by three agents were 1.4% for *Cryptosporidium*+*E.coli* K99+*Giardia Lamblia* and 1.4%, *Cryptosporidium*+Rotavirus+Coronavirus. However, 70 fecal samples were tested for bovine coronavirus-rotavirus by RT-PCR and the diagnostic performance of rapid test was evaluated in comparison with a RT-PCR. RT-PCR was positive for rotavirus in 25/70(35.7%) samples; 20 of these 25samples were also positive using the rapid assay, resulting in a sensitivity of 80%; two samples were positive in the rapid assay but negative in the RT-PCR (specificity 95%). RT-PCR for coronavirus was positive in 20/70 (28.6%) samples, of which 8/20 (40%) were also positive using the rapid assay. These results indicated a sensitivity of 40 % and a specificity of 96 % of the rapid assay for detection of coronavirus.

In this study, the results suggest that *Cryptosporidium* together with Rotavirus, Coronavirus, *E. coli* K99 plays a very important role in etiology of neonatal diarrhea and is the most common cause of diarrhea in neonatal calves. However, the sensitivity of rapid test kit for the detection of coronavirus was found highly low. The result of rapid test for BCV should be carefully interpreted; especially by field veterinarians using these kits for detection of this agent in the etiology of neonatal diarrhea.

Keywords: Calf, Neonatal Diarrhea, Rapid Diagnostic Test, RT-PCR, Sensitivity, Specificity



Additions to the Knowledge of Injurious Mites Living on Garlic in Kastamonu/TURKEY

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Abstract: Garlic is the one of the most important agriculture crops because it is specially tolerant to aganist climate conditions at production stage, it is suitable for export because it's head parts are big and high quality and it characterize to area as "Taşköprü garlic". Selenium element is a chemical material that is cancer inhibitor and risk dedactive. It exist only in Taşköprü garlic and not the garlics that product at other areas. Taşköprü is the richest cultivar in terms of compound elements, minerals and vitamins. It can be maintained at normal storage condition for 10-11 months without need for cold storage and weight loss of more than 33-37% of dry matter content. Garlic production is one of the very important agricultural products in Kastamonu, Turkey. Taşköprü is the the largest produced area in Kastamonu (85-90%).

Pests and diseases are playing an important role in the garlic production, depending on these effects crop losses may up to 50% from 10%. This loss sometimes reach 100% depending on crop plants, species and density of the pest. Mites causes largely the product and yield loss. Detail and comprehensive studies that targeted directly harmful garlic mites in the world and our country are not negligible. Most of the studies is aims to determine the mites of onion and ornamental plants and it is reported to mites cause major problems. In this study, field sampling were conducted for the purpose of identifying most harmful mite species and their distribution and population density in the garlic cultivation areas that are placed in Taşköprü, Hanönü and Merkez Districts in Kastamonu Province in 2014-2015 . When the densities of species that have been identified from samples collected in field surveys were evaluated, identified that *Rhizoglyphus robini* is the most common species with a frequency of 58.82%. *R. robini* was reached the highest density value in Hanönü district. Other than *R. robini*, *Tyrophagus putrescentia* (Schrank) and *Histiostoma feroniorum* (Kramer) were identified intensely.

In this study, 8 species from Acaridae, 2 species frim Glycyphagidae, 3 species from Tetranychidae, 2 species from Tarsonemidae and one species from Eriophyidae totally 16 plant parasitic mite were determined. So plant the Turkish fauna of plant parasitic mites on garlic were put forth first time The density of the harmful mite species that were identified were given on family and genus level according to localities.

Keywords: Plant Parasitic Mites, Garlic, Acari, Taşköprü, Turkey



Harmfull Diptera (Insecta) Species and Their Control Possibility On *Allium sativum* L. and *Allium cepa* Growing Areas in TURKEY

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Abstract: Onion and garlic are the most common species of the *Allium* spp. and are produced at very high rate all over the world. The using of garlic in the world although varies from country to country generally garlic is used in various forms as spices, mashed potatoes, canned, dried garlic powder, garlic oil and garlic tablets. Onion is used as food material besides and is used used in the field of health as healing. Onion has the chemical constituents which a positive impact on within cancer, cholesterol lowering agents and antioxidant properties such as Quercetin. The large using area of garlic and onion and the revealing the positive impact on human health by the results of research studies were caused increasing of their importance. Garlic and onion production occupies an important place between agricultural products of Turkey. Kastamonu is the most important city is term of garlic production with % 25.2 share. Almost all of the garlic produced in Kastamonu (85-90%) are grown in Taşköprü district. The yield loss caused by pests is the most important problem in production of *Allium sativum* and *Allium cepa*. In the absence of control measures, yield loss would be around 35% on average. The yield loss sometimes depending on the pest species and population density can reach about 100%. Insects are one of the most important pests of them. Incests cause largely the product and yield loss. These pests that cause damage to *A. sativum* and *A. cepa* shows a wide range of taxonomic categories. Diptera species are one of these harmful insects. In this study important species that their level of damage and economic importance are high were given information about their morphology, life cycle and damage types by examined studies conducted about the harmful Diptera species in garlic and onion cultivation areas in Turkey. So the harmful Diptera fauna of onion and garlic plants in Turkey was determined.

Keywords: *Allium sativum* L., *Allium cepa*, Acari, Garlic, Onion, Diptera, Turkey



Evaluation of Genotype Environmental Interaction Yield and Quality of Some Oat (*Avena sativa* L.) Genotypes using GGE Biplot Analysis

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Abstract: Three field location experiments were carried out to find out yield and yield components of different genotype of oat (Yeşilköy 330, Seydişehir, Faikbey, Checota and Saia6) in Turkey environmental condions using methodology. Yield and yield components of genotypes of oat were investigated under three different environmental conditions of Turkey during 2015 and 2016 seasons that were combined in GGE-biplot analysis. The environmental locations were Bursa, Balıkesir and Manisa. The experiments were arranged in the randomized complete block design (RCBD) with four replicates in each experiment. The purpose of the study is determination of environmental interaction with yield and quality as a fodder and grain yield of some oat (*Avena sativa* L.) genotypes. In the research, yield, hay yield(dry matter), crude protein, crude fat, ADF and NDF ratios were investigated. As a result of the research the highest and the lowest mean yield by 463,8 kg ha⁻¹ was obtained from Saia6 and 402,8 kg ha⁻¹ from Yeşilköy 330 respectively, and also the highest and the lowest mean hay yield was obtained by 135,9 kg ha⁻¹ from Saia6 and 121,9 kg ha⁻¹ from Yeşilköy 330 genotypes respectively. In terms of average yield and hay yield there was significant, but average crude protein, crude fat, ADF, NDF ratio and seed yield there was insignificant differences among genotypes statistically. Conversely in point of locations differences among genotypes was significant. Also genotype x environment interactions was observed significant statistically. In point of average yield, hay yield and crude protein the highest value was obtained from Manisa location, In point of average yield, hay yield the lowest value was obtained from Balıkesir location.

Keywords: Oat Genotype, GGE Biplot, Yield, Quality, Location



Effects of Salicylic Acid on Plant Nutrient Content and Yield on Cress (*Lepidium sativum*)

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Abstract: This study was carried out in the implementation areas of Ordu University Faculty of Agriculture Department of Horticulture in 2015-2016 growing season with the aim of investigating the effects of different doses of salicylic acid on plant nutrition contents, yield and some yield components. Zeybek cultivar was used as plant material in the experiment. Salicylic acid doses used in the experiment were 0 mM (control), 0.5 mM, 1.0 mM and 2.0 mM. The experiment was established according to the completely randomized design with 3 replicates. Plant length, number of leaves, leaf stem length, leaf length, leaf width, leaf color (SPAD), vitC content, dry matter content, yield and plant nutrient contents were determined. The effects of salicylic acid on K, S, B, Zn, Cu and Mn contents of cress were not found statistically significant, it decreased Na, Ca and Mg contents and increased significantly P and Fe contents of the plants. Salicylic acid application have caused increases in the yield values. While the lowest yield value was obtained from control plots at 2.55 kg/m² the highest yield was obtained from the 2 mM salicylic acid applied plots (3.08 kg/m²). Similarly, salicylic acid applications positively affected plant height, number of leaves, leaf width and length, leaf stem length, SPAD values and vitC content comparing to the control plot. The highest plant length value was obtained from parcels applied with 1 and 2 mM salicylic acid at 19.53 cm and the lowest value was obtained from control parcels with 17.20 cm. The control plots gave a mean value of 5.33 leaves per leaf, while this value was 6.33 for plots treated with 2 mM salicylic acid. The highest values of leaf width and length were obtained from 1 mM salicylic acid application and lowest values from control plots. The effects of salicylic acid applications on the dry matter content are not significant. The overall results showed that salicylic acid application has positive effects on yield and yield components of cress.

Keywords: Plant Nutrient, Salicylic Acid, Yield, Cress, *L. sativum*



Salt Movement in Soil Column with Proportionally Decreased Amount of Leaching Water

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Abstract: Saline soils have a significantly large surface area in the world and the only solution for the reclamation of these soils is to leach the salts from root zone by water. Particularly, intermitted leaching is advised as more effective method since it caused more salt movement from the soil surface to down layers. However, new techniques obtain more effective salt leaching by using less water are still required in the field. For this purpose, we conduct an experiment on soil columns with light and medium textured soils. Leaching water as a 1.5 fold of soil depth (93 cm) was intermittently applied in equally decreased 5 different portions (48 cm, 24 cm, 12 cm, 6 cm, and 3 cm) to the columns under laboratory conditions. Time between leaching intervals were decided according to three different moisture drying ratios (15%, 30% 45%).

There were statistically significant differences among the results of leaching applications at different moisture levels of soils at all depths. The most effective salt leaching from the soil profile was at %45 moisture drying level for both light and medium textured soils. Total amount of leaching water leached out 84.92% of total salt from light textured soil, 84.54% of total salt from medium textured soil.

Keywords: Leaching, Reclamation, Salt, Soil Texture, Water



Determination of Yield and Yield Components of Some Sunflower Genotypes (*Helianthus annuus L.*) in Erzurum and Iğdır Wet Conditions

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Abstract: The study was carried out in the irrigable trial areas of the Eastern Anatolia Agricultural Research Institute (DATAE) Erzurum and Iğdır stations in 2017 growing season. The material of the study consists of three control varieties and five sunflower variety candidates obtained from Trakya Agricultural Research Institute, which prevailed under the ecological conditions of Erzurum. This study was designed in randomized complete blocks with four replications. The highest oil rate (34.4%) 16 Tr 66 seed yield (370.4kg/da) and oil yield (116.5kg/da) were produced by 16 Tr 60 variety candidate. Plant output time ranged between 14.8-15.8 day, 50 % flowering time between 72.3-75.3 day, physiological diagnosis between 123.5 day, head diameter between 21.7-24.6 cm, plant height between 140.5-164.3 cm, 1000 seed weight between 71,1-76,8 g, seed yield between 287.5-370.4 kg/da, oil rate between 30.4-34.4 % and oil yield between 82.7-116.5 (kg/da). According to results, in both Erzurum and Iğdır locations, 16 TR 60, 16 TR 66 and 16 TR 67 variety candidates performed better than control varieties in terms of oil rate, seed yield and oil yield. Research has shown that it would be appropriate to continue working with these lines.

Keywords: Sunflower Oil, *Helianthus annuus*, Head Diameter, Seed Yield, Oil Rate



Characterization of Naturally Grown Festuca Species for Forage Purposes

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Abstract: This study aimed at examining forage quality and yield of 130 *Festuca arundinacea* Schreber, 217 *Festuca ovina* L., 46 *Festuca pratensis* Huds and 77 *Festuca rubra* L. collected from Turkey.

The materials were collected as whole plant or seed from 18 locations in 2014. Each material was planted at 50 x 50 cm (as seedling or clone) to application field of Agriculture Faculty of Selçuk University in 2015. The plants were observed in forage yield visually as 1-9 scale at the pre-flowering stage and then harvested. The harvested plants were investigated in ADF, NDF, Ca, Mg, K and P ratio using NIRS.

Forage yield was averaged as 3.25 in *F. arundinacea*, 2.37 in *F. pratensis*, 2.35 in *F. ovina* and 2.13 in *F. rubra*. Crude protein content of the species was follows; *F. rubra* (15.83 %), *F. ovina* (15.38 %), *F. arundinacea* (15.04 %) and *F. pratensis* (14.57 %). While the average ADF content was ranked as *F. rubra* (32.29 %), *F. ovina* (33.43 %), *F. arundinacea* (33.45 %) and *F. pratensis* (34.16 %) with very close variation. Average NDF content was ranked as *F. rubra* (63.17 %), *F. arundinacea* (64.59 %), *F. ovina* (65.80 %) and *F. pratensis* (66.31 %) among the species. In terms of nutritional content, intra-species variation was higher than inter-species variation. This indicates that yield can be effective feature for material selection especially inter-species level.

As a result, each species has promising genotypes that can be improved as forage with, high forage yield, high protein and nutrient content.

Keywords: ADF, *Festuca*, Forage, NDF, Protein



Effect on Hay Quality of Seed Ratios in Different Forage Crops Mixes

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Abstract: Common vetch (*Vicia sativa* L.) and fodder pea (*Pisum sativum* spp. *arvense* L.) which are lodged legume species are generally intercropped with cereals under different seed ratio to increase yield and quality of hay. This research was conducted to determine forage quality of the different legume (common vetch “*Vicia sativa* L.”, fodder pea “*Pisum sativum* spp. *arvense* L.”) – cereal (barley “*Hordeum vulgare* L.”, oat “*Avena sativa* L.”) binary mixtures with different seed ratio under Cekerek ecological conditions (Yozgat - Turkey) during the 2012 and 2013 growing seasons.

Fodder pea (Taskent), common vetch (Segmen), oat (Checota) and barley (Karatay- 94) were used as a plant material. The experiment was arranged in randomized block design with three replications. The mixtures were harvested base on the cereals when they were at milk dough stage. Then each treatment separated as legume and cereal and, samples were dried at 70 0C to constant weight. After samples were milled chemical analyses were performed by NIRS. The significant differences were determined among cropping treatments in terms of crude protein ratio, Calcium, Potassium, Phosphorus and Magnesium contents. According to two years results crude protein ratio, Calcium, Potassium, Phosphorus and Magnesium content were 17.57 %, 1.13 %, 2.09 %, 0.33 % and 0.27 % respectively.

Consequently, considering crude protein ratio, Calcium, Potassium, Phosphorus and Magnesium content 20 % oat:80 % fodder peas and 30 % barley:70 % fodder pea mixtures exhibited higher results, in our conditions. Furthermore, it has been identified by suitable for similar ecologies and Yozgat of these mixture and seeding ratio.

Keywords: Common Vetch, Crude Protein Ratio, Intercropping, Fodder Pea, Oat



Export Potential in Fattening and Meat Production in Turkey

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Abstract: Issues related to nutrition and foods are increasing as world population increases. Healthy nourishment and a balanced diet, together with sufficient intake of animal proteins, has become a priority issue of developing and developed countries. For this reason, despite national policies on advancing technologies and industrialization, the livestock sector has maintained its strategic importance. The role of cattle in the nutrition of human beings and animal protein production in the world is highly significant. The place of meat among sources of animal proteins is beyond question. In today's world, developed countries feed their people with meat and meat products at high quality as well as quantity.

In Turkey, there is a high demand for meat products caused by population growth and rapid urbanization on one hand, and a specific growth rate on the other. For this reason, there is a necessity of balancing production, and making sufficient production for domestic and foreign markets. Meat production cost varies from region to region, from operation to operation. The most important factors affecting meat production costs are capital, feed costs, machinery costs, labor, taxes and risk (i.e. natural disasters and price changes). Cutting down on unnecessary investments, increasing fertility rate, health checks, following vaccination and nutrition rules, using feed effectively (ways to boost production, taking into account the nutritional values of silage and other feeds), careful and proper transport, and good marketing will improve business performance by reducing production costs. The fertility rates of cattle in Turkey are below the required values. Entire production bottlenecks on fertility rates. Turkey has 5.4 million milking cows, and 3.5 million calves are born annually. That is, the calf-to-cow ratio is 64.8%.

We can say that there is at least a 15% margin of improvement in the calf-to-cow ratio in our country. Considering the 5.4 million milking cows currently in Turkey, the number of calves born annually will rise from 3.4 to 4.3 million with a fertility rate of 80%.

Artificial insemination, record keeping, milking, healthcare and technical services cannot be achieved by breeders alone. It should not be forgotten that breeders can only perform one stage of production, and there must be multi-dimensional cooperation and support at other stages. Moreover, direct marketing of produced meat and milk or promotion and presentation to consumers after the meat and milk have been processed and packaged are not easy tasks. The procurement and use of suitable and necessary tools and equipment for all these activities usually requires expertise. For all these reasons, cattle breeders should not be left alone in the meat and dairy sector. Support for increasing production should be made to the product itself (6 months old calves and feed plants).

For cattle breeding, the objective of Turkey for 2023 and 2071 should not be self-sufficient production alone. Turkey should target production levels that enable the country to distribute meat and dairy products to its students, help poor and underdeveloped countries, and export meat and dairy products to the world. For 2023 and 2071 targets, the key for going back from imports to exports in livestock and meat production is more calf and feed production.

Keywords: Cattle, Fattening, Meat Production, Fertility Rate, Feed Plant



Health Promoting Oils; Fish and Olive Oils

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Abstract: Fish and olive oil are two healthy oils which are known as noble oils for a healthy life. There are many dietetic association recommends fish at least two times a week and olive oil in daily intake routine in order to get and stay health. Because fish and olive oil commonly provide omega 3 [EPA (eicosapentaenoic acid, C20:5n3) and DHA (docosahexaenoic acid, C22:6n3)] and omega 9 [Oleic acid (C18:1n9)], respectively. While fish oil rich in polyunsaturated fatty acid which is easy to oxidize, olive oil has a source of monounsaturated fatty acids, especially oleic acid (60–80%) which is less susceptible to oxidation, having an important role in terms of contributing to the high stability and long shelf life. The content of phenolic compounds is an important parameter considering the evaluation of the quality of virgin olive oil since phenols are mainly responsible for oil flavour and aroma. Nowadays, the phenolic compounds in olive oil and omega 3 content of fish have raised attention due to positive health effects along the last years. They are rich in antioxidant and also have got some fat soluble vitamins such as; vitamin A, D, E, K. These issues let many scientific studies and numerous publications and some guidelines recognizing the health benefits of omega 3 from fish and omega 9 from olive oil sources. According to the previously published studies, these two different kind of oils have been found to be effective against different kinds of cancer, aging, hypertension. They also help losing weight, lowering blood pressure and improving digestion system. This paper got closer attention the health benefits of these two oils and will discuss in detail. The results provide valuable information for preparing our diet tables in a healthy way. These health promoting oils can improve our health and our lives.

Keywords: Fish Oil, Olive Oil, Health, Omega 3, Phenolic



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Feeding Studies of Eggs Quality in Eggs Chicken

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Abstract: Egg is an important protein source for adequate and balanced nutrition in diet, besides that has a great importance both in human diet and physical and mental development of children. Recently, besides the studies have been done towards the increase of product amount in animal feeding, some studies have gained importance for the improving the product quality. Egg quality is determined by considering the internal and external quality criteria. Internal quality ara evaluated on the basis of some criteria including white and yellow appearance, yellow color, meat - blood stain, Haugh unit and nutrient composition. The parameters such as egg weight, shell thickness, shape index and shell breaking strength are taken into consideration when determining the external quality of the egg. Egg is a product that can be easily affected by the composition of the ration. Many studies have been conducted to improve egg quality and consumer liking using various nutrients or feed additives. In this article, the current studies about this subject will be discussed.

Keywords: Egg, Internal Quality, External Quality



The Biological Control of *Pseudaulacaspis pentagona* (Targioni-Tozzetti) (Hemiptera: Diaspididae) by Entomopathogenic Bacteria

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Abstract: *Pseudaulacaspis pentagona* (Targioni-Tozzetti) (Hemiptera: Diaspididae) which has a wide host, is an important pest causing losses in yield in agricultural fields, The chemicals are used for control against this pest but adult individuals are less affected by pesticide treatments. Also, the negative effects of the chemicals used in the control against pest and with the increasing awareness on environmental issues, alternative methods were sought. In this context, studies were conducted to find new methods in which bacteria were used in the biological control against pests, and successful results were reported.

The insecticidal effect of three bacterial isolates obtained from *Ricania simulans*, raspberry and Graminea and defined as *Brevibacillus brevis*, *Bacillus pumilus* and *B. megaterium* respectively by microbial identification system (MIS) were investigated in controlled conditions in this study. Insecticidal effects of bacterial isolates changed 41.68 and 89.04 on adults. The highest mortality rate values were observed TV-67C (89.04%) against *P. pentagona* adults. CP-1 (83.23%), TV-91C (41.68%) followed this application. All bacterial isolates tested different group with the control. The lowest mortality rates were observed with control (0.56%).

According to this study results, all tested bacterial isolates has effected against *P. pentagona* adults under controlled conditions. This study matters to highlight the successful usage of an environment-friendly, natural, and for health of humans and other livings, risk-free product against *P. pentagona* in substitution for the chemical pesticides that are in-tensely used and harmful for environment, natural balance and human health.

Additional field research is needed to determine how effective these bacterial species are at controlling *P. pentagona* adults in the field conditions.

Keywords: *Pseudaulacaspis pentagona*, Entomopathogens, Biological Control, White Peach Scale, *Bacillus pumilus*



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Marketing Structure of Fresh Fruit and Vegetable in Turkey

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Abstract: Turkey has a very high level of fruit and vegetable production potential due to its climate and soil characteristics. Processed agricultural land in the world and in our country is limited and it is caused that adequate and balanced nutrition problems of the rapidly increasing world population. Production and consumption of fruit and vegetables should be extended for the solution the problems of balanced nutrition. When comparing Turkey with many countries of the world, fruit and vegetables are produced almost every seasons and in every region in Turkey. According to Turkey Statistical Institute, total fruit and vegetable productions in Turkey in 2016 were realized as 124.1 million tons. 27.6 million tons from vegetable production and 78.6 million tons of fruit production were obtained. Turkey also has an important position in the foreign trade as well as its fresh fruit and vegetables production potential. Turkey exported 3.5 million tons of fresh fruit and vegetables in 2014. Provided income from the total fruit and vegetable exports was 2.3 billion dollars. However there are a number of problems in the fresh fruit and vegetable marketing in Turkey where has high production capacity and many fruits and vegetables. This situation affects the development of the processed fruit and vegetable industry and producer and consumer prices. Due to undeveloped marketing structure and the high number of vehicle, producer income is reduced and the marketing margin is increased. Farmers need to be organized, especially in marketing. In this study, it is aimed to examine fruit and vegetable marketing structure and marketing problems in Turkey.

Keywords: Fruit, Marketing, Marketing Margin, Vegetable, Horticulture



Important of Nuts in Healthy Feeding

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Abstract: Fruits such as walnut, pistachio, almond, pine nuts, hazelnut, chestnut which we know as nuts in our country, are known as "nuts" in western countries. According to botanic science they are not fruits but seeds. In fruit known as hard crust, we eat the seeds rather than the fruit itself. Hard shells are very rich in basic carbohydrates, proteins and fat. Especially in terms of fat content, we can see hard shells as oil drums. Except chestnut, hard shells contain almost 50-70% of their weight of fat. Hard shells are often very rich in linoleic acid (Omega 6), a polyunsaturated fatty acid. Nuts are also a good source of Omega 9 (Oleic Acid / Olive Oil), Omega 3 (Linolenic Acid), a fatty acid that has recently come to the forefront and is sought after, is found mostly in walnuts among hard shells. Omega 3 (Linolenic Acid) is very little or no in other hard shells. The other oils found mostly in nuts are saturated fats. These are Palmitic Acid and Stearic Acid. Fats of nuts contain other minor compounds such as natural antioxidants and fat soluble vitamins. Hard shells are important energy sources, absolutely necessary diet food, and also sources of plant chemicals. Nuts are also used as a component of some skin moisturizers and cosmetic products. It is also known that nuts contain a number of bioactive and health-promoting compounds, their fats and by-products (pulp and husk / green crust). Consumption of hard shells provides many cardio protective effects. It is assumed that this effect is derived from their lipid content. Research has shown that the use of nuts in feed is more beneficial than the use of whole nuts in hard shells. Although walnuts, pistachios, almonds, pine nuts, hazelnuts and chestnuts are widely grown in our country, although they are known as hard-shelled ones, a large number of nuts grow in many geographical regions of the world and in different climate characteristics. In this study, nuts such as walnut, pistachio, almond, pine nuts, hazelnut and chestnut are widely used in our country. As well as some nuts grown widely in other geographies and located in our tables, in terms of nutritional values. For example, some of the fruit species we have introduced here have been found in our country. As a matter of fact, Pikan (Pecan) is one of these fruits even though it is not widely grown. Among our people, Pikan, also known as American walnut, has found a place to grow up in the southern coastal areas. Cashews, which has not yet been cultivated in our country and cannot be trained to meet the climate demand, but consumed a lot as a snack by our people, is another nutshell that we introduced in terms of nutrition here. The number of fruits that are evaluated as nut in the name of our horses, hard shells, in the name of western sources, are certainly not as much as those introduced here. There are more nuts in different geographies of the world.

Keywords: Nut, Omega 3, Omega 6, Omega 9, Walnut, Hazel nut, Pistachio nut, Almond, Pine Nut, Chestnut, Pecan, Cashews



Structural Status of Beekeepers and Beekeeping Enterprises in Ardahan

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Abstract: Ardahan province is the important gene center of the Caucasian honey bee (*Apis mellifera caucasia*) and is one of the four important bee breeds which are economic values in the world. Ardahan province has an important potential with its delicious, high quality and registered honey production. This research was carried out in Ardahan Province and 5 provinces to determine the structural status of beekeepers and beekeeping enterprises. The data of the study were obtained from questionnaires of 213 settled and migratory beekeepers selected by chance. The obtained data were analyzed using chi-square test. In addition to family knowledge and skills, it has been determined that reading and practicing this knowledge is effective in learning beekeeping. This rate was determined as 59.40% for settled beekeepers and 57.90% for migratory beekeepers. The difference between beekeeping learning methods of migratory and settled beekeepers was statistically significant ($P < 0.01$). While a large proportion of settled beekeepers (66.66%) regard as beekeeping an additional source of income, a significant proportion of migratory (51.20%) regard as beekeeping their main occupation. The difference observed between migratory and settled beekeepers was significant ($P < 0.01$) for the purpose of beekeeping. While the vast majority of migratory beekeepers (% 62.80) are beekeeping with 100-200 beehives, a great deal of settled beekeepers (%81.90) are beekeeping with 1-100 beehives. The proportion of the beekeepers participating in the beekeeping course was determined as 82,6%. The participation rate of any beekeeping course was determined as 75,70% for settled beekeepers and 90,20% for migratory beekeepers. A large majority of beekeepers (% 99,1) said they were members of a association and generally (% 82,6) received hive support. It has been determined that the yield of honey per hive is between 10-20 kg in settled beekeeping enterprises (75,70%), 20 kg and over in migratory beekeeping enterprises (65,70%). It has been determined that migratory beekeepers more spend per hive and earn more income per hive. It has been determined that the beekeepers prefer the artificial swarm production in bee products and they have a similar tendency in this issue. This rate was calculated as 47.70% for settled beekeepers and 52.90% for migratory beekeepers. While settled beekeepers market 100% of their own honey, this rate is calculated as 76.50% for migratory beekeepers.

Keywords: Ardahan, Beekeeping, Enterprises, Honeybee, Migratory And Settled Beekeeper



Seed Invigoration of Stored Forestry Seeds Improved the Seed Viability and Vigor

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Abstract: Seed viability will decrease naturally, and seed deterioration will occur more rapidly under unfavorable storage condition especially in recalcitrant seeds. Studies on several species of forestry seeds proved that various invigoration treatments such as hydropriming, osmoconditioning or matricconditioning improved seed viability and vigor after storage. Treated rubber seeds (*Hevea brasiliensis*) by soaking in water with water replacement every 24 h for 5 d (~ hydropriming) before being stored in polypropylene or the untreated seeds stored in the polypropylene containing zeolite (<500 μ , 20% moisture) could prolong the seed storability for up to 10 weeks with high seed germination and did not differ significantly between the two treatments (92% and 88% respectively). On the contrary, the seeds without hydropriming treatment and stored in the polypropylene without zeolite, the germination was decreased to 59% after 10 weeks of storage. Seed storage was carried out at 25 °C and 60-75% RH. Osmoconditioning (the seeds were soaked in aerated PEG 6000 solution of - 0.4 MPa for 5 d then air-dried for 2 d) applied on gmelina (*Gmelina arborea* Roxb) seeds after being stored for 16 weeks in open storage or air-conditioned room, increased percent of germination and total number of normal seedlings. Germination percentages of teak (*Tectona grandis*) seeds without treatment or treated by hydropriming (soaking the seeds in water with water replacement every 24 h for 3 d) were very low 3% - 19%, however, matricconditioning [using rice-hull ash as the carrier with the ratio of seed to carrier to water 1:0.7:1 (g) for 7 d at ambient room] increased the germination up to 71% in clone 51. Matricconditioning (the ratio 5:3:4, 2 d, 20 °C) on seeds of *Shorea selanica* reduced the time needed to reach 50% total germination after 4-8 weeks of storage and increased seedling growth after 6 weeks of storage. Similarly, matricconditioning (the ratio 5:3:6, 2 d, ambient room) applied on *Shorea stenoptera* after the seeds were stored for 4 weeks in open storage or 4-8 weeks in controlled room at 20 °C and 90% RH effectively increased percent and speed of germination, and improved seedling growth after 6 weeks in both storage condition. Thus, recalcitrant seeds stored under ideal condition could extend the seed lifespan to two-fold. In other study, seeds of *Pinus merkusii* were treated with either antioxidant or mixture of CO₂+N₂ gas and stored for 3 months. After storage, the seeds were invigorated either by osmoconditioning or matricconditioning. Osmoconditioning (- 0.5 MPa of PEG 6000, 2 d, 20 °C) decreased the electrical conductivity (EC) value in the seed-soaked water. The lowest EC was shown in the seeds treated with CO₂+N₂ then were osmoconditioned. Low EC indicates low membrane leakage rates. Vigor index was higher in the seeds that were matricconditioned with vermiculite as the carrier (the ratio 2:1.2: 2, 2 d, 20 °C) although both invigoration treatments were significantly better than the untreated. Matricconditioning was more effective than osmoconditioning in increasing germination percentage, germination rate and seedling growth rate of *P. merkusii* seeds.

Keywords: Deterioration, Hydropriming, Matricconditioning, Osmoconditioning, Storability



Estimation of Meat Quality in Broilers by Fuzzy Logic and Ordinal Regression Method

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Abstract: In this study, two prediction models were developed for estimation of meat quality in broilers with ordinal regression and fuzzy logic methods. The material of the study consists of data from a research conducted at Gaziosmanpaşa University Rotary Capital Management Poultry Farm Chicken Unit. pH, cooked loss and L* parameters of the product quality values of 48 Ross 488 male poultry for 42 days were utilized. In fuzzy logic model, cooking loss, pH and L* parameters are used as input variables. Using the input variables, three different meat quality classes were created: 'low', 'middle' and 'high'. In ordinal regression model, cooking loss ratio, pH and L* values were used as independent variables and expert decisions were used as dependent variables. Experimental results were compared with results obtained from models. The relationship between fuzzy logic model results and expert decisions was found to be as high as $R^2 = 0.85$. Similarly, the relationship between ordinal regression model results and expert decisions was found as $R^2 = 0.76$. The predictive performances of the developed models have been evaluated comparatively. When the model results are compared, it is found that the model developed with fuzzy logic methods predicts with a lower error rate than the ordinal regression model. Conclusively, it can be said that both prediction models are successful. But fuzzy logic method results are more successful than those of ordinal regression method. This is thought to be due to the fact that fuzzy logic is a flexible modeling method and that the relationship between inputs and output can be interpreted in rules using human experience.

Keywords: Broiler, Meat Quality, Fuzzy Logic, Fuzzy Set, Ordinal Regression



Lead Adsorption/Desorption in Soils: The Effect of Soil Properties

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Abstract: Lead (Pb) concentration of agricultural soils arises from either many industrial or agricultural pollution sources, and it is of most harmful heavy metals. Its reactivity and mobility in agricultural soils has significant environmental and ecosystem health consequences. Therefore adsorption–desorption processes of Pb at changing concentration levels 28 surface soils with differing physico-chemical properties and mineralogy were investigated by batch technique. Scope of 1 g soils were reacted with 20 mL of 10^{-4} - 10^{-2} molar Pb concentration prepared in 0.01 molar $\text{Ca}(\text{NO}_3)_2$ solution at 25°C for 24 h. Then the adsorbed Pb were released by 5 successive desorption batch with 0.01 M $\text{Ca}(\text{NO}_3)_2$ solution. The sorption data were tested against Langmuir and Freundlich models by regression analysis. Results indicated both Langmuir and Freundlich models successively described the Pb adsorption onto the soils. The maximum adsorptions of the soils were ranged from 2500 to 100000 mg kg^{-1} . The Freundlich n parameters varied between 0.270 and 5.62 mL g^{-1} and Kf parameters 430-57402 mg kg^{-1} . The desorption ratio of the adsorbed metal was very small that indicating the inner-sphere complex formation and insoluble separate phase or surface precipitation on soil minerals. Correlation and principal component analyses revealed that Pb adsorption by the experimental soils were strongly related to pH, clay and carbonate contents, and soluble salt concentrations. Therefore it can be concluded that sandy textured soils were relatively more susceptible to increased level of Pb comparing the clayey and calcareous alkaline soils.

Keywords: Soil Properties, Lead, Adsorption, Desorption, Langmuir Model, Freundlich Model



Current Situation of Organic Livestock Farming, Problems in Turkiye and Solutions Offers

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Abstract: Turkiye has a potential for organic farming by consisting of diversity of plant and animal products, cattle and sheep presence adapted to environmental conditions, abundance of pasture areas, and adequate labor. However, due to some existing problems especially the inadequacy of organic pasture areas and lack of producing concentrate feed, expected developments in the sector haven't been experienced. During the last 20 years that organic animal products have been produced, quite a lot of fluctuations have been occurred rather than a stable growth. According to current data of the Ministry of Food, Agriculture and Livestock, the conventional production rate of organic products such as meat, milk, eggs, and honey is lower than 0.1%. Issues such as animal health and welfare, organizing, publishing and consulting, exclusion of domestic breeds, marketing, certification costs, and transitional issues are at the forefront of the issues to be addressed; especially the lack of organic pastures and lack of concentrate feed production. The solution of the existing problems will provide benefits such as increasing socio-economic gains in rural areas, obtaining better quality and healthier food, increasing employment opportunities and ensuring sustainable animal husbandry.

In this study, the changes that have occurred from 2000s, when the production of organic animal products has begun, to the present day will be discussed. Current problems will be identified and solutions will be offered.

Keywords: Organic Livestock Farming, Organic Animal Production, Organic Meat, Organic Milk, Organic Honey



Effect of Redox Potential Induced Changes on Manganese Availability in Soils with Differing Characteristics

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Abstract: Differences in soil-water regime have influences on key plant nutrition parameters such as pH, redox potential, and electrical conductivity (EC). pH can affect mineral solubility and properties of colloidal surfaces whereas deflection of redox potential can have impacts on both pH and plant nutrient concentrations of soil solution. Manganese (Mn) is the most sensitive and the first responding essential metallic plant nutrient against redox potential changes. Therefore its availability in a specific soil or soils with differing physico-chemical properties is largely dependent on the seasonal soil-water regime and irrigation practices that become problematic to make fertilization programmes. Thus 15 soil surface samples (0-30 cm) with different characteristics were incubated at moderately reducing environment, 1:1 soil: water, condition for 91 days at constant ambient temperature (22 ± 2 °C). pH, oxidation reduction potential (ORP), DTPA extractable-Mn concentrations were measured on 3, 7, 14, 21, 31, 45, 60 and 91st days. Results indicated that redox potential had significant effects on DTPA extractable and Mn concentrations. Correlation analysis indicated that there were a significant correlation between plant available Fe and phosphorus concentration and initial (Fe, 0.680**), 31st (Fe, 0.525* and P, 0.628**) and 45th (Fe, 0.516* and P, 0.563*) days' Mn concentrations. ORP at different incubation periods and initial Mn concentration always showed apparent correlations. Consequently inclusion of ORP analysis to the soil characterising analysis set may contribute to our understanding about available Mn concentration in soils at different times and developing environmentally friendly fertilization programmes.

Keywords: Soil Properties, Redox, Manganese, Reducing Environments



Plant Parasitic Nematodes Associated with Rose in Ordu, Turkey

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Abstract: Turkey is one of the most important rose producing countries in Europe. Plant parasitic nematodes are economically important pests and responsible for losses in the ornamental crops in the World. A survey was conducted to investigate plant parasitic nematode community associated with roses in Ordu province. Soil samples were collected from cultivation areas. Nematodes were extracted using the Modified Beermann Funnel technique from 100 cm³ soil from each sample. Thirteen plant parasitic nematode genera were recovered including *Aphelenchoides*, *Aphelenchus*, *Criconemella*, *Diphtiphora*, *Filenchus*, *Helicotylenchus*, *Meloidogyne*, *Merlinius*, *Pratylenchus*, *Scutellenema*, *Tylenchorhynchus*, *Tylenchus*, and *Xiphinema*. *Helicotylenchus* spp. was found the first rank with 86% frequency of occurrence. The population density per 100 cm³ soil ranges from 0 to 205 for *Helicotylenchus* spp. The other important nematodes *Meloidogyne* spp. and *pratylenchus* spp. were found with a frequency of occurrence of 59 % and 54,5% respectively.

This study has shown that a large number of plant parasitic nematodes are present in rose production areas in Ordu province and that is a first step for nematode management in the future.

Keywords: Cut-flower, Plant Parasitic Nematodes, Rose, Turkey



Effects of Gibberellic Acid Applications on Fruit Drop in Black Myrtle (*Myrtus communis* L.)

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Abstract: Myrtle (*Myrtus communis* L.) is one of the main aromatic and medicinal plants of Mediterranean macchia and belongs to *Myrtaceae* family. It can be grown in many locations up to 600 m elevations in Aegean, Marmara and Mediterranean regions of Turkey. Myrtle is the evergreen bush plant with the high amount of aromatic substances in leaves, flowers, and fruits. Myrtle oil is produced from the leaves of the plant. Fruits are sold as fresh or dried aromatic crop in local markets or shops in Turkey. It has two ecotypes with white or black colored fruits. Selected individuals of both ecotypes can be cultivated in the orchards in Turkey. Wild ecotypes grow naturally in the forests. Black myrtle is recently getting more popular and commercial value because of high antioxidant capacity and phenolic compounds of fruits. The main goal of this study was to investigate the effects of gibberellic acid (GA₃) which is applied around flowering time for obtaining seedless fruit on seasonal fruit drop in black myrtle plants.

Studies were carried out in an orchard of black myrtle located in Antalya. GA₃ at the dose of 100 ppm was sprayed to the whole plant at pre-, post- and full bloom stages, alone or in combination, in black myrtle. Control plants had no GA₃ spray. Fruit drop percentages were monthly recorded from fruit set in July to harvest time in December.

GA₃ applications did not affect early and mid-season fruit drop except pre-harvest fruit drop. Fruit drop at pre-harvest increased up to 57.25 % when GA₃ applied at pre- and full-bloom stages whereas control plants had a very little percentage of fruit drop in all months. Post-bloom GA₃ spraying alone had lower fruit drop when compared other GA₃ applications.

These results suggest that GA₃ applications at different periods, alone or in combination, increased pre-harvest fruit drop.

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Keywords: *Myrtus communis*, Hormone, Yield, Fruit Set, Quality



Effects of Nitrogen and Phosphorus Fertilizers on Yield and Quality of Quinoa (*Chenopodium quinoa* Willd.)

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Abstract: This study was conducted to determine the effects of different levels of Nitrogen and Phosphorus fertilizers on yield and quality components of quinoa. The agronomic performance and nutritive value of quinoa was analyzed as an alternative dry-season feed for ruminants and food for human during growing season of 2015-2016 in Ankara. In this study, 4 different levels of nitrogen (N_0 : 0, N_1 : 50, N_2 : 100 and N_3 : 150 kg ha⁻¹) and phosphorus (P_0 : 0, P_1 : 30, P_2 : 60 and P_3 : 90 kg ha⁻¹) were tested in randomized block design with three replications. We studied herbage (H), hay (dry matter=DM) and grain yield (GY), crude protein content in DM (DMCP) and grain (GCP), acid detergent fiber (ADF) and neutral detergent fiber (NDF) levels. The highest average herbage yield (47.9 t ha⁻¹) was obtained from the application of 150 kg N ha⁻¹ + 90 kg P ha⁻¹, the highest average crude protein content (14.93%) was determined in DM from 150 kg N ha⁻¹ + 60 kg P ha⁻¹. The highest average grain yield (1.6 t ha⁻¹) and crude protein content of grain (16.8 %) were obtained from the application of 150 kg N ha⁻¹ + 90 kg P ha⁻¹. From the results of the study, it was concluded that the optimum fertilizer levels of N and P for quinoa in terms of yield and quality were N_3 and P_3 .

Keywords: Quinoa, Nitrogen, Phosphorus, Yield, Quality



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A Historical Review on Turkish Viticulture; The Importance of Viticulture Genetic Resources

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Abstract: The vineyard culture and also the historical background of Turkey has an importance in the world. Turkey is one of the motherland of grape. Because of the grape growing for hundred years in Anatolia, a large grape variation was obtained in this area. It is determined that, there are more than 1400 grape varieties were growing in Turkey until very recently. And all of them are genetic resources of our country. It is difficult to say that we are doing the necessary protection studies. Because of this, richness of grape variety is getting lost day by day. On the other hand, our grape biodiversity has an important value in the other countries hands. Our major grape varieties are spread all over the world without our control.

However, many of our grape varieties remained unclaimed because of our disclaimed. An important sample of this is Thompson Seedless. In fact, the true name of Thompson Seedless is “Sultani Çekirdeksiz” and it is our genetic resource. But, it is known as “Thompson Seedless” by all of the world. The actual situation of our grape biodiversity has been revised after a short brief of grape history. At the end of the article, we made some recommendation for protecting our grape biodiversity.

Keywords: Grape, Grape and History, Biodiversity, Genetic Resource Viticulture



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A Global Culture: Grape, From the Past to Today

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Abstract: Grapes and grape-related notions (vine, leaves, wine, etc.) have had an importance in the all periods of the human life. Symbols and notions of grapes has been had importance role on religious beliefs, daily life, goods, habitats that they used as well as architectural monuments and artistic works since human being beginnings. This situation is an indication of the importance given to the grapes. The biggest evidence of these is the symbols and notions of grapes that found by archaeological excavations emerging since the human being until today. Grape has continued to be one of the world's most important fruit from the mythological period. Grape and grape products were dedicated to the gods, also grape and grape notions were used in artistic works during the mythological period. Also grape and wine that made from grape have flourished in every historical period. During monotheistic religions, especially with Christian era wine has winning a great value in religious meaning. With the spread of Islam, wine has lost its importance in areas where Muslims were dominated. However, grapes and grape figures have continued to take its place in art in these places. In this study, the emphasis on grape in different areas of human life and in different societies also the importance of grape in the mythology were explained with examples revised as historical approach.

Keywords: Grape, History and Grape. Mitolgy, Vine, Viticulture



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Effect on *Fusarium culmorum* of Fungicides Used in Wheat Seed

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Abstract: *Fusarium culmorum* (W. G. Smith) Sacc. In our country, wheat causes significant yield loss in root, stem, stem and head in the fields. It is the cause of severe infections, especially in moist and climatic conditions. Seed application is important with fungicides. This study was carried out to determine the sensitivity of *Fusarium culmorum* isolates to wheat seed licensed fungicides and the effect of fungicides on pathogens, which were obtained from the wheat cultivation areas of Trakya region. It has been determined that the *F. culmorum* isolates differed in sensitivity to prothioconazole+tebuconazole, tebuconazole and carboxine+thiram effective fungicides used in seed spraying and EC₅₀ values were changed according to fungicides or isolates. Germination seeds and plant height (cm) and disease severity (%) were found to be significantly different ($P \leq 0.05$) effect of fungicides used on seed when compared with control.

Keywords: Wheat, *Fusarium culmorum*, Fungisid, Sensitivity



Effect of Recycled Carbon Black and Silica Fume on Unconfined Compressive Strengths of a CH Clay

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Abstract: There have been many studies on the improvement of soils using waste materials in the last decade. In these studies, researchers aimed not only to use waste as additive material for economical point of view, but also disposing of waste for environmental point of view. Recycled carbon black (rCB) and silica fume (SF) are these kind of waste materials. Recycled carbon black (rCB) is a nano-sized waste material that is the result of scrap tires by means of pyrolysis method. Also, silica fume (SF) is a pozzolana which is a waste of ferro chrome facilities.

The aim of this study was to investigate the effect of both rCB and SF on unconfined compression strength of a CH clay. For this purposes, a high plastic white clay (WC) was obtained from the reservoir in Erzurum-Oltu region. The samples were prepared at optimum water content and maximum dry unit weight. The unconfined compressive strengths (UCS) tests were carried out in accordance with ASTM D 2166. The loading speed of the experiments was chosen 0.8 mm/min which was carried out in the deformation-controlled UCS tester. Cylindrical specimens 38 mm in diameter and 76 mm in height were used in the experiments. In order to confirm validity and repeatability of the test results, three similar samples were prepared and the results were taken as the average of these three samples. The samples were prepared by mixing rCB and SF to CH clay at certain ratios. The rCB and SF were mixed with CH clay in 5%-0%, 1%-4%, 2%-3%, 3%-2%, 4%-1% and 0%-5% respectively at a dry state. Also, the samples were cured for 1 day and 7 days. The UCS experiments were also performed on unmixed (0%) high plastic clay soil for comparison. From the results of the UCS tests, the peak stress values generally increased in clay-waste mixtures without rCB. With the increase of rCB, a decrease trend in the peak stress values of both 1 day and 7 days cured samples was observed. In addition, the 1 day samples showed about two times more deformation at the same load level than the 7 days cured samples. The results also showed that the mixtures that contain SF behave more ductile than both pure WC clay sample and rCB mixtures.

Keywords: CH Clay, Silica Fume, Recycled Carbon Black, Unconfined Compressive Strength, Waste



A Spatial and Relational Analysis of Clay and Heavy Metals in Soil

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Abstract: This research was carried out in an area on the banks of the River Ergene where pollution is heavy. The area is located between the Hıdırağa-Çorlu District and Marmaracık-Ergene District, Tekirdağ. A total of 60 specimens were taken at 3 different depths from 20 points in the study area. The spatial data were displayed using a geographic information system (GIS) and mapped using the inverse distance weighting (IDW) interpolation method. Texture maps and heavy metal maps were generated based on the calculated values. The relationships between clay and heavy metal contents were particularly analyzed. Additionally, the correlations between soil textures and heavy metal content were found using the Mstat software. Thus, the correlations between them were mathematically demonstrated. The correlation between clay and lead in the soil specimens taken from a 0-30 cm depth was found to be significant at 1% level, while the correlations between clay and cobalt, chromium, nickel, and vanadium were insignificant. The correlations between clay and cobalt, lead and vanadium in the soil specimens taken from a 30-60 cm depth were found to be significant at 1%, while the correlations between clay and nickel, and chromium were insignificant. The correlation between clay and chromium in the soil specimens taken from a 60-90 cm depth was found to be insignificant, while the correlations between clay and the other elements (cobalt, lead, nickel, and vanadium) were significant at 1%.

Keywords: Clay, Heavy Metal, Tekirdağ, CBS, Ergene



Determination of Factors Affecting Lentil Productivity by Data Mining: a Case Study of Mardin (Midyat) Province

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Abstract: This survey was conducted on all the 110 Lentil Producing farms collected with Simple Random Sampling method in Mardin province for the purpose of determining some factors that is influencing average lentil yield (MV) per decar in 2014. For the purpose of study, predictive performances of several data mining algorithms (CART, CHAID, Exhaustive CHAID and GLM) were evaluated comparatively. Several factors which are thought as independent variables in the survey were planting area (EA), Education Level (ES), amount of seed (TM), amount of farm fertilizer (CGM), amount of synthetic fertilizer (SGM), amount of remedy (IM). For the best prediction of MV in CART, CHAID and Exhaustive CHAID for parent and child node ratio of 12:6 was used. According to the study results, 7.4 house hold with an average age of 47 and 76.3% primary education level was involve with the farm. Minimum Lentil Production farm numbers for parent and child nodes were arranged as 12:6 in CART, CHAID and Exhaustive CHAID for attaining the best predictive performance in MV. According to the study results, 7.4 household, average age of producers is 47 and 76.3% have at the primary education level. Farms have 45.77 da land property. In the GLM, Chaid and Exhaustive CHAID, only 3 independent variables, TM, IM and SGM were found statistically. In the CART algorithm, only TM, IM, SGM and CGM independent variables were found significantly. The significant order of the Pearson coefficients between actual and fitted values in MV was CART (0,978a) > CHAID = Exhaustive CHAID (0,975ab) > GLM (0,940b). It was concluded that the CART algorithm having the best predictive accuracy among all the algorithms might offer a good solution to Lentil producers in describing interactions of significant independent variables. In addition, since insufficient amounts of seedlings, remedies and fertilizers have been deposited, it is necessary to apply the optimum amounts of these inputs to the lentil to increase the yield.

Keywords: Lentil, Yield, Regression Tree Analysis, Data Mining, Production Economics, Mardin



Determination of Sheep Milk Production Cost-The Case of Sanliurfa Province

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Abstract: The purpose of this work is to study the cost of sheep milk production in Urfa province. In addition, the most effective factor on this cost and possible solution on reduction of the cost is also other issues which are investigated in this study. For the purpose of the study, a survey among 127 sheep farms has been performed utilising Simple Random Sampling Method. The result of study shows that, the average number of the sheep in the farms, is 125 and duration of lactation is 177 days. The amount of milk obtained from per operation and per sheep is 5767.5 lt and 46.16 lt during the lactation. The cost of the milk is found out to be 0.42 \$/Lt by the Sales Revenue Method. The marketing price, however, is determined as 0.66 \$/Lt. The producers' profit from the milk is calculated to be 0.24 \$ per liter. While 56.73 % of the cost of sheep milk comes from the variable costs, 43.27% of it comes from the fixed costs. Among the variable costs the biggest share, which is 74.80% feed costs. Whereas the labour is highest among the fixed costs with 90.81% share. The yield of milk per sheep and the low market price are determined as the most important problems for the producers. In order to cope with these problems a higher sheep breed is required and establishment of marketing cooperatives are crucial for milk sales at reasonable price, and moreover the producers needs to be encouraged for self-feed production.

Keywords: Sheep Breeding, Sheep Milk, Production Cost, Profitability, Sanliurfa



Comparison of the Energy Requirements of Standard Mouldboard Plough, Conventional Reversible Mouldboard Plough and Swing Plough

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Abstract: Mouldboard ploughs are used widely for primary tillage. There are two types of mouldboard ploughs according to turn the furrow slices: one-way version and a two-way version. One-way versions are designed to turn the furrow slices only to the right. Two-way versions or reversible mouldboard ploughs are designed to turn the furrow slices to the right and left. The two sets of bottoms are mounted on a common frame that is rotated 180° about a longitudinal axis to change from one set to the other. The swing plough was developed as an alternative to the conventional reversible mouldboard plough. The energy requirements of mouldboard ploughs are high. Energy requirement of mouldboard ploughs depend on working depth of the plough, working width, number of bottoms, type of mouldboard, soil moisture content, soil bulk density, draft force, soil penetration resistance, forward speed.

This study aimed at comparing total energy requirement in relation to the inputs of fuel-oil energy, machine production energy and human labour energy for the standard mouldboard plough, conventional reversible mouldboard plough and swing plough.

Mouldboards of standard mouldboard plough and conventional reversible plough used in the study have cylindroid and the bottoms of swing plough have square shaped. The ploughs examined are tractor mounted type and have two bottoms. The total weights of standard mouldboard plough, conventional reversible mouldboard plough and swing plows are 205, 402 and 270 daN respectively. During the tests, the ploughs was operated at 25 cm average furrow depth in condition of medium heavy soil. Fuel-oil energy, machine production energy, human labour energy and total energy requirement of ploughs were calculated by using equations.

As a result of the study, it was determined that the total energy requirement per unit area (991.43 MJ ha⁻¹) of the swing plough was lower than the standard mouldboard plough (1037.92 MJ ha⁻¹) and conventional reversible plough (1059.95 MJ ha⁻¹). The total energy requirement of the swing plough is 4.48% less than that of the standard mouldboard plough and 6.46% less than that of the conventional reversible plough.

Keywords: Standard Mouldboard Plough, Conventional Reversible Mouldboard Plough, Swing Plough, Ploughing, Total Energy Requirement



Predicting Draft Power and Specific Energy Requirement of Cylindroid Mouldboard Plough

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Abstract: Mouldboard plough is primary tillage implement used in conventional tillage. It is one of the equipment that needs high draft power and specific energy. Predicting the draft power and specific energy requirement of mouldboard ploughs depending on technical properties of the plough, the physico-mechanical properties of the soil and the working conditions before the soil tillage will be useful in terms of energy saving. This study aimed at predicting draft power and specific energy requirement of cylindroid mouldboard ploughs in medium heavy soil conditions. For this purpose prediction equations were developed to calculate draft power and specific energy requirement of mouldboard plough. The prediction equations were developed based on dependent variables such as soil parameters including cone index, bulk density and moisture content, working width, working depth, forward speed and field capacity. Equation 1 for predicting the draft power in medium heavy soil conditions and Equation 2 for predicting of the cone index of medium heavy soil working with cylindroid mouldboard ploughs were used. The draft power obtained from Equation 3 was rated to the area capacity to predict specific energy requirement of mouldboard plough. As a result, a basic Equation 4 for predicting the specific energy requirement of the mouldboard plough was obtained. To test the reliability of the developed prediction equations, the regression coefficients between the results from prediction equations and some other research results were determined.

The study showed that draft power and specific energy requirement could be successfully predicted by the prediction equations with good accuracy when working in medium heavy soil condition with cylindroid mouldboard ploughs. The regression coefficients of relationship between predicted and measured draft power of mouldboard ploughs were varied from 0.948 to 0.996. The regression coefficient of relationship between predicted and measured specific energy requirement of mouldboard ploughs was 0.924.

Keywords: Cylindroid Mouldboard Plough, Soil Tillage, Draft Power, Specific Energy, Prediction Equations



Determination of Percent Crop Residue Cover by Drone and Image Processing Method in Wheat Field After Harvesting

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Abstract: Crop residue management is very important to control soil erosion. Leaving crop residue on the soil surface before and during planting provides very good cover for the soil. Measuring percent crop residue cover is an essential step in improving knowledge about the adoption and impact of conservation tillage.

This study aimed at determining the percent crop residue cover using drone and image processing method in wheat field after harvesting. Measurements were performed during in August-October 2017. Line transect method was used as a reference method to control the results obtained from drone and ImageJ image processing method. In order to determine the percent crop residue cover using drone and ImageJ image processing, photographs were taken with a digital camera of the drone from various places of a field (A, B, C parcels) covered with wheat surface residues. The crop residue covers of A, B and C parcels were $\leq 30\%$, 30-60% and $\geq 90\%$, respectively. Wooden frame of size 1x1 m was used to determine sampling areas. During the tests, the flight height of the drone was 1.5 m. The captured digital photos were transferred to the computer and converted to JPEG format. Digital photos were analyzed using the ImageJ image processing software.

In the line transect method, the square-shaped areas with a dimension of 10.6 x 10.6 m with a diagonal length of 15 m were marked on field surface. A measuring tape was then laid across the field surface at an angle of 45 degrees along a 15 m long diagonal. Intersecting points with crop surface residues at 30 cm intervals along the single edge of the measuring tape were counted. The percent crop residue cover was calculated by multiplying the number of intersecting points by the total number of slices and multiplying the value by 100.

At the end of study, the mean values of percent crop residue cover using drone and image processing software ImageJ (Method 1) and line transect method (Method 2) were determined as 30.33% and 30.00% in A parcel, 64.55% and 58.83% in B parcel, 93.20% and 89.67% in C parcel, respectively. Variance analysis showed that the differences between the results obtained from Method 1 and Method 2 were statistically insignificant ($P > 0.05$) in all parcels.

Keywords: Percent Crop Residue Cover, Drone, Image Processing Method, Imagej, Line Transect Method



A Review of Image Processing Techniques Used for Detection of Plant Existence in Agricultural Applications

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Abstract: In today's life intelligent and sensitive farming applications are emerged to increase product yields and also to reduce production costs. This increases the competitiveness of producers in a competitive market. In developed countries, farmers trace their land using information technologies and are able to benefit from highly reliable information when deciding on the changing conditions. Image processing techniques, which are computer based techniques that takes and processes a digital image as input, produces an output image again and produces meaningful results from the image, is often encountered in intelligent and sensitive agricultural applications parallel to fast technological developments. When we look at agricultural applications, it is seen that these studies are grouped in three phases as plant formation and growth, harvest time and post harvest. Image processing applications during plant formation and growth appear to be grouped around the detection of weeds and density in the weed struggle for the purpose of spraying. In addition, there are a number of studies in which the growth monitoring of the plant is made and some operations are performed automatically according to the growth status. The harvest time studies are confronted as robotic applications for the detection and collection of harvested products in the production environment. After harvesting, it is anticipated that studies such as the determination of various physical quantities of the plant (height, surface area, color, etc.), product classification (detection of stained products) In this study, a compilation of image processing applications in which the density of vegetation and its density are determined automatically is made in the literature. The details of the image processing applications used in these studies are examined, details of the methods are given and the results obtained are detailed.

Keywords: Image Processing, Agricultural applications, Plant detection, Intelligent farming, Sensitive Farming



Determination of Seed Yield and Yield Components of Some Hungarian Vetch Varieties (*Vicia pannonica* Crantz) in Bilecik Ecological Condition

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Abstract: This research was carried out to determine the seed yield and seed yield related components of some Hungarian *Vicia pannonica* Crantz genotypes under Bilecik ecological conditions. The research was carried out the planting in winter in 2016-17 in Bilecik Şeyh Edebali University in the field of Agricultural Biotechnology Application and Research with four (4) replications according to the Randomized Blocks Experimental Design. In this research, 4 lines (Hat-5, Hat-16, Hat-23, Hat-28) were used with 6 variety of Hungarian vetch (Budak, Aegean Beyazı, Tarm Beyazı, Erzurum Beyazı, Kansur, Oğuz).

According to the research results, the differences between the varieties in terms of physiological seed maturity number of days, number of pods per plant, number of seeds per pod, seed yield, biological yield, straw yield and harvest index were found statistically significant. The number of days of physiological seed maturity was 188.00-200.00 days, number of pods per plant 23.40-27.60 pods plant⁻¹, number of seeds per pods 2.86-7.40 seeds pods⁻¹, seed yield 85.67-125.7 kg da⁻¹, biological yield 567.1-833.9 kg da⁻¹, straw yield 443.1-738.7 kg da⁻¹ and the harvest index varied from 15.0% to 22.0%. However, in this research, the highest seed yield was obtained from the Ege beyazı hungarian vetch genotype with 125.7 kg da⁻¹ value, the highest biological yield from Kansur hungarian vetch genotype with 833.9 kg da⁻¹ value and the highest straw yield was obtained from Tarm beyazı hungarian vetch genotype with 738.7 kg da⁻¹ value.

Acknowledgement: This study is supported by Scientific Activities Support Program of Bilecik Şeyh Edebali University

Keywords: Hungarian Vetch, Seed Yield, Yield Components, Adaptation

**Fruit Mass Estimator Based on Physical Attributes by Feed Forward Neural Network*****Bünyamin DEMİR¹*, İkbal ESKİ², Feyza GÜRBÜZ², Zeynel Abidin KUŞ³****¹Mersin University, Vocational School of Technical Sciences, Mersin-TURKEY**²Erciyes University, Faculty of Engineering, Kayseri-TURKEY**³Erciyes University, Faculty of Agriculture, Kayseri-TURKEY***Corresponding Author: bd@mersin.edu.tr*

Abstract: Fruit mass and shape play significant roles in marketing. Consumers usually prefer the fruits with an equal mass and uniform shape. Some postharvest processes are required for automatic, fast and efficient estimation of physical characteristics such as mass of agricultural products. Fruit mass estimations are generally used in quality inspection, grading, packaging, transportation and marketing of the fruits. Fruit mass can efficiently be estimated from physical attributes. Artificial neural networks (ANNs) have started to be used increasingly in agricultural and food processes. Nowadays, ANNs are used to predict some characteristics of agricultural products by easily measured properties. Feed forward neural network (FFNN) is a special form of ANNs.

In this study, fruit mass was estimated from fruit physical attributes with feed forward neural network structure of artificial neural networks. Two training structures were studied, the root mean squared error (RMSE) of each was calculated. The results showed that the Radial Basis Neural Network (RBNN) structure provided a better accuracy in fruit mass estimation than the other training structure. The RBNN training is very fast, without increasing the computational cost of standard local learning algorithm. For this reason, the RBNN could reliably be applied to estimate the mass of all fruit species.

Keywords: FFNN, Artificial Neural Network, Fruit, Training Structure, Physical Properties



Effects of Lovastatin Supplementation on Laying Performance, Egg Quality, Yolk Lipid Profile and Some Serum Parameters in Laying Hens

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Abstract: This study was carried out to determine the effects of lovastatin supplementation on laying performance, egg quality, yolk lipid profile and some serum parameters in Lohmann LS white commercial laying hens reared in poultry houses of Research and Application Farm of Agricultural Faculty, Ataturk University. In this experiment, Lohmann layers (n=48, 46 wks of age) were randomly divided into two groups such as control (C) fed with basal diet and treatment (T) group fed with diet including 0,0059 % of lovastatin. After one week of the adaptation period, experiment lasted for five weeks. During the experimental period, hens were fed as ad-libitum and water through nipples was available all the times. Lovastatin supplementation increased feed consumption (FC) and feed conversion ratio (FCR). Except for yolk color, other egg quality traits were not affected by diet including 0,0059 % of lovastatin. Hens fed with treatment diet had greater triglyceride and phosphatidyl serine values than hens fed with basal diet. Differences between the groups in terms of the levels of egg yolk and serum cholesterol were not significant in present study. These differences could be attributed to short experimental period and low lovastatin added to basal diet of hens. In conclusion, further studies should be conducted to clarify the effects of lovastatin supplementation on laying performance, egg quality, yolk lipid profile and some serum parameters in laying hens fed with diets including lovastatin at different levels during long feeding period.

Keywords: Laying Hens, Lovastatin, Laying Performance And Egg Quality, Egg Yolk Lipid Profile, Some Serum Parameters



Comparison of Forage Evaluation in Buffalo and Cattle

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Abstract: The aim of this review was to understand why buffalos kept under similar conditions with cattle could better evaluate low quality forages especially agricultural crop residues. The general principles of buffalo feeding are similar to those recommended for cattle. Despite these similarities, wide differences have been mentioned between buffalos and cattle with respect to digestion and utilization of various feeds, particularly low quality forages under similar feeding system. Firstly, buffalos have greater rumen-reticulum volume but lower intestine length than cattle. Buffalos have longer rumination time, more chews per cycle, stronger contraction force in rumen and a slower rate of ingesta output than cattle. The longer retention time of fibrous material in rumen results in higher degradability and digestibility. Rumen microfauna in buffalos could be different from that of cattle when both of them have fed a similar diet. Rumen microbial population and metabolism in buffalos can supply an advantage for especially in terms of the activity of cellulolytic microorganisms compared to cattle. It has been shown that buffalos have higher population of predominant species of cellulolytic bacteria and fungal zoospores but lower protozoal population in the rumen. Regarding digestibility, buffalos can utilize low quality forages and crop residues more effectively (up to about 5%) than cattle. Moreover, buffalos produce a higher concentration of rumen ammonia nitrogen and are capable for rumen nitrogen recycling compared to cattle. Additional researches which include bio-molecular techniques is required for rumen microorganisms, their potential roles in fermentation process, improving digestibility and productivity in buffalos.

Keywords: Buffalo, Cattle, Forage Evaluation, Ruminant Fermentation



Diet Strategies that Reducing Enteric Methane Emission in Ruminants

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Abstract: In recent years, methane has been one of the most discussed and researched subject due to its effect on global warming and climate change. The livestock sector is a significant source of greenhouse gas (GHG) emissions in the worldwide. According to the most recent Intergovernmental Panel on Climate Change (IPCC) report, livestock contribution to the global anthropogenic greenhouse gas emissions was estimated at 6.3%, with GHG emissions from enteric fermentation accounting for 2.1 Gt CO₂ Eq/yr and manure management accounting for 0.99 Gt CO₂ Eq/yr. Enteric fermentation of feed by ruminants is the largest source of anthropogenic methane emissions. Methane gas is produced predominantly in the rumen (87%) and to a small extent (13%) in the large intestines. Methane is also a net loss of feed energy to the ruminant. Extensive research in recent years has provided a number of viable enteric methane mitigation practices, such as dietary strategy, alternative electron receptors, and increased animal productive efficiency, but it is not completely possible to avoid enteric methane emissions. Dietary manipulation is one of the most promising mitigation strategies due to its effectiveness in reducing methane. Dietary strategies can be divided into two main categories: i) improving the forage quality and changing the proportion of the diet and ii) dietary supplementation of feed additives that either directly inhibit methanogens or altering the metabolic pathways leading to a reduction of the substrate for methanogenesis. Reducing methane emissions by means of dietary strategies will contribute to reduce the rate of global warming without negatively affecting environmental safety, animal health and animal productivity.

Keywords: Ruminants, Enteric Methane, Diet Strategy



Determination of Some Technological Characteristics of Local Popcorn Genotypes in The Black Sea Region of Turkey

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Abstract: Maize is one of the important cereals grown in the world. Popcorn (*Zea mays everta* Sturt.) industry has been increasing continuously throughout the world. Development of microwave technology for popping corn has increased popcorn production.

Although corn (*Zea mays* L.) is principally cultivated for carbohydrate production, in the past several years, it has gained great significance as a source of vegetable oil for the food industry. Corn kernel oil is mainly used for salad and cooking oil and for the production of table margarin. Its fatty acid composition comprises 40-68% of linoleic acid, 20-32% of oleic acid, and 8-14% saturated fatty acids, mainly palmitic acid.

Determination for Fatty Acid Composition; The fatty acid composition of seed oils was determined by gas-liquid chromatography (GLC) of fatty acid methyl esters after Thies. About 20 μ L of extracted oil were transmethylated for 20 min at 20 °C with 1 mL of a 0.5 M solution of sodium methylate in methanol. Then, 0.5 mL of isooctane and 0.2 mL of 5% (wt/v) of NaHSO₄ in water were added in that order. The samples were centrifuged, and 2.5 μ L of the upper phase was injected into the gas chromatograph at a split ratio of 1:70. Analyses were performed on a Perkin-Elmer gas chromatograph.

In this Study, 48 popcorn genotypes were used. 10 technological characteristics of 48 local popcorn genotypes were examined. Local popcorn genotypes were collected from 10 cities in the Black Sea Region of Turkey. Variance analysis showed that there were high variations in most of the technological characteristics.

Crude fiber content, dry matter content, oil ratio, protein ratio, starch ratio, palmitic acid ratio, stearic acid ratio, oleic acid ratio, linoleic acid ratio and linoleic acid ratio between 1.51-3.59%, 87.20-89.99%, 2.22-5.95%, 10.69-16.42%, 63.00-73.64%, 9.61-15.93%, 1.25-3.62%, 24.43-42.14%, 40.39-59.53% and 0.0005-1.21% respectively. It was concluded that local popcorn genotypes collected from the Black Sea Region could form a rich genetic base in improvement programmes.

Keywords: Popcorn, Local Popcorn, Technological Characters, Cluster Analysis



Carbon Dioxide Changes of Civril Bean at Different Moisture Contents

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Abstract: The main cause of spoilage during storage of seeds is high moisture content. For this reason, high moisture content can cause a change in the levels of carbon dioxide (CO₂). Depending on this, the respiration rates of seeds may vary. In the current study, experiments were performed to use the CO₂ measurement system for early detection of spoilage in bean instead of spoilage detection, using the traditional methods, such as temperature measurement, visual or smell inspection. In this study, the effects of different moisture contents (6.4, 11.7, 17.3 and 23.7% (d.b.)) on the CO₂ level of civril bean seeds harvested in the fall of 2017 from Bolu province, Turkey was investigated. Respiratory rates were determined by examining the CO₂ levels at the end of 10 days storage in the laboratory conditions of the civril bean seeds. In the present study, it was found that CO₂ production increases with moisture content increases. The CO₂ levels increased from 524 to 593. 666 to 2376. 538 to 9974, and 967 to 9993 ppm, respectively, as the moisture content increased from 6.4 to 23.7%. The device capacity, 9999 ppm level, was reached earlier in seeds with high moisture content due to their respiration at high speed. The seeds with moisture content of 18.3% was reached to the device capacity at 112th h of storage and the seeds with moisture content of 23.7% at 28th h of storage. Therefore, the measurements were terminated without reaching the targeted 10th day. As a result, it was determined that respiration rates of civril bean seeds at 6.4, 11.7, 17.3 and 23.7% moisture contents ranged from 6.49 to 0.03, 7.23 to 0.19, 5.38 to 0.97 and 10.29 to 3.80 mgCO₂/kgbeanseed/h, respectively. Significant differences were found in the respiration rate of civril bean seeds at different moisture contents. It is shown that the CO₂ production rate measurement may be useful for spoilage detection at an early stage in stored bean seeds.

Keywords: Civril Bean, Carbon Dioxide, Respiration Rate, Moisture Content



A Study of Some Physical Properties of Hulled Siyez Einkorn Wheat

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Abstract: In the current study, experiment was conducted to investigate physical properties such as length, width and thickness, arithmetic mean diameter, geometric mean diameter, sphericity, surface area, volume, 1000 unit mass and bulk density of hulled siyez einkorn wheat seeds as well as establish a database for engineering properties. The physical properties were determined moisture content range of 5 to 25%. The length, width, thickness, arithmetic mean diameter, geometric mean diameter, sphericity, surface area, volume and 1000 unit mass of einkorn wheat seeds ranged from 8.76 to 10.11 mm, 3.53 to 4.16 mm, 2.40 to 2.86 mm, 4.89 to 5.71 mm, 4.19 to 4.92 mm, 0.48 to 0.49, 55.23 to 76.12 mm², 18.65 to 25.24 mm³ and 40.48-50.05 g, respectively as the moisture content increased. The bulk density decreased linearly from 486.6 to 383.6 kg m⁻³ with the increase of moisture content. Little is known about the functional properties of the stored einkorn wheat relative to their storage conditions. Recently, there has been an increasing interest by food industry and producers to assure consumers on the preservation of their einkorn wheat foods. These research results demonstrated that the internal climatic conditions should be kept under constant control to provide the requirements of the optimum design of grading, conveying, processing, and packaging systems.

Keywords: Siyez Wheat, Moisture Content, Physical Properties



Evaluation of Enterprises Raising Water Buffalo in Bafra

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Abstract: Aim of this study is to analyse general characteristics of enterprises raising water buffalo in Bafra Turkey. For this purpose, 45 farms were selected by using random sampling. Data were obtained from survey which was made face to face with the owners in their enterprises. Indoor and semi-open barns constitute 53.3 and 31.1 % of total, respectively. While barn material of all enterprises was concrete, air conditioning was highly inadequate. About half of the enterprises have birth compartment. Ad-libitum feeding was highly popular and 86.7% of total was determined to prefer concentrate feed stuffs as a supplement to rangelands. All were having their own silage, silages were based on corn and corn-grass mixes. Milking is made by hand and by women with 71 and 62.2% rate, respectively. Although pre-milking udder cleaning was almost perfect, post-milking udder cleaning rate was only 17.8 %. Milk obtained from water buffalo is highly sold after being stored in plastic vessels. The 20 % of milk was determined to be sold as yogurt and cheese. Owners stating that milk of the water buffalo has a distracting odor is just 8.9 %. It has been determined that prices of water buffalo's milk is 3.85 Lira and average milk production of farms was 19.35 liters in a day. Based on the data, it can be concluded that owners need some informations and educations about air conditioning of barns, milking hygiene, animal welfare, milk storing process and animal nutrition.

Keywords: Bafra, Milking Hygien, Survey, Water Buffalo



Importance of the Property Rights for Sustainable Forest Management

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Abstract: Property is important. Believed by some to be a keystone right, or even the core of liberty. All environmental problems are property rights problems. In the vast literature on relationships between fundamental institutions and the governing of resources, the dominant paradigm has been that property rights matter. Adoption and implementation of sustainable forestry practices are essential for sustaining forest resources, yet development of effective policies and strategies to achieve them are problematic. Part of the difficulty stems from a limited understanding of the interaction between obtrusive forest policies and tenure systems and how this affects sustainable forest management. Deforestation and forest degradation have been the major problems facing natural resource management, mainly attributed to lack of clearly defined and enforced property rights, leading to a de facto open access situation. It is now widely recognized that secure tenure arrangements are one important prerequisite for achieving sustainable forest management – albeit not the only one. FAO's State of the World's Forests 2016 shows that 74 percent of the global forest area was publicly owned and 19 percent was private, with the remaining area of unknown or unreported ownership. However, that the proportion of publicly owned forest under public administration declined. This study concludes that establishing appropriate forms of tenure to delineate boundaries and limit exploitation constitutes an important step toward achieving sustainability.

Keywords: Ownership, Forest, Resource Management, Sustainability



A Review of Determining Principles of Industrial Wood Windows Manufacturing

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Abstract: In this study, manufacturing conditions and quality control processes that has impact on success for implementation of laminated window profiles were discussed within the framework of essentials for manufacturing laminated wood window profiles that has very important impact on improvement for industrial wood window manufacturing. In recent years, it has been observed that the expectations of the windows and windows, which are changing continuously in terms of quality and quantity of production in the world, are becoming different today due to the ecologic approaches dominated by every field especially with the developing technology. In comparison with these changes, it can be said that the use of solid wood material, which is the traditional and indispensable material of window production, has lost its advantage against alternative materials (plastic, aluminum, composite material, etc.) in window production with laminated joinery profiles developed in the framework of technological innovations.

Due to the fact that the produced laminated wooden window profile is not anisotropic as it is in the massive wood, within the use of lamination technology the product properties are becoming more homogeneous. Thus, using lamination technology makes it possible to produce a much more stable and long-lasting material. Moreover, thanks to the production of window profile from laminated wood material; advantages such as savings from raw materials, removal of natural defects in massive woods, access to high quality materials, evaluation of very short parts and the ability to reach desired dimensions can be achieved.

As a result, it is found out that industrial wood window manufacturing is based on production conditions and quality control processes that has effect on the success of implementing laminated window profiles. Manufacturing conditions consist of the following; general facility conditions, material properties, the structure of profile sections and the suitability of longitudinal and transverse joints, whereas quality control process include preparation of system identification, control of materials and control of the laminated profile section.

Keywords: Industrial Wood Windows, Laminated Profiles Manufacturing, Laminated Window Profiles, Wooden Materials, Quality Control Process For Laminated Profiles



Almond (*Amygdalus orientalis*) Leaf Litter Decomposition on Gypsum Soil

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Abstract: Arid and semi-arid environments cover approximately 41% of the world's land area. These regions are generally defined as having low average rainfall, often associated with high temperatures, which impose fundamental limits on animal and plant populations. Semi-arid climates tend to support short or scrubby vegetation and are usually dominated by either grasses or shrubs. Shrubs species serves nutrient input for plant nutrition via litterfall in a semi-arid area. Purpose of this study determine of Almond decomposition processes in gypsum soil in Çankırı.

There are no studies on the litter decomposition of *Amygdalus orientalis* Miller leaf litter in Turkey. In this context, the Dereçatı region of Çankırı where located on the steppe to forest transition zone was selected. The study area is located in Çankırı, Turkey, between 40°50'44" - 40°39'28" N latitude and 33°34'28" - 33°52'33" E longitude. According to the (long-term) data given by the Meteorology Station, which is the nearest meteorology station to the study area, the mean annual precipitation is 402 mm, the mean annual temperature is 11.1 °C, the highest temperature is 42.4 °C, and the lowest temperature is -23.9 °C. Dereçatı region is semi-arid climate, mezothermal, with water deficiency in summers. The altitude is between 900-1400 m. The study area was formed from gypsiferous (gypsum) series which came to the 3rd geological time.

The litter decomposition rate was determined using the litterbag method. During the autumn of 2016, we collected recently-fallen leaves and immediately dried them at 65 °C. We filled fiber litterbags (10 cm × 10 cm) of 1mm mesh sizes with 3 g of air-dried Almond leaf litter. Five litterbags were collected bimonthly from each plot at every sampling time between November 2016 and March 2018. The samples were weighed after drying at 65 °C for 72 h. The decomposition constant rate (k) was calculated from the percentage of dry mass remaining using a single exponential decay model.

After 1 y in the field, 33% Almond leaf litter was decomposed. Decomposition constant (k) of almond leaf litter 0.34. Using the decomposition constant, $t_{0.95}$ and $t_{0.99}$ were 8.8 years and 14.7 years respectively.

Keywords: *Almond*, Semi-Arid, Decomposition, Leaf Litter, Steppe, Gypsum



Seed Characteristics of Downy Oak (*Quercus pubescens*) Populations in Central Anatolia Region

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Abstract: Oak species are the prominent, widespread, and well-known woody species in Turkey. *Quercus pubescens* is one of the most important oak species in Turkey in terms of natural distribution in stressed sites in Central Anatolia.

In this study, seed characteristics of *Quercus pubescens* which is an important woody taxon in dry areas of Turkey were researched in detail. The seeds were collected from 7 different populations in Central Anatolia. By determining the morphological and physiological characteristics of the seeds, variations among populations were determined. The seed moisture content was reduced to different moisture levels and stored at different temperatures in order to contribute to ex-situ conservation strategies of the species. The study demonstrated that the provenances varied in terms of seed morphological characteristics. The average 1000-seed weight of the provenances was measured as 3055.36 gr. The average seed length, seed width, and individual seed weight were found 28.91 mm, 13.90 mm, and 3.29 gr, respectively. The seeds demonstrated superficial dormancy level. Unstratified seeds (control) germinated in high percentages. The seeds reached the optimum germination performance after the two weeks stratification. During the stratification duration, the large amount of seeds germinated. The local seed sources of native species are crucial importance in forestation studies. Thus, the seed characteristics of *Q. pubescens*, a typical tree of Central Anatolian stressed sites, is very important for Turkey.

Keywords: *Quercus pubescens*, Downy Oak, Seeds, Germination, Storage



Resource Potential of Especially Protected Natural Territories in The Development of Ecological Tourism of Kazakhstan on the Case of West-Altay State Nature Reserve

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Abstract: The results of research about the resource potential of especially protected natural territories in the development of ecological tourism of Kazakhstan on the example of West-Altay State nature reserve were presented in this article. Complex assessment of modern state of nature - climatic conditions on the nature of the landscape, temperature and precipitation is given in the work. Considerable attention is paid to the biodiversity issues of the regional flora, mammals, birds and insects. During botanical research it was found that 60 sub endemic and endemic species are grown in the nature reserve. 25 species are included in the Red data book of Kazakhstan. It is shown that 52 species of mammals and 130 species of birds are of great interest for ecological tourism.

Currently, there are only four routes in the Western Altai Reserve, which function only during the summer season: "Zapovednye dali" (Reserved distance), "Kamennaya skazka" (Fairy Tale Stone), "Aleshkiny stezhki" (Aleshkin's Stitches) and "Etalon Zapadnogo Altaya" (Etalon of the Western Altai). They were developed by the employees of the reserve. The number of ecological paths with a significant amount of resource potential is small, which requires the creation of new routes. Existing trails give an opportunity to see interesting representatives of animal and plant life. They were developed by the employees of the reserve. The number of nature trails, with substantial resource potential is small, which requires the creation of new routes. Existing trails give the possibility to see interesting representatives of fauna and flora.

The diverse landscape, a great diversity of flora and fauna of West-Altay State nature reserve allows creating new routes and nature trails. The natural and resource potential of the reserve under study gives an opportunity to organize and conduct various types of ecotourism: foot, horse, mountain, bicycle and photo tourism. The development of ecotourism activities in the territories near the reserve will allow creation of new jobs, improvement of the social and economic state of the region, which is one of the main advantages for sustainable development.

Keywords: Ecotourism, Flora, Fauna, Biodiversity, Landscape, Photo Safari



Non-Market Valuation of Benefits in the National Parks of Kazakhstan

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Abstract: In the article it is presented questionnaire study aimed at a non-market valuation of benefits on the case of SNNP “Burabay” which is located in the northern part of Kazakhstan. Before the questionnaire was conducted, three different templates of questionnaires were developed, allowing mainly to perform a targeted assessment, as well as to identify specific categories of non-market value that are components of the whole economic value of the forest of the complex under study.

First of all, a template of the basic questionnaire has been developed, which makes it possible to survey opinions and views on the nature of the environment and monetary valuation, as its peculiarity, and the goods, services and benefits used in this environment.

The development of a sample of a basic questionnaire for the study of views, opinions and valuation of forest products should be taken as an important stage of the study and requires considerable effort from the research team. Since the sample of this questionnaire in Kazakhstan is applied for the first time, it is necessary to draw on the theoretical and practical experience of foreign countries, in particular Poland, to develop carefully all the necessary items to obtain full and reliable information. Further, the second and third of versions of the questionnaire were adapted for economic and forest research. The questionnaire was developed by the consultation of Lech Plotkowski, professor of Warsaw University of the Life Sciences, Poland. All samples of the questionnaires were reviewed and discussed by experts, employees and managers of forestry organizations of the Republic of Kazakhstan. According to the developed questionnaire, visitors of the SNNP “Burabay” were tested by the students from Turkey (Kastamonu University, Karadeniz Technical University, Artvin Chorukh University), South Korea (Chonbuk National University), Russia (Ural State Forestry University), Kyrgyzstan (K. Skryabin Kyrgyz State Agrarian University) and Kazakhstan. It was used such methods as Travel Cost Method (TCM), Contingent Valuation Method (CVM), Willingness To Pay (WTP) and Willingness To Accept (WTA) during questionnaire survey.

Keywords: Questionnaire, Survey, Benefit, Travel Cost Method, Contingent Valuation Method



Litter Decomposition of *Quercus pubescens* in Semi-arid Region

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Abstract: Plant growth and development are closely related to decomposition processes in the terrestrial ecosystem. Death plant material is a resource of energy and nutrient for heterotroph organisms and plays a major role in determining the structure and function of the ecosystem. In a situation where there were no decomposition, ecosystems would quickly accumulate large quantities of detritus, leading to a sequestration of nutrients in forms that are unavailable to plants and eventually cause many biological processes. The studies on litter decomposition of oak (*Quercus pubescens* Wild) species is inadequate in Turkey. The aim of this study determine the oak litter mass loss in the semi-arid region of Çankırı in Turkey.

Studies were conducted in steppe (33°34'28" - 33°52'33" W, 40°50'44" - 40°39'28" N) at an elevation of between 900-1400 m. Mean annual precipitation 402 mm, mean annual temperature 11 °C. The main rock is gypsum in study sites.

In the early autumn of 2016, five individuals randomly selected from oak species were collected brown leaves. After oven-drying (65 °C) 3g portions of leaf litters were placed in fiber net litterbags (10cm x 10cm, mesh 1mm). In November 2016, litterbags were placed on the soil below the plant canopy of each individual. Litterbags were collected bimonthly and total 60 litterbags collected end of the study. Dry remaining organic matter (dried at 65°C for 72 h) and litter decomposition rate (k) were estimated.

After 1 year of incubation, the average remaining mass of the oak leaf litter was 67.7% and decomposition constant (k) was 0.34. Using the decomposition constant, the average time for the loss of 95% of the mass of oak leaves in the semi-arid ecosystem was found to be 9 years.

Keywords: Oak, Semi-Arid, Decomposition, Leaf Litter, Steppe



The Therapeutic Properties and Toxicity of Horse Chestnut Seeds

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Abstract: *Aesculus hippocastanum* L. is a tree which widely cultivated in parks and gardens. The large seeds of this tree is commonly known as horse chestnuts or buckeyes. Since 18th century a lot of articles have described medicinal characteristics of horse chestnuts. In this study, it was aimed to inform about chemical composition, therapeutic properties and toxicity of horse chestnut seeds that one of the popular folk medicines.

Horse chestnut seeds contain saponins (3–5%), starch, flavonoids and sterols. The escin (a mixture of acylated triterpene glycosides) is main compound. Escin is used for a variety medical problems, such as bladder and gastrointestinal disorders, malarial fever. In addition, horse chestnut extract (HCSE) has been traditionally used to treat chronic venous insufficiency (CVI) to reduce its symptoms including leg swelling and vascular problems. Chronic venous insufficiency is that the vessels in the lower legs are chronically inadequate to take the blood back to the heart due to damage to the one-way vessels in the legs. Escin reduces inflammation and swelling of the legs by the increasing blood circulation in the veins. Severe side effects such as anaphylactic shock, toxic nephropathy and renal insufficiency have been reported following intravenous administration of isolated escin. These reactions were not detected by oral ingestion of HCSE preparations. The oral use of the standardized HCSE at the recommended doses is generally seems as safe, according to German Commission E. The gastric complaints, nausea, pruritus and irritation of the gastric mucous membranes and reflux are rare adverse effects.

Esculin is a toxin that found in untreated horse chestnut seeds. Esculin may increase the risk of bleeding because of ability to prevent blood clotting. The horse chestnut seed poisoning symptoms are a wide range such as vomiting, diarrhea, headache, weakness, confusion, poor coordination, muscle twitching, coma, and paralysis. Therefore horse chestnut seeds are processed to remove the toxic component, so that the purified HCSE is obtained.

Keywords: Horse Chestnut, Seed, Extract, Treatment, Toxicity



Some Physical and Mechanical Properties of Crimean Juniper Tree (*Juniperus excelsa* M. Bieb.) Wood Naturally Grown in Turkey

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Abstract: The aim of this study is to determine some physical and mechanical properties of Crimean juniper tree (*Juniperus excelsa* M. Bieb.) wood naturally grown in Turkey.

In accordance with the purpose of this study, samples of the Crimean juniper wood was obtained from the Kastamonu. Then, the air dry and oven dry densities, fiber saturation point, shrinkage, maximum water absorption percentage, compression strength, tension strength, bending strength, modulus of elasticity, shear strength and brinell hardness values of the Crimean juniper wood were determined.

As a result, it is determined that the Crimean juniper wood is very similar characteristics to the tree species such as black pine (*Pinus nigra* Arnold.), Scotch pine (*Pinus sylvestris* L.), Turkish pine (*Pinus brutia* Ten), Mediterranean cypress (*Cupressus sempervirens* L.), and red gum tree (*Eucalyptus rostrata* Schldl.) when concerning with the physical and mechanical properties. In addition, the lower fiber saturation point value as 21,51% of Crimean juniper wood is found as compare to the most of the other wood species which is around 30%.

Keywords: Crimean Juniper (*Juniperus excelsa* M. Bieb.), Mechanical Properties, Bending Strength, Physical Properties, Fiber Saturation Point



Soil Respiration Measurements: Comparing Soda Lime and Automated Dynamic Closed Chamber Techniques

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Abstract: Soil CO₂ efflux (Fc) is one of the major pools in the global carbon cycle. However, there are uncertainties in quantifying the size of this pool due to the large spatial and temporal variations and the differences in methods of measurements. In this study, the static closed chamber (soda lime) and automated dynamic closed chamber (LI-8100A automated soil CO₂ flux system, which have been commonly employed in the measurement of soil CO₂ efflux (Fc), were compared. The soda lime technique was compared against two techniques in the automated system: point-in-time survey and continuous long-term measurements. Direct comparisons were conducted by measuring the mean daily Fc in paired chambers, placed directly adjacent to each other. Soil temperature and soil moisture to the Fc were also measured. Results showed that the Fc measured with soda lime is smaller by about 23% compared with point-in-time survey measurements ($P < 0.001$, $n = 574$) and about 29% compared with continuous long-term measurements ($P < 0.001$, $n = 48$). Estimates of Fc measured with soda lime were in good agreement with long-term chamber ($R^2 = 0.78$) and survey chamber ($R^2 = 0.59$). Rates of Fc showed strong relationship with soil temperature, but not with soil moisture. The reliability of soda lime technique could be improved by scaling up the Fc values by about 20 to 30 percent.

Keywords: Soil Respiration, Carbon Balance, Dynamic Chambers, Soil Temperature, Soil Moisture, Long-Term Chamber, Survey Chamber



Young Fast Growing Tropical Tree Species Demonstrated Rapid Carbon Sequestration Rates

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Abstract: Climate change is one of the most challenging environmental issues in our times. To address this problem, vegetation fix solution, through terrestrial carbon sequestration, has been promoted as a cheapest, but most effective alternative solution to mitigate climate change impacts. This study aimed to determine the carbon sequestration potentials of tree plantation species that have been commonly used in reforestation projects in Philippines. Fast growing tree species, consisting of Mangium (*Acacia mangium*), Large Leaf Mahogany (*Swietenia macrophylla*), Falcata (*Albizzia falcataria*), were planted in four replicate blocks using a Complete Randomized Block Design. Measured variables include the above- and belowground biomass, basal area, crown evolution, and diameter breast height. Destructive sampling method was employed to determine the above- and belowground biomass components. It is assumed that carbon content is 50% of the dry matter. A conversion factor of 3.67 is used to convert biomass into CO₂ equivalent (CO₂eqv.). Falcata, Mangium, and L.L. Mahogany demonstrated rapid growth rate with C sequestration rates ranging from 56- to 170-tons CO₂eqv ha⁻¹ yr⁻¹. The size of the aboveground C pools is about 5 to 6 times higher than the belowground C pools. The species also exhibited high survival rates despite weed competition and drought period during the conduct of the study. Generally, the above mentioned species demonstrated high C sequestration rates and good tolerance against drought and weed competition, which make them a good choice for reforestation and carbon sequestration projects.

Keywords: Climate Change, Biomass, Falcata, Mangium, Large Leaf Mahogany



Examination of Vitamin D2 Change of *Agaricus bisporus* and *Pleurotus ostreatus* Under The (UV) B Radiation

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Abstract: Vitamins D are steroid-type vitamins that are soluble in fat, which is naturally found in food, and is responsible for increasing intestinal absorption of minerals such as calcium, magnesium and phosphate. Vitamin D is most commonly found in fatty fish such as salmon, tuna and mackerel, in small quantities in cattle liver, cheese and egg whites. However, it is difficult to obtain enough vitamin D from only natural foods. For this reason, it may be necessary for many people to consume vitamin D-supplemented foods. Some mushrooms contain ergosterol, a variable source of vitamin D2. These substances turn into ergocalciferol (vitamin D2) when exposed to ultraviolet light under controlled conditions.

In this study, ultraviolet (UV) B radiation of 290-320 nanometer wavelength was applied to cultured fungi of *Agaricus bisporus* and *Pleurotus ostreatus* containing ergosterol (provitamin D2) for 90 seconds to investigate the changes in vitamin D2 concentrations. For the UV radiation application, a prototype device previously designed by Elit Engineering firm was used. Vitamin D2 values of cultured fungi of *Agaricus bisporus* and *Pleurotus ostreatus* were found to be 137 µg / 100 g and 927 µg / 100 g, respectively. As a result, it has been observed that the values obtained are well above the limits set by the European Union Standards (25-50 µg/100g)

Keywords: *Agaricus bisporus*, *Pleurotus ostreatus*, Vitamin D2 , Ergosterol, UV Radiation B



Plant Biodiversity of Yenice Wildlife Development Area

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Abstract: In order to investigate the flora of Yenice Wildlife Development Area, as a result of the field studies carried out by considering the vegetation periods of the plants between 2015-2017, 243 genera and 339 taxa belonging to 76 families naturally grown on the field were detected. From these taxa, 6 genera and 7 taxa belonging to 5 families belong Pteridophyta, and 71 families and 332 taxa are Spermatophyta. Spermatophytes also contained 2 families, 3 genera and 5 taxa belong to Gymnospermae and 327 species and subspecies taxa belonging to 69 families belong to Angiospermae class. The largest five families are respectively Asteraceae (32), Fabaceae (30), Lamiaceae (21), Rosaceae (20) and Poaceae (17). The total number of taxa of 8 families which are the highest number of taxa is 159, and the ratio to the total number of taxa is 47%. The most common taxa in the studied area are *Trifolium-Campanula* (6), *Vicia-Geranium-Galium* (5) and *Hypericum-Potentilla-Cardamine-Silene-Veronica-Salvia-Stachys*. When the plant taxa found in the research area are classified according to Raunkiaer's life forms; it has been seen hemicryptophytes have a rate of 47%. General formation type of the area is forest, the proportion of fanerophytes is 19%, terophytes are 17%, cryptophytes are 8%, geophytes are 6% and camephites are 2%. The Yenice Wildlife Development Area is generally characterized by taxa belonging to the Euro-Siberian flora region. The total number of species belonging the Euro-Siberian flora region sub-areas is 145, which constitutes 42% of the total number of taxa. The proportion of species that are widespread and unknown floristic regions is 51%. The total number of endemic taxa in the area is 12, which corresponds to approximately 3.5% of all the plants in the area. At the end of the study, the floristic list of the plants found in the area was given in accordance with the rules and the protection statutes according to IUCN, BERN and CITES were established.

Keywords: Karabük, Yenice, Biodiversity, Flora, Turkey



Determination of Antioxidant Activities and Chemical Composition of Some Industrial Tree Barks' Extracts

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Abstract: Forest products, especially wood and non-wood forest products, have potential usage areas in chemical and pharmacological industries as their rich chemical components like phenolic compounds and terpenes. This kind of components can be got from wood and non-wood forest products easily by different extraction techniques with different solvents.

During wood processing, because of their own characteristics, bark, trimming residues and sawdust are consumed as fuel sources in most of plants. Although chemical structures of tree barks are similar with wood, content and variety of the bark extractive compounds are quite rich, also researches about it urgently needed by related industries.

In this study, *Abies nordmanniana*, *Fagus orientalis*, *Pinus sylvestris*, *Populus alba* and *Quercus robur* barks were supplied. The dried bark powders were extracted by hexane for analyses volatile components by GC-MS and extracted by methanol-water mixture (65-35% v/v) for flavonoid components analyses by HPLC (scanned at 4 different wavelength with 8 different flavonoid standard). Total phenolic content, total flavonoid content, antioxidant oxidant activities (DPPH, FRAP, metal chelating and H₂O₂ scavenging) were determined after lyophilization of methanol-water extracts. Highest total phenolic, total flavonoid contents and antioxidant activity were obtained from *Populus alba* extracts. It was observed that amount of volatile compounds and types were changed with tree species. According to HPLC results, highest value obtained from white poplar bark extract is 87.761 mg/L (at 280 nm) with myricetin, famous flavonoid on antioxidant properties. Consequently, it can be said that bark extracts are valuable for chemical compounds. After separation and purification, they can be usable for many chemical industries like cosmetic, perfumery, pharmacy and food preservatives.

Keywords: Bark Extractives, HPLC, GC-MS, Antioxidant Activity

**Plant and Animal Production of Kastamonu Province from Past to Present*****Fatih GÜREL^{1*}, Kerim GÜNEY²****¹Çankırı University Faculty of Forestry, Çankırı-TURKEY**²Kastamonu University Faculty of Forestry, Kastamonu-TURKEY***Corresponding Author: fatih_gurel@hotmail.com*

Abstract: Kastamonu Province is located in the North of the Central Black Sea region of Turkey at the altitude of 775 meters above sea level. It covers 13108 square kilometers area which consists of 20 towns and 1064 villages within its boundaries. The influence of three different phytogeographic region (Euro-Siberian, Irano-Turanian and Mediterranean) can be observed in this district. This area has a total forest area of 889.817.7 hectares with 657.930.4 hectares decent forests and 231.887.3 hectares degraded forests, which corresponding to 65% forest cover of the land cover of Kastamonu province.

Total agricultural area of Kastamonu province is 359,226 hectares (27.4%). 34.4 percent of this area (123.891 hectares) is used to make dry land farming. The irrigable farming area is 234.335 (65.6%) hectares and within these areas non-irrigated area is 127.715 hectares (75.4%) and 52.825 (24.6%) hectares are irrigated. The main agricultural products are wheat, barley, potato, corn, rice, feed plants, sugar beet and garlic. Garlic production of Kastamonu corresponds to one quarter of whole production in Turkey. Garlic exports was 71.640 kilograms and mushroom exports was 89.934 kilograms in 2017. In addition, honey production was 443.306 kg. When stockbreeding production of this province examined, small cattle production was 89.382 while cattle production was 262.022.

In this study, the actual productions given in abstract were compared with agricultural products, animal husbandry in the year of 1938 which was issued to mark the 15th anniversary of the Republic.

Keywords: Kastamonu, Agriculture, Forestry, Production



Influence of Heat Treatment on Equilibrium Moisture Content and Density of Scots Pine (*Pinus Sylvestris*) Wood

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Abstract: The purpose of this study was to determine equilibrium moisture content, air-dry and oven dry density of heat treated scots pine (*pinus sylvestris*) wood. Wood is a hygroscopic material, so it shrink and swell. Heat treatment is applied to wood materials in order to provide dimensional stabilization by decreasing shrinkage and swelling at the end use place of wood. For this aim, the samples were prepared in 20 mm × 20 mm × 30 mm sizes for determining some physical properties of control and hot-treated samples. A total of 90 samples, 10 for each treatment group, were used. The samples were hot treated with two different times (4 and 6 hours) and four different temperatures (120, 150, 180 and 210 °C) in oven. Oven dry density was determined by wood samples dried at 103±2°C. Air-dry density of wood samples which were held at 20 °C and 65% relative moisture in air conditioner was found. As a result of this study, equilibrium moisture content of heat treated wood samples decreased 50% approximately. Because the hydroxyl groups of the heat treated wood reduce, the cell wall of wood absorbs less water.

Keywords: Heat Treatment, Scots Pine, Equilibrium Moisture Content



The Economical Potential and Distribution of Hawthorn (*Crataegus* sp.) Species in Kastamonu

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Abstract: In this research, the botanical and ecological characteristics of Hawthorn (*Crataegus* L.) taxa, which is naturally distributed in Kastamonu province in Central Black Sea region, have been revealed and the possibilities of usage in the market have been evaluated. Findings are based on the field surveys and the literature reviews made within the provincial borders between 2001-2017. Presence and distribution of 8 taxa were determined in Kastamonu. These are; *Crataegus rhipidophylla* Gand. var. *rhipidophylla* (Syn: *Crataegus curvisepala* Lindman), *Crataegus microphylla* C. Koch. subsp. *microphylla*, *Crataegus monogyna* Jacq. var. *monogyna*, *Crataegus orientalis* Pall. ex M.Bieb. subsp. *orientalis*, *Crataegus orientalis* subsp. *szovitsii* (Pojark) K.I.Chr. (Syn: *Crataegus szovitsii* Pojark.), *Crataegus pentagyna* Waldst. & Kit. ex Willd., *Crataegus tanacetifolia* (Poir.) Pers, *Crataegus x bornmuelleri* Zabel ex K.I.Chr. & Ziel. Trees in the form of perennial small trees attract attention with the fruits that are collected and sold when they mature. It is also an important measure of the contribution of wild life to the feeding of wild animals. According to the habitat, the fruits matures in 8-9 months, which flow between 3-7 months, may be multicoloured as yellow, orange or red in color. This species can be distributed in forest openings, leafy or mixed forests, at the edge of streams and in sloping terrain (0-2200 m. altitude). Different species of hawthorn are also economically valuable because of using their fresh fruits and juices, extracts, tea from dried flowers and leaves, dried fruits, tobacco, marmalade and pestle by people.

Keywords: Kastamonu, Agriculture, Forestry, Production



Actual Sedimentation Eventuated in Forest Roads and comparison of Universal Soil Loss Equation

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Abstract: Forests, as one of our natural resources, provide diversity of plant and animal species and among the main sources pure and freshwaters. Industrialization and population growth are increasing the necessity of natural resources. Forests are among one of the important resources to meet this requirement. Forest roads are an infrastructure work to provide the necessary access to forests and forest areas. Forest roads which are planned to have a minimal impact on the ecosystem and should be acceptable when compared to the benefits to be achieved for forest management. With the construction of the forest roads, the protective vegetation and the organic strata is become removed so the large areas are exposed to superficial erosion eventually. As a result, the sediment transport also increases by the effect of rainfall in the roads in comparison with prior to the road construction. Cutting slopes of forest roads collect on both sides of the shallow underground stream, as well as the shallow underground flow. The precipitation that directly falls to the cutting slopes and road surface, accumulated finally to the slopes below the road and the edge ditches with superficial flow. The material from the erosion on the road surfaces, edge ditches and from the collapses on the cutting slopes also increase the amount of sediment reaching the streambeds. In this study, we aimed to compare the actual sedimentation values originating from forest roads for one year in Kastamonu Araç district with the Universal Soil Loss Equation (USLE).

Keywords: Sedimentation, USLE, Forest Roads



Vocational Qualification in Turkey Forestry

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Abstract: The differences in work and labour qualifications in the regional and social sense are being tried to eliminate via vocational qualification activities based on "lifelong learning" at international and national scale. Due to the fact that vocational qualification activities are investments in people over the long term, at the same time economic and social development could be supported in the context of sustainability. For this purpose, firstly European qualifications framework was established by European Council and Parliament, then on a national scale, Turkey qualifications framework was developed. And definitions and standards of the professions in Turkey continue to be created. In this study, the vocational qualification process of the forest harvesting workmanship which is one of the most important vocation for the forest villagers was evaluated. Forest harvesting workmanship has the vocational standards published by the Vocational Qualification Institution. The studies-process of vocational qualification can be regarded as an important milestone in forest harvesting workmanship which was done by traditional methods by forest villagers until recently. Also; when taken into account that forest areas are hazardous workplaces in forest harvesting work involving cutting, product skidding, loading and unloading activities; vocational qualification activities could be evaluated as the studies that will increase the quality of the labour force in forest enterprise. For this reason, in Turkey forestry, forest villagers, forest harvesting workmanship and vocational qualifications were discussed on the conceptual and legal framework. Finally, the suggestions were made in order to manage professional qualification process in forestry efficiently.

Keywords: Forest Villagers, Vocational Qualification, Forestry Harvesting Workmanship, Turkey



Forests Republik of Azerbaidjan: Modern Conditions, Ways of Development and Sustainable Used

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Abstract: Azerbaijan is largest countries in South Caucasus. With a total area of the republic 8,6 million hectares, the area of forests are 1 million hectares. Azerbaijan are forests low country with forests covered of land area 11,8%. Forests carry out the important agroecological functions and are the carrier of a biological diversity. 90 % forests of republic grow in mountains (Great and Lesser Caucasus, Talish) and are the water - soil protective forests.

In forests naturally grow 107 tree and 328 bush species. Beechen (*Fagus orientalis*, 31,68 %), oak (*Quercus* sp., 27.40%) and horn beech (*Carpinus caucasica*, 26.01 %) species grow on 85.09 % forests areas. At a total area of forests of 1021 thousand in hectares, beechen forests occupy 327 thousand in hectares. Beechen forests - a source of high-quality wood, its fruits, beechen nuts, find food and technical application, growing in mountains (from 600-800 m to 1600-1800 m above sea level), carry out ecological functions. For an estimation of a condition of natural renewal and the analysis of age structure beechen forests are surveyed. Results of researches specify in non-uniform distribution of beechen woods on age classes. In structure woods of middle age classes prevail (81.5 %), practically there are no young growths (8.5 %) and ripe woods (10 %). Currently, 60% of beech forests are not provided with natural renewal, 30% of the area is unsatisfactory or weak, and only 10% of the area is naturally renewed beech. The state of oak forests is not the best way. In the republic there are 5 species of oak (*Quercus castaneifolia*, *Q. macranthera*, *Q. iberica*, *Q. longipes*, *Q. araxina*), 3 of them form forests (*Q. cataneifolia*, *Q. macranthera*, *Q. iberica*). Satisfactory general condition and natural renewal of chestnutleaf oak. Unsecured by natural renewal, unauthorized cutting and unregulated pasture of livestock contribute to the reduction of the area, replacement of their secondary rocks, transformation into bushes, and sometimes even to treeless plots near the Georgian oak. Over the past 100 years, the area of tugai forests has reduced by almost 6-7 times (from 109 thousand hectares at the beginning of the 20th century to 15-17 thousand hectares at the beginning of the 21st century). The main reason for the reduction of forest area in the republic is deforestation (legal and illegal), use of forest lands for agricultural land, widespread and unregulated grazing of cattle and other anthropogenic (man-caused) loads. For today in woods of republic manufacture of wood is suspended. Every year on an area of 10 thousand hectares, work is carried out to restore forests. It is necessary to expand the scope of work on measures to promote the natural renewal of valuable forest-forming species, the artificial resumption (silva culture promote) of oak and tugai forests.

Keywords: Forests Covered Area, Agroecological Functions, Tugai Forests, Natural Renewal, Silva Culture



A Web Based Application of Universal Soil Loss Equation

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Abstract: We are currently in a period that we use the global information network that called the internet very often. The most valuable feature of web-based software is that they are provide the information can be accessed anywhere and anytime by everyone. When the increasing population and the rate of industrialization are taken into consideration, we can say that the demand for natural resources increases evenly. Among the natural resources, forests and forest areas are among the rare natural resources that can renew themselves. We need to benefit from these sources without damaging it in a way that is not possible to compensate. Particularly in recent years, studies on the adverse effects of forest roads on the ecological system have gained importance and so prediction models had developed in line with these studies. Universal Soil Loss Equation is one of these prediction models. The equation contains many factors and, together with the calculation of these factors, leads us to a conclusion about soil loss. Our goal in this study is to make these factors are to be able to calculated through web-based software and to enable everyone to access the information faster and easier.

Keywords: Sedimentation, USLE, Web, Software



Mining Industry and Heavy Metal Content in Needles of *Pinus silvestris* Pine in Azerbaijan

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Abstract: The article is devoted to the results of an investigation of the content of heavy metals in pine needles (*Pinus silvestris* L.) in the mining zone of the Gedabek district. As a result of technogenesis, the most dangerous pollution of the environment is the content of heavy metals (HM) in soil, plants and water. The first place among the sources of HM entering the environment is, according to the general opinion of the researchers, the mining industry.

Mining activity at Gedabek is reported to have started as long as 2,000 years ago. More recent activity began around 1849 when the Mekhor Brothers, followed by the German Siemens Brothers Company, developed and operated a copper mine at Gedabek during the period between 1849 and 1917. Mining activity ceased in 1917 with the onset of the Russian Revolution. In XXI centuries Anglo Asian Mining PLC is operated gold, copper and silver exploration and production in Gedabek. Siemens Brothers during operated a copper mine created a *Pinus silvestris* silva culture at Gedabek (elevations 1200-1600 m). Planted *Pinus silvestris* on Gedabek continue to present timr. Because native pine *Pinus eldarica* bye see elevations more than 1000 m is frosted.

For investigations to determine the content of heavy metals around Gedabek mine (Anglo Asian Mining PLC) in a radius of 0.5-10.0 km was collection of pine needles at 10 trial plot area. Collection of needles samples, their washing, drying and preparation for analysis were carried out according to the generally accepted method. HM are determined by the atomic absorption spectrometry method. The results of the investigations of content are Pb, Co, Cd, Ag, Cu, Zn, Fe, Mn, Au Let us draw the following conclusions.

Accumulation in pine needles of such highly toxic HM as lead (Pb) and cobalt (Co) is not observed. Excess from the background is observed in precious metals (Ag, Au) and iron (Fe). The content of the remaining metals is below the background content of HM in the soil.

Keywords: Mining Industry, Heavy Metals, *Pinus silvestris*, Needles, Clark Number



Polymorphism of Wild Hazelnut (*Corylus avellana*) in the Lesser Caucasus within Azerbaijan

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Abstract: The studies are devoted to the research of the current state and distribution, visible and genetic polymorphism, conservation and rational use of genetic potential of wild hazelnut (*Corylus avellana*) in the Lesser Caucasus within Azerbaijan.

Azerbaijan is experiencing erosion of genetic resources, loss of biodiversity. Increasing anthropogenic impact and changing environmental conditions contribute to reducing the range of wild relatives of nut fruit and irretrievable loss of their genetic heritage. Today it is difficult to predict what wild varieties can be required in decades or even centuries to use their useful alleles in cultivars. Therefore, in order to prevent the loss of "best" genes, it is necessary to preserve the widest possible spectrum of wild races - genetic diversity, even those species of the species that do not have visible useful attributes to date.

The hazelnut (wild) naturally grows throughout the republic. It is widely distributed in the undergrowth of lowland (Flat) forests, a frequent satellite of broad-leaved forests of the Greater and Lesser Caucasus and the Talysh Mountains. Usually it grows shrubs up to 5 ... 7 m high, the number of trunks in the bush reaches from several tens to hundreds. There are also tree-shaped forms with one trunk and a height of 8 ... 12 and more meters.

In the Lesser Caucasus, three hazelnut populations were selected and evaluated: Hacikend, Gedabek and Taz (1000-1500 m sea level). Areas are remotely isolated from each other, which exclude outbreeding - the transfer of genetic information from outside, and the size of populations provide panmixia - the free exchange of genetic information within populations, excluding inbreeding - closely related crosses. These areas differ not only in spatial and orographic and ecological conditions, but also in biodiversity. Being typical of the Lesser Caucasus, they cover the whole aggregate of genetic polymorphism of the hazelnut. Polymorphism hazelnut appears in the form and size of nuts, in the number of nuts on the stem, according to the nature of their confinement in pluck and color. With an amplitude of variability of 0.96 ... 2.42 g, the average weight of the hazelnut is 1.5 ± 0.2 g. The thickness of the shell varies from 0.9 to 2.5 mm. The mass of 1000 pieces of nuts is 1300 ... 1700 g (an average of 1500 g). The yield of individual bushes reaches 1.5-3.0 kg.

The level of genetic polymorphism of hazelnut in populations in the process of molecular genetic studies of xpDNA, 9-12 loci of DNA with identification of 42 fragments were amplified. At that, 34 fragments (80.9%) to be polymorphic, 8 (19.1%) of the fragment are monomorphic. The actual heterozygosity (H_0) was 0.359 while the expected heterogeneity (H_E) was 0.414.

Keywords: Hazelnut, Wild Relatives, Gene Pool, Population, Polymorphism, xpDNA, Heterozygosity



Genus *Quercus* L. in the Republic of Macedonia: Species and Forest Communities

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Abstract: This article refers to diverse oak species and oak forests on the territory of the Republic of Macedonia. The main aim of the research is to present a checklist of oaks on species level in the country and phytosociological overview according to the newly developed syntaxonomy of recent vegetation science. Therefore, various 20th century literature was consulted, including the only two national overviews of the plant (and woody) species in Macedonia and of the plant communities until present date. The desk analysis consists of comparing and compiling data on: i) Species classification and taxa, distribution, morphology- habitus, phytogeography, ecological valence; ii) Forest communities with oaks syntaxonomy, distribution, site conditions and forest cover, since there is no national forest inventory made. In addition, during the period 2012-2017 field research was conducted on different sites of special interest and existing insufficient data where oaks occur. Noticed is much uncertainty and heterogeneity concerning nomenclature and taxonomy of the oaks both in literature and on field. After the investigation and certain clarification, the species overview was made and adapted new checklist of the past oak forest communities with newly established plant taxonomy of the 21st century.

The oaks are the largest genus (*Quercus* L.) classified in the beech family (fam. Fagaceae Dumort.) in the Republic of Macedonia. More than half of the total forest cover in the country is under oak-associated plant communities i.e. pure oak and mixed oak forests, what makes the largest forest cover. According to the literature from the past century and analyses of recent research, the authors of this article note 7 species of oak, with occurrence of subspecies, varieties, forms, and natural hybrids. Furthermore, all of the species are predominant or as a part of 15 communities with oak as new checklist of the syntaxonomy is presented.

In the southern parts of our country, at lower altitudes, in the areas where the influence of the Mediterranean and Sub-Mediterranean climate is strongly represented, there are evergreen and deciduous Mediterranean and sub-Mediterranean oaks such as *Quercus coccifera* L., *Qu. pubescens* Willd., *Qu. trojana* Webb. In the areas on hilly terrains where the sub-Mediterranean and continental climate influence is present, the following oaks are present *Qu. cerris* L. and *Qu. frainetto* Ten. In the higher hilly and mountainous regions where the influence of the temperate continental climate is more pronounced, *Qu. petraea* (Matt.) Liebl. is found. *Qu. robur* L. occurrence is less and this species thrives on alluvial floodplains or by the riverbanks. Generally, oaks create oak forest region that stretches from the lowest altitudes up to approximately 1,200 m a.s.l.

The interest in the oaks in Macedonia is high not only for the vegetation science, in particular of dendrology and phytosociology, because of very diverse leaf morphology, but also due to the importance for the forestry as one of the most exploited wood for heating houses. Recently, oaks are very interesting concerning the ecology-resilience and adaptability to possible climate change and fast rehabilitation after forest fires.

Keywords: *Quercus*, Oaks, Oak Species, Oak Forest Communities, Oak Forests, Checklist, Macedonia



Medicinal Uses of The Genus *Cistus* (Rockrose) in Turkey

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Abstract: The aim of this study is to revise the medical use of the genus *Cistus* L.-Rockrose (Cistaceae) by the Turkish folk according to the literature records. According to the plant list, there are 26 species and 26 hybrids from genus *Cistus* in the world *Cistus* a typical Mediterranean plant are evergreen shrub attracting attention with their flashy flowers in our country. Five species from *Cistus* including pink flowered *Cistus creticus* L. and *C. parvifolius* Lam.; white flowered *C. salviifolius* L., *C. laurifolius* L., and *C. monspeliensis* L. grow naturally in Turkey. They grow naturally mostly in maquis or frigana in a large scale in the Mediterranean region in Turkey. *C. creticus*, *C. salviifolius* and *C. laurifolius* from this natural species are used for medicinal treatment. Roots, aerial parts, leaves, flowers, buds, and the resin called "Ladanum" are the plant parts used in medical treatment. The resin gives the name to plant as "Laden" (Rockrose) in Turkish. Also, for the plant, such different local names as Kartli, Pamuk otu, Karahan are used locally in Turkey. It has been determined that the area where these plants are used mostly include stimulant, expectorant, sedative, antitussive rheumatism, bronchitis, asthma, diabetes, cardiac diseases, digestive, hemorrhoids, diarrhea, toothache, snake bites, wounds and burns. The preparation methods are infusion, decoction and other ways or they were directly applied. The genus *Cistus* has been used among folk for different medical purposes. Natural *Cistus* species is not used only for medical purposes but also for soil conservation and browsing. Therefore, it is important to make additional and intensive researches about different use of all natural species belong with this genus in Turkey in order to create economical value for the country.

Keywords: *Cistus*, rockrose, Ethnobotany, Cistaceae, Turkey



An Experimental and Simulation Study on the Electromagnetic Field Inside a Solenoid

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Abstract: The magnetic flux density of a current carrying solenoid was analyzed in this study using analytic methods, experiments and finite elements analysis, in an attempt to verify the Biot-Savart law. The use of software in designing and analyzing magnetic systems has become an indispensable practice. Virtual prototyping allows for saving time and money. Nevertheless, multiple configurations ensure results to be obtained rapidly having provided information about methods to improve the design and reduce the costs. Using the 2D/3D electromagnetic field simulation software embedded in Infolytica software, it is conveniently possible to create simple prototypes of complex electromagnetic and electro-mechanic devices. MagNet 2D/3D is a powerful simulation software commonly used by engineers and scientists all over the world in order to design motors, sensors, transformers, actuators, solenoids, or any components using permanent magnets or coils. This study consists of a simulation performed using MagNet software with regards to solenoid properties. In the experimental design, first, the properties such as solenoid's length, number of turns in the coil, diameter of the copper wire, the current feed from the source of current, etc. and system design and simulation were developed based on these properties. In the experiments, a gauss meter, magnetic field measurement device, was used at locations with a certain distance to the center and locations outside of the coil, and the magnetic field values were obtained from these locations. The materials used in this study were a copper wire of 0.5 mm diameter and a solenoid of the following values: 3.7ohm resistance, 580uH frequency, 1A maximum current, 32 mm diameter and 150 mm length with a number of 300 turns in the coil. Measurements were taken, having relocated the measuring end of the gauss meter with respect to the solenoid as part of the experiments. The measuring end of the gauss meter was located at three different distances to the solenoid. Then, having fixed the measuring rod at each one of these locations, the direct current passing through solenoid was altered. Among the currents experimented were 0.4 A, 0.8 A, and 1.2 A Readings were obtained for all three current values using the gauss meter display. Moreover, the same distances were selected for the simulation and magnetic field values were measured virtually for different points inside and outside of the solenoid. It was found that the experimental and simulation results were very close to each other and the compatibility between theory and practice was shown using graphs.

Keywords: Biort-Savart Law, Solemoid, Simulation, Magnetic Field

**Research of Cost Effect of Openness in Steel Deck Suspension and Cable Stayed Bridges**

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Abstract: Formerly, people have encountered some obstacles while meeting their transportation needs. Humans have also discovered bridges to exceed obstacles such as rivers and deep valleys. Bridges are generally consisted of two abutments on the sides, middle pier if exists and decks that sit on top of them. Many bridges were constructed from the first bridge to the present day. Each bridge made one step for the next bridge, namely the accumulation of knowledge. The increased knowledge of people has enabled the development of bridges and the emergence of new types of bridges.

Suspension and Cable Stayed bridges are the most commonly used building systems. The most important factor in the development of suspension and Cable Stayed bridges are steel cables. The effect of increasing traffic load is increasing bridges manufacturing. Therefore, the economics of various bridge construction techniques are being investigated for economic bridge design.

In the world, the costs of suspension bridges and cable stayed bridges were very controversial. The cost of these bridges according to different openings also shows much difference. For this reason, our study is to investigate the effect of bridge openness on cost in both types of bridges.

In this study; Analyzes and designs of suspension bridge and cable stayed bridges with steel deck of 250, 500, 750, 1000, 1500, 2000 meters were realized and cost analysis of bridge types was realized. In this content, six numbers of bridges in both system types has created three-dimensional models with CSI Bridge Program and numerical analyses were performed. The results of the cost analysis obtained at the end of the study were compared and evaluated.

Keywords: Bridge, Suspension Bridge, Cable Stayed Bridge, Bridge Cost, CSI Bridge Program



Optimization Applications for Renewable Energy

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Abstract: The aim of this study is to emphasize the importance of the application of optimization models developed for renewable energy systems, which are so crucial today in response to global energy demand. Especially the developed and developing countries attach importance to renewable energy institutions. The main reason for this is the provision of energy production without causing consumption in the nature.

Most of the renewable energies are generated either directly or indirectly from the sun or the wind, for homes and other buildings for direct heating and lighting purposes, for generating electricity and for hot water heating, and for industrial uses. In this study, optimization models applied to renewable energy types were investigated. In many researches, optimization methods are proposed for solving the problems existing in renewable energy systems.

The most important findings obtained in the researches are that the cost of installation for renewable energy facilities is minimized and the maximum energy production is obtained by optimization models. Generally, the use of linear optimization techniques ensures that the feasible or optimum results for renewable energy are obtained in short time and with less cost. Many geographical factors need to be taken into consideration in order to obtain maximum energy with minimum cost in renewable energy. However, considering these factors as noninteracting in the investigated studies leads to the linearization of the generated optimization model. The solution of optimization models in a very complex structure makes it possible to obtain optimum values for renewable energy with the help of computer programs.

In this study, we present a clear view of the mathematical optimization methods applied to renewable energy and the optimization models developed in this area. In addition, with today's technology, it is aimed to conserve natural resources to meet the need for energy by means of renewable energy technologies.

Keywords: Renewable Energy, Optimization Models, Installation Cost, Energy Production, Optimum Values



ORAL PRESENTATION

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Machinability of AZ21, AS21 and AM20 Magnesium Alloys

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Abstract: This study investigates the effect of Zinc (Zn), Silicon (Si) and Mangan (Mn) in (AZ91: 2% Al, 1% Zn, AS21: 2% Al, 1% Si, and AM20: 2% Al, 0.5% Mn) magnesium alloys on mechanical properties, wear resistance and machinability. In magnesium alloys, the effect of mechanical properties, wear resistance and machinability was investigated by establishing the impact of 1% zinc (in AZ21), 1% silicon (in AS21), and 0.5%Mn (in AM20) within the microstructure in these alloys with aluminium amount less than 3%. It was found that the intermetallic phases found in the microstructure within the alloy had an effect on mechanical properties (ultimate tensile strength, yield strength, elongation, hardness), wear resistance and machinability.

Keywords: Machinability, Cutting Force, Mechanical Properties, Hardness, Magnesium Alloys



Experimental Determination of the Effective moisture Diffusivities in Air and Microwave Drying Systems of Banana

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Abstract: Drying techniques have been used for the food preservation for centuries as it caused the minimize biochemical, chemical and microbiological deterioration. Despite high energy consumption and decreasing of quality, obtained product gains longer life by drying. The moisture diffusivity of a foodstuff is a material property and it changes with many factors including moisture content, process variables, water holding capacity and physiochemical attributes of food. Effective moisture diffusivity describes all possible mechanisms of moisture movement within food, which is combination of liquid diffusion, vapor diffusion, surface diffusion, capillary flow and hydrodynamic flow. In this work, the effective moisture diffusivity of banana was determined in air convective and microwave drying systems. For air drying system three different air velocities, air temperatures and solid thickness were investigated. In addition, three microwave powers and three solid thicknesses were tested. Effective moisture diffusivities varied between 4.75-6.48 $10^{-10} \text{m}^2/\text{s}$ for temperature investigated, 3.66-9.53 $10^{-10} \text{m}^2/\text{s}$ for air velocities investigated and 6.48-3.12 $10^{-10} \text{m}^2/\text{s}$ for solid thickness investigated. Effective moisture diffusivities for microwave drying were determined as 2.75-5.27 10^{-9} for microwave power and also determined as 4.55-1.98 10^{-9} for solid thickness.

Keywords: Drying, Banana, Effective Moisture Diffusivity



An Application of Battery Charging using Buck Converter for the Energy Generated from a Wind Turbine

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Abstract: The aimed of this study was to charge a battery in a controlled environment using the electric power generated at a wind turbine. The system designed in this study consists of DC-DC buck converter, Arduino microcontroller, and a battery. As the wind turbine generates 24V alternating current, a full wave rectifier was attached to the outlet. The system designed consisted of a 12V6.5Ah gel battery, and Arduino R3 microcontroller. Arduino products draw attention with its versatility, popularity, low cost, and ease of programming. With these features in mind, Arduino microcontroller was selected as the control unit. First, parameters such as voltage and current were collected from the battery and wind turbine and necessary measurements were made. A circuit-switched buck converter was designed for the power circuit. In the calculations made, irfz44n switching element was used in converter and the following values were obtained: $L=3.19\text{mH}$, $C=80\mu\text{F}$. 12.5 KHz PWM frequency was used. The duty cycle, on the other hand, was calculated to be 61%. The charging process was then performed in a controlled environment where the current was taken as 1 A which was 10-20% of the battery current; and the nominal stress was taken as 14.8 V. The control program resulted in 12.5 KHz PWM and the instantaneous current voltages of the battery and turbine were controlled. The charging process was terminated when the battery voltage reached at the reference voltage of 14.8V. And the charging process restarted when the battery voltage was below 11V. An LCD display was used to read instantaneous current voltages of the battery and turbine, battery indication (percentage), and battery temperature. The charging process was automatically terminated when the battery temperature reached 50 °C. As the power generated using wind power is variable, it was possible to increase the life and efficiency of the battery with controlled charging, which in turn allowed for an economic and efficient charging system. With a controlled charging environment, it was possible to store electrical energy in an efficient manner while improving the product life cycle of the battery. It is believed that this study contributes to fields where energy storage is of importance.

Keywords: Microcontroller, Wind Power, Buck Converter, Arduino



Application of Statistical Optimization Model for Wind Energy Performance

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Abstract: The objective of this study is to provide maximum benefit from wind energy with the statistical optimization model approach. Nowadays, the utilization of wind energy is increasing day by day because of the fact that it takes place in the renewable energy status. Generally, high cost is required for wind energy systems. Besides that, if the amount of energy obtained is also not at the desired level, it reveals an important problem.

In this study, a regression equation was established by calculating the significance levels of the factors affecting the energy amounts obtained in wind energy systems. As a result of the statistical analysis, it was seen that some factors have a positive influence and some factors have a negative influence in energy production. It has been found that the optimization model has an effect on the regression equation which constitutes the objective function.

The aim of the mathematical optimization model is to maximize the amount of energy obtained by maximizing the objective function. The constraints in this model are formed by the limits of the factors that determine the energy system. In addition, variables in both the objective function and constraints are defined as decision variables in the optimization model, a linear mathematical programming model, was established.

As a result, optimum values for both the objective function and the constraints are calculated. Thus, in order to achieve maximum energy value in a wind energy system to be installed, it is ensured that a concrete feasibility is obtained by help of statistical optimization approach. In this case, accurate analysis of the available data contributed to the maximum benefit in a short time and with a low cost.

Keywords: Renewable Energy, Wind Energy, Statistical Optimization Model, Objective Function, Optimum Values



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The Effect of Sensor Properties of Multi-metal Electrocatalysts on Food

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Abstract: The present study was conducted on the determination of glucose in food with high glyceic index by electrochemical methods, using activated carbon-assisted Pd and Co nanoparticles synthesized by polyol method without enzyme, surface active substance or ionic electrolyte. The new (PdCo/C) nanostructures have been successfully synthesized by the polyol method. The prepared enzyme-free sensor showed excellent catalytic activity against glucose thanks to the synergistic effect between ternary metals. These results provide a new way to produce electrocatalysts for high performance electrochemical sensors and applications in foods.

Keywords: Non-enzymatic, Glucose Detection, Ternary Metals, Glycemic Index, Beverages



Increasing Water Flow in the Outlet Line in RAM PUMP

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Abstract: Irrigation in agriculture is one of the important factors that increase the cost of agricultural production. The use of pumps that cause environmental pollution and financial problems in the irrigation of agricultural lands is an important question. Ram pump is an old technology. A lot of variations have been tried on the general configuration of the pump, which is longer than the last two centuries. Existing RAM pumps do not require any fossil fuel or electricity. Only the water works by taking advantage of its specific weight. A minimum of one tenth of the water from the pump can be pumped up to 10 times the water height. Then the water is collected and used for irrigation purposes. However, if the pump is costly and the water flow is low, this limits the use of RAM pumps.

With this study, a new pump design was made with lower production cost and higher water flow compared to existing RAM pumps. The discharge rate was increased by 20% and water was sprayed to 30 meters height from the floor. The cost of construction is reduced by 50% compared to Ram, which is sold on the market. With this designed pump, 53, 25, 18 and 11.2 m³ / day of water were collected from the ground at 6, 12, 18 and 30 meters in height, respectively. Thus, a pump is designed to deliver the water to the determined heights at 4, 2, 1 and 0.6 m³ / day more than the other RAM pumps sold on the market.

Keywords: Irrigation, Pump, Water Flow, Agriculture, Specific Weight



A Model Proposal to Determine Region for the Installation of Offshore Wind Energy Turbines in the Aegean Region of Turkey

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Abstract: It is aimed to determine alternative regions where is positioned wind energy turbines which have never been built on the Aegean region thanks to the Fuzzy Analytical Hierarchy Process (FAHP) with a software based on Geographical Information System (GIS) in order to make more use of renewable energy. The determination of the region selection for wind turbines to be installed on the seas, with alternative areas identified, requires the use of uncertain data. The FAHP algorithm that uses the AHP and fuzzy numbers has been proposed as an integrated methodology in order to determine the suitable criteria and alternatives, transform verbal uncertainty into numerical data through ArcGIS which is software based on GIS.

Criteria used in the study are determined as the result of the literature research, the opinion of the academic staff working on this subject and by taking into consideration the comments, knowledge and accumulation of qualified personnel in the Directorate General of Renewable Energy.

In the study, it is firstly ensured that the five criteria weights are taken equally. Then, the weights of these five criteria are determined by the integrated FAHP algorithm. Afterwards, the criteria with the specified vector data format are converted into raster data format by using various commands in ArgGIS. The raster data generated for each criterion is combined into a single layer in ArcGIS. Thus, the Aegean Region has been categorized as alternative regions, optimal areas and suitable areas for the installation of wind power plants over the sea.

It is observed that the coasts of Çanakkale, Gökçeada and Bozcaada are the most suitable areas for the establishment of wind power plants over the Aegean Sea. The identified alternative regions are interpreted under two scenarios.

Keywords: Renewable Energy, Wind, Multi Criteria Analysis, Geographical Information System (GIS), Fuzzy Analytical Hierarchy Process (FAHP)



The Effect of Çatalağzı Fly Ash on Alkali-Silica Reaction

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Abstract: Alkali-silica reaction is a chemical reaction, it occurs when there would be moisture in the environment, alkali ratio ($\text{Na}_2\text{O} + 0.658\text{xK}_2\text{O}$) in cement and reactive silica (SiO_2) ratio in aggregate. As a result of this reaction, alkali-silica gels with high water absorption are formed and absorb water in time to increase the internal tensile stress of the concrete. Therefore, the concrete surface deforms and in the long run the concrete becomes exposed to external influences and becomes dysfunctional.

Alkali-silica reaction can be avoided by using low aggregate of reactive silica ratio, low cement of alkali ratio, pozzolans and lithium based chemicals may be used due to aggregates in some regions. In this study, as a pozzolanic additive, the effect of Çatalağzı fly ash on alkali-silica reaction (ASR) was investigated. The aggregate of İzmir Gediz region, which has a high ratio of reactive silica, which has an important place in the reaction of alkali-silica as aggregate, has been used by being granulated. The accelerated mortar bar test method ASTM C 1260 was used to determine the alkali-silica reaction that occurs in the concrete. In this study, fly ash (UK) substitutes were made at 0%, 5%, 10%, 15% and 20% instead of cement. Prepared samples were stored at $23 \pm 2^\circ \text{C}$ for 24 hours and then were demolded and kept at $80 \pm 2^\circ \text{C}$ for 24 hours in normal water. After the first readings, the last readings were made after 14 days at $80 \pm 2^\circ \text{C}$ in 1M NaOH solution.

According to ASTM C 1260, up to 0.1% of the length change is non-detrimental zone in terms of ASR, between 0.1% and 0.2% is controlled zone, and the higher length change ratios is detrimental zone. According to ASTM C 1260, length changes were observed %0.21 in FA0, %0.188 in FA5, %0.112 in FA10, %0.073 in FA15, %0.044 in FA20. The results of the readings were found that FA0 in detrimental zone, FA5 and FA10 in controlled zone, FA15 and FA20 in non-detrimental zone in terms of ASR. As a result, it was observed that the effect of alkali-silica reaction decreased as fly ash substitution ratio increased.

Keywords: Alkali-silica Reaction, Fly Ash, Reactive Aggregate, Accelerated Mortar Bar Test



Electrospun Conductive Polycaprolactone (PCL)/Carbon Black Nanofibers and Their Optical Properties

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Abstract: Nanofibers are defined as fibers with diameters in nanometer scale. The reduction in diameter gives nanofibers unique properties such as small pore size, high porosity, high surface area to volume, light weight, flexibility and high mechanical strength. Therefore, nanofibers have found many different application areas from medicine to filtration.

With the increasing demand for nanofibers, researchers have also focused on their electrical conductivity and optical properties. Electrical conductivity of the nanofiber increases due to the confinement in small diameters. Transparent electrically conductive nanofibers can be used in optoelectronic devices such as touch screens, e-readers etc. where electrical conductivity and transparency is needed. Moreover, nanofibers offer light weight and flexibility which make them preferable for such applications.

Nanofibers can be produced by electrospinning. Electrospinning uses electrical forces to produce polymeric nanofibers. In this method, high voltage is applied to a polymer solution held in a syringe. With increasing voltage, polymer jet ejects from the tip of the syringe and travels towards to a collector under the influence of electrical field. During the travel of the jet, the solvent evaporates and polymeric nanofibers were collected on the collector.

In this study electrical and optical properties of electrospun polycaprolactone (PCL)/carbon black composite nanofibers were investigated. PCL was chosen for its low cost and easy spinnability. PCL nanofibers were produced by electrospinning with the addition of carbon black into the spinning solution. Carbon black was used to make PCL nanofiber conductive. The effect of deposition time on optical and electrical properties of the samples were investigated. Nanofibers with diameters around 1 μm were obtained. With the increasing deposition time, the conductivity values were increased while transmittance values were decreased. The results showed that conductivity values were comparable with the literature and conductive PCL/carbon black nanofibers are promising for optoelectronic applications.

Keywords: Electrospinning, Conductivity, Transparency, Nanofibers, Polycaprolactone, Carbon Black



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Relations Among Planting Area, Production and Yield Over The Years in Maize Plant in Turkey

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Abstract: Maize, which is in the family of gramineae, is a single year warm climate cereal plant. It can be cultivated in tropical and subtropical temperate climates, and cultivated almost everywhere in the world. In the world, corn is grown in 183 million hectares of approximately 712 million hectares cultivated in terms of planting area, while 1,038,281 thousand tons of corn is produced in 2.7 billion tons of grain production in terms of production amount. The share of corn in cereal planting area and production was 25.7% and 38.1%, respectively. Maize in the world after wheat and rough rice in terms of planting area is the first in terms of production amount. The countries that produce the most corn are the USA, China, Brazil, Argentina, Mexico, India, Ukraine, Indonesia. Turkey ranks 24th among producing countries. Over the last 10 years, maize cultivation areas in the world have increased by 24%, while production has increased by 42.3%. In our country, it is in the third place after the cultivation of maize, wheat and barley in cereals. Maize, the first product in more Marmara and Central Anatolia region of Turkey, the Mediterranean and in the South region as the second maize is grown. Maize in Turkey, and many more are produced in animal production including cultivation of silage and field corn.

In this study, the production of maize production made in Turkey since 1960, planted area was analyzed the relationship between yields and are intended to contribute in the future plans of the results.

Keywords: Maize, Production, Planted Area, Yield, Turkey



Effect of Nickel and Chromium Oxide on The Hardness of Alumina Ceramics

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Abstract: Hardness is among the most crucial properties for the potential application of alumina ceramics like wear parts and armour materials. The hardness of alumina ceramics which is between 15 and 20 GPa is lower compared to the carbide ceramics (silicon carbide, boron carbide: 20-30 GPa). The purpose of the study is enhancing the hardness of monolithic alumina ceramic by adding both nickel and chromium oxide particles.

As chromium oxide and nickel precursor, chromium carbide and metal salt (nickel nitrate hexahydrate) were used respectively. Heterogeneous precipitation method was used to obtain nano nickel particles after heat treatments. During reduction process of nano nickel oxide to nano nickel (1 vol.%), chromium carbide particles (5 vol.%) oxidized at 700⁰ C in H₂/Ar atmosphere. So, in the alumina matrix, both nano nickel and chromium oxide particles could be obtained. The specimens were prepared in pellet form under uniaxial pressing following cold isostatic pressing and pressureless sintered at 1550⁰ C for 2h. Phase analyses were performed by X-ray diffractometry (XRD) and the densities of the sintered samples were measured by the Archimedes' method. The microstructure was studied by Scanning Electron Microscopy. For hardness measurement, Vickers indentation technique was used, and the indentation load was selected as 5 kg.

XRD results showed that after reduction process in H₂/Ar atmosphere, most of the chromium carbide powder oxidized as eskolaite structure of chromium oxide. After sintering in the same conditions at 1550⁰ C, only alumina and nickel peaks could be identified because chromium oxide forms a solid solution in alumina. The measured densities of alumina and the composites were 3,95 g/cm³ and 3,93 g/cm³ respectively. It should be noted that although the density of chromium oxide is higher than the alumina density; still, after sintering monolithic alumina and composite have very similar densities. Vickers hardness values were measured to be 2190 HV for monolithic alumina. On the other hand, the hardness values of the specimens were increased to 2561 HV for the composites.

Keywords: Alumina, Nickel, Chromium Carbide, Chromium Oxide, Sintering, Hardness



Evaluating Afşin-Elbistan Fly Ash as Geopolymer Concrete Raw Material with Blast Furnace Slag Incorporation

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Abstract: Concrete is the most common construction material. The main constituents of concrete are cement, aggregates and water. It is well known that cement production steps have serious of contribution to CO₂ emission. For this reason, from the point of ecology, researchers have been aiming to produce cementless green concretes. Geopolymer concrete is one the most popular green concretes recently. In order to produce geopolymer concrete, aluminosilicate sources and alkaline activators have been used as raw materials. Generally, fly ashes have been preferred as aluminosilicate sources. Fly ashes are by-products of coal combustion process in the thermal power plants. Fly ashes are also used as concrete mineral admixture. According to ASTM C 618 fly ashes are divided into two classes as F and C. Afşin-Elbistan thermal power plant fly ash does not correspond to any of these two classes and it is not preferred as concrete admixture. Therefore, this fly ash occurs huge amount of waste material for the region.

In this study, in order to evaluate Afşin-Elbistan fly ash, it was used as geopolymer concrete raw material. As the control group, 100% fly ash was used. In order to investigate the availability of the fly ash it is also combined with 25% and 50% of blast furnace slag, which is another by-product obtained from steel-iron factories. As activator, sodium silicate (SS) and sodium hydroxide (SH) solutions were used together. The molarity for SH was 12 and SS/SH ratio was chosen as 1.0 and 1.5. Also activator/binder ratio (Ac/B) was chosen as 0.45, 0.55 and 0.65. 50x50x50 mm cube samples were produced. All the samples were cured at 85 °C for 24 hours. After heat treatment samples were kept in room temperature for 28 days. Compressive strength, splitting tensile strength, ultrasonic pulse velocity, fresh and hardened unit weight tests were performed.

At all sample groups it can be seen that increment in the Ac/B ratio and SS/SH ratio increased the mechanical properties. Besides blast furnace slag usage also increased the mechanical properties. Best results were obtained from the series which incorporates 50% blast furnace slag, 0.65 Ac/B and 1.5 SS/SH. From the samples produced using 100% fly ash with 0.45 Ac/B ratio and 1.0 SS/SH ratio, 8.78 MPa compressive strength was obtained and 50% blast furnace slag incorporation with 0.65 Ac/B and 1.5 SS/SH increased this value to 33.81 MPa, which is acceptable for ordinary reinforced concrete buildings. Also, splitting tensile strength and ultrasonic pulse velocity results are similar to the compressive strength results. Unit weight of geopolymer concrete is generally lower than conventional concrete. 100% and 75% fly ash containing groups have similar unit weight values but 50% of blast furnace slag containing groups have higher values.

As a result, Afşin-Elbistan fly ash usage by itself was given lower results but it can be utilized by using blast furnace slag together. Also higher SS/SH and Ac/B ratios were given better results for the Afşin-Elbistan fly ash containing geopolymer concretes.

Keywords: Geopolymer Concrete, Afşin-Elbistan Fly Ash, Blast Furnace Slag, Compressive Strength, Sodium Silicate, Sodium Hydroxide



The Effect of Blast Furnace Slag on Alkali-Silica Reaction

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Abstract: Alkali-silica reaction occurs when there would be aggregate containing reactive silica, high alkaline amount in cement and enough humidity in environment. The sodium oxide and potassium oxide in the cement enter the chemical reaction when there would be the amount of reactive silica in the aggregate reaches sufficient moisture content, resulting in alkali-silica gels. The resulting jellies can contain too much water and cause internal stresses in the concrete. As a result of these stresses, the concrete surface is damaged and concrete is deformed due to freeze-thaw, reinforcement corrosion etc.

In order to reduce most of the deformations due to alkali-silica reaction, aggregates with low alkali rate can be used. It may be necessary to use some chemical or pozzolanic additives economically in order to decrease the cost of bringing aggregate and cement from other areas. In this study, the effect of the blast furnace slag which produced Zonguldak Ereğli iron and steel plant was investigated on the alkali-silica reaction (ASR). The aggregate of İzmir Gediz region, has a high ratio of reactive silica, which has an important place in the reaction of alkali-silica as aggregate was used by being granulated. The accelerated mortar bar test method ASTM C 1260 was used to determine the alkali-silica reaction that occurs in the concrete. In this study, blast furnace slag (BFS) substitutes were made at 0%, 5%, 10%, 15% and 20% instead of cement. Prepared samples were stored at 23 ± 2 ° C for 24 hours and then were demolded and kept at 80 ± 2 ° C for 24 hours in potable water. After the first readings, the last readings were made after 14 days at 80 ± 2 ° C in 1M NaOH solution.

According to ASTM C 1260, up to 0.1% of the length change is non-detrimental zone in terms of ASR, between 0.1% and 0.2% is controlled zone, and the higher length change ratios is detrimental zone. According to ASTM C 1260, length changes were observed %0.21 in BFS0, %0.195 in BFS5, %0.169 in BFS10, %0.148 in BFS15, %0.107 in BFS20. The results of the readings were found that BFS0 in detrimental zone, BFS5, BFS10, BFS15 AND BFS20 in controlled zone in terms of ASR. As a result, it was observed that the effect of alkali-silica reaction decreased as blast furnace slag substitution ratio increased.

Keywords: Alkali-silica Reaction, Blast Furnace Slag, Reactive Aggregate, Accelerated Mortar Bar Test



Investigating the Effectiveness of Some Mineral Materials on Residual Strength of Concretes after Fire: A Taguchi Analyze

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Abstract: In this study, four different mineral materials were used as additives in an effort to improve the fire resistance of concretes. Three of these additives were natural minerals which are pumice, barite and colemanite. One of them was blast furnace slag which is an industrial by-product. It is important to evaluate natural minerals and proper industrial by-products in the cementitious composites from the point of economy and ecology. All four mineral materials used at four different levels. Pumice, barite and blast furnace slag used as %0, 2.5, 5, 10 and colemanite used as %0, 0.25, 0.5, 0.75 due to retarding effect of boron minerals on hydration at higher levels.

In order to evaluate the fire resistances of admixture containing concretes, 100x100x100 mm cube samples were produced. All the samples cured for 28 days in the tap water which is 20±2 °C. After curing period samples subjected to 600 °C and 800 °C for one hour. Two different cooling regimes were conformed which are air and water cooling. Than compressive strength tests were performed to the samples before and after fire exposure. Ultrasonic pulse velocity tests also performed to the samples before and after fire.

In order to determine the effectiveness of each mineral material on the residual compressive strength of the samples after fire exposure, Taguchi analyses were performed to the each sample group. Taguchi method served to reduce the experiment number to 16 by using L16 design which includes four factors and four levels. By using Taguchi method, effectiveness levels of all the mineral materials were obtained on the residual compressive strengths after 600 °C and 800 °C. Besides ANOVA was performed by using the signal to noise ratio values obtained from the Taguchi analyze in order to obtain the contribution percentages of the mineral materials on the residual strength.

According to the test results at both temperatures, pumice was the most effective parameter on the residual compressive strength. Barite, blast furnace slag and colemanite additives follow pumice respectively. Pumice is a volcanic rock and it has lots of voids in its structure. It is also being used as lightweight aggregate. Therefore pumice has low thermal conductivity and low coefficient of thermal expansion. Barite is a chemically stable mineral and it has similar coefficient of thermal expansion to the mortar phase. Blast furnace slag, consumes the Ca(OH)₂ in the concrete which is a product of Portland cement hydration. Ca(OH)₂ experiences decomposition as CaO and H₂O. Rehydration of this material brings expansion in the concrete. So it is known that blast furnace slag concrete has lower amount of Ca(OH)₂. Colemanite is an effective material on compressive strength but it is the lowest effective mineral on fire resistance. But this can be related to the lower amount of colemanite than other minerals.

As a result pumice is very effective on residual strength than other mineral materials used. Also it can be concluded that residual strength results of air cooled samples are lower than water cooling, due to much more volumetric degradation.

Keywords: Fire Resistance, Taguchi Method, Pumice, Barite, Blast Furnace Slag, Colemanite



Possibility of Silica Removal from Low Grade Metallurgical Bauxite by Size Reduction and Sieving

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Abstract: Both of aluminum (Al) and alumina (Al₂O₃) are very important materials due to its superior physical and technological properties, are widely used in industry for many applications. Nowadays, almost all of the aluminum and alumina production obtained from the Bayer process using metallurgical-grade bauxite ores as the raw material. The most significant determinations for metallurgical-grade bauxites are its alumina (Al₂O₃) and silica (SiO₂) content, and the Al₂O₃ / SiO₂ mass ratio of bauxite ores which is also defined as “module”. Total reactive silica content of bauxites plays a critical role in the viability and economics of the Bayer process. Because reactive silica which tends to dissolve during bauxite leaching causes excessive caustic soda (NaOH) consumption and alumina losses in the Bayer process. Therefore it is essential to determine the reactive silica content in bauxite ores, and the high silica content of the ore should be reduced.

In this study, possibilities of silica removal from low-grade bauxite sample was investigated by means of particle size distribution. For this purpose, bauxite ore with 57.33% Al₂O₃ and 9.01% SiO₂ content (and module 6.36) was used in experimental studies. Experimental studies were carried out in two stages. In the first stage, the bauxite ore sample was crushed and then ground to reduce particle sizes. In the second stage, ground bauxite ore was sieved to determine particle size distribution, and than alumina and silica contents of the sieve fractions were determined with XRF analysis. According to experimentals results, when going from coarse size fractions to fine size fractions, it was seen that while SiO₂ grade tends to increase Al₂O₃ grade conversely decreases.

Keywords: Bayer Process, Bauxite, Silica Removal, Size Reduction, Sieving



Investigation of the Effect of Coating Thickness on Surface Roughness of WC / Co Coating on AISI 304 Stainless Steel by HVOF Method

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Abstract: In this study, an experimental study has been carried out to investigate the effect of coating thickness on surface roughness of WC / Co coated on AISI 304 stainless steel using HVOF method in thicknesses of 150 μm , 250 μm and 350 μm . WC / Co powders were deposited onto substrate with and without NiCr as bond coating layer using a HVOF method. WC/Co was selected as coating powder. Tungsten carbide is a hard material with high melting point and high resistance to wear. HVOF method was selected as the coating process of this study. In the HVOF method the base material does not reach very high temperatures. It has high spray speed. The distance of the spray torch to the base material during processing can be adjusted. So with this method, low porosity, high density coatings with high bond strength can be obtained. The produced layers were characterized by optical microscope, scanning electron microscope and microhardness tester. The cross-section of all samples was sand papered and polished before microstructural observations and microhardness measurements. The effect of the coating thickness of the coated specimens on the surface roughness was investigated in the computer aided TR200 surface roughness measuring tester. The average roughness R_a , defined as the arithmetic mean of departures of the profile from the mean line, was used to quantify the coating surface roughness. As a result of experimental studies, it has been observed that as the coating thickness increases, the coating hardness and surface roughness amounts increase. Also, when the surface roughness values of samples with the same coating thickness were compared, it was found that the surface roughness values of the NiCr-binding samples were lower than those of the binder-free samples.

Keywords: HVOF, Coating, Surface Roughness, Hardness, Microstructure



Investigation of Improvement of Soft Clay by Chemical Additive

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Abstract: In geotechnical engineering soft clay is defined as problematic soils. Lime and cement are used as traditional binders in the treatment of such soils. There are various engineering problems because of light structures to be built on soft soils. Different methods are used to improve soft clay soils and reduce settlement. Stone columns, sand compaction columns, lime-cement columns, embankment and deep mixing methods have been widely used in recent years. Lime and cement are used as traditional binders in the treatment of soft clay soils. In the deep mixing method, the cement and / or lime are injected as a binder in dry and / or liquid form and mixed with soils by means of mixing blade and the columns are manufactured. In this study, sodium hydroxide (NaOH) was used to improve low plasticity clay (CL) in liquid limit form. In experimental study, NaOH (according to dry weight of clay) were added to CL clays in ratios of 1, 3 and 5%. Then, 40% of water in liquid limit value of CL clay, added to mixture and mixing like deep mixing method. The prepared mixture was filled into cylindrical metal molds with 38 mm in diameter and 76 mm in height. Before filling the mixture into the mold, interior of mold was lubricated with a thin film layer to reduce friction. Samples are cured in proper condition (90% humidity and temperature 20 ± 3 °C) subsequently unconfined compressive strength (UCS) were determined at 7, 14 and 28 curing days. The UCS test results of sodium hydroxide added samples in 7, 14 and 28 days were compared with the results of the unconfined compressive strength of CL clay without using sodium hydroxide. Results showed that the UCS improved with increasing of curing time and NaOH ratio. A maximum UCS value of 1055 kPa was obtained in samples with 5% of sodium hydroxide and 28 days of curing.

Keywords: Soft Clay, Liquid Limit, Deep Mixing, Unconfined Compressive Strength, Sodium Hydroxide



Time Dependent Radiation Effect on The Dielectric Properties of Au/PVA/n-Si MPS type structures at Room Temperature

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Abstract: In this study, nanofiber PVA-Co, Zn acetate film was deposited on n-type silicon substrate at room temperature with electrospinning technique. Scanning electron microscopy results indicate that PVA-Co, Zn acetate film has a nanofiber structure. The electrical and dielectric properties of Au/(Co, Zn-doped)PVA/n-Si MPS structures were investigated under time dependent radiation effects. For this purpose, capacitance-voltage (C-V) and conductance-voltage (G/ω-V) measurements were performed immediately after exposure to ⁶⁰Co γ-rays the source at 1MHz frequency at room temperature for 1st and 30th days in the range of ± 4V. The radiation dependence of dielectric constant (ε'), dielectric loss (ε''), dielectric loss tangent (tanδ), the real and imaginary parts of electric modulus (M' and M'') and the ac electrical conductivity (σ_{ac}) are studied for Au/PVA/n-Si MPS type structures. ε'-V, ε''-V, tanδ-V and σ_{ac}-V values were found to decrease, while M'-V and M''-V values increase with time dependent radiation effect. Experimental results show that the electrical and dielectric parameters were found to be strong functions of time dependent radiation effects and applied bias voltage especially in depletion and accumulation regions. Such bias and time dependent radiation effect of these parameters can be explained on the basis of Maxwell-Wagner interfacial polarization and restructuring and reordering of charges at interface states.

Keywords: Dielectric Properties, MPS, Time Dependent Radiation, C-V and G/ω-V Measurements, Electrospinning Technique



Theoretical and Experimental Studies for the Corrosion Inhibition Potentials of 4-(4-bromophenyl) Thiosemicarbazide for Mild Steel in 1.0 M HCl

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Abstract: In this study, the effect of different concentrations of 4-(4-bromophenyl)thiosemicarbazide (4-BrPh-TSC) possessing oxygen, nitrogen and sulfur hetero atoms in its structure, as a corrosion inhibitor for mild steel was practiced by measuring AC Impedance and current-potential techniques in 1 M HCl solution at 20°C temperature. While E_{corr} value was -0.518 V in uninhibited solution, it shifted slightly in the positive direction in inhibited solutions with the increase of inhibitor concentration. The current density of anodic and cathodic regions has lower compared to that of 1.0 M HCl solution. i_{corr} value was $158.78 \mu\text{A}\cdot\text{cm}^{-2}$ in uninhibited solution and $8.10 \mu\text{A}\cdot\text{cm}^{-2}$ at the 1×10^{-2} M concentration of 4-BrPh-TSC. When inhibitor concentration increased the values of corrosion current densities decreased, inhibition efficiency values increased. The percentage inhibition efficiency values ranged from 71–95%. The values of R_{pblank} and R_{pinh} are 235 and 2006 $\Omega\cdot\text{cm}^{-2}$, $\text{CPE}_{\text{blank}}$ and CPE_{inh} are 348 and 36 $\mu\text{F}\cdot\text{cm}^{-2}$ and n_{blank} and n_{inh} 0.94 and 0.84 for uninhibited and highest concentration of 4BrPhTSC solutions, respectively. The R_{p} values increase, the CPE values and n decrease with increasing inhibitor concentration most probably due to the decreasing local dielectric constant and/or increasing thickness of the metal/solution interface. The adsorption of inhibitor on a mild steel surface obeyed Langmuir model. Adsorption equilibrium constant and adsorption free energy were determined. The value of $-\Delta G_{\text{ads}}^{\circ}$ is -36.00 kJ mol^{-1} for derivatives of 4BrPhTSC, it is suggested that the adsorption of these inhibitors involve two types of interactions: chemisorption and physisorption. The density functional theory (DFT) at the B3LYP functionals with the 6-311G(d,p), basis set were performed on for 4BrPh-TSC.

Keywords: Corrosion, Inhibition, Mild Steel, Thiosemicarbazide, Quantum Chemical Studies



Comparitive Study of Calculated and Experimntal Pka values for Some Acetoxy Derivative Compounds

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Abstract: Pka is the negative base -10 logarithm of the acid dissociation constant (Ka) of a solution. $pK_a = -\log_{10}K_a$. The lower the pka value, the stronger the acid. It depends on the identity and chemical properties of the acid. Therefore, pKa was introduced as an index to express the acidity of weak acids. because of the importance of pka values for enzymatic reactions as an indicator to the difficulty of the uncatalyzed reaction, which is important for understanding the proficiency of the enzyme.

In this study we have calculated pKa value for acetoxy group using CBS-Q method which is one of the Complete Basis Set methods to find accurate energies. The acetoxy group molecules were also planned by Quantitative Structure Activity Relationship (QSAR) to study their effect on paraoxonase1 activity. Moreover the quantum chemical calculations have been carried out at the CBS-Q level of theory using Gaussian-09 series of program package. Some descriptors for the same molecules like HOMO, LUMO, Energy gap, Hardness, Softness, Electronegativity, Chemical potential, Electrophilicity index, Electrofugality, and Nucleofugality were calculated. Those molecules and their experimental pka in

Keywords: Acetoxy, QSAR, Pka, HOMO, LUMO



Experimental and Numerical Investigation of Lateral Torsional Buckling Behavior of IPE and UPE Steel Beam

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Abstract: Beam-columns are structural members subjected to a combination of axial and bending forces. Lateral-torsional buckling is one of the main failure modes. Beam-columns that are bent about its strong axis may buckle out of the plane by deflecting laterally and twisting as the values of the applied loads reach a limiting state. Lateral-torsional buckling failure occurs suddenly in beam-column elements with a much greater in-plane bending stiffness than torsional or lateral bending stiffness. Beam-columns are structural members that combine the beam function of transmitting transverse forces or moments with the compression (or tension) member function of transmitting axial forces. Beam-columns are mostly loaded in the plane of the weak axis so that bending occurs about their strong axis. First order bending moments and in-plane deformations are produced by the end moments and transverse loadings of the beam-column, while axial force will produce second order moments and additional in-plane deformations. When the values of the loads on the beam-column reach a limiting state, the member will experience out of plane bending and twisting. At this limiting state, the compression flange of the member becomes unstable and bends laterally while the remainder of the cross section, which is stable, tends to restrain the lateral flexure of the compression flange. The net effect is that the whole section rotates and moves laterally. Lateral-torsional buckling (LTB) failure occurs suddenly in slender beam-columns with a much greater in-plane bending stiffness than their lateral bending or torsional stiffnesses. LTB is often the main failure mode controlling the strength of thin-walled structures and should be considered in design of slender beam-columns with insufficient lateral bracing due to it may occur long before the bending stress at the extreme fiber of the section reaches to yield point. As summarized above, the lateral torsional buckling failure mechanism in delicate steel beam members is a disruption of stability which is undesirably suddenly formed. Experimental studies on this subject are extremely limited. The literature review shows that there is no experimental stability study for lateral torsional buckling stability deterioration for IPE and UPE profiles which are commonly used in steel structures. For this reason, an experimental investigation of the lateral torsional buckling of the IPE160 and UPE80 steel beam test elements. In the scope of this study, four test elements, two IPE160 and UPE80 were tested total. In order to compare with the experimental results, computer simulations of steel beams which have been implemented with nonlinear finite elements. The results obtained by using ABAQUS software in numerical analysis are compared with the experimental results. With this comparison, it is discussed how successful the analysis results are.

Keywords: IPE Steel Beam, UPE Steel Beam, Lateral Torsional Buckling, Finite Element Analysis, ABAQUS



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GIS Information About the Urban Information System Focus: Çankırı Example

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Abstract: In the last fifty years, the population of the cities has increased rapidly due to the migration from the rural areas to the cities. A technology-based platform was needed in cities in order to meet various expectations and solve problems effectively. Many urban administrations have turned to the use of Geographical Information Systems (GIS) in the rational application of urban services to identify and address the needs of people living in urban areas. This trend developed over time, leading to the emergence of the Urban Information System (UIS). The UIS, which emerged from the use of GIS architecture, has begun to be formed in municipalities that are trying to find solutions to all the issues related to the city, providing resources for these operations and in direct contact with people. Local governments can use UIS to increase the quality of services provided, to collect taxes, to make plans, to carry out infrastructure works and to solve problems in all kinds of issues that fall within the municipality's duties and powers.

In this study, the main service areas of municipalities in Çankırı Municipality were evaluated, such as reconstruction, science works, water and sewage structures, park and garden services, cemetery services and similar activities carried out in these areas. For this purpose, the present situation of the legal, institutional and information systems infrastructure of the municipality has been examined. What is the application of UIS for the municipalities; the structure of the municipalities, their duties, and the information they need to implement these duties. In the next step, the Çankırı Municipality was introduced and the data used as the base for the existing UIS application were examined and the software used in designing and studying the database was examined. The existing structure of the municipality, the units, the location of the units and the non-spatial information were examined and the problems encountered were determined. At the last stage, the purpose of the system is to assess the needs, objectives, practices, sharing, and coordination of the inquiries.

Today, municipalities use UIS as a solution to the problem of collecting, storing and analyzing necessary information about the city and making it impossible to be presented by traditional methods. The use of UIS is crucial in ensuring the fulfilment of the various institutional services dealing with the work of the municipalities, the efficiency of services, the provision of resources and time, the availability of current and reliable information during decision making, and the efficiency of work.

Keywords: Geographical Information System, Urban Information System, Municipal Services, Çankırı



Effect of pH and Time of Acidic Extraction on the Yield and Characterization of Pectin Obtained from Medlar (*Mespilus Germanica*)

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Abstract: Pectins are a family of complex polysaccharides present within the primary cell wall and intercellular regions of growing plants. Pectins are regarded as a complex heteropolysaccharide consisting mainly of galacturonic acid with different degrees of esterification. The commercial usage of the pectin is as food additives especially for jams, soft drinks, and milk products generally and also pharmaceuticals and a number of other industries including use in edible films, dye, paper substitute, foams and plasticizers and etc. Different methods such as chemical, physical or enzymatic treatments are used for extraction and isolation of pectin from the plant sources. Among these methods, the most utilized method in pectin manufacture is chemical extraction with acidified water. In this study extraction of pectin by acidic water from Medlar was conducted. Influence of the selected parameters such as pH (2,3,4) and extraction time (1,1.5,2 h) at the temperature of 80°C on pectin yield were investigated. The highest yield of pectin was obtained at pH 4 and for 2 h. Pectins can be characterised by different parameters in which the degree of esterification (DE) is an important factor to determine rheological properties of pectins. In order to determine the type and color, the degree of esterification and color analysis were conducted in obtained pectin. The degree of esterification in the pectin was found as up to 85% which indicates that the medlar pectin was the high-methoxyl pectin. As a result, the medlar is an attractive source of pectin regarding to its pectin content and can be used for jam and jelly manufacturing because of the degree of methylation.

Keywords: Pectin, Extraction, Medlar, Degree of Esterification, Yield



Investigation of Boriding Effect on Tensile Strength for Ti6Al4V Titanium Alloy

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Abstract: Titanium and its alloys are widely used in many biomedical applications, areas of aerospace, marine, chemical, power and automotive industries etc. The main problem with titanium and its alloys is that their poor tribological performance properties limit their applications in related industries.

Surface modification seems to be the effective way to improve the tribological performance of titanium alloys. Titanium borides are well-known for their high hardness and excellent wear resistance in many tribological systems. These characteristics make boriding an excellent candidate for surface modification of titanium alloys.

The paper presents the study results of microstructure, microhardness and tensile strength of Ti6Al4V titanium alloy after boriding process. Boriding, also known as boronizing, is thermochemical diffusion based surface hardening process. As a result of boriding process, the layers consisted of two phases: TiB and TiB₂ which have high hardness and high wear resistance and excellent heat conductivity.

Ti6Al4V alloy was boronized in a liquid media which is the mixture of Na₂B₄O₇, SiC and Al at 1100 °C for 12, 16 and 20 h. The thickness of borided layers was investigated by scanning electron microscope (SEM). X-ray Diffraction was used to determine the elements of coating.

The microhardness from surface was measured by a standard Vickers microhardness tester under 50 g load. The hardness of untreated Ti6Al4V is approximately 330 HV. The hardness value increased 2789 HV after boriding process. The boron diffusion zone was measured to be approximately 200 µm.

From obtained results of tensile strength, the yield strength and tensile strength of the untreated Ti6Al4V alloy used as reference is higher than all borided samples. It has been determined that the strength of the Ti6Al4V alloy by the boring process is lower (between 2.7% and 9.6%) than untreated alloy.

When boronized Ti6Al4V samples are compared within themselves, the highest yield and tensile strengths were obtained at 1100 °C and 20 h and the lowest yield and tensile strength borided Ti6Al4V samples were obtained at 1100 °C and 12 h.

Besides, the percent elongation and percent reduction of area decreased from 16% to 2% and from 44% to 4% respectively after boriding process. These results suggest that boriding reduces the ductility of the titanium alloy.

Keywords: Ti6Al4V, Boriding, Microstructure, Microhardness, Tensile Strength



Corporate Social Responsibility Awareness: An Assessment of the Relationship Between Green Management and Energy Management

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Abstract: The purpose of this study is to conceptually investigate the relationship between green management and energy management that are seen as the social responsibility strategies of enterprises. In this respect, the sense and significance of the topic are explained with a detailed literature review. The concept of social responsibility indicates that enterprises are in interaction with all their stakeholders regarding their social and environmental activities and operations in accordance with the principle of volunteerism and beyond their obligations and responsibilities to the environment where they are located. The increasing importance of habitable environment forces both individuals and enterprises to be more sensitive to the environment. Especially from the point of enterprises, green management or environmentally friendly management is an understanding of management that adopts the ecological environment culture and increases the awareness of employees and employers regarding protection of the ecological environment by incorporation of the inclusion of ecological environment in decision-making processes, minimization or elimination of damages to the environment and assurance of the product designs and packaging's not posing a risk to human health and ecological environment. Energy management is a group of strategies adopted by enterprises for productive energy production within the context of limited resources, ensuring energy conservation and extending the general use of environment-friendly energy resources. Technology is the main factor of energy management in this day and age. Through technological advancements and engagement of smart management systems, significant developments are achieved in producing energy with lower costs, preventing losses in distribution, ensuring energy conservation and minimizing energy consumption hazardous to life and environment. However, it is a known fact that these developments are also connected to the social responsibility awareness or culture of the enterprises. Thus, this study will be meaningful when evaluated within this context.

Keywords: Green Management, Energy Management, Social Responsibility



The Effect of Sandblasting Parameters on Surface Roughness of Orthopedic Implant Materials

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Abstract: A number of studies have been conducted on the factors affecting the mechanical strength of the implant-bone cement interface. One of them is implant surface roughness. Surface roughness is vital for interdigitation of implants with bone cement, or during pre-coating preparations of cementless implants. Surface roughness has been used as a parameter in many investigations. However, it is not clear how the surface roughness values used are obtained.

In this study, the effects of different sanding parameters on the surface roughness of three different materials (Ti-6Al-4V, 316LVM and Co-Cr-Mo alloy) which are frequently used in implant manufacturing were investigated. Aluminum oxide sand has been used because of its biocompatibility in the sandblasting process. The effect of the surface roughness of four different aluminum oxide sands under constant sand blasting pressure and distance was investigated.

When the measured surface roughness values were examined, it was found that the surface roughness values decreased as the sand grain size decreased. For the titanium material; a surface roughness of 7.5 µm with EKF16 sand and a surface roughness of 2.7 µm with EKF60 sand were obtained under fixed sandblasting pressure and constant sandblasting distance. The highest surface roughness value ($R_a=7.5$ µm) was found in the Ti-6Al-4V material, while the lowest surface roughness value ($R_a=4.7$ µm) was found in the Co-Cr-Mo alloy material under same sand size, fixed sand blasting pressure and distance. The results show that as the hardness values of the materials increase, the surface roughness values formed by the sandblasting are decreased.

Keywords: Surface Roughness, Sandblasting, Aluminum Oxide, Implant, Ti-6Al-4V



Temporal and Spatial Variation of Land Cover and Land Use by Remote Sensing Techniques and Geographic Information Systems: Kastamonu

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Abstract: One of the most important and common application areas of remote sensing technologies is the monitoring of urban development with the aid of satellite imagery. Detailed determination of urban land use is important for decision makers, planners, practitioners, and researchers. Many environmental factors such as ecosystem, biodiversity, and regional climate change are negatively affected because of industrialization and rapid urbanization. Therefore, today remote sensing technology is used as an important tool for the rapid and effective detection of temporal changes of cities. In this study, the temporal and spatial variation of land use and land cover of Kastamonu between 1999-2016 was examined.

This study was conducted in 135 km² area, including the provinces of Kastamonu province and central districts. In the study, Kastamonu province was selected as an example area, it was urban growth, its agriculture usage was variable with time, and it was a factor of the wide occupation of forest areas intensively in land cover. The boundaries of the study area on the satellite images were determined and limited. This area is grouped into four different land use classes, forested area, water area, agricultural area and built-up areas. The infrared band was removed and the remaining bands were classified as unsupervised and the change in the satellite images of different dates was spatially expressed.

In the study area, 49.5% forested areas, 1.1% water areas, 33.2% agricultural areas and 16.2% built-up areas were determined in 1999. Likewise, spatial distributions were determined 41.7% forested areas, 11.9% water areas, 19.2% agricultural areas and 27.2% built-up areas in 2016. It was determined that forested areas decreased by 7,8%, water areas increased by 10,8%, agricultural areas decreased by 13.9%, and built-up areas increased by 10.9%.

Migration to population and cities has increased rapidly in recent years, as various health and social services become more accessible. The reduction in the rate of construction, the decrease in agriculture and forested areas are supported by this. This increase is accompanied by negative impacts on the ecosystem and biological diversity. For city planners or decision makers, it is of great importance to increase such studies and to elaborate the analyzes so that these adverse conditions can be avoided and more rational and effective decisions can be made. Nowadays, when technology is rapidly spreading and the availability of computing systems participates in the account, it will be advantageous to use remote sensing and GIS techniques in effective decision making and planning studies.

Keywords: Remote Sensing, Land Use, Land Change, Kastamonu



The Role of Boride Layers in Impact Energy for Ti6Al4V Titanium Alloy

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Abstract: Titanium (Ti) and its alloys have an excellent combination of the desired material properties, such as high corrosion resistance, high strength, low density, non-magnetism, and excellent biocompatibility. Titanium alloys are known to have low hardness, poor wear resistance and high friction coefficient. Surface modification seems to be the effective way to improve the tribological performance of titanium alloys. Titanium borides are well-known for their high hardness and excellent wear resistance in many tribological systems. These characteristics make boriding an excellent candidate for surface modification of titanium alloys.

The paper presents the study results of microstructure, microhardness and impact energy of Ti6Al4V titanium alloy after boriding process. Boriding, also known as boronizing, is thermochemical diffusion based surface hardening process. Purpose of the boriding process, formation of ceramic boride layer which consisted of two phases: TiB and TiB₂ have high hardness and high wear resistance and excellent heat conductivity.

Ti6Al4V alloy was boronized in a liquid media which is the mixture of Na₂B₄O₇, SiC and Al at 1100 °C for 12, 16 and 20 h. The thickness of borided layers was investigated by scanning electron microscope (SEM). X-ray Diffraction was used to determine the elements of coating.

The microhardness from surface was measured by a standard Vickers microhardness tester under 50 g load. The hardness of untreated Ti6Al4V is approximately 330 HV. The hardness value increased 2789 HV after boriding process. The boron diffusion zone was measured to be approximately 200 µm.

From obtained results of impact test, the impact energy of the untreated Ti6Al4V alloy used as reference was obtained 30 Joule. The impact energy of borided Ti6Al4V at 1100 °C for 12, 16 and 20 h were obtained as 32 Joule, 31 Joule and 31 Joule respectively. The significant changes were not observed on impact energy values of the samples. It is known that the boriding process reduces the impact energy in steels. Due to borided layer is very thin, it has been determined that there is no positive or negative effect on impact energy. These results suggest that boriding has no effect on ductility and toughness of the titanium alloy.

Keywords: Ti6Al4V, Boriding, Microstructure, Microhardness, Impact Energy



Investigation of Impact Behaviours of Bone Cement and Implant Materials Interfaces

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Abstract: The mechanical strengths of implant-cement and bone-cement interfaces are very important for the cemented total hip replacement to maintain long period stability. In the previous studies, the strengths of both interfaces were examined for tensile, shear and multi-axial loading. However, the impact strength of the interfaces is uncertain. Whereas, in the cases such as high jump, falling, crash of an object, or traffic accidents, it may occur to force of impact in the surgical area. In this study, the impact strengths of both interfaces were tested in vitro and the effects of different parameters on the interface impact strengths were investigated.

Bovine bone and bone cement were used at the bone-cement interface and three different materials were used which are frequently used in implant manufacturing at the implant-cement interface. Implant materials were sandblasted with different sizes of aluminium oxide particles and the effect of surface roughness on the impact strength of the interface was investigated. The test specimens were subjected to izod impact test according to the ASTM D 950-03 standard used to determine the impact strength of the adhesively bonded joints.

The obtained data shows that for the same implant material, the surface impact strength increases with increasing surface roughness. In addition, bone-cement interface impact strength (8.83 kJ/m^2) was found to be higher than implant-cement interface impact strength (1.25 kJ/m^2) for surface roughness values (avg. $R_a=3.4 \text{ }\mu\text{m}$) close to each other. Therefore, it is likely that damage will occur at the implant-cement interface during an impact.

Keywords: Total Hip Replacement, Bone Cement, Impact Strength, Implant-Cement Interface, Bone-Cement Interface



Theoretical Studies on the Corrosion Inhibition Characteristics of Thiosemicarbazide Derivatives

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Abstract: In this study, density functional theory (DFT) was used. As an inhibitor, this study was used to protect the corrosion behaviour to determine the relationship between the quantum chemical descriptor parameters obtained from the molecular structure of the compound and the inhibitory efficiency of the compounds treated with the standard Gaussian 09 software package [1]. Quantum chemical calculations using B3LYP and RHF methods with the 6-311G(d,p) and 6-311++G(2d,2p) basic sets and CBS-Q method were used and performed to give further insight into the inhibition mechanism of benzaldehyde thiosemicarbazone (BTSC, **1**), *p*-chlorobenzaldehyde thiosemicarbazide (PCIBTSC, **2**), 4-dimethylaminobenzaldehyde thiosemicarbazide (4DMBTSC, **3**) [2] for neutral and protonated forms in gas phase and water phase (Fig. 1). The quantum chemical parameters, E_{HOMO} , E_{LUMO} , Energy gap (ΔE), chemical hardness (η), softness (σ), electronegativity (χ), chemical potential (μ), global electrophilicity (ω), nucleofugality (ΔE_{n}) and electrofugality (ΔE_{e}) were found by using the above basic sets. As a result of these calculations, the order of inhibition efficiency is found 4DMBTSC (**3**) > BTSC (**1**) > PCIBTSC (**2**) as compatible with the experiment results for neutral and protonated forms in gas phase and water phase. The correlation coefficient between the experimental inhibition efficiency (IE %) and theoretical results was found using the theoretical results. There was no significant difference between the reference set and the trend results ($R^2 = 0.9988$ and $R^2 = 0.9993$), between the same rows.

Keywords: Corrosion, Inhibitors, Thiosemicarbazone, Theoretical Studies, DFT



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Hardness Test Investigations of API 5L X65 Pipe Joints

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Abstract: In this study, the welding performance of natural gas pipes made of API 5L X65 steel material by electric arc welding method was investigated by using Taguchi method. The specimens from the welded joints specified by the Taguchi method were subjected to hardness tests. The data and hardness graphs obtained from the tests showed that similar hardness behaviors. It was determined that hardness values differed according to applied strength of current, welding direction and electrode type. In all hardness data and graphs, the highest hardness values were determined in Heat Affected Zone (HAZ). The lowest values were in base material areas. The hardness values of weld metal were specified between the values of base metal and the HAZ.

Keywords: Hardness, API 5L X65, Pipeline, Welding, Taguchi



Toughness Investigations of API 5L X65 Pipe Joints

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Abstract: In this study, the welding performance of natural gas pipes made of API 5L X65 steel material by electric arc welding method. The specimens from the welded joints specified by the Taguchi method were subjected to Charpy Impact test. The data and obtained from the tests showed that toughness values changed according to applied strength of current, welding direction and electrode type. Because heat input increased and rate of cooling lengthened out, it has been observed that the toughness values increased with high strength of current values. So welding process which made bottom to top direction, effect of the heat input and rate of cooling, higher weld metal toughness values were observed in the tests. The impact resistance of the alkaline electrode has showed higher values than cellulosic electrode.

Keywords: Toughness, API 5L X65, Pipeline, Welding, Taguchi



A New Technique for Sorting of Metals in Scrap Industry

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Abstract: In recycling sector, reliable, fast and accurate identification of scrap metals is still a challenge which usually causes noticeable financial losses and market insecurity. Most of the companies use traditional methods for sorting of metals such as making an assessment through colour, shape and density. However, incorrect identifications usually take place in conventional techniques, and this results in undesired economic outputs in buying and selling of scrap metals. Commercially available measurement systems are somewhat expensive, hence they are not widely used in recycling sector. In this respect, novel methods are highly required for low-cost, fast and accurate identification of scrap metals. Therefore, a new technique based on thermal conductivity is developed within the scope of this research, and the accuracy of the novel method is justified through different scrap metal samples. The new method can be considered as a successful application of Fourier's heat conduction law. Copper, brass and stainless steel samples are utilised in this study to verify the accuracy of the results. For a reliable and scientific approach, three independent sets of experiments are carried out, and the results are comprehensively assessed in terms of accuracy and consistency.

Calibrated scrap test samples are received from a manufacturer with the actual thermal conductivity values given at room temperature prior to starting the experiments. These values are compared with those of other manufacturers in literature, and a very good agreement is observed. Afterwards, the aforesaid samples are mounted inside the propylene body to check the reliability and the accuracy of the novel design through the repeating independent experimental tests. The tests start with the adjustment of electrical power to a certain value about 5 W and the cooling unit is set to 5 °C at the same time. The whole system is left to run, and it is checked from the axial temperature values that whether or not steady-state conditions are achieved. Then, thermal power and axial temperature values across the scrap metal samples are recorded to calculate the thermal conductivity for each sample. Three independent tests are repeated to check the accuracy and reliability of the results for a scientific and realistic approach, and each test consists of four separate experiments. A single test lasts about half an hour and in total, twelve experiments are carried out for each sample. The results indicate that twelve experiments for each sample provide sufficient consistency since there is a very good agreement between the literature data and the experimental results. The samples are selected from three different thermal conductivity ranges to evaluate the response of the novel measurement system to the change in heat conduction ability.

Experimental thermal conductivity values of the said samples are compared with the reported data in literature and a good accordance is achieved. Error in measurements is calculated to be 1.37, 3.31 and 4.46% for copper, brass and stainless steel sample, respectively which is acceptable. Through this acceptable accuracy range achieved for different scrap metal samples, the system is also considered for thermal conductivity measurement of endemic stones like Bayburt stone. The thermal conductivity of Bayburt stone is determined to be 0.59 W/mK, which is also in very good accordance with the previous literature.

The total cost of the system developed in this research is also insignificant, thus it is very easy to be adopted by the companies in scrap industry irrespective of size and transaction volume. It can be also asserted from the findings that the novel design can completely eliminate the remarkable financial losses and market insecurity due to incorrect material identification in buying and selling of scrap metals.

Keywords: Recycling Industry, Scrap Metal, Material Sorting, Thermal Conductivity, Heat Conduction



Fabrication of Polyvinyl butyral (PVB) Nanofiber Membranes by Electrospinning Technique for Oil/water Separation

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Abstract: Pollution of water sources due to the contamination of oil is a serious environmental problem. This pollution is mainly due to shipping accidents, offshore or marine vessel leaks and illegal discharges of oil waste. For this reason, it has prompted to a necessity to develop cost-effective and environmentally friendly ways to oil spill cleanup. Oil-absorbing materials are widely used for cleaning methods due to their some unique properties such as low cost, selective wetting behavior, high-throughput production of clean water, adequate buoyancy and reusability. Among the oil absorber materials nonwoven fibrous mats are commonly used for oil based cleaning due to their scalable production. In addition, nonwoven fibrous materials have been used as a sorbent with interesting properties such as fine diameters (ranging from submicron to several nanometers), large surface area, high porosity, and small interfibrous pore size in order to remove heavy metals and oily contents from wastewater.

In this study, an oil absorbing nanofiber membranes with high hydrophobicity and high oleophilicity were prepared by electrospinning technique. For this purpose, *Polyvinyl butyral* (PVB) was chosen because there have been no studies using this polymer to fabricate a nanofibrous membrane for the oil removal. First of all, different solvents were used to make this polymer spinnable, then the optimization was evaluated to determine electrospinning conditions. Secondly, chitosan and clay nanoparticles (organically modified montmorillonite o-MMT) Cloisite 20A (C20A) were incorporated separately to PVB polymer solution to produce two different oleophilic and hydrophobic nanofiber membranes called as PVB/Ch and PVB/C20A. The generated membranes surface morphology was observed by SEM and other analysis techniques. The motor oil absorption behavior of membranes was investigated and oil absorption capacities were calculated in terms of weight gain. Membranes exhibited excellent absorption capacity for motor oil up to 60-80 times of their weight. However, membranes showed lower capacity for motor oil than other domestic oils such as sunflower oil, corn oil, and soybean oil. As a result, this work demonstrated that the novel electrospun membranes have a potential for membrane applications in wastewater treatment systems.

Keywords: *Polyvinyl Butyral, Nanoclay, Chitosan, Oil Separation, Nanofiber*



Preparation of SAM Films of 2-Methoxy Phenylthiosemicarbazide and Investigation of Inhibition Effect on Copper Corrosion

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Abstract: In this study, 2-methoxy phenylthiosemicarbazide (MPTSC) coating on fresh copper surface was successfully prepared using a self-assembly process. Copper was preferred as coating surface because of its high thermal and electrical conductivities, low cost, malleability and wide application in industry [1]. Self-assembled monolayer (SAM) obtained in an inert gas environment after etching with nitric acid at ambient temperature [2]. The optimum conditions for formation of SAM were established using cyclic voltammetry [3]. The optimum conditions are acetone + ethanol as solvent, 20 mM concentration of the molecule and an immersion period of 24 h. The MPTSC SAM on copper surface was characterized by energy dispersive X-ray analysis (EDX), scanning electron microscopy (SEM), atomic force microscopy (AFM) and attenuated total reflectance – fourier transform infrared spectroscopy (ATR-FTIR). The EDX was used to characterize the MPTSC SAM and revealed the presence of various elements : copper, carbon, nitrogen, oxygen and sulphur in the MPTSC SAM. Surface properties of the MPTSC SAM was probed using SEM and AFM. ATR-FTIR was used to verify the functional groups belong to the MPTSC SAM. Corrosion protection ability of MPTSC SAM was studied in 3.5 % NaCl solution using impedance and potentiodynamic polarization methods. While bare copper showed a polarization resistance (R_p) value of 25763 Ω in NaCl aqueous environment, the R_p value for SAM concentration of 20 mM covered copper surface is 295801 Ω . The MPTSC SAM on copper afforded corrosion inhibition efficiency of 91 % in NaCl solution in the concentration range studied. SAM film of MPTSC is a good corrosion inhibitor for copper corrosion.

Keywords: Copper, SAM, Corrosion, EIS, EDX, SEM, AFM, ATR-FTIR



Effects of Solidification Rate on Microstructure and Mechanical Properties with Cd at Different Rates of AM60 Quality Mg Alloy

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Abstract: Some studies have been made on the development of Mg alloys based on the research and development (R&D) requirement arising from the use of Mg metal and its alloys in all commercial sectors. In this study, Cadmium (Cd) element of 0.2-0.5 and 1.0 % alloy was added in order to improve the microstructure and mechanical properties of AM60 quality magnesium alloy produced by casting method in atmosphere controlled melting furnace. The AM60 series Mg alloys, which were reflowed and Cd added, were poured into a stepped steel mold with three different cooling rates. As a result of the production, the effect of cooling rate and Cd addition on the AM60 alloy was investigated. Mg alloys which have cooled and solidified at different times have been subjected to tensile, hardness and microstructure (SEM + EDX). Experiments were conducted and evaluated according to ASTM standards. From the experimental results, it was observed that the Cd addition in different ratios generally increased the elongation (%). According to the other data of the tensile test, the highest tensile stress was found to be in the alloy with 0.2% Cd added. When the microstructure and chemical structure of Mg-based AM60 alloy is examined, it is seen that the structure consists of intermetallic phase of α -Mg and β -Mg₁₇Al₁₂. In addition, the microstructure morphology of the AM60 alloy varied considerably with the addition of Cd and the effect of the cooling rate of the special steel mold, and the grain boundary Mg₁₇Al₁₂ structure was thinned and reduced. The other phases in the microstructure, α -Mg, have been observed to decrease. As a result, with the addition of Cd added to improve Mg alloys, significant increases in mechanical properties have occurred and the microstructure phase distributions have changed.

Keywords: Magnesium, AM60, Cadmium, Microstructure, Mechanical Properties, Cooling Rate



Determination of Fire Resistance of Lightweight Geopolymer Concrete Produced with Perlite Aggregates

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Abstract: Along with the widespread use of concrete as building material in the world, concrete properties are being improved to produce concrete that is lighter, cheaper and better insulation. The main feature of these studies is the production of lightweight concrete by using light aggregate or by applying various methods to reduce the unit weight of concrete. Lightweight concrete is a building material that has gained importance in recent years and its usage has gained importance in many applications. In this study, the fire resistance of lightweight geopolymer concrete with perlite aggregates has been investigated in the production of lightweight construction materials that solve many problems such as earthquake, economy, heat and sound insulation, fire resistance. For this purpose, instead of cement used as a binder in the production of geopolymer concrete, sodium hydroxide (NaOH) and sodium silicate (Na₂SiO₄) as activator of mineral admixtures were used at the equal dosage (50/50%). Blast furnace slag was used as the main binder component and perlite aggregate was used as aggregate. It has been added to lime mixtures in ratios of 10%, 20% and 30% by blast furnace slag. In addition, milled aluminum dust (<300 micron sieve) was added in proportions of 1%, 2% and 4% of the blast furnace slag to lighten the samples. The fire resistance was determined by keeping 28 days samples at 300 °C, 600 °C and 900 °C for 1 hour in oven. As a result of the study, perlite aggregated geopolymer concrete was determined to be A1 fireproof.

Keywords: Construction Materials, Geopolimer Concrete, Lightweight Concrete, Perlit, Fire Resistance



A Numerical Study of the Effects of Spray Angle and Swirl Ratio on Combustion and Emission of Diesel Engines

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Abstract: During combustion process of a diesel engine inside the cylinder, it is very important that the fuel and air mix homogeneously. Aerodynamic effects due to air movement are very effective in separating diesel fuel into droplets and evaporating fuel. This effect is dependent on the fuel spray angle of the injector, the spray pressure, the nozzle diameter of the injector, and the swirl ratio of air taken into the cylinder.

In diesel engines, the fuel-air mixture is formed in the cylinder. For this reason, homogenizing the mixture and increasing the combustion efficiency takes place in a limited time frame. On the other hand, it is possible to damp this disadvantage somewhat by modeling the fuel injection process with the air movement formed in the cylinder. Especially at high speeds, the duration of combustion takes place in a shorter range. For this reason, the spray angle and the swirl ratio of the air movement must be optimally adjusted.

In this study, the effects of spray angle and swirl ratio on engine performance and emission values are investigated numerically. The AVL FIRE CFD software is used to obtain numerical results. The numerical model generated is compared with the experimental results and validated. The original engine's injector spray angle is 148 degrees and the swirl ratio is 2.37. Numerical results were obtained by examining the effect of different spray angles and swirl ratios in this study. The values of 140, 148 and 153 degrees as the spray angle and the values of 2, 2.37 and 2.5 of the swirl ratio were investigated. 9 different cases were created by obtaining the binary combinations of all these values. The case in which the experimental conditions are modeled is called "Reference Case". By comparing the other 8 cases both the Reference Case and among themselves, comments are made on the most optimum conditions in terms of both emission values and performance values.

Whereas highest values of NO_x, SOOT and HC emissions are determined at 140 degrees of spray angle and 2 of swirl ratio, lowest values are determined 153 degrees and 2.5, respectively. Lowest specific fuel consumption per unit power in terms of performance values is obtained at 153 degree of spray angle, 2 of swirl ratio. Power and torque values are found to be very close to each other at all spray angle and swirl ratios. When both emission and performance values are taken into account one can say 153 degree of spray angle and 2.5 swirl ratio value give better results compared to the reference motor.

Keywords: Diesel Engine, Numerical Simulation, Emission, Spray Angle, Swirl Ratio



Hardness Evolution of Vibrating Mold Casting

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Abstract: In this study, hardness development of Al7Si0,3Mg alloy according to DAS, SDAS and phase ratios were investigated. The mold in which the castings are carried out was a cascaded mold and specimens with variable wall thicknesses of 20 mm, 10 mm and 5 mm were produced. The casting temperature 750°C and the mold temperature was chosen 400°C. Images of the samples were taken using the light microscope from the edge, the center and the bottom of the specimen. Measurements were made on these images with the aid of the ImageJ program. For the non-vibrating specimens, the values of DAS, SDAS and phase ratios at 20 mm thickness were calculated; DAS 209 µm, SDAS 28 µm and the primary phase ratio 66,42% for the region near the mold surface. For the middle of the sample, the DAS was 282 µm, the SDAS was 31 µm and the primary phase ratio was 64,5%. For the lower part of the sample, DAS 321 µm, SDAS 25 µm and primary phase 68,5% were measured. While casting, 1,5 mm amplitude and 60 Hz frequency vibration was applied for 90 secs to the mold. Same measurements were taken. According to these measurements; DAS and SDAS decreased by 11% and 10,7% respectively for the region close to the mold surface and the primary phase increased by 7%. In measurements taken from the middle region of the sample; the DAS by 47,8%, the SDAS were decreased by 13%, and the primary phase increased by 7,5%. In the measurements taken from the area corresponding to the lower part of the sample; DAS by 25,2%, SDAS by 4% and primary phase by 1,6% were decreased.

It has been observed that the application of vibration increases the primary phase while reducing DAS and SDAS sizes. The hardness values were measured with the Brinell method using a 62,5 kgf load and a 2.5 mm diameter steel ball from the areas where the measurements were made. The changes in the hardness measurements are as follows; it was determined that the area near the surface of the mold were increased by 5,3%, in the middle part of the sample by 1,4% and in the lower part by 9,5%. As the increase in hardness value causes the material to become durable, it has the potential to be an alternative to the use of grain refiner for different applications with the optimization of the method.

Keywords: Aluminum, Casting, Hardness, Dynamic Nucleation, Mold Vibration



Heat Transfer Enhancement by Delta Winglets in a Periodic Channel Flow

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Abstract: Enhancement of the heat transfer and the pressure drop were investigated numerically in the rectangular channels with delta winglets. The delta winglets were placed in periodically staggered manner in the direction of flow to the upper and lower surfaces of the channel. The problem was solved under the periodically fully developed turbulent flow conditions. A constant heat flux was applied at the upper surface of the channel and the other surfaces were adiabatically accepted. The time-averaged Navier-Stokes (RANS) equations and energy equation for the turbulent flow in the channel and the heat conduction equation for the vortex generators were solved simultaneously as three-dimensional by using ANSYS Fluent 15 CFD package program. Realizable $k-\epsilon$ model was selected to model the turbulent flow and Enhanced Wall Treatment model was used to capture effects of near-wall. In the study, the length and angle of attack of the delta winglet producing longitudinal vortex were kept constant. For the fixed period value and the distance between the two winglets, which provides the highest thermal performance, the effect of height of the vortex generator winglet on heat transfer and pressure drop was investigated. Delta winglet height was varied from 5 to 20 mm. The highest Nu number and the least pressure drop were obtained for the winglet height of 20 mm and 5 mm respectively. From the perspective of heat transfer augmentation, the best performance was obtained for winglet height of 5 mm. The holes to provide the pressure drop were opened on the winglets, which improved the thermal performance.

Keywords: Delta Winglet, Vortex Generator, Periodic Flow, Heat Transfer, Channel Flow



Evaluation of Deteriorations Due to Air Pollution in Building Stones by non-Destructive Testings (NDT): Karatay Madrasa (Konya, Turkey)

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Abstract: Building stones in urban historical monuments deteriorate due to chemical weathering under the effects of anthropogenic pollutants such as particulate matter (PM_x), carbon monoxide (CO), sulphur oxide (SO_x), etc. depending on the use of fossil fuels. The climatic conditions combining with a dirty atmosphere accelerate the chemical weathering processes in immovable cultural assets. It is possible to determine the degree of the effects of deteriorations due to air pollution in building stones by non-destructive testing techniques (NDT) that have been increasingly used in recent years. As a result of developing industrial zones and the rapid increase in the housing industry in recent years in Konya, Seljuk monuments in the historical city core are exposed to the dirty atmosphere. The Karatay Madrasa from among these monuments was included in the study due to its proximity to the roads where traffic is the most intense in the city center. The portal of the Karatay Madrasa, in which chemical weathering is observed at the highest level with the effects of exhaust gas and dirty atmosphere due to traffic, was examined by NDT (IR thermography and portable XRF). The obtained data were aimed to constitute a basis for the evaluation of chemical weathering processes due to air pollution in historical buildings.

Keywords: Konya, Karatay Madrasa, chemical weathering, IR thermography, portable XRF



Some Mechanical and Thermal Properties of Light Powder Concrete Produced with Pumice Aggregate

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Abstract: Light construction materials solve many problems such as earthquake, economy, heat and sound insulation, resistance to fire and the pumice aggregate which is at the beginning of these materials is sufficient in our country and also the use of pumice in the production of lightweight concrete constitutes the most important point of today's work. For the production of lightweight concrete, there are various methods such as lightweight aggregate use, sandless aggregate usage, concrete made by using concrete weight reducing materials. The most common method of producing lightweight concrete is lightweight aggregate, which is an important material used to reduce the unit weight of both concrete and non-concrete. To reduce the unit weight of concrete, the light aggregate is used by replacing some or all of the normal weight aggregate. The purpose of this study is to investigate the usability of lightweight concrete, obtained by using pumice aggregate as a screed and a maximum particle diameter of 1 mm, to be produced for a construction material that provides economical and sufficient conditions. The amount of material required for concrete mix is used as weight. The total volume of the mixtures was determined by finding the volume of material in each group. Aggregate volume was used for the weights and pycnometer density factor values, and also water volume was determined by the amount of water added to the mixture. Light concrete was prepared with 250 kg/m³ and 350 kg/m³ dosages, water / cement (w/c) ratio was determined with pre-mixes as 0.98. In addition, light concrete blocks were produced by adding lime to the mixtures at 0.20, 0.40 and 0.60 percent of cement. These produced lightweight concrete blocks were water cured and steam cured. Unit volume weight, water absorption, porosity, compressive strength, freeze thaw resistance and thermal conductivity values of the samples were determined. When the results are examined, it was determined that unit volume weight values changed between 1.338 t/m³ and 1.471 t/m³, water absorption porosity values changed by about 14±2%, and porosities were changed to about 21±1% . it has been observed that the compressive strength decreases with increasing lime ratio between 10 MPa and 2.2 MPa and the freezing and thawing strengths are improved positively. The thermal conductivity values of the lightweight concrete block elements were determined to be 0.83 W/mK at 350 kg/m³ dosage samples and 0.74 W/mK 250 kg/m³ dosage samples. According to the results obtained, it can be seen that the pumice, which is expressed as screed, can provide advantages in the case of using in concrete block production.

Keywords: Construction Materials, Lightweight Agregate, Lightweight Concrete, Pumice, Powder Concrete, Cure Condition



Electrical conductivity of A356 aluminum alloy on vibrating mold casting

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Abstract: In this study, main perspective is focused on possible grain variations of Al7Si0,3Mg aluminum alloys throughout solidification while mold vibrating. Alloy was melted via resistance furnace and at 750 °C was poured to a metal mold, heated to 400 °C, has an amplitude of 7,5 mm. Alloy was allowed to solidify during 90 s. Furthermore, specimens were examined to reveal any microstructural variations on an optical microscopy. All grains were appeared to be refined, after analyzed. It is seen that mold vibration is a distinguished method to refine as-cast grains like other grain refinement methods. Measured values of DAS and SDAS of three different section from three different points, side, center and top surface, of mold were determined via ImageJ program, whereas comparison of %IACS values (The International Annealed Copper Standard) were conducted. There is a direct correlation between decreasing in DAS and SDAS and increasing in electrical conductivity. Measurements of 20 mm section when DAS = 143 µm and SDAS = 31 µm, %IACS = 21,58, from 10 mm section measurements when DAS = 135 µm and SDAS = 18 µm, %IACS = 22,98 and measurements of 5 mm section when DAS = 123 µm and SDAS = 15 µm, %IACS = 23,25 were evaluated. The results show that use of vibrating casting, which causes dynamic nucleation, or grain refiner has a positive effect on increasing the electrical conductivity of refining grains.

Keywords: Al7Si0,3Mg, Vibrating Mold Casting, Electrical Conductivity, Dynamic Nucleation, Mold Vibration



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Determination of Deteriorations in the Portal of the İnce Minareli Madrasa

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Abstract: Konya province, which served as the capital city of the Anatolian Seljuk state, became one of the most important cities of its period along with the progress in science, art, and architecture. The architectural works that have reached the present day from the Seljuk period have become the symbols of the city nowadays. Among these works, the portal of the İnce Minareli Madrasa is one of the most important examples of the development of the Seljuks in architecture with rich stonemasonry. The portal was built using easy-to-process pyroclastic rocks in the masonry structure. These rocks are easily deteriorated depending on climatic and environmental effects. Deteriorations in the building stones of the portal have become quite apparent recently. In the study, it was aimed to determine the deteriorations in the portal of the İnce Minareli Madrasa, which is included in the tentative list of the UNESCO and to constitute a basis for its sustainable protection. For this purpose, in-situ (Schmidt rebound hammer test, P-wave velocity test and material moisture measurement test), laboratory tests and deterioration maps were made.

Keywords: Konya, İnce Minareli Madrasa, Stone Deterioration, P Wave Velocity, Schmidt Hammer Rebound, Moisture Measurement Test



Usage of Artificial Intelligent Tools in Drying

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Abstract: As well-known, there is no requirement for mathematical model of the system while artificial intelligent tools are using. This is the main attributes of the artificial intelligence and the necessity for training algorithm and its time consumption are the main drawbacks of these kind of tools. In this study, application of some of the artificial intelligent tools such as: artificial neural networks (ANN), genetic algorithms (GA), adaptive network based fuzzy inference systems (ANFIS) on drying phenomena have been investigated. Firstly, breif information for these tools have been presented. Next, design stages of these approaches to apply for the food drying have been given in detail. Then, effect of training and transfer functions on these tools have been examined with a tabular form. Finally, some of the application and comparison results have been demonstrated. It was observed that the accuracy of the obtained results have been increased with the usage of artificial intelligent tools based on obtained results.

Keywords: Artificial Intelligence, Artificial Neural Networks (ANN), Genetic Algorithms (GA), Adaptive Network Based Fuzzy İnference Systems (ANFIS), Drying



Evaluation of the Parameters Affecting the FRP Reinforcement-Concrete Bond and the Existing Equations in the FRP-Reinforced Concrete Codes

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Abstract: The bond properties of the FRP reinforcing bars constitute one of the most important parameters affecting the flexural behavior and ductility values of FRP-reinforced concrete beams. The bond between FRP bars and concrete is mainly dependent on 13 different parameters, i.e. the type of FRP fibers (Carbon, Glass, Aramid, Basalt), the type of polymer (epoxy, polyester, vinyl ester), the modulus of elasticity, surface condition (smooth, ribbed, sanded, braided, wrapped and strand), diameter, embedment length, spacing, clear cover and location of the FRP bars, the compressive strength and fiber content of concrete, the transverse reinforcement ratio of the member and the environmental conditions (the presence of alkalis, temperature cycles and freezing-thawing cycles).

In the present state-of-art study, the parameters, which are thought to have influence on FRP-concrete bond, were evaluated individually through the studies in the literature and the question of whether each parameter affects the bond or not was tried to be clarified. Furthermore, the equations in the international codes on FRP-concrete bond were evaluated based on the aforementioned parameters. This study indicated that there are contradictory conclusions about the effects of certain parameters in various studies and the degree of influence of each parameter was not set forth, although there are numerous studies on each parameter. Although the international FRP-reinforced concrete codes (ACI 440 1R-15, CNR, CSA S6-06, CSA S806-12, JSCE 1997) present different equations on bond strength and development length of FRP bars, none of these equations take all of the aforementioned parameters into account. Furthermore, these equations were found to yield to over-conservative estimates in the literature, and therefore, they need to be revised. Considering that there are a significant number of parameters and different test methods on FRP-concrete bond and different materials were used in the previous tests, reaching exact conclusions based on the test results available in the literature is rather cumbersome, if not impossible. For these reasons, an accurate evaluation of the effects of each test parameter on FRP-concrete bond can only be realized through an experimental study, in which each test parameter needs to be isolated in the experiments, i.e. only this very parameter is changed and the remaining parameters kept constant in the test matrix.

Keywords: Surface Deformations of Bars, FRP-concrete Bond, Development Length, FRP Bar, Polymer Reinforcement



Magnetic Features of Fe-Co Film with Various Cr-Underlayer Thicknesses

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Abstract: The next generation of high-tech memory technologies is rapidly being studied by scientists around the world. In order to emerge and fulfill the requirements of applications such as low power consumption, high speed, high efficient and long lasting durability, higher and superior magnetic thin films should be produced rapidly [1]. It is assumed that a higher anisotropy is now desirable for use with high magnetic recording and high frequency magnetic devices for recording high density data. At present, $L1_0$ -CoPt and FePt from the materials used for the magnetic recording are very attracting attention due to their strong magnetic anisotropy properties [2]. However, the elements containing these alloys are rarely found in nature and therefore they cause very high budgets for such applications. So, the use of materials of lower budget elements in such applications can be change the direction of these studies. Recent theories and experiments have proved that in-plane magnetization Co-Fe layer, or the similar oriented with the Fe layer are forming a consistent interface tunneling to the magnetic tunneling system and result in high tunneling. Some groups have proven that Co-Fe layer can be created only through the hybridization of Fe (3d) while others show that placing an appropriate underlying non-magnetic material is critical to developing PMA [3].

Here, we report the results of our work focused on developing a in plane anisotropy (IPA) on Si using anti-ferromagnetic Cr element as precursor underlayer and exploring what enables these underlayers to enhance the anisotropy. The full stack structure was as follows: **Si (substrate) (500nm)\Cr(0-10 nm)\Fe₇₀Co₃₀ (200 nm)\Si (2 nm) cap**. In order to see how the film underlayer thickness affects Co-Fe properties, Cr underlayer was deposited by changing the Cr layer thickness 0 to 10 nm.

According to the performed measurements, all films are in the desired crystal structure CoFe phase. The magnetic anisotropy energy (K_u) of thin films without the underlayer are comparable to the materials obtained with Co and Fe elements in the literature ($K_u \sim 10^4$ ergs/cm³) [1]. The anisotropy field of the Fe₇₀Co₃₀ films monotonically increases with increasing underlayer thickness up to 10 nm. In addition, the magnitude of K_u ($\sim 10^5$) in films where the Cr element is used as the under layer is increased as indicated in the motivation of the study. In addition to all of these, when used as a Cr sublayer, it has been observed superior to other magnetic properties such as squareness of hysteresis curve (M_R/M_S), saturation magnetizations (M_S), magnetic anisotropy field (H_K).

Keywords: In-plane Magnetic Anisotropy, Magnetic Anisotropy Energy, Fe₇₀Co₃₀ System



Determination of the Some Mechanical Properties of Alkali Activated Composites

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Abstract: The production of ordinary Portland cement (OPC) requires large amounts of fuel and raw materials and responsible about 7% total CO₂ emissions in the earth's atmosphere. The handicaps of the production of OPCs can extinguish with a new type of green and eco-friendly material, namely, geopolymer. The aim of the study is to investigate properties of alkali-activated slag/bottom ash mortars and different rates of rice husk ash. The ratio of blast furnace slag (BFS) / fly ash (FA) was chosen 100/0, 72.5 / 27.5, 45/55 and 7.5 / 92.5, and also the ratios of alkali (BFS + FA) / rice husk ash (RHA) 0%, 2.5%, 5% and 7.5% were used. As the activator used Na₂SiO₄ (SS) and NaOH (SH) used was used at four different dosages, varying between 0/100%, 70/30%, 40/60% and 100/0%. Prepared using Taguchi L16 test design matrix for experimental study, and also the FA and RHA to be used in the work were firstly grounded with sufficient fineness through a ball mill. The samples were poured into prismatic samples prepared in dimensions of 40 x 40 x 160 mm and 25x25x285 mm and thermal curing was applied at different temperatures and times. Bending and compressive strength tests were applied on prepared 2, 7, 28 and 90 day samples. In addition, the geopolymer mortars of 25x25x285 mm prism sample sizes prepared according to the stated mixture ratios, shrinkage properties were determined in water and room conditions up to 90 days. As a result of the study; it has been observed that the use of RHA up to 7.5% gives favorable results in terms of drying shrinkage and compressive strength. The maximum compressive strength was obtained in 27.5% ratio of FA and 7.5% in SH and 30% in SH. However, in terms of both the compressive strength and the shrinkage values, it is more appropriate to use 27.5% of the FA ratio.

Keywords: Geopolymer, Fly Ash, Slag, Sodium Silicate, Sodium Hydroxide, Compressive Strength



Effect of Smoke Removal System Flow in Ships on Smoke Control

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Abstract: Today, in line with technological and industrial developments, diversity of commercial products increased. However, with increased competition, firms start to search for new markets. This caused generation of intercontinental distribution and passenger networks. Seaway is preferred for intercontinental transportation as this transportation method is safe and cheap. Therefore, commercial and passenger ship traffic in open seas is constantly increasing. However, this traffic increases probability of negative scenarios. One of these negative cases is the fire on ship. High tonnage load carrying capacity of transport vessels may cause high financial losses in case of fire. Most importantly, with cruise type ships, high number of passengers can be carried across international waters. Fire in such ships may cause loss of life and property. Ship fire can occur due to various reasons including human-based or technical problems. However, engine room has the highest probability for fire on ship. Fire in these rooms may prevent control and movement of the ship and cause high financial damages. If this fire reaches fuel of the ship, the ship may explode, sink, and cause significant loss of life.

Therefore, in case of fire in engine room of the ship, different scenarios were numerically investigated. For this purpose, Pyrosim package program was used to simulate different fan flow. During analysis, size of the fire was constant, and fan flows were changed as 1 m/sec, 2m/sec, 3m/sec, and 4m/sec. Gas intensities as a result of fire were analysed instantaneously, and smoke flow was observed. Data obtained after simulation were compared with life threat limit data. While these data were compared, ambient temperature, air flow rate, and carbon monoxide intensity were analysed, and optimum parameters of personnel evacuation and fire intervention were determined.

Based on simulation data, it was determined that as fan flow increased, ambient temperature decreased. Additionally, with increased flow, smoke can be contained in specific region inside the room, and safe region volume was increased. This resulted in decrease in CO intensity over time. As a result, optimum ventilation system design was determined for removal of toxic gases during a fire in ship engine room.

Keywords: Smoke and Temperature Control, Carbon Monoxide Intensity, Ventilation System, Ship Fire



Numerical Analysis of Possible Fire Scenario in Ship Engine Room

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Abstract: Globalised world and advances in industry introduced the need for intercontinental logistic support. This could be provided with various transportation methods including sea transportation. Sea transportation is commonly preferred due to cheap and safe structure. This type of transportation is suitable for passenger and load transportation. As demand for seaway transportation increases every day, sea traffic in open seas also increases. Possible fire case in such ships may cause loss of life and property. Ship fire can occur due to various reasons including human-based or technical problems. However, engine room is one of the regions on the ship with highest probability for fire on ship. Fire in this section may prevent control and movement of ship and cause high financial damages. If fire on engine room is failed to control on-time, this fire may spread to fuel. If this fire reaches fuel of the ship, the ship may explode, sink, and cause significant loss of life.

In this study, in case of fire in engine room of the ship, different scenarios were numerically analysed. For this purpose, fire scenarios with different sizes were designed in engine room. With Pyrosim package program, time-based simulations were conducted. Analyses were repeated for 500, 1000, and 1500 kW fire sizes for first 6 minutes from the start of fire. Ambient temperature and smoke distributions were analysed. Time-based distribution of emission gas intensities was determined. Data obtained after simulation were compared with life threat limit data.

While these data were compared, ambient temperature, heat load of fire, air flow rate, and carbon monoxide intensity were analysed, and optimum parameters of personnel evacuation and fire intervention were determined. As a result, it was observed that with increased fire load, emission intensity increased. It was determined that in particular, carbon monoxide intensity was above predetermined limits. Similarly, it was observed that with increased fire size, ambient temperature in engine room increased. When these changes were analysed, it was determined that smoke tend to spread inside the room in a short time after the fire started.

Keywords: Ship Fire, Smoke Control, Temperature Control, Emission, Carbon Monoxide Intensity



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Effect of Si Content on Machinability of Al-Si Alloys Casted Sand and Metal Moulds

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Abstract: This study investigates the effect of metal and sand moulds casting (solidification or cooling rate) and increase of %Si content in Al-Si (Aluminium-Silicon) cast alloys on mechanical properties and machinability properties. The effect of cooling was analysed by casting the experimental samples in metal and sand moulds. Al-Si cast alloys with varying rates of Silicon (%Si) content (from 2% up to 12%) were used in the study. It was observed that the metal and sand moulds casting (cooling rate) of Al-Si alloys and mechanical properties (hardness and strength) increased depending on the %Si content in the alloy and that cutting forces formed during machining gradually decreased and thus machinability increased. Also noted in the study was the increase in the cooling rate and surface quality (Ra) of alloys (surface roughness value decreased) depending on the rise in %Si amount.

Keywords: Machinability, Cutting Force, Mechanical Properties, Al-Si Alloys, Surface Roughness



Comparison of the Machine Learning Algorithms with the Existing Experimental Data and Code Formulations in Estimating the FRP Bar-Concrete Bond Properties

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Abstract: The FRP-concrete bond properties influence the ductilities and load-carrying capacities of the structural bending members. Debonding of the bars from concrete is delayed, and therefore, the load capacity and deformation capacity of a bar increases, as the FRP-concrete bond is improved.

In the present study, artificial neural networks (ANN), support vector machines regression (SVMR), Gaussian process regression (GPR), regression tree (RT) and multiple linear regression (MLR), which are among the machine learning methods, were used for estimating the FRP-concrete bond together with the analytical equations, presented in the FRP-reinforced concrete codes (ACI 440 1R-15, CSA S6-10, CSA S806-12, JSCE 1997). In the learning process of the methods, four different data bases, comprising the experimental data from the various studies in the literature on hinged beam, beam-end pullout, beam splice and direct pullout test methods, were individually used. By comparing the bond stress estimates from both the machine learning techniques and the code formulations, the methods yielding to the closest agreement with the experimental data were established for all of the four test techniques. Furthermore, eight different parameters, i.e. the bar diameter, fiber type, bar surface type, bar location, bar clear cover, concrete compressive strength, embedment length and transverse reinforcement, were considered in the present study for estimating the bond strength.

Based on the RMSE, r and MAPE statistical evaluation criteria, GPR, ANN, MLR and SVMR methods were found to provide the most accurate estimates for the FRP-concrete bond. The estimates from the GPR method had an extremely high correlation with the experimental results as high as 0.95 and an error as low as 0.14. Among the ACI 440 1R-15, CSA S806-12, CSA S6-10 and JSCE 1997 code formulations, on the other hand, the ACI 440 1R-15 code formulation was found to provide the closest bond stress estimates, but the estimated values were shown to be over-conservative. All of the remaining code formulations were observed to provide extremely over-conservative estimates, which are in an almost constant (not changing) range. The estimates from these formulations were found to have almost no relation with the experimental results.

Keywords: Machine Learning, FRP Bond, Development Length, FRP Bar, Polymer Reinforcement



Influence of Wetting-Drying Cycles of Lime Stabilized Clayey Soil

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Abstract: Wetting-drying process happening in rainy places cause durability loss of natural soil. This study is focused on wetting-drying cycles of clayey soil stabilized with lime. Low plasticity clayey soil is mixed with 2%, 4%, 6%, 8% and 10% lime, respectively. Curing period of test specimens for the wetting-drying period is 28 days. This study is based on volumetric stability of test specimens and the test specimens were subjected to 12 wetting-drying periods according to ASTM D 559 after curing period. According to the relevant standard for the durability conditions, the maximum allowable loss in sample weight at the end of 12 wetting-drying periods is between 6-14%. As a result of this study, it was observed that the natural soil sample could not maintain its volumetric integrity on the first day and dispersed. The samples containing 2% lime lost their volumetric stability after the second wetting-drying cycle. The samples containing 4% and 6% lime showed durability against the wetting-drying cycle for 5 and 9 days, respectively. Samples containing 8% and 10% lime provided the durability requirements in the relevant standards as a result of the 12th wetting-drying cycle. In the light of this obtained data, it can be said that it may be suitable to use minimum 8% lime in the stabilization of low plasticity clayey soil against the wetting-drying cycle.

Keywords: Soil Stabilization, Lime, Wetting-Drying Cycles, Clay, Volumetric Stability



Investigation of Mechanical and Electrical Conductivity Properties of Concrete Produced by Using Steel Slag

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Abstract: De-icing salts and chemical solutions are often used to remove snow and ice during winter months. However, significant amounts of moneys are spent for salts and chemical solution by institutions and the using these chemicals results in deterioration of concrete and the environment. In recent years researches are carried out on conductive concrete technology to prevent snow and icing. Concrete with high electrical conductivity, when supplied with electric power by power sources, quickly heats the conductive concretes and prevents snow and icing on their top of the surface easily.

In this study, usability of waste steel slag in producing of concrete as aggregate, and the changes in the physical, mechanical and electrical conductivities of concrete specimens were experimentally investigated in case of using steel slag as aggregate. For this purpose, the steel slag was crushed to the same dimensions as the crushed stone aggregates of 4-11.2 mm in size and it used in replacement of the traditional aggregate at certain proportions in the concrete production.

To determine the physical, mechanical and electrical properties of the steel slag added concrete specimens, unit weight, compressive strength, electrical resistivity and electrical conductivity tests were carried out. Because of the experimental studies, it was concluded that waste steel slag aggregate can be used in concrete production. Due to the high iron content of the steel slag, it was concluded also concretes with high electrical conductivity could be produced.

Keywords: Steel Slag, Conductive Concrete, Mechanical, Waste Assessment, Electrical Properties



Controlled Manner Synthesis and Properties of Metal Nanoparticle Supported Hydrothermal Carbons from Glucose

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Abstract: Hydrothermal carbons (HTC) can be prepared from various types of biomass under milder conditions with a green synthetic approach. Recently, there has been a growing interest in functionalization of HTC for many purposes including energy storage, catalysis and nanocomposites electrode materials for Li-ion batteries. Modification of HTC with inorganic nanoparticles may involve in situ functionalization or post chemical treatments. Preparation, incorporation of nanoparticles and properties of nanoparticle-supported HTC strongly affects the performance for the intended applications. Therefore, controlled manner synthesis and preparation of HTC modified with different morphologies was investigated. For this purpose, silver nanoparticles stabilized by different moieties including polyvinylalcohol, polyvinylpyrrolidone and gelatin was considered and incorporated into glucose derived HTC by two different steps and characterized accordingly. Nanoparticle supported HTC can be controlled through the preparation method, nanoparticle type, and solution characteristics. Incorporation of nanoparticles into the HTC can be achieved by a controlled manner.

Keywords: Hydrothermal Carbons, Nanoparticle, Incorporation, Core Shell, Functionalization



Optimization of Geometric Parameters of Sandwich Structure under Oblique Impact using Response Surface Methodology

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Abstract: Sandwich structures are widely used for the safety of vehicles carrying personnel and equipment in various applications as shock absorber and protective due to their energy absorption capability and high impact resistance. A vehicle is rarely exposed to pure axial loads at the time of a crash or explosion. On the contrary, it meets the mixture of axial and oblique loads and deformation occurs in a complex way. For this reason, the oblique impact load must be taken into consideration in the design of sandwich structures. This paper treats the crushing behaviour and impact energy absorbing performance of sandwich structure with aluminium corrugated core subjected to oblique impact loading. The trapezoid profile was selected as the corrugated core geometry because of its successful performance against lateral loads. The effect of geometric parameters such as wall thickness, lateral wall angle, core height and the face sheet thickness of sandwich structure on impact performance at different impacts angle was investigated using the finite element method. Spherical shape impactor was used for impact analysis. The oblique impact angles to be applied to the sandwich plate by the rigid impactor were selected to be 45°, 60° and 75°. The design of experiment (DOE) technique was used to construct the experimental parameters. FEM analysis was performed using the commercially available software ABAQUS. Geometric parameters of the sandwich structure were optimized for optimal impact resistance performance for different impact angles using Response Surface Method (RSM). It is clear that the impact resistance performance of sandwich structures was influenced by the angle of impact load. The primary end result of this work is design information for the use sandwich structure to be expected of oblique impact loading.

Keywords: Sandwich Structure, Finite Element Analysis, Response Surface Method, Optimization, Oblique Impact Analysis



Lime Fineness Effect in Soil Stabilization

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Abstract: The major objective of this study was to investigate lime fineness effect on the unconfined compressive strength clayey soil. Soil used in this study was taken from a fine-grained soil deposit of Bayburt in the north east of Turkey. According to the Unified Soil Classification System, the classification of the soil is defined 'low plasticity clay (CL)'. In this study, lime was evaluated in natural and finely granulated forms to compare mechanical behaviour of low plasticity clayey soil before and after sieving process of lime. The amounts of lime used in the study are 2%, 4%, 6%, 8% and 10%, respectively. A series of unconfined compression tests were conducted after 1, 7 and 14 days of curing period as criteria for strength behaviour. The results of the study show that the amount of lime for maximum strength was 6%. It was seen that, usage of granulated forms of lime in soil stabilization has further increased the unconfined compressive strength results. The findings indicate that fineness of lime has direct effect on strength behaviour of soil.

Keywords: Soil Stabilization, Lime, Strength, Fineness Effect, Clay



The Effect of Brass Shavings and Copper Powders on the Electrical Resistivity of Cementitious Composites

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Abstract: The electrical resistivity of cement paste is an important key for many mechanical and physical studies in cement paste and concrete. This study examined the feasibility of using brass shavings and copper powder in cement paste for investigating the reduction in electrical resistivity of cement paste. In the experiments, brass shavings were used. Hybrid composition of copper powder and brass shavings were also considered for comparisons of the electrical resistivity. A water to binder ratio of 0.35 was used. The brass shavings used in the mixtures by replacing the cement in ratio of 0%, 10%, 20%, 30% and 40% by weight, while the hybrid composites conduct by fix the copper powder ratio as 10% in all specimens and the brass shavings ratio changed as 5%,10%,15% and 20% by cement weight. The resistance of the conductive cement composites was measured by AC two-probe method using a commercial LCR meter. The results from electrical resistivity measurement show that the higher electrical resistivity value of the pastes can considerably reduce by present brass shavings and copper powder. The composites with 20% of brass shavings reduced the electrical resistivity of cement paste to 60%, while the composites within 40% of brass shavings show 64% of reduction. Copper powder in hybrid composites has not change much the results compare with the same replacing ratio of brass shavings in cement pastes.

Keywords: Cement Paste, Electrical Resistivity, Brass Shavings, Copper Powder, Current Frequency



Potential of Using Self-Compacting Concrete in the Production of Concrete Sleepers

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Abstract: Railway sleepers are the superstructure elements that transverse the loads from the railway vehicles to sub layers support the rails, protect the gage side and support the horizontal and vertical movements of the rails. Due to the increase in construction of high-speed railway projects in the world and our country in recent years, also increased the need for prestressed concrete sleepers. Because of their structural performance, good durability properties, long term cost advantages, high service life, using prestressed concrete sleepers especially in high speed railway systems are increased day to day.

In recent years, a concrete type that emerges due to improvements in concrete technology is self-compacting concrete (SCC). It is an innovative concrete that does not require any vibration for compression and installation in the mold. SCC has many advantages compared to traditional concrete. Higher performance is obtained compared to traditional concretes because it is fluent, requires minimum labor, it is economical, rapid application, prevents noise pollution and easily fills the mold with its self-weight without apply any vibration. In the production of prestressed concrete sleepers, after the concrete casting is performed, vibration is applied in two stages as rough and thin. Since the self-compacting concrete does not require any vibration, saving of labor and time can be achieved if concrete traverse is produced with SCC method. Therefore, by using SCC method in prestressed concrete traverse production, daily production quantities can be increased, or costs can be reduced.

In this study, SCC design was performed to use in producing concrete sleepers and fresh and mechanical properties of SCC specimens were determined. In addition, according to the ratios obtained because of the designs, prestressed concrete sleepers specimens were produced in the factory and various tests were carried out. It was concluded that SCC method can be used in producing of prestressed concrete sleepers.

Keywords: Concrete Sleepers, Self-compacting Concrete, Railway



Investigation of the Usability of Grounded Diatomite and Pumice in Cement

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Abstract: Innovative studies have been continued in the field of construction. Particularly the studies has gained speed for the improvement and development of building materials. Cement is also one of the building materials that is frequently a good topic for researches. The aim here is to obtain alternative cement-based binders with better compressive strength by using different materials which are easily obtained in cement-based mortars. For this reason, two different materials were used in this study. And it was investigated whether these materials could be used in cement. These materials are ground diatomite and pumice. Diatomite is an organic sedimentary rock that forms from the fossilized siliceous shells of microscopic algae. Turkey has rich diatomite resources. However, diatomite is generally not used widely in Turkey due to diatomite is not well known in Turkey. The other material is pumice that is a light stone with a voided and spongy-like structure that formed as a consequence of volcanic events. Turkey is among the world countries which have rich pumice resources. In this study, the diatomite was obtained from Ankara-Kizilcahamam region and the pumice was obtained from Nevşehir-Urgup region. The maximum aggregate size is 4 mm in the prepared mortar samples. The water used in the mixture is Ankara city network water. For this study, the test samples were ground in cement slurry at 3 μ to 90 μ for 4 hours with the aid of a diatomite and pomace grinder before preparation of the samples. These fine materials obtained were used as substitutes of cement in mortar mixtures in 5%, 10%, 20% and 30% ratios. After that the slump-flow test was performed on the fresh mortars and then the mortar mixtures were filled with prism molds of dimensions 40x40x160 mm. The samples were left in the curing pool for 28 days. Then, 7 and 28 days compressive and bending strength tests were carried out for hardened mortar samples. According to the results of the tests, the head and bending strengths of the control mortars without pumice are higher than the charges produced as substitutes. The amount of pumice in the mortar has increased and the pressure has decreased in compressive strength. Diatomite-substituted mixtures showed an increase in stiffness in mortars up to 10% diatomite while a decrease in stiffness of 20% and 30%.

Keywords: Diatomite, Pumice, Cement Mortars, Slump-Flow, Compressive Strength



Estimation of Streamflows by Using Online Back-Propagation Neural Network

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Abstract: During the planning and projecting of water resources, reliable runoff estimations, runoff modeling studies and the modeling of the rainfall-runoff relationship has great importance. The modeling of the rainfall-runoff relationship is a non-linear process and depends largely on inputs. In this study, it was tried to determine the modeling of rainfall-runoff relationship with Artificial Neural Networks (ANN). In the study, Alyuda Neural Network software was used for modeling. In practice, monthly average temperature and monthly total rainfall data of rainfall stations nearest to the streamflow gauging station were used for estimating monthly mean river runoffs. In practice, for estimating monthly average flow of Karasu river, monthly average temperature and monthly total rainfall data of rainfall stations nearest to the streamflow gauging station were used. Rainfall and temperature data are given as input to the models and runoff values are obtained. For network training, 68.3% of the datas were selected as the training set, 15.85% as the test set and 15.85% as the verification set. The online feedback algorithm was chosen as training algorithm. Hyperbolic tangent was selected as the activation function. In the modeling phase, different number of layers and different hidden node numbers have been tried in the hidden layer to get the best results. The best matching network architecture is determined by tests that are 6-1-1. The test result showed that the coefficient of determination (R^2) of ANN equal to 0.91. According to the this result, it has been determined that Artificial Neural Networks can be successfully applied to the flow estimation problem using rainfall and temperature variables and produce safe estimates.

Keywords: Artificial Neural Network, Streamflow, Back Propagation, Prediction Model



A Numerical Investigation of Impact Resistance of Sandwich Structure Subjected to Spherical Impactor Using Finite Element Method

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Abstract: Sandwich structures are often preferred for engineering applications requiring high stiffness with low structural weight. The impact resistance of the sandwich structures under the impact load is largely influenced by shape and dimensional parameters. In this study, impact resistance performance of the aluminium corrugated core sandwich structures subjected to spherical impact loading are discussed. The trapezoid profile was selected as the core geometry. The influence of dimensional parameters such as wall thickness, lateral wall angle, core height and the face sheet thickness of sandwich structure on its impact performance parameters such as indentation depth, peak force, and absorbed energy were studied by using the finite element analysis (FEM) software ABAQUS. Experimental parameters for different dimensional parameter values were determined by using optimization techniques and geometric models were created accordingly. The Response Surface Method (RSM) was applied to optimize the dimensional parameter values that will exhibit the best impact performance. Results show that the dimensional parameters have an effect on its impact performance of sandwich structure. In particular, increased face sheet thickness was increased plastic energy dissipation.

Keywords: Sandwich Structure, Finite Element Analysis, Response Surface Method, Optimization, Impact Analysis

Thermal Performance Assessment of Jointings in Perforated Brick Walls by the Combined Use of Infrared Thermography and Guarded Hot Box

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Abstract: The study examines the thermal resistance capacity of some types of brick wall samples and thermal defects which may effect their thermal performances by using InfraRed Thermography (IRT) on quantitative basis. For that purpose, the study focuses on the development of a standard testing method by the joint use of calibrated hot box method and IRT in laboratory conditions in order to determine some basic thermal transmission characteristics of the perforated brick wall samples, such as thermal transmittance value (U , $W m^{-2}K^{-1}$), thermal resistance (R , $m^2K W^{-1}$), heat flow density (q , $W m^{-2}$) and thermal conductivity (λ , $W m^{-1}K^{-1}$). Some measurable parameters, such as “rate of warming up (R_w , $K s^{-1/2}$), “temperature index (TI, unitless)” and “temperature difference between the defect and sound area” (ΔT_{DEFECT} , °C) are introduced for the identification of some thermal failures, such as thermal bridge, air leakage and surface condensation.

Three types of brick wall samples (BW1, BW2 and BW3) were prepared at laboratory. The composition of brick walls were described below:

- Wall BW1: composed of vertically perforated conventional brick units (B1), with horizontal and vertical mortar joints,
- Wall BW2: composed of vertically perforated up-to-date brick units in which the internal perforations/cells are placed in staggered order (B2), with tongue and grove joints in vertical and mortar joints in horizontal,
- Wall BW3: composed of horizontally perforated up-to-date brick units (B3) in which there are voids in its cross section for placement of insulation boards in staggered order. Horizontal and vertical mortar joints are used while thermal insulation board infill is placed in its cross section. The boards were placed in staggered order, one is positioned closer to inside (warm side) while the other one is positioned closer to outside (cold side).

The use of jointing mortar or filling the broken parts of brick units with mortar cause thermal bridges in brick wall, therefore reduce its thermal resistance. Tongue-and-groove joints in brickwork has higher thermal resistance than mortar joints. The placement of thermal insulation board within the cross section of brick units in staggered order enhances the thermal resistance of brick wall and reduces heat loss through the mortar joints, while placement of thermal insulation board closer to the cold side contributes more to the thermal performance of brick wall. Using thermal insulation board within the brickwork in staggered order (BW3) has better thermal insulation performance than using tongue-and-groove joints between perforated up-to-date brick units (BW2). However, the wall BW3 suffers from heat loss considerably in case that there are air leakages through the wall section. The warm air inside when leaks through the defect areas runs through the staggered voids within the cross section of brick units. Therefore, the staggered positions of these voids should be designed in such a way that those voids entrap the leaked warm air within the wall section.

The results are promising that measurement set-up can be adapted on site for quantitative assessment of thermal performance for existing building walls and allow in-situ thermal monitoring of wall surfaces at the cold side while inside was warming up.

Keywords: Infrared Thermography, Calibrated Hot Box Method, Thermal Transmittance, Perforated Brick Wall, Thermal Defects

**Hygrothermal Aging Properties of Heat Treated Chestnut Wood (*Castanea sativa Mill.*)**

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Abstract: The heat treatment of wood is defined as the application of heat to wood in order to bring about a desired improvement in the performance of the material. The aim of this study is to determine changing of colour and hardness values of heat treated wood exposed to hygrothermal aging. For this purpose, chestnut woods (*Castanea sativa Mill.*) have been used. Heat treatment applications were applied in a temperature controlled small heating unit. Experimental samples, they were subjected to heat under atmospheric pressure and in the presence of inert (nitrogen) environment at three different temperatures (130, 180 and 230 °C) and two different time levels (2 and 8 h).

Then, heat treated samples have been exposed to hygrothermal aging conditions (in distillate water and 75° C heat) one and half month (forty five days). After the hygrothermal aging, changes in the colour and hardness of the samples have been determined according to ASTM-D 2240 and ASTM-D 2244-2 standards. Results have been compared with values of control samples belong to each group.

Keywords: Hygrothermal Aging, Heat Treatment, Colour, Hardness, Chesnut



Statistical Modelling of Railway Passenger Transportation with Artificial Neural Networks (ANN) and Analytic Hierarchical Process (AHP)

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Abstract: The aim of this study is to determine the railway passengers satisfaction level about the existing services and to determine whether is it necessary to protect the existing condition, to make improvements or to perform renovation works in the term of passengers satisfaction level.

In this study, a survey study was conducted with 515 passengers in determined 8 pilot provinces (Ankara, Eskişehir, Istanbul, Kocaeli, Sivas, Erzincan, Erzurum and Elazığ). In the literature survey, 7 criteria (Time, Comfort, Price, Safety, Transportation, Hygiene and Personnel Behaviors) and 3 decision options (Constant, Improvement and Renewal) based on expert opinions were determined.

These criteria were calculated by using Analytic Hierarchical Process (AHP) method developed by Thomas L. Saaty and Artificial Neural Networks (ANN) from multi-criteria decision making methods and the results were compared. Passenger behaviors and attitudes were analyzed by statistical methods.

It was concluded that, the time, comfort, security, transportation and personnel criteria remain the same, the price criterion is improved and the hygiene criterion is renewed.

This study is supported by Erzincan University, Scientific Research Projects Coordinator FAP-2017-431 Nolu Project and we thank the Rectorate and the Coordinator.

Keywords: Railway, AHP, ANN, Statistical Modelling



High Temperature Effect on Compressive Resistance of Heavy Concrete Including Polypropylene Fiber Produced with Barite Aggregate

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Abstract: Concrete is still an indispensable building material for humanity. However, concrete can not maintain its physical, chemical and mechanical properties in every environment. One of the harmful factors for concrete is high temperature. The damage caused by the high temperature effect on concrete is clearly visible in fire situations. The decline in the strength of the concrete under high temperature conditions indicates that the behavior of the high temperature effect of the concrete should be examined. Because of these; the investigation of the damages of the concrete exposed to the high temperature effect and the examination of the properties of the concrete after the high temperature have become an important subject.

In this study, the changes of compressive strengths of polypropylene fiber heavy concrete produced with barite aggregate and high temperature effect of polypropylene fiber normal concrete produced with crushed aggregate were investigated.

Production was realized in all concrete mixtures with a dosage of 450 kg / m³ for cement, 3 kg / m³ for polypropylene fiber, 1.3% for fluidizing additive cement and 0.40 for water / cement ratio. The specimens were cured for 28 days in a curing pool filled with water at 20 ± 2 ° C inside. Prior to high temperature application, samples (48 hours) were stored in the sample (105 ± 5 ° C). The samples were then exposed to high temperatures of 300, 600, 900 and 1300 ° C for 3 hours. Samples after high temperature effect; (22 ± 2 ° C) for 5-24 hours in the air until the temperature decreases to the temperature of the laboratory environment. Then compressive test was applied to the samples.

As a result; the compressive resistance of heavy concrete with barite aggregate was determined as 57.69MPa and the pressure resistance of normal concrete was determined as 58.78MPa. At 300 ° C, the compressive strength of barite aggregate heavy concrete is 48.70 MPa and the compressive strength of normal concrete is 54.90 MPa. At 600 ° C, the compressive strength of heavy concrete with barite aggregate is 23,38 MPa and the compressive strength of normal concrete is 24,52 MPa. As the temperature increases, compressive strength decreases. Under high temperature effect, normal concrete has better compressive strength values. The compressive strengths could not be determined because the samples at 900 and 1300 ° C were crushed. The high temperature effect has affected the pressure resistance in the negative direction.

As can be seen from these values, the effect of high temperature effect on the concrete in the negative direction, the compressive resistance values decreased. When the compressive resistance test results are examined; large amounts of loss were detected in the strengths of samples exposed to high temperature impacts compared to samples not exposed to high temperature effects. It has been determined that the high temperature has an adverse effect on the mechanical properties of concrete.

Keywords: Concrete, Barite Aggregate, High Temperature Effect



Binary Coated Nickel Mesh for Hydrogen Evolution Reaction

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Abstract: Hydrogen energy from renewable energy types is seen as the future energy. Hydrogen energy is preferred due to its environmental friendliness and high energy content. Hydrogen is a primary energy source that can generate energy directly. Hydrogen can be produced by a variety of methods such as coal gasification, thermolysis, thermal water separation, hydrocarbon steam reforming, biomass pyrolysis, photolysis and electrolysis. Water electrolysis is now used for hydrogen production from renewable energy sources due to its high energy efficiency. The hydrogen evolution reaction (HER) formed by electrocatalytic separation of water can provide a sustainable energy support for the future. Despite the advantages of electrolysis, electrocatalytic electrode development studies are being carried out due to its cost. Ni based electrodes are used in the hydrogen evolution reaction (HER). Nickel-supported electrocatalysts have high catalytic activity and low cost compared to other transition metals. Ni mesh is produced for applications such as fuel cells, cathode ray tube, sonic control and UV filtration. In addition, the flexibility of the Ni mesh allows it to be shaped into different forms and placed closer to the anode to reduce ohmic loss. The Ni mesh is used as a current collector especially in different applications.

In this study, nickel mesh electrodes were used as the cathode supporting material. Fe and Cu metals were precipitated on nickel mesh at different current densities and amounts. The surface morphologies were investigated by scanning electron microscopy. The HER activity is assessed by recording cathodic current–potential curves, cyclic voltammetry, electrochemical impedance spectroscopy.

The results show that the electrode with a higher amount of copper exhibits a more catalytic effect for the HER in alkaline media.

Keywords: Hydrogen Evolution, Nickel Mesh, Electrocatalyst



Solving Path Planning Problem in Mobile Robots using Meta-Heuristic Algorithms

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Abstract: In this study, the path planning problem was focused which has an important role in mobile robotics. In the robotic systems, different intelligence algorithms are utilized to find the shortest path from one start point to one target point. The path planning comprises finding the possible shortest solution of the mobile robot in an environment with obstacles. These possible solutions have to include paths free of collision with obstacles between start and target positions. We selected five of the well-known meta-heuristic algorithms to solve the path planning problem in the mobile robot systems. These algorithms are Differential Evolution (DE) algorithm, Particle Swarm Optimization (PSO) algorithm, Artificial Bee Colony (ABC) algorithm, Firefly Optimization (FO) algorithm and Gray Wolf Optimization (GWO) algorithm. DE algorithm based on the idea the fact that new candidates by adding a weighted difference between two population members to a third member. PSO algorithm imitates the sociological attitudes of flocking birds. ABC algorithm is based on the behavior of honey bees in nature. FO algorithm is inspired by the flashing behaviour of fireflies. GWO algorithm mimics the hunting mechanism and social leadership of gray wolves in nature.

In this study, five well-known meta-heuristic algorithms were adapted to solve path planning problem for mobile robots. In the comparison works of the robot path planning, we designed a map including three circular obstacles with different radius. For finding the candidate solutions in path planning, three coordinate points are used between start and target points. At each iteration, these coordinate points are updated by operators in the meta-heuristic algorithms. If the solution point is in the obstacle zone, then violation is added to the cost function. In comparison work, maximum number of iterations is 1000 and population size is 50 for all algorithms. The performances of the meta-heuristic algorithms were evaluated in terms of some metrics as best cost, mean cost, worst cost and standard deviation. According to the comparison results, GWO algorithm has the best performance among the algorithms.

Keywords: Path Planning, Differential Evolution, Artificial Bee Colony, Particle Swarm, Firefly, Gray Wolf



Trend of Monthly Streamflow Data Using Various Methods: A Case Study of Murat River

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Abstract: This study aims to determine the monthly and annual trends of the streamflow data obtained from a streamflow gauging station located at Murat River in the Euphrates basin.

The trend analyses are carried out for the period between 1968-2005. The monthly and annual trends of the station are determined with non-parametric Mann-Kendall and Spearman's Rho tests and Innovative Sen method, gives trend results graphically. In addition, Sen's estimator of slope, the median-based slope estimation technique, is used to determine trend slope. The pre-whitening method is used to remove the effect of serial correlation.

Prior to applying the nonparametric Mann-Kendall and Spearman's Rho tests to time series, it is required to remove the serial correlation effect from the series. For the referred station, the serial correlation is determined for only at October at the 5% significance level and the serial correlation effect is removed with the pre-whitening method.

The linear trends for all months and annual data except for February and March are determined the decreasing tendency. The trend analyses with nonparametric Mann-Kendall and Spearman's Rho tests show that there is no statistically significant trend at the 5% significance level for all months and annual streamflow data. The trend slope values calculated by Sen's estimator of slope show that the highest decrease is determined in April with $-6.78 \text{ m}^3 / \text{s} / \text{year}$ and the highest increase is obtained in February with $0.32 \text{ m}^3 / \text{s} / \text{year}$. According to the results of the Innovative Sen's method, it is determined that the streamflow values over $800 \text{ m}^3/\text{s}$ indicate an decreasing trend.

Keywords: Euphrates Basin, Streamflow, Mann-Kendall, Spearman's Rho, Innovative Sen's Method



Numerical Modelling of Flow over a Broad-Crested Weir

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Abstract: The flow over rectangular-broad crested weir was investigated in an open channel experimentally. In the experiments, free surface flows upstream and downstream of the weir were measured for three different flow rates. Computational Fluid Dynamics (CFD) simulations which have the same conditions with the experiments were used to analyze the flow field theoretically. The Volume of Fluid (VOF) method was used to determine the turbulent free surfaces of the flow in the CFD simulations. Different mesh compositions with standard k- ϵ turbulence closure model were examined and the numerically computed results compared with experimental measurements. The comparisons show that the results obtained by using the standard k- ϵ model with optimum mesh density found to be in good agreement with measured data.

Keywords: Broad-crested Weir, Open Channel, Computational Fluid Dynamics, Water Surface Profile, CFD



Wave Climate Study for Cide, Kastamonu Coastal Area

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Abstract: In this article long term wave climate and extreme wave statistics for Cide, Kastamonu coastal area are presented. Cide coastal area with a 90 km. shoreline has a 11 km. of main beach at the town center, and has a number of beautiful beaches including the famous Gideros Bay. Cide coastal area is one of the popular tourism destinations of Black Sea. In coastal engineering applications a detailed and comprehensive wave climate analysis is essential. The results of wave climate form an input for coastal engineering modelling and design which include modeling of longshore transport, design of coastal structures and sea outfall systems. In the wave climate study HYDROTAM-3D software and database is used. In the wind analyses, Cide Meteorological Station of General Directorate of Meteorological Works, and 6 hour wind estimates of ECMWF 42.0°N-33.0°E ve 42.1°N-33.0°E coordinates are compared. As a result of the comparison ECMWF wind data is concluded as the source data for the wave climate study. CEM method is utilized in the long term wave statistics using the results of ECMWF wind estimates for Cide coastal area. In the context of the long term wave statistics significant wave height, H_s and mean wave period, T_m occurrence frequency distribution and relation are shown. For each dominant direction H_s - T_m relations are given yearly and seasonal wave roses are presented. Model estimates have shown that the dominant wave direction range for Cide coastal area is North(N)-EastNorthEast(ENE). In the extreme value statistics, H_s with a 50 year return period is calculated as 9.05 m. The presented results can be used as a preliminary input for future coastal engineering modelling and design applications.

Keywords: Cide, HYDROTAM-3D, wave climate, ECMWF, CEM Method



Determination of Optimum Conditions of Biodiesel Production from Beef Tallow Using Ultrasonic Energy

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Abstract: Biodiesel is a renewable fuel produced from vegetable oils, animal fats, and recycled cooking oils. It can be produced by the transesterification of triglycerides using a primary alcohol and acid or base catalyst. Its most important advantages are biodegradable, non-toxic, environmentally friendly and sustainability. However, the high cost of biodiesel is its main disadvantage. Using a suitable raw material in the production of biodiesel will be convenient to reduce costs. Beef tallow is an oil which is accepted as a waste which is not preferred in the food sector. For this reason, producing biodiesel from it will benefit both the environment and the economy. This study examined the optimization of biodiesel production from beef tallow using ultrasound energy. Taguchi optimization method (L16 orthogonal array) was used to optimize the biodiesel yield. Catalyst amount, methanol/oil molar ratio, reaction time, ultrasound time and ultrasound power were chosen as parameters. The optimum conditions were determined to be 1.5 (wt. % of oil) catalyst amount, 7/1 methanol/oil molar ratio, 60 minute reaction time, 10 minute ultrasound time and 40W ultrasound power. Confirmation experiments were conducted to prove the effectiveness of the Taguchi method after the optimum parameter levels were determined. Under optimum conditions, the biodiesel yield reached 99.8%. According to this result, ultrasound energy reduced the necessary time to achieve high biodiesel yield and improved the transesterification reaction in this way. In addition, an ANOVA table was created to determine the effectiveness of the parameters. The most effective parameter was the reaction time. The effect of ultrasound power on the transesterification reaction was minimal.

Keywords: Biodiesel, Beef Tallow, Ultrasound, Optimization, Taguchi Method

**A Model Study for Tekirdag Rural Tourism Project: Ucmakdere (Sarkoy/Tekirdag)**

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Abstract: Tourism has today focused much on tourism forms and products that are nature- and human-friendly and contributes to the economy. There is a trend towards diversification in tourism and evaluation of tourist attractions to meet the increasing demands for various reasons. In this regard, efforts have been made to diversify tourism products and services and to detect tourist attractions in order to put destinations with high attractiveness and competitiveness on the market. Thus, there is a need for pilot and inventory studies for the efficiency of tourism activities. Additionally, the increased importance of diversification in the tourism market, the intense competition, and changing demands and needs have led to the emergence of alternative tourism types. Rural tourism has become one of the popular tourism types that have emerged due to changing tourism trends and tourist profiles. This type of tourism considered a tool in rural development is of growing importance in the national and international tourism market. The purpose of this study is to present data on the planning of Ayrasılı/Uçmakdere tourism area that will be put into operation within the scope of Tekirdag Rural Tourism Project. It is anticipated that this area primarily designed for recreation and tourism purposes will be initiated within the scope of Turkey's Strategic Vision 2023 and hold a major place in the Thracian Cultural Corridor. The study method supported by field research and observations were centered on the idea of compiling an inventory for the determination and selection of tourism supply resources. Additionally, visits were made to relevant institutions and organizations working on the project and interviews were held especially with village headmen and locals. The study found that this area, which is rich in tourist attractions, lacks accessibility and accommodation facilities. Based on the study results, it seems to be more appropriate to enlarge this tourism area originally designed to cover a total area of 51 hectares considering the recent trend towards the diversification of tourism products.

Keywords: Rural Tourism, Tekirdag Rural Tourism Project, Tourism Supply Resources, Inventory Checking, Tekirdag



Study on Maritime Pollution and Ecologic Damage from Ships and Preventive International Conventions

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Abstract: This study aimed at raising awareness pertaining to increasing maritime pollution. Industrial areas are increasing all over the world, day by day. Almost 90% of global transportation are taken place by oceans. When industrial areas and maritime transportation network started to develop, we had to face with an important threat which is maritime pollution.

Maritime pollution arise from domestic, industrial, environmental, chemical and agricultural wastes, basically. In addition to these basic maritime pollution resources, pollution from ships have also extremely critical effects on the oceans. Maritime pollution by ships generally derive from operational mistakes and marine accidents.

In parallel with increasing demand to petrochemical products which are used in industry, the rates of carrying oil quantity through seas raised. When any kind of tanker collision or any kind of accident occurred at sea, oil can be spilled into the sea at a tremendous rates. These type of substantial oil spills cause environmental disasters like ecologic damage as well as maritime pollution. However the oil spill and chemical wastes are the extremely critical pollutants which caused by ships. Solid wastes, garbage, sewage and air pollution are other pollutants which caused by vessels. Especially, one of the biggest dangers steam from plastic wastes. Because, plastic material wastes can float on surface of the oceans over the years. Most of the marine animals and birds can in some conditions mistake plastics for nurture. Therefore, all living creatures in marine ecosystem are adversely effected from these pollutants. In reality, almost all of these pollutants have bad effects on the oceans and marine ecosystem.

To prevent maritime pollution, International Maritime Organization (IMO) put into action a regulation which was called as International Convention for the Prevention of Pollution from Ships (MARPOL). Moreover, some special sea areas where need to have special protection due to their ecological, environmental and social economic and scientific reasons were declared by International Maritime Organization (IMO).

In this context, implementations of MARPOL have vital importance to protect seas from pollution which caused from ships. MARPOL is not only provide convenience to contracting countries to prevent maritime pollution, but also lead to change national regulations to provide cleaner seas and maritime ecosystem. This study has been created by relevant authors with a wide range of literature research in consideration of last updated information resources.

Keywords: Maritime Pollution, MARPOL, Pollution from Ships, IMO, Hazardous Pollutants



Introducing Environmental Schemes for the Management of the Urban Lake Watershed and Sustainable use of Ecosystem Services in Greater Baku Area, Azerbaijan

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Abstract: Urban lakes' watersheds in Greater Baku Area are under heavy pressure and is influenced both by natural and anthropogenic influences. On the natural side, climate change may lead to reductions in precipitation amount and distribution. Anthropogenic changes, including unplanned development and pollution have a heavy influence on the lake environment. As noted, untreated wastewater directly released to the lakes and partially substitutes historical groundwater input that was cut because of land reclamation and urbanization. Recently, wastewater input mixed with groundwater makes up 90% of total water input to the lake.

This study aimed to examine future management options in the Khojasan Watershed lake, located very close to Baku, Azerbaijan. According to scenario 1, cutting of all inflows and re-direction them into the centralized sewage system of Baku will result in fatal consequences for the lake hydrology and ecology. Cutting of all inflows will cut the lake outflow as well, making lake a closed system. This will result in reduced ecosystem and recreational importance. According to scenario 2, construction of a new water treatment plant is suggested. After the proper treatment, all wastewater and rain water could be directed to the lake. This would improve hydrological regime of the lake, simultaneously improving ecosystem and environmental values of the lake. Scenario 3 suggests construction of water treatment stations with simultaneous construction of stormwater system. Stormwater system would separate rain and sewage waters and enable rain water release directly to the lake. Scenario 4 suggests that current situation around the lake will be remained. This situation leads to continued pollution and reduced environmental and ecological values of the lake. Worsened circumstances around the lake will increase environmental degradation.

Based on above aspects it is obvious that future water balance will be strongly affected by management decisions and good governance regarding recreational use, fishing, and tourism. Respectively a functioning institutional setup that can play a key role in future management is the main success factor for sustainable management of Khojasan.

Keywords: Watershed, Lake Pollution, Wastewater, Ecosystem Services, Hydrological Rejime



Investigation of The Sufficiency of The Clarification Tanks Used in The Concrete Plant Wastewater Treatment

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Abstract: As a result of the rapid development in the construction sector and the need for ready mixed concrete, ready mixed concrete production facilities have been increased and an important production potential has been reached. Despite the considerable water consumption in the ready-mixed concrete production process, there is no waste water discharge from this process which is closed-circuit operated. However, as a result of the washing of vehicles and equipment used during production and transport of the produced concrete, significant waste water is generated. This washing process aiming to clean concrete wastes is used in concrete production process or washing of vehicles and equipments again after the wastewater formed is treated in clarification tanks. In this study, the sufficiency of clarification pools used in the treatment of waste water in ready mixed concrete production facilities and the reusability of waste waters in ready mixed concrete production process were examined. In line with this aim, waste water samples were taken from 5 concrete production plants in different sizes located in Marmara region of Turkey and analyses were conducted in line with the required parameters in pollution control regulations (Table 7.5) applied in Turkey. The analysis is performed on the desired parameters accordingly. One, two or three compartment clarification tanks are used in the facilities surveyed. Analyzes made demonstrate that although the results obtained in all the clarification tanks studied are different, they are below the limit values given in SKKY 7.5. According to the results in the clarification tank with the highest values: The value of the suspended solids; initial value: 636 mg / L and final value: 92 mg / L, the pH values; initial value: 10.15 and final value: 8.96, the color values; initial value: 29.3 (Pt - Co) and final value: 24.3 (Pt - Co), the oil and grease values; initial value: 18 mg / L and final value: 10 mg / L. These values demonstrate that treatment process was successful and that the precipitation tank could be used effectively. Furthermore, it was understood according to the results obtained by comparison with the TS EN 1008 concrete mixed water standards that the usage of treated wastewater in concrete production does not have any negative effects on the concrete quality or the used process.

Keywords: Wastewater Treatment, Treatment Efficiency, Wastewater From Concrete Plant, Clarification Tank



An Evaluation Framework for Life Cycle Assessment of Post-Combustion CO₂ Capture

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Abstract: The combustion of fossil fuel accounts for approximately 85 % of the world's energy supply. It is also the most significant source of carbon dioxide (CO₂) emissions worldwide. It is well-known fact that the increase of the concentration of CO₂ in the atmosphere leads to a global impact in the environment, economy and society, thus, immediate actions are required. Post-combustion CO₂ capture is a promising technology to mitigate global warming by significantly reducing CO₂ emissions from large point sources, such as fossil fuel power plants, cement and ceramic factories.

In post-combustion capture, CO₂ is removed from the flue gas at the end of a power plant cycle through various methods including chemical absorption, membrane separation, pressure swing adsorption etc. Currently, chemical absorption in other words amine-based scrubbing is the only commercially available and mostly used technology to capture CO₂ from dilute atmospheric pressure gas.

CO₂ capture technologies have several environmental impacts from the system infrastructure production stage to the end of their lifetime, owing to the consumption of resources in the form of materials and energy, as well as the formation of chemical by-products. Hence, CO₂ capture technologies are required to evaluate the environmental impacts over the whole system lifetime. In this context, life cycle assessment (LCA) is an appropriate tool to analyze and evaluate the environmental effects of the whole system capturing CO₂ from flue gas. LCA approach depends on the quantification and the evaluation of all energy and material flows into and out of the system, covering all emission and the wastes releasing into the environment.

In this study, a general evaluation will be presented about the environmental impacts of post-combustion CO₂ capture and a limited number of studies in the literature will be revealed.

Keywords: Post-combustion CO₂ Capture, Life Cycle Assessment (LCA), Environmental Impacts, Carbon Capture, Carbon capture and Storage (CCS)



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Monthly Pan Evaporation Modeling Using Four Different Computing Techniques

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Abstract: Evaporation is one of the most important components of the hydrological cycle and is influenced by many parameters. It is difficult to estimate the amount of evaporation due to the complicated nature of the evaporation process and the influence of many parameters. The amount of evaporation can be measured directly by Class A evaporation pan, or can be determined indirectly by various empirical equations. Estimation of evaporation is very important for the monitoring, research and management of water resources and irrigation practices in many arid and semi-arid regions where water resources are scarce and seriously endangered, particularly due to excessive water use. Recently, the artificial intelligence techniques such as Artificial Neural Networks, Support Vector Machines, Artificial Neural Fuzzy Inference System have been successfully used to estimating of hydrological data due to their ability to learn complex and nonlinear relations.

In this study, Artificial Neural Network (ANN), Random Forest (RF), Support Vector Machine (SVM), and K-Nearest Neighbor (kNN) were used for monthly evaporation estimation. For this aim, the monthly climatic data, mean air temperature, maximum air temperature, minimum air temperature, relative humidity, wind speed and precipitation data of Adana meteorology station (Station No: 17351) on Seyhan Basin in Turkey, were used as inputs. The meteorological data used for evaporation estimation in the present study include 648 monthly values from 1963 to 2016. The performances of the models are compared using mean absolute error (MAE), root mean square error (RMSE) and determination coefficient (R^2). The results indicate that the Random Forest performed superior to the other methods.

Keywords: Evaporation, Hydrological Cycle, Artificial Neural Networks, Support Vector Machines, Random Forest



Trend Analysis of Annual and Monthly Minimum, Maximum and Mean Air Temperature Using Three Trend Tests

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Abstract: It is of vital importance to examine temporal dynamics of meteorological variables, to evaluate climatic changes and to suggest appropriate adaptation strategies. Air temperature is an important variable that affects the dynamics of atmospheric processes. Precipitation and streamflow are two of the most important hydrological variables for water resources planning, irrigation and agriculture, and these variables are significantly affected by air temperature change. Therefore, it is important to examine the change in air temperature. The determination of trends in air temperature time series has been investigated by many researchers in recent years.

In this study, it is aimed to examine the change point and trend analysis of annual and monthly mean air temperature, maximum air and minimum air temperature data obtained from 3 meteorological stations (İlgin, Yunak, Akşehir) operated from the Turkish State Meteorological Service for the period ranging from 1960 to 2012 in Turkey. The Standard Normal Homogeneity Test (SNHT), Pettitt Test (PT) and Buishand Range Test (BRT) were used to determine the points of change in the used data. These three tests can determine the year in which the data set used was broken. The nonparametric Spearman's Rho (SR) and Mann Kendall (MK) tests were used to determine whether there is a negative or positive trend at the 95 % significance level in annual and monthly temperature data. Moreover, for comparison purpose Innovative Şen trend method which determines categorical trend behavior in a given time series was applied to the same data. The main findings revealed that the mean, maximum and minimum temperature data had a general increasing trend in three meteorological stations.

Keywords: Temperature, Hydrological Cycle, Trend, Homogeneity, Mann Kendall



Treatment of Kastamonu Solid Waste Landfill Leachate by the Fenton Process: Effect of pH and H₂O₂

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Abstract: The amount of solid waste is directly proportional to increasing population, and it varies depending on the socioeconomic status. As a solid waste disposal method, the sanitary landfill method is used in general. The leachates in the sanitary landfill are the waters arise from the leakage of the moisture within solid waste and the precipitation waters rained on the landfill. The leachates of solid waste landfill vary depending on the characteristics of solid waste being stored; these leachates cause the pollution of underground and aboveground waters because of their high organic matter, heavy metal, nitrogenous material, and organic and inorganic salt contents. The processes implemented in treating the leachates are the biological methods (aerobic, anaerobic), physicochemical methods (chemical treatment, chemical oxidation, adsorption, reverse osmosis, ammoniac stripping), advanced oxidation processes (Fenton oxidation, ozonation at high pH), and the combined methods incorporating several ones among these alternatives. The Fenton oxidation is a process, in which the hydroxyl radicals are formed as a result of chain reactions between Fe⁺² and H₂O₂; the resultant hydroxyl radicals have high level of oxidation power.

The chemical oxygen demand (COD), color, ammonium, pH, and conductivity values of raw leachate obtained from Kastamonu Solid Waste Facility were determined. And then, by using the Fenton oxidation process, the effects of pH and H₂O₂ concentration, which are the parameters affecting organic matter treatment from the leachate, were examined.

The pH of wastewater is the most important parameter affecting the reaction mechanism in Fenton oxidation process, and the optimum pH level was found to be 3. As a result of experiments carried out in order to determine the optimum H₂O₂ dosage, the maximum COD treatment efficiency (83.1%) was achieved at H₂O₂ dosage of 8 g/L. Under optimum conditions (the reaction duration of 3 hours, temperature of 20°C, stirring rate of 500 rpm, and Fe⁺² dosage of 1 g/L), COD treatment value was found to be 790.3 mg/L and color to be 150 Hazen.

It was determined that an extra treatment method shall be employed in order to meet the COD discharge standard set by Water Pollution Control Regulation but it has been determined that the color treatment can be achieved by the Fenton oxidation process.

Keywords: Advanced Oxidation Process, Solid Waste, Landfill Leachate, Fenton Process, Treatment



Phosphate Removal in Aqueous Solutions by Using Anion Exchanger Resin

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Abstract: Since the phosphorus is one of the fundamental nutrients, it is necessary for the proper operation of many organisms in the ecosystem. The phosphorus types in aqueous medium are phosphate, organic phosphorus, and polyphosphates; the highest portion among these sorts belongs to the phosphate phosphorus. The phosphorus might merge into the receiving environments due to domestic wastewaters, agricultural activities, and industrial activities. The increase in phosphorus concentration in the receiving aqueous environment is the main reason for eutrophication and it is considered to be one of the most severe environmental problems among all the pollution issues. Since high levels of phosphorus (> 0.02 mgP/L) deteriorates the nutrient balance, it might accelerate the undesired eutrophication. For this reason, one of the first preventions to take is the P-removal from the wastewaters containing phosphorus before discharging them into the aqueous environments. Many methods such as biological processes, chemical precipitation, membrane processes, electrochemical processes, adsorption, and ion exchange have been used for removing the phosphorus from wastewaters. The ion-exchange method is used in effectively removing the phosphorus and various chemicals from the polluted natural waters and wastewaters since this method is cheap and easy-to-perform one among these methods.

For this purpose, the effects of pH, resin dosage, stirring speed, initial phosphate concentration, and temperature among the parameters affecting the removal of phosphate by using commercially-available ion exchanger resin (Purolite A200E) used in synthetically prepared aqueous solutions containing phosphate were examined.

The ion exchange process depends on pH and the optimum phosphate removal was observed between pH levels of 7 and 9. It was determined that the increasing resin dosage, stirring speed, and temperature increased the phosphate removal rate, but increasing the initial phosphate concentration reduced the phosphate removal.

In conclusion, in order to control the eutrophication, it was determined that the ion exchange process can be used in achieving the phosphate concentration within the limits set by Water Pollution Control Regulation.

Keywords: Phosphorus, Eutrophication, Phosphate Removal, Anion Exchange Resin, Purolite A200EMB



Effect of Fungicide on Pollen Germination in Cherry (*Prunus avium* L.) Plant In-vitro Conditions

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Abstract: Fruit production is a large group of plant-based agricultural products. In order to increase productivity in agricultural activities, various chemical treatment methods are one of the basic applications. Fruit set is the result of pollination, which occurs in the plant's flower and is a biological mechanism.

While the beneficial crops are aimed to be obtained, the other side is aimed at increasing the crop by combating harmful species such as insects, weeds and fungi. To this end, unconsciously used chemicals affect ecosystems and organisms in various forms. When import and manufacturing data are examined in 2012, total of 17,253,391 kg fungicide has been used in our country. This amount has reached much more today. In this study, the effects of pollen germination on the cherry plant of Calcium Hydroxide + Copper II Sulphate, which is used to inhibit the formation of fungi in plants, are discussed in in vitro conditions.

The pollen obtained from the flowers of *Prunus* varieties was directly cultivation in 2% agar, 10% sucrose medium. Calcium Hydroxide + Copper II Sulfate was added to the medium in various ratios in the experimental groups and the germination and development of pollen tubules at different concentrations were observed in the light microscope.

The chemicals that are used affect not only the ecological problems but also the biological mechanisms that occur in living things. Depending on the presence of Calcium Hydroxide + Copper II Sulfate used to inhibit fungal germination pollen tubing has been affected at different levels of germination. In order to ensure fruit formation and increase of crops, these types of chemical applications should not be exposed in plants that have opened flowers and flowering continues, pollen germination time should be taken into consideration.

Keywords: Pollution, Environment, Pollen germination, Cherry, Fungicide Treatment



Environmental Impact of Waste Management using Life Cycle Assessment in Istanbul

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Abstract: Increasing population levels, booming economy, rapid urbanization and the rise in community living standards have greatly accelerated the waste generation rate in developing countries. Municipalities, usually responsible for waste management in the cities, have the challenge to provide an effective and efficient system to the inhabitants. However, they often face problems beyond the ability of the municipal authority to tackle. Mainly due to lack of organization, financial resources, complexity and system multi dimensionality. Waste is a significant environmental problem, especially for large cities in developing countries, such as Istanbul. The increasing amount of waste arising from municipalities and other sources and its consequent disposal has been one of the major environmental and economic problems in Turkey and Istanbul. Alternative management system could produce different interactions with the surroundings by means of variables related to environmental, social and economic issues. All these variables depend on the processes included in the system and define the overall waste management sustainability. Environmental, economic and social variables are strongly correlated to the process that leads to the choice of the “best” municipal solid waste management system; the LCA is often used to make the evaluation and comparison between alternatives.

In this study, optimum disposal of wastes for the province of Istanbul was found by life cycle analysis. Results of this study suggested that 65% landfilling–35% composting are the best solutions from health and environmental viewpoints. The use of methane in substitution of energy mix to produce electric energy produced non excellent results because the avoided burdens can be limited. The utilization of material recovery facilities to sort metals and plastics prior the waste-to-energy and prepare a secondary fuel enhances the global environmental impact.

Keywords: Life Cycle Assessment, Waste Management, Landfill, Composting, Istanbul



The Product Distribution of Various Chipboards via Thermochemical Treatments: Pyrolysis of Industrial Forestry Material

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Abstract: The furniture industry wastes and along with its by-products wood powder can be assessed for the production of valuable chemicals and solvents. The wastes in furniture industry can be used as a fuel in various type of combustion devices for the production of energy. However, the uncontrolled combustion can release various ecotoxic gas products due to its content such as polisher, resins and natural benzoic compounds.

In this study, instead of direct incineration of wastes from these industry, thermochemical conversion process was applied on them to obtain precious chemicals while preventing the environment. The powders of low and medium density chipboards, and wood dusts were heated to some high temperatures 400-700°C in special thermo-reactor at oxygen free medium. This application is called pyrolysis process in which generally carbon based solid materials is converted into solid, liquid and gas products. Here, the mentioned chipboards and wood powders were pyrolysed and the main products percentages were tabulated and graphed. With increased temperature while solid products decrease gas products increase and liquid products pass through a maximum.

As a result; at a special point of 500°C the solid, liquid and gas percentages are obtained as 25, 50 and 25 sequentially for low density chipboard waste dust. And the percentages for the remaining two materials were also obtained. The valorization of processed woody materials in forestry rich province of Kastamonu have access of special importance.

Keywords: Chipboards, Wood Powder, Pyrolysis, Biomass, Additive



The Ecological Assessment of Derivative Industrial Forestry Product via Bio-Assay Test

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Abstract: The biomonitoring has gained extreme importance in environmental assessment of consumer end use commercials. The production of material as well as conservation of environment should be taken into account in terms of health hazards, habitat & flora and surrounding environment. Meanwhile the test system relaying on living organism increases awareness environmental impacts. The consumption of furniture in modern society has gained an acceleration in increasing portions of various chipboards rather than lumber.

In the study, before the pyrolysis of the chipboards and wood powders the basic thermal analysis were realized. First of all, the glass transition temperatures(T_g) and melting and crystallization temperatures (T_m & T_c) were determined by differential scanning calorimetry(DSC) and differential thermal analysis(DTA). In addition to these, in order to determine basic mass loss of material with temperature, the thermal gravimetric analysis(TGA) were made. By inspection of these temperature values, pyrolysis temperatures were determined. And the pyrolysis of the materials was accomplished and the liquid products were collected. These liquid products were tested with biomonitoring. Here the *Allium cepa* bioassay test system was executed to determine the ecotoxicological effect. It is understood that the pyrolysis process may affect the hazardous nature of these materials. And the root lengths of onion bulbs were compared for the processed and unprocessed chipboards and wood dust.

By this way, the mitigation of environmental impact of these waste materials was evaluated by the mitotic index and chromosomal aberration. This study can become frontiers study and inspire smart resolution of environmental problems.

Keywords: Chipboards, Wood Powder, Pyrolysis, *Allium cepa*, Pollution Biomonitoring



Determination of Some Heavy Metal Concentrations in *Acer negundo* Leaves and Branches in the Atmosphere

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Abstract: In this study it is targeted monitoring heavy metal concentrations as a biomonitor plants. However, different heavy metals accumulate at various levels in plant species and organelles. Therefore, it is necessary to determine how much of each heavy metal accumulates in which organelle and to use these plants and organelles as biomonitor. Heavy metals are released into the air from industrial or traffic sources. In addition to being carcinogenic in terms of a majority of human health, monitoring of heavy metal pollution is crucial because some people exposed to toxic substantial for human health even at low concentrations and tend to bioaccumulate. The use of plants as biomonitors is one of the most effective methods for determining long-lasting heavy metal pollution. However, the capacity of plants to accumulate heavy metals can vary according to many factors, especially heavy metal species, plant organism and heavy metal concentrations in the air. Therefore, the species and organelle which are most effective in monitoring each heavy metal species need to be determined separately. In this study, the concentrations of Ni, Cd, Zn, Fe, K, Mg and Mn in *Acer negundo* were determined depending on the organism from traffic density. As a result of the study, it was determined that the variation of Ni, Cd and Zn depending on the traffic density in the organelle of Fe, K, Mg and Mn differ statistically as significant at 95% confidence level. As a result, the highest concentrations were found Mn and Fe in the leaves, K in the seeds, and Mg in the branches.

Keywords: *Acer negundo*, Heavy Metal, Organelle, Traffic, Biomonitor



Variation of Some Heavy Metal Concentrations Due to Traffic Intensity in *Morus alba* Leaves and Branches

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Abstract: The population of the world has increased more than ever in its history in the last 150 years, this increase combined with the immigration from the village to the city and the concentration of the urban centers to the extreme, this density has caused the increase of the air pollution in the urban centers. This study aimed that the increasing population and the number of vehicles in the cities have brought air pollution. It has become one of the most important problems of the modern age. Many pollutants emerge from city roads due to exhaust gases, car wheels, vehicles and vehicle wear, and these sources of pollution are affecting the development and health of living things in their environment. Among these pollution factors, heavy metals have a huge important role of air pollution. The heavy metals tend to bioaccumulate and some have toxic effects even at very low concentrations. Therefore, monitoring of the change in heavy metal concentration is extremely important. Plants are used as a biomonitor for determining heavy metal pollution. In this study, it was tried to determine the possibilities of using *Morus alba* as biomonitor which is frequently used in landscape studies. So concentrations of Cr, Pb, Ba, Cu, Na, Al, B and Ca elements were determined by analyzing *Morus alba* leaves and branches collected from some areas including no traffic, mid-intensity, intense traffic. As a result of the study show that Cr, Pb and Al has increased depending on the traffic intensity, but there is no clear correlation with the traffic intensity of the other elements.

Keywords: *Morus alba*, Leaves, Branches, Heavy Metal, Traffic, Biomonitor



Boron Removal with Poplar and Willow Species In Small Scale Constructed Wetlands

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Abstract: Boron (B) pollution is an expanding environmental problem throughout the world. The purpose of this study was to investigate B removal performance of four poplar and four willow species in small scale Constructed Wetland (CW). Rooted cuttings of tested species were treated with simulated wastewater having five elevated B concentrations (0.5, 5, 10, 20 and 40 ppm). All the tested species could resist up to 20 ppm wastewater B supply and could regrow from their roots in the soil having maximum 15 mg/kg B content. The result of the study indicated that $65\% \pm 5.3$ of B was removed from the wastewater in 5 ppm B treatment while the same efficiency decreased to $45\% \pm 4.6$ at 40 ppm B supply. The average effect of sediment on B removal was found to be approximately 20% for all B treatments while the remaining part of the loaded B was removed from the CW within effluent (35-54%). Therefore, actual effects of plant species on B removal was ranged from 45% to 25% between 5 and 40 ppm B treatments. Mass B removal within plant body (phyt extraction) comprised the 13-10% of total loaded B in CW while the remaining part of the loaded B (31-15%) was stabilized into the sediment with the effects of poplar and willow roots. These results presented clear understanding of effective B purification mechanisms in CWs. Boron phyt extraction capacity of a plant species was less effective than its phytstabilization efficiency which increase filtering capacity of the sediment and stabilization of more B around the rhizosphere. In terms of their B removal ability, *P.nigra* and *S.anatolica* had the highest B removal capacities with phyt extraction (20-11%) while *S.alba*, *P.alba* and *S.babylonica* had more phytstabilization performance (40-15%) in CW. Disposal of B loaded plant material create another environmental costs for CW applications. Therefore, B loaded wood and leaf tissues were mixed and used for production of wooden panels in the study. Then a combustion test was applied on these panels to test their fire resistance. The results of the tests revealed much higher burning tolerance of the B loaded panels (5-20%) compared to controls. Annual harvesting, fast growing and deep rooting ability of the poplar and willow species with their high phytstabilization and phyt extraction efficiencies make these species excellent tools to remove B from the polluted waters. Utilization of these species for B removal in large scale CWs is quite possible which should be also investigated in further studies.

Keywords: Poplar, Willow, Constructed Wetland, Boron, Phytoremediation



Nanomaterials For Pem Fuel Cells

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Abstract: Rapid depletion of available energy resources with increasing energy demand has led to the concentration of research on alternative energy sources. Many of the researches and developments in the field of clean energy are realized by nanotechnology. Nanomaterials, which can provide solutions for many applications in energy production and storage, have become a focus in energy research. With high energy densities and efficiencies, fuel cells are one of the clean power generation systems that use hydrogen energy, which has recently begun to shown among alternative energy sources. Proton exchange membrane fuel cells (PEMFCs) have become popular in clean energy researches because of their high efficiency and power densities, modular structure, quiet operation, quick start-up and low temperature operation among other many fuel cell types. In addition, PEM fuel cells -with proton exchange membranes, catalysts, catalyst support layers and bipolar plates- are important areas of application of nanotechnology. In this study, the use of nanomaterials in PEM fuel cell components, researches and future prospects were investigated.

Keywords: Energy, PEM fuel cell, Nanomaterial, Catalyst, Membrane



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Study on Maritime Education Programme for Problems of Maritime Transportation Engineering Students

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Abstract: Merchant vessels can sail on the world-wide waters as independent from nationality of the seafarers who work on board and hold different flags.

Thus, all merchant vessels are subjected to the same technical and personnel regulations. In this context, in the maritime sector, in order to meet the requirements of deck and engine labor force with especially unlimited seafarer certificate, there are several educational institutions with diverse properties in Turkey, similar to other nations. This education is conducted by undergraduate and associate degree programs affiliated to Council of Higher Education at the academic level and by authorized private institutions under the supervision of Transportation, Maritime and Communications Ministry (TMC) within the context of "Seafarers Training and Testing Directive" in Turkey. Review of the education models in countries with achievements in maritime education would demonstrate that a standard education is conducted based on the conventions, agreements and directives introduced by International Maritime Organization (IMO).

Although, there are several studies about maritime education in the literature which has been reviewed different perspective, there are lack of dealing about maritime students' problem. It is known that maritime students have some educational problems during their maritime education period. In this study, it is aimed to conduct a quantitative research amongst maritime students of Turkey in higher education institution's maritime departments that gives education on bachelor's level. Factors which are caused the main problem are gathered, together. Significance levels and interrelations of such factors are analyzed with Fuzzy DEMATEL (Fuzzy, The Decision Making Trial and Evaluation Laboratory) is used for the determination of the solution recommendations.

Keywords: Transport Engineering, Maritime Education, DEMATEL, IMO, Maritime Students



Comparison of VRS and FKP Techniques in Different Application Fields

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Abstract: The satellites are recorded by a receiver of satellite signals in the positioning system. The time elapsed between the moment that the data (*code and phase measurements*) collected at the receiver are transmitted from the satellite and the moment the signal is recorded at the receiver is measured very precisely. This time is multiplied by the propagation speed of the signal to determine the distance between the satellite and the receiver. This process is also performed by transmitting the reference station data or the calculated corrections in real time to any receiver (*GPRS, satellite, internet, mobile phone, etc.*). However, the positional accuracy achievable in this method is limited by the increasing systematic effects due to the distance from the stationary station. A fixed GNSS system (*Network-RTK / CORS*) has emerged with the idea of establishing multiple fixed stations to reduce these limitations. Thanks to the CORS system, the dependence on a single reference station has been lifted, allowing for the atmospheric modeling of a specific region by taking advantage of the data from a large number of reference stations.

In this study, P1 point of the forested area and P2 point of the built area were determined as application areas. At these points, measurements were made using both VRS and FKP techniques for 2 days. These measurements were then compared against standard deviations and average values. As a result of these comparisons, the standard deviation of Δy according to CORS-VRS technique is 1.7 cm, mean value is 2.8 cm; the standard deviation of Δx is 2.1 cm and the mean value is 1.5 cm; the standard deviation of Δh is 6.4 cm and the average value is 6.6 cm. Standard deviation of Δy according to CORS-FKP technique is 2.8 cm and average 2 cm; the standard deviation of Δx is 4.5 cm and the average value is 4.9 cm and the standard deviation of Δh is 4.3 cm and the average is 4.6 cm. As a result of comparison, the Δy and Δx values of the CORS-VRS technique give better positional accuracy than the CORS-FKP technique. However, in CORS-FKP technique, Δh value better positional accuracy than CORS-VRS technique was obtained. When these results are evaluated in general, it should be remembered that reflection effect (multipath) is high in forested and structured areas and satellite number and satellite geometry negatively affects position accuracy.

Keywords: CORS, VRS, FKP, Forestland, Built-Up Areas



Analysis of Flow Under a Sluice Gate

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Abstract: In open channels, sluice gates are widely used elements for flow regulation. It's easier to study either just experimental or numerical. Therefore, experimental and numerical studies rarely conducted together by researchers. Since experimental studies represents more realistic data with regard to numerical ones, besides more data obtained by numerical studies, in this paper both experimental study and numerical modeling conducted. The aim of the study was to analyze the effect of the opening height of a sluice gate on flow characteristics (velocity and depth) for several flow rates. For that purpose, a 900 cm length open channel which has a 60 cm width was used. The opening heights of the gates were 1 cm and 2 cm and flow rate of the experimental study was 10 lt/s and the velocity of the flow was measured by a current meter. To calculate the flow field and the free surface, a free evaluation version of FLOW 3D was used. Standart k-ε and renormalisation-group (RNG) k-ε turbulence closure models were performed throughout the modeling stage. The results obtained by experimental study were compared with those of FLOW 3D. It's deduced that the simulations with RNG turbulence closure model provides close results to the experimental study.

Keywords: Sluice Gate, Open Channel, Flow Rate, Turbulance



Thermodynamic Analysis of Waste Heat Recovery System in Glass Industry

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Abstract: Glass industry uses the melting furnaces that are fired by the conventional fuels with high temperature. Due to this, high thermal capacity of flue-gases are released into the environment. The systems that gain back the waste heat have become more important in point of energy and environment. Organic Rankine cycle (ORC) is one of the best technological systems with more valuable contributions in heat recovery from industrial processes. In this study, thermodynamic analysis of the power generation system with ORC driven by the waste flue gasses from a glass production facility was performed. The proposed system is composed of three main parts that are the waste heat cycle, ORC, and cooling cycle. In waste heat cycle, the flue gasses and thermanol are used as working fluid while Cyclohexane is as working fluid in ORC. On the other hand, the cooling cycle is performed by using water whose the inlet and outlet temperature are respectively 20 °C and 34 °C. While the low pressure ranged between 1,4 bar and 1,8 bar, the high pressure was chosen between 18 bar and 20 bar. The physical properties of the fluids were obtained by using Reference Fluid Thermodynamic and Transport Properties (REFPROP) software program. According to calculations, the ORC was generated the electricity power of 174.10 kWe by using the thermal energy of 950.90 kWt from waste flue gasses. As a result, the proposed system provided generating the useful electricity power by using waste flue gasses in a glass production facility. In this way, the waste flue gases were utilized by ORC and it has provided the positive and valuable contributions to the environment with generating the electricity power.

Keywords: Waste Heat Recovery, Glass Industry, ORC, Cyclohexane, Thermodynamic Analysis



Applications of Taguchi Method in Pem Fuel Cells

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Abstract: Proton Exchange Membrane (PEM) Fuel Cells have received much attention from researchers because of its superior properties such as high efficiency, high power density, quick start-up capability, and low operating temperature. This future power generation system has some complex multiscale and multiphysics phenomenas. Therefore, many parameters could have either strong or weak roles in the fuel cell performance. Optimization of these parameters to attain maximum power in PEM fuel cells could have an important role to reduce the costs of fuel cell technology. The design of experiments (DOE) –which reduces substantially experimental time and cost while simultaneously yielding reliable results and products- has attracted increased attention. In recent years, the Taguchi method –which is one of the DOE methods- has been used by many researchers to determine the effect of parameters affecting the performance of the PEM fuel cell and to reduce the number of experiments when working with many parameters at the same time. The Taguchi method can be applied to a wide range of applications from the design of each fuel cell components to the optimization of fuel cell operating conditions. This study aimed at revealing all available areas of the Taguchi method after reviewing the areas where it has been used so far in the PEM fuel cell.

Keywords: Energy, PEM Fuel Cell, Design of Experiments, Taguchi Method, Optimization



Performance Analysis of Isopentane, R123, and R141b for Organic Rankine Cycle Used in Waste Heat Recovery System

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Abstract: In this study, the performance of different organic fluids used in organic Rankine cycle (*ORC*) was thermodynamically investigated for waste heat recovery system. For this purpose, isopentane, R123, and R141b were selected as the working fluid because of similar physical properties and common usage in the literature. *ORC* mainly composed of three components that are the primary heat exchanger (*PHE*), turbine, condenser and pump. The thermal energy obtained from the waste flue gasses was transferred to the *PHE* by thermol. The working fluid in *ORC* was evaporated by the thermal energy from *PHE* and it expanded in the turbine generating the electricity power. After turbine, the working fluid was condensed in the condenser that was cooled from the cooling tower. The working fluid went back to *PHE* by pump. Different turbine inlet and outlet pressures of the working fluid were utilized to get the maximum power generation. The thermal energy recovered the waste flue gasses was 980.30 kWt as the constant value for three *ORCs*. The physical properties of the fluids were obtained by using Reference Fluid Thermodynamic and Transport Properties (*REFPROP*) software program. According to calculations, the efficiencies of *ORC* for isopentane, R123, and R141b were calculated respectively the range of 0.1487-0.2005, 0.1643-0.2199, and 0.1737-0.2300. The maximum electricity power of 218.70 kWe was obtained from R141b while the minimum electricity power was 141.4 kWe for isopentane. R141b have showed the best performance among the selected organic working fluids. As a result, the analyzed *ORCs* make the positive and valuable contributions to the environment despite they generate the different power outputs.

Keywords: Waste Heat Recovery, Performance Analysis *ORC*, Isopentane, R123, R141b



X-Band Frequency Selective Surface Design

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Abstract: Frequency selective surfaces (FSSs) are periodic arrays consisting of slot or patch elements. Planar and curved FSSs have been traditionally used for a variety of applications including design of antenna radomes, dichotic surfaces for reflectors and subreflectors of large aperture antennas, superstrades, radars or even absorbers [1]. FSSs are constructed from periodically arranged metallic patches. The geometry of the FSS plays a critical role in the reflection/transmission characteristics. Proper choice of the constituting elements and spacing between cells are important, as well. These parameters define the overall frequency response of the FSS, e. g. its transfer function, bandwidth, polarization and dependence on angle of incidence.

In this study, an X-band FSS is designed by using circular patches. FSS is designed in three layers: The top and bottom layers consist of one circular metallic part each. The medium layer is a square metallic part with a cross-shaped slot. 0.51 mm thick Rogers RO4003C high-frequency laminate with a relative dielectric constant of 3.38 is used in the FSS as the substrate material. Conductive structures with circular loop geometry have been placed periodically on the dielectric layer. Resonance frequencies and transmission characteristics have been investigated in detail, and the effect of the metal patch and the dimensions of the aperture to the resonance frequency were observed. Parametric analysis is performed in order to evaluate the effects related to unit cell geometry such as rectangular slot width and length along with the diameter of circular patch. In addition, the effect of the incident angle of the electromagnetic wave on the radiation characteristics has been observed and discussed.

Keywords: Frequency Selective Surface (FSS), Circular Patch, Reflection, Transmission, X-band



Motorless Plaster Grinding Machine

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Abstract: Largely based on the national capital to Turkey Construction Industry, employment and production processes due to concerns the hundreds of occupations affected significantly. The proportion of construction sector in total employment exceeds 7%. The construction sector is still a sector that needs a lot of work power (Alçı Dergi Sayı: 1). Although this field is based on the power of the muscles as large as everyday, it is now going too fast to machine. The gypsum sanding machine is one of these machines.

There are various disadvantages of the gypsum sanding machines in the market. The purpose of these studies is to provide a more useful mechanism by considering the missing aspects of existing machines. For example, vacuum sanding machines are both expensive (4 500 ttl) and take up a lot of space. On the other hand, vacuum-free gypsum sanding machines are cheaper, but the absence of a dust-absorbing zone causes many discomforts from the dust.

With this project, it is aimed to produce a machine that is both vacuum and cheap, which can fully meet the needs of the users.

Keywords: Plaster Grinding, Drill, Health



U-Value Analysis of Argon Filled Double Glazed Windows

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Abstract: U-value assessment is an important process to be able to assess the thermal insulation performance of building materials notably windows. Co-heating test methodology is usually considered in the U-value analysis of building materials. The co-heating test is an experimental technique of determining the heat loss coefficient of a building element which is calculated by plotting the heat input against the difference in temperature between the inside and outside of the building material. Although the reliability and practicality of the co-heating test method in practice is questioned due to the long test duration and uncertainty in the heat loss coefficient, it is still widely utilised for preliminary thermal resistance evaluation of building materials.

About 60% of energy losses from building envelope is attributed to windows, hence accurate and reliable thermal resistance evaluation of glazed areas is of vital importance for a sensitive energy demand analysis of buildings. U-value assessment of windows is usually conducted through theoretical and numerical methods in literature. However, dwellers frequently complain about the insufficient thermal insulation performance of commercial glazing products when compared to the reported U-values in datasheets. This inconvenience arises from the lack of comprehensive experimental tests which simulate the actual operating conditions. Therefore, in this research, argon filled double glazed windows, which is one the most common fenestration products in market, is numerically and experimentally analysed in terms of U-value performance. Although computational fluid dynamics (CFD) analyses reveal that the U-value of the reference sample (4 mm pane + 20 mm argon + 4 mm pane) is 0.89 W/m²K, which is in good accordance with the theoretical data (0.80 W/m²K), it is observed from the environmental chamber tests that the U-value in simulated operating conditions is 1.25, 1.18 and 1.32 W/m²K for top, centre and lower positions of the window sample. The tests are repeated for accuracy verification, and the U-value is found to be 1.23, 1.18 and 1.31 W/m²K for the said points. In this respect, it is concluded that thermal bridges and edge effects play a key role in actual U-value performance of glazing products. Therefore, experimental performance figures are recommended to be utilised in energy demand analyses of buildings.

Overall, in this research, U-value assessment of commercial argon filled double glazed windows is conducted through theoretical, numerical and experimental methodology. Although there is a good accordance between theoretical and numerical U-values, it is achieved that the experimental U-values from environmental chamber tests are noticeably higher due to thermal bridge and edge effects. In this respect, the reasons of complains of dwellers about the insufficient thermal insulation performance of commercial glazing products when compared to the reported U-values in datasheets are illuminated through an accurate and reliable research. For further energy demand analyses, experimental U-values of glazing systems and other building materials are highly recommended to be utilised to be able to monitor and experience the predicted outputs.

Keywords: U-value Assessment, Double Glazed Windows, Thermal Resistance, Energy Losses, Buildings



Role of Greenery Systems in the U-value of Building Envelopes

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Abstract: By increasing urbanisation, the energy consumption due to buildings has considerably grown over the last four decades at global scale. The buildings are responsible for 40% of total world energy consumption, according to United Nations Environment Program (UNEP). For this reason, the effects of building envelopes on building energy consumption is indisputable. The amount of energy used in building sector accounts for one-third of global energy consumption for space heating and cooling. In addition, energy consumption in cold climates has an increasing trend approaching 50%. In buildings, heat loss takes place at walls, roofs and floors due to comprising external areas of buildings. By providing insulation against heat loss, either in cold regions or hot climates, the energy consumption can be decreased remarkably for different building envelope materials. Nowadays, a large number of countries and local administrations are aware of the numerous impacts of building envelopes on the building energy performance. So, building energy codes released by policymakers are growing gradually year after year. Although this progression is conducted through the energy codes, two-thirds of the countries have not implemented the energy codes yet for building sector. Depending on the reports, building envelope performance increases by approximately 6% in the last five years. The wall and roof heat transfer coefficients (U-values) based on uninsulated and typical building stocks take place between 0.6 and 1.2 W/m²K. On the other hand, the rate in the developing countries are greater due to rise in the floor areas and thermal comfort demands. The building envelope performance has considerable influences on the heating and cooling needs. It can, therefore, be assumed that high building envelope performance can be managed by deep renovation and retrofitting of the existing buildings. In this respect, building sector attracts attention of many policy makers and governments to reduce the building-related energy consumption and to mitigate the role of buildings in energy use. For this reason, the energy codes for building need to be revised to meet the target of the building energy performance. The rate of retrofitting the existing buildings are in the range of 1-2% today and the percentage is expected to rise by 2-3% per year up to 2025.

Greenery systems (GSs) have a leading role to improve the energy performance of the buildings due to the relation with building envelopes. As claimed by UN, green buildings have an advantage to obviate hazardous effects of existing buildings on environment. Based on the survey carried out in the USA, traditional buildings consume approximately 30% more energy in proportion to green buildings. For this reason, GSs can be utilized to achieve zero energy or zero carbon buildings. While enhancing the energy efficiency of buildings, both energy consumption and carbon emissions steadily decrease as well. The systems can cover the whole building envelope notably roofs and walls.

Thermal resistances of green roofs with respects to types of vegetation are reported to be between 0.27 and 0.42 W/m²K. On the basis of the research findings, the heat loss from the roofs in cooling and heating seasons decreases by approximately 70-90% and 10-30%, respectively owing to green roofs.

Keywords: Greenery Systems, Energy-efficient Building, U-value, Energy Demand, GHG



Thermoelectric Refrigeration Systems: From Theory to Applications

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Abstract: The environmental disasters such as global warming, greenhouse gas emission, climate change, ozone layer depletion and acid rains increase especially in the last decades as a result of extensive fossil fuel consumptions. Significant efforts are made to mitigate energy consumption levels, and in this respect, sectoral energy consumption analyses are conducted for decisive measures. These analyses reveal that cooling demand plays a key role in primary energy consumption figures, and alternative solutions to conventional cooling systems are developed at global scale. One of the effective solutions developed is expressed to be thermoelectric coolers as a consequence of their numerous application areas, cost-effectiveness and eco-friendly aspects. A thermoelectric cooler (TEC) transforms electricity to heat through Peltier effect. When the current is applied to the thermoelectric cooler, heat is transferred from one side of the thermoelectric cooler to the other side and so one face of TEC gets cool while the other side gets warm. A classic TEC consists of a number of N-type and P-type semiconductor junctions connected electrically in series and thermally in parallel. Since traditional cooling methods such as air cooling, water cooling and liquid cooling reach the limits in terms of cooling capacity, thermoelectric coolers become in the centre of interest as an alternative cooler day by day. The application area of TECs can be split into three main groups as cooling of electronic devices, air conditioning and space cooling, and refrigerator applications. Refrigerators are used for a wide range of purposes from the military, aerospace and biotechnology industries to the food industries and especially in 20th century, scientists achieve great improvements in refrigerator technologies. These technologies can be classified in three groups as electrically operated, thermally operated and hybrid systems. Also refrigeration and air conditioning systems cause 29.6% of the total ozone depletion. Although conventional refrigerators such as vapor compression and absorption systems have a high COP value and provide safe operation, they have some disadvantages like being noisy and having moving parts. In addition, they are harmful for the environment because the refrigerants used in these systems generally pollute the air. Through the enhanced environmental consciousness, thermoelectric refrigerators are considered as a promising alternative to the conventional cooling systems owing to their advantages such as no-moving parts, quiet and vibration-free operation, lightweight and eco-friendly structure. A typical thermoelectric refrigerator covers a isolated cabine, a peltier module, two heat exchanger, a DC power supply and a temperature controller. There are many studies in the literature about thermoelectric refrigerators and their COP values are generally between 0.65 and 1. These values are lower than those of other systems, but especially for the low cooling loads, thermoelectric coolers seem promising because of their low energy consumption, high response time and not including a harmful refrigerant, compressor, expansion valve, evaporator, condenser or solution pump.

Keywords: Thermoelectric Coolers, Refrigerators, Coefficient of Performance (COP), Clean Energy



Biosynthesis and Characterization of Silver Nanoparticle from *Paeonia kesrouanensis* Plant Extract

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Abstract: Metal-based silver nanoparticles (Ag-NPs), one of the fastest growing product categories in the nanomaterials sector, are used as drug carriers and contrast agents, and especially for therapeutic and diagnostic purposes, which are their potential applications. There are many studies reporting the toxicity effects of chemical synthesized NPs. Hence, during recent years, studies on biosynthesis of NPs have increased. In many studies, simple, clean and effective methods of biosynthesis have been developed by using biological sources such as plants, fungi, algae and microorganisms. By means of biosynthesis of Ag-NPs from some plant species which naturally contain strong reducing and stabilizing agents, it is aimed to develop solutions related to the deficiencies and some problems encountered in this area. In this study, it was aimed to synthesize Ag-NPs using active reducing agents naturally found in *Paeonia kesrouanensis* plant (dried) instead of chemical reductants. Ag-NPs were synthesized using 1 mM AgNO₃ solution with leaf and stem extract of the plant. UV-Vis, FT-IR, TEM, SEM, EDX, XRD, DLS and Zeta Potential analyses were performed for the characterization of the Ag-NPs. As a result of the biosynthesis study, UV-Vis absorbance peaks of Ag NPs obtained from plant leaf and stem extracts were observed at 440 nm and 420 nm, respectively. TEM results showed that AgNPs were 5-30 nm in size and spherical and morphology was confirmed by means of SEM analysis. During EDX analysis, a number of elements in little amounts were found in addition to the elemental Ag, which were believed to have originated from the plant extract and oxidation. The face-centered cubic structure was confirmed by XRD analysis and the size of crystallites has been calculated to be 16.77 nm for Ag-NP obtained from stem extract and 22.92 nm for the Ag NP obtained from plant leaf extract. The FT-IR spectrum has shown that carboxyl, hydroxyl and amine groups were effective in coating both synthesized Ag NPs. The particle size distributions of Ag-NPs obtained from leaves and stem extracts were 71 nm and 142 nm, respectively, while zeta potential values were obtained as -32.2 mV and -32.0 mV.

Acknowledgement: This study contains some of the results of the Ph.D. study conducted by Gaziosmanpasa University, Institute of Science, Department of Bioengineering.

Keywords: *Paeonia kesrouanensis*, Silver Nanoparticle, Biosynthesis, Characterization



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The Effective Atomic Numbers for Compounds of Some Biomedically Important Elements

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Abstract: The effective atomic number for compounds of some biomedically important elements have been determined by using an extremely narrow collimated-beam transmission method in the energy 59.5 keV. Gamma-rays of ²⁴¹Am passed through compounds were detected with a high-resolution Si(Li) detector and using energy dispersive X-ray fluorescence spectrometer (EDXRF). Obtained results have been compared with theoretically calculated values of WinXCom (Windows-Photon Cross Sections Database) and FFAST (X-Ray Form Factor, Attenuation, and Scattering Tables). The relative difference between the experimental and theoretical (WinXCom) values are -9.348% to +11.714%; theoretical (FFAST) -9.248% to +11.595%. Results are presented and discussed in this study.

Keywords: Biomedically Important Elements, EDXRF, Effective Atomic Number, WinXCom, FFAST



Micro Mechanical Behavior of Er doped Zinc Oxide Nanostructures

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Abstract: $Zn_{1-x}Er_xO$ system is prepared as polycrystalline nanoparticles with various compositions ($x = 0.01, 0.02, 0.03, 0.04, 0.05$ and 0.10) using sol-gel techniques. Zinc acetate dihydrate and erbium 2-4 pentanedionate are used as precursors. All samples are annealed at $400^\circ C$ for 30 min. XRD, SEM and Vickers microhardness analyses of produced rare earth element (Er) doped zinc oxide nano bulk materials are carried out in detail. Especially, we are focused on the mechanical properties. Undoped and Er doped nano bulk samples are investigated according to the Meyer's law, proportional sample resistance (PSR), elastic/plastic deformation (EPD), Indentation-Induced Cracking (IIC) models and Hays-Kendall (HK) approach. As a result, IIC model is more suitable to determine the micromechanical properties and RISE behavior of all ZnO semiconductors.

Keywords: Sol-gel, Vickers Microhardness, IIC Model, RISE, Er Doped



Investigation of Nutrients and Some Biochemical Contents in Different Tissues of Taşköprü Garlic

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Abstract: Garlic (*Allium sativum L.*) is one of the medicinal and spicy plants, and it is traditionally used as a therapeutic herb. Main goal of this present study was to investigate the macro- and micro-nutrient contents, proline, free amino acid, β -caroten and total phenolics in the bulb (small bulbs) and the different clove parts of the garlic.

The garlic samples were collected from the local farmers, and analyzed before planting. The collected garlics were divided into three parts (the pickled part, big cloves, the central cloves). Mean macro (Ca, K, Mg, P and S) and micro (Na, Mn, Cl, Si, Al, Cu, Fe, Zn, Ag, I, Sr, Se, Ba, Ti and Te) nutrients in the dry matter of the garlic bulb and cloves were determined by using ICP-MS. Proline, free amino acid, β -caroten and total phenolics were spectrophotometrically analyzed.

Among the macro nutrients, Ca, Mg, P and S concentrations (11260 \pm 20, 504 \pm 12, 7577 \pm 8 and 12200 \pm 10 respectively) was highest in the pickled garlic cloves compared to the other parts. However, K concentration was highest (23740 \pm 30 ppm) in the central cloves of the garlic. The central cloves of the garlic also had the highest Si and Al concentrations, while the pickled cloves had the highest Fe, Zn and I concentrations. The small bulb of the garlic showed the highest Cl, Cu, Se and Ba concentrations. On the other hand, the big cloves of the garlic contained the lowest Mn, Si, Al, Fe, Zn and Sr concentrations. Sodium concentration was, however, similar for all samples (101 ppm). Among all micro nutrients analyzed, Se concentration for all parts of the garlic was found the lowest (0.5 ppm). Mean proline and free amino acid concentrations were highest in the big cloves of the garlic (6.91 \pm 0.02 μ mol/g and 21.76 \pm 0.001 μ mol/g respectively), whereas the small bulbs had the lowest mean proline and free amino acid. β -caroten concentration ranged from 0.282 \pm 0.003 ppm and 0.164 \pm 0.011 ppm in the garlic tissues, and it was highest in the small bulb of the garlic. Mean total phenolic concentration were between 40.59 \pm 0.15 and 19.99 \pm 0.26, and the highest concentration was found for the big cloves of the garlic.

The results in general indicated that the pickled cloves had the highest macro- and micro-nutrient concentrations, while the big cloves had the highest proline, free amino acid and total phenolics. The small bulbs were, however, richest in Cl, Cu, Sr and Se compared to the other parts of the garlic analyzed in the present study.

Keywords: Bulb, Cloves, Garlic, Nutrients, Phenolic



Adsorption Performance of Glutaraldehyde Cross-linked Chitosan-packed Cranberry (Cornus mas) Kernel for the Uptake of Cr (VI)

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Abstract: In order to remove Cr (VI) from aqueous solutions, glutaraldehyde cross-linked chitosan-packed cranberry kernel shell (Cts/CbKS) capsules were used as adsorbents. FTIR spectra were completed for the characterization of adsorbents. The interaction of the adsorbents with Cr (VI) was conducted in batch vessels. The adsorbents were slowly added to the prepared Cr (VI) solution and mixed in the vessel in a particular time until equilibrium was reached. The effect of Cr (VI) concentration, adsorbent dose, agitation time, initial solution pH on adsorption was studied. Adsorption performance is high at pH 2 and equilibrium occurs within 120 min. The experimental data of equilibrium was described by Langmuir, Freundlich, Scatchard, and D-R isotherms. The data were fitted to the Langmuir adsorption isotherm. Adsorption parameters (k, n, As, Kb, Xm, K, E) were calculated from these isotherms. The maximum monolayer adsorption capacity of Cts/ CbKS obtained from the Langmuir model was found to be 78.13 mg/g. The experimental results of this work showed that Cts/ CbKS is an effective material for the adsorption of Cr (VI) ions compared to the reported adsorbents in the literature.

Keywords: Chitosan, Glutaraldehyde, Cranberry Kernel Shell, Chromium, Isotherms, Equilibrium



Effects of Convective Hot Air Drying on Drying Characteristics, Colour, Total Phenolic Content and Antioxidant Capacity of Carrot Slices

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Abstract: In this study, the effects of different temperatures applied by convective hot air drying on drying characteristics, colour, total phenolic content and antioxidant capacity of carrot slices were examined. Carrot (*Daucus carota* L.) slices with the moisture content of 5.18 kg water/kg dry base were dried by convective hot air drying at 60, 70 and 80°C temperatures until the moisture content fell down to 0.05 kg water/kg dry base. Drying experiments were completed between 240 and 395 min depending on drying temperatures. For the selection of the most suitable thin layer drying model, seven mathematical models (Page, Modified Page, Logarithmic, Lewis, Henderson and Pabis, Two Term Exponential, Wang and Singh) applied to the drying treatments. According to the results obtained by this study, Page and Modified Page were considered to be the best models with the highest value of correlation coefficient (R^2) and the lowest value of root mean square error (RMSE) and chi squared (χ^2) compared to the other models. All colour parameters (L^* , a^* , b^* , C^*_{ab} , ΔE^* and h°) changed depending on the drying temperatures. Compared to the fresh samples, dried carrots resulted with 52.21-41.79 % and 17.12-16.35 % decrease in total phenolic content and antioxidant capacity, respectively. The effective moisture diffusivity (D_{eff}) values of dried carrot slices increased with the rise of drying temperatures and ranged between 1.52×10^{-9} to 2.57×10^{-9} m²/s.

Keywords: Carrot, Drying, Modelling, Colour, Phenolic Content, Antioxidant Capacity, D_{eff}



Bioactivities and Flavonoid Profiles of Turkish Honeys from Different Floral Origins

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Abstract: Honey possess high nutritional value resulting from its chemical composition. Honey includes phenolic compounds as phenolic acids and flavonoids that exhibit wide range of biological effects and act as natural antioxidants. There are only a few studies carried out on the flavonoid profile of different Turkish honeys with less sample numbers and less phenolic compounds.

Aim of this study was comparison and evaluation of total phenolic contents, flavonoid profiles and antioxidant capacities of 128 honeys from different origins produced in different regions of Turkey.

For this study the honey samples were obtained from 5 different origins namely pine (*Pinus pine and/or, Pinus brutia*), sunflower (*Helianthus annuus*), cotton (*Gossypium hirsutum*), citrus (*citrus spp.*) and polyfloral. The honey samples were collected directly from beekeepers between May 2017 and November 2017.

The total phenolic content of the samples were determined spectrophotometrically by the Folin–Ciocalteu method. The antioxidant capacities were determined using spectrophotometric scavenging assay of DPPH. An analytical procedure using HPLC-DAD detection for the determination and quantification of 31 individual flavonoid compounds in honey was used. The mean levels of total phenolic contents of the pine, sunflower, cotton, citrus and polyfloral honey samples were determined as 65.8, 38.7, 30.7, 25.8 and 40.3, mg GAE/kg in, respectively. The mean levels of antioxidant capacities (with DPPH scavenging method) of the pine, sunflower, cotton, citrus and polyfloral honey samples were 68.2%, 49.2%, 33.5%, 16.8% and 54.7%, respectively.

Bioactivities and flavonoid profiles of the honey samples were greatly changed as depending on their botanical origin. It was shown that honey botanical origins can be distinguished using flavonoids profile analysis.

Keywords: Bioactivity, Turkish Honey, Different Origins, Flavonoid Profiles, Antioxidant Activity



Genetic Diversity in Backcross Wheat Mutant Population

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Abstract: Induced mutations using mutagenic agents change in plant genome architecture and play a significant role in adaptation to adverse conditions. Therefore, mutants are valuable germplasm resources in crop improvement programs. DNA based molecular markers have become the most effective tool and feasible method for assessment of genetic diversity and structure in a plant germplasm.

In the present study, we have focused on constructing a mapping population from backcross mutant lines obtained from reciprocal cross between Sagittario and M₆ Sagittario derived drought tolerant mutant(s). The genetic diversity of this population was screened using over the 200 SSR (Simple Sequence Repeats) markers. Consequently, a total of 287 bands (alleles) were detected using SSR markers. Polymorphism rate (23.31%), polymorphic information content (0.72), marker index (1.83) and resolving power (1.16) were recorded according to SSR marker results. Two SSRs, Xwmc170 and Xwmc416 were identified as the most useful markers and proved information for diversity. Unweighted Pair-Group Method with Arithmetic Mean (UPGMA) dendrogram classified the backcross mutant lines into four un-identical-groups.

Keywords: Wheat, Genetic Diversity, Backcross Mutant Population, SSR Markers, UPGMA



Effect of Whey Protein Concentrate as Fat Mimetic on the Structure and Textural Properties of Labneh Cheese

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Abstract: Milk fat is an important component in the production of dairy products with nutritional and technological properties such as flavor, texture and overall acceptability. Unfortunately recently many of consumers focused on to decrease their fat intake and increase their consumption of low-fat products with health preferences due to the health problems associated with obesity, coronary artery disease, colon cancer and diabetes. However, removing all or a part of the fat from dairy products can unfavorable affect its sensory and textural properties. Ordinarily low-fat cheeses tend to have a non-characteristic taste, hard and springy texture, less sticky and cohesive, less meltable and poor baking properties, more rubbery and gummy texture than full-fat cheeses.

Using of fat replacers decrease the calorific value of cheese and but also improve the functionality of milk fat in cheese due to rheological and sensory problems by reducing fat in low-fat products. Generally, the ingredients of fat replacers are fats, proteins, or carbohydrates, giving similar physiochemical properties as milk fat. Fat replacers are classified into two subgroups; Fat substitutes which are fat based indigestible macromolecules with a caloric value lower than that of milk fat, or fat mimetic often called protein and/or carbohydrate based fat replacers which are polar, water soluble compounds having different chemical structures in contrast to fat. Fat mimetics are the *commonly* used ingredients for producing emulsion-based reduced-fat products. They give some functional properties of fats such as viscosity, mouthfeel, appearance and desirable rheological and eating qualities. Their major functions are gelling, water binding, *viscosifying*, stabilising, suspending, *emulsifying* properties and adhesion.

The use of whey protein concentrate (WPC) in dairy products would be an alternative trend for maintaining the favorable sensory and textural quality with more functional properties for the consumer. WPC has been considered an interesting fat- mimetic ingredient due to its functional and technological properties, as well as its nutritional appeal since it contains high concentrations of bioactive proteins. WPC are used in reduced-fat foods, either alone or in combination with other fat mimetics.

Objective of this study was to develop reduced-fat (12% fat) and low-fat (6% fat) Labneh cheese using WPC as a protein based fat mimetic. The results revealed that the addition of WPC enhanced viscosity, altered the textural properties, structure and sensory attributes of low-fat Labneh cheeses.

Keywords: Labneh Cheese, Fat Mimetic, Whey Protein Concentrate (WPC)



Effects of Using Double Emulsion as Beef Fat Replacer on Some Quality Characteristics of Model System Chicken Meat Emulsion

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Abstract: Although the animal fat has an important role in meat products such as improving binding properties, cooking yield and water holding capacity, its negative health effect concerns most of the consumers. Because of this reason, meat industry has begun formulating meat products with healthier lipid profile. Recently, double emulsions (DE) showed promising potential on beef fat replacement/reduction in meat products, however, there are very few studies on their application in product formulations.

In this study, it was aimed to investigate the effects of replacing beef fat with double emulsion which is constituted by linseed oil and peanut oil on some quality characteristics of model system chicken meat emulsion (MSME). For this purpose, 3 different MSME treatments were formulated by replacing beef fat with double emulsion in different ratios (DE25, DE50, DE100). DE showed good stability against centrifugation forces and thermal treatment. Similarly, creaming stability results were no less than 90%. DE addition to product formulation significantly increased pH of raw MSME while no difference was observed on final products ($P<0.05$). Chemical composition of both raw and cooked MSME were affected by beef fat replacement with double emulsion. Moisture content of DE treatments were higher compared to the control (C) samples while a declining trend was observed in fat content of DE containing treatments depending on the amount of DE addition ($P<0.05$).

One of the main disadvantages of beef fat replacement is losing emulsion stability of the product. However, in our study, replacing beef fat with DE showed better results on cooking yield, water holding capacity and emulsion stability compared to C samples ($P<0.05$). Due to using egg white powder in formulation the L^* values were found higher and a^* values were decreased with respect to DE addition while b^* values were found similar in all treatments. Replacing beef fat with double emulsion also affected textural properties of MSME. Hardness values of C and DE100 treatments were similar while chewiness and gumminess of DE100 were higher than C, DE25, DE50.

The results of this study showed that replacement of beef fat with double emulsion prepared with linseed oil and peanut oil can significantly increase the quality characteristic of MSME.

Acknowledgment: The authors thank to TÜBİTAK – TOVAG (Project Number: 116O506) for financial support.

Keywords: Model System Meat Emulsion, Quality Characteristic, Peanut Oil, Linseed Oil, Fat Replacement



Dietary Fiber Rich Cereal Brans Differentially Impact the Fecal Microbiota Composition and Metabolic Outcomes

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Abstract: Dietary fibers have been shown to influence the composition of the colonic microbiota, and hence the metabolic inputs that humans gain from these bacteria. One excellent source of dietary fibers in the human diet is cereal brans. Thus, the aim of this study was to investigate how different cereal brans influence the human colonic microbiota composition and metabolic outputs. For this purpose, we performed a series of in vitro fermentation assays of corn, rice, sorghum and wheat brans using fecal microbiota obtained from three healthy donors. The chemical structure differences of cereal brans were determined by analyzing the neutral monosaccharide contents using gas chromatography (GC) coupled with mass spectrometry (MS). Metabolic outputs were measured by short chain fatty acid (SCFA) formations (namely acetate, propionate and butyrate) were determined using GC at 6, 12, 24, and 48 h of fermentation. Alterations in microbial communities were determined at 24 and 48 h of fermentation using the 16S rRNA gene sequencing technique. Our data revealed that, at the end of the fermentation period, wheat and rice brans resulted in formations of significantly higher amounts of total SCFAs ($p < 0.05$), compared to corn and sorghum brans. Specifically, among the treatment groups, wheat bran caused the highest amount of butyrate production, which is known to show anti-carcinogenic properties. The propionate amount measured in wheat bran treatment was significantly higher ($p < 0.05$) than that in sorghum and corn bran treatments, but indistinguishable than of rice bran. Amplicon sequencing results revealed that, at the end of the fermentation period (48 h), rice and sorghum bran treatments resulted in similar microbial community structures that were dissimilar to those observed with wheat and corn bran treatments. Taxonomy-based comparisons revealed that cereal bran treatments selectively promoted specific microorganisms; for instance, compared to the initial time point, wheat bran treatment caused 10-fold increases in the relative abundances of a *Prevotella* operational taxonomic unit (OTU) a surrogate of species. A 28-fold increase was observed in the relative abundance of a *Bacteroides ovatus* OTU, and the relative abundances of *B. dorei* almost tripled with rice bran treatment. We found that these differences in the microbial communities and in the amounts of SCFAs are largely attributed to different chemical structures of cereal brans. Overall, these results reveal that dietary fiber-rich cereal brans distinctly influence the colonic microbiota composition and SCFA formations due to differences in their monosaccharide compositions.

Keywords: Prebiotic, Short Chain Fatty Acid, Wheat, Corn, Rice, Sorghum, Bran



The Evaluation of the Textural and Sensorial Properties of Chocolate Dairy Dessert

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Abstract: Currently, people are being more interested about dessert consumption along with the rapid change in popular life style and eating habits. Concerning consumer preferences a pleasant taste and attractive texture are essential key parameters for acceptability of a dairy dessert. Dairy desserts have important contributions to daily diet as being a major source of calcium and vitamin D, and also phosphorus, potassium, magnesium, riboflavin, niacin, essential fatty acids and protein.

Dairy desserts that exist in a broad variety of products which are prepared with various formulations are widely appreciated by consumers. They can be formulated with several traditional and/or innovative additives. These ingredients result in a wide variety of textures aside with nutritional, physical, and sensory characteristics that interact directly on consumer acceptability and technological properties. Knowledge of the textural and sensorial properties of desserts during shelf life is another important parameter since the predicted shelf life is related to maintaining the desired physical, chemical and sensory quality characteristics.

The chocolate dairy dessert is made from milk, plain flour, cocoa powder, sugar, vanilla extract and butter or margarine, and generally preferred by several groups of consumers, including children and youngsters. Therefore, the main objective of this study was to evaluate the textural and sensorial properties of chocolate dairy desserts obtained from different producers to understand the correlation between texture and sensorial characteristics with consumer preference. Textural properties of samples were evaluated instrumentally using a texture analyzer TA-XT Plus, and a nine-point hedonic scale was used to profile sensorial attributes of the samples by trained panelists. CIE Lab color scale was used to obtain the L* indicating the color variation (brightness) from black to white; red (+a*) to green (-a*); and the b* axis shows the variation from yellow (+b*) to blue (-b*).

The results of color, textural and sensorial analyses indicated that chocolate dairy dessert obtained from different producers presented distinct characteristics. We established a relationship between the sensorial acceptability of chocolate dairy dessert with textural properties. This information will be useful in designing new dairy-based product with nutritional and technological characteristics that meet consumer demands.

Keywords: Chocolate Dairy Dessert, Texture, Sensory Characteristics, Consumer Acceptability



Association Between intake of Yogurt Consumption and Sensory Aspects

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Abstract: Yogurt is a dairy product made by fermenting milk with a yogurt culture containing *Lactobacillus delbrueckii subsp. bulgaricus* and *Streptococcus thermophilus*. There are many types of yogurt such as plain, drinking, probiotic/prebiotic, fruity, that provide varying levels of nutritional benefits. Yogurts with fruits/vegetables/cereals are not only an excellent source of antioxidants, prebiotic fibres and polyphenols but also relatively low in energy, thus can promote human health. Recently the consumer preferences have focused on low-fat and low-sugar yogurt.

Yogurt constitutes fundamental components of milk which is considered as the only foodstuff that contains all different nutrients known to be essential for human diet such as protein, B group vitamins (thiamine, riboflavin, niacin, vitamin B₆, and folate), vitamin A, vitamin C, calcium, magnesium, zinc, and essential fatty acids. Thus yogurt has been reported to reduce the risk of osteoporosis, due to calcium of which is generally associated with improved bone health, and prevent chronic diseases such as obesity, diabetes, hypertension, and ischemic heart disease.

As a consequence, the vast majority of consumers are aware of product type/characteristics and market prices of yogurt. In general consumer research surveys basically focus on the socio-demographic factors that affect consumption behaviour and preferences such as age, occupation, education, motivation, perception and beliefs, attitudes, culture, reference groups, society, and marketing strategies (i.e. advertisements, leaflets, etc.). The individual consumer's acceptance for a food product takes place in a complex context and is highly dependent on a multitude of factors such as cultural practices, sensory aspects (colour, taste, and texture), package, habits, dislikes and health consciousness.

Therefore, the principal aim of this population-based cross-sectional yogurt consumption survey was to investigate the possible associations between yogurt intake and consumer acceptability. A structured questionnaire was used to obtain data on consumer personal characteristics and socio-economic conditions that influence yogurt perception. The present study focused on the identification of differences in the prevalence of yogurt intake according to the yogurt milk and yogurt type, preferred purchasing place, packaging material, technologic-quality and hygiene parameters as well as consumers demand for novel products. The results revealed that demographic, socio-economic, and lifestyle factors associated with yogurt intake had dissimilar effects, and consumption habits and perception of consumers were the main drivers for preferences regarding yogurt consumption.

Keywords: Yogurt, Consumption Behavior, Sensory Aspects



Effects of Black Garlic Usage on Various Quality Characteristics of Pastırma Cemen Paste

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Abstract: Cemen paste plays an important role in pastırma (a dried-cured meat product) production and is used to provide a special taste, aroma, color, flavor and various quality characteristics to the product. Garlic (*Allium sativum*) is one of the most important components in the pastırma cemen paste (PCP) composition. Although garlic has been widely used as one of the popular seasonings for food and medicinal purpose, consumption of fresh garlic and garlic-containing products is limited due to its unpleasant odour and taste. Therefore, in recent years many new methods have been investigated to obtain garlic products with improved organoleptic properties and enhance its beneficial effects. Black garlic is a processed garlic product that is prepared by heat treatment of the fresh garlic at high temperature under controlled humidity. Black garlic has sticky and jelly-like textures and does not give off strong pungent odor like fresh garlic. The color of the garlic is black and has a sour-sweet taste. Due to these properties, it can be easily adapted to food materials as a component.

The purpose of this study was to determine the effect of black garlic usage on the various quality characteristics of PCP. For this purpose, primarily fresh garlic was processed to black garlic under controlled temperature (70°C) and relative humidity (%80) conditions for 7, 14, 21, 28 and 35 days, separately. The fresh garlic (control) and the obtained black garlics were added to PCP composition at 10%, 15%, and 20% levels. The prepared PCP samples were placed in glass jars and closed hermetically, then stored at 4°C for 90 days. The moisture, pH, color (L*, a*, b*), antioxidant activity (DPPH, ABTS and FRAP assays) values and total phenolic contents (TPC) of PCP samples were determined at 30 days intervals (0, 30, 60 and 90 days) during storage period. In addition, sensory analyzes were applied to determine the most appropriate PCP for consumption.

The garlic variety (fresh and black garlic aged 7, 14, 21, 28 and 35 days), garlic levels (10%, 15% and 20%) and the storage time had very significant effect on the moisture, pH, color (L*, a*, b*), TPC, antioxidant activity values of the PCP samples (P<0.01). The moisture, pH, L*, a*, b* values of PCP samples were generally decreased as the aging period of the garlic used increased (P<0.05). The highest TPC and antioxidant activity values were determined in PCP produced with black garlic aged for 21 days, followed by PCP samples produced with black garlic aged for 28, 35, 14, 7 days, respectively. The lowest TPC and antioxidant activity values were determined in PCP produced with fresh garlic. As the garlic level increases, the moisture, pH, color (L*, a*, b*) values decreased while the TPC and antioxidant activity values increased (P<0.05). During storage time, the moisture content of PCP samples increased while pH, color (L*, a*, b*), TPC and antioxidant activity values generally decreased. According to sensory analyzes results, the PCP samples produced with black garlic aged for 21 and 35 days were received the highest score by panelists in terms of color, odor, texture, taste and overall acceptability parameters. Consequently, the black garlic usage as an antioxidant agent can be considered in pastırma production.

Acknowledgement: This study was supported by “Ordu University Scientific Research Projects Coordination Unit” (Project code; AR-1642)

Keywords: Black Garlic, Cemen Paste, Pastırma, Antioxidant Activity



Effect of Different Aging Periods on Antioxidant and Antimicrobial Activities of Black Garlic Produced from Kastamonu Garlic

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Abstract: Garlic (*Allium sativum* L.) is widely used as a seasoning for foods and has been known as a traditional medicine due to beneficial properties for centuries against several diseases. The consumption of garlic and its products is limited due to characteristic pungent odor that causes uncomfortable body and breath odor in people. Therefore, in recent years, different methods such as heat treatment, aging and fermentation have been used to eliminate the unpleasant odor and improve the organoleptic properties of garlic and garlic-containing products. Black garlic (BG) is generally produced by aging of fresh garlic (FG) under controlled high temperature and high humidity conditions without any additional treatments. During the aging process, the color of FG turns to black, the texture of the obtained BG is sticky and has a sweet-sour flavor. BG does not have the unpleasant odor of FG.

The aim of this study was to evaluate the effect of different aging periods on antioxidant and antimicrobial activities of BG produced from Kastamonu (Taşköprü) garlic. For this purpose, primarily BG was produced from FG under controlled temperature (70°C) and relative humidity (%80) conditions for 7, 14, 21, 28 and 35 days, separately. The moisture, pH, color (L*, a*, b*), antioxidant activity (DPPH, ABTS and FRAP assays) values, total phenolic contents (TPC) and antimicrobial activity (disk diffusion assay) of FG and BG were determined. Ultrasound-assisted water extraction was performed to extraction of bioactive compounds of the FG and BG samples for antioxidant and antimicrobial analyzes.

The aging period had very significant effect on the moisture, pH, color (L*, a*, b*), TPC, antioxidant activity values of the garlic samples ($p < 0.01$). The moisture contents of BG decreased with aging, highest value was determined in FG (59.04%) and lowest value in BG aged for 28 days (29.03%). The pH, L and b values of BG samples decreased as the aging period increased compared with FG ($p < 0.05$). The pH values of BG significantly decreased from 6.37 to 3.67 after 35 days of aging ($p < 0.05$). The redness (a*) values of BG were higher compared to FG. The TPC of BG increased approximately 10-fold compared to FG (64.50 mg GAE/100g), the highest value (703.41 mg GAE/100g) were determined on the 21st day of aging. The DPPH radical scavenging activity of BG (52.58–460.40 µg TE/100mg) was significantly ($p < 0.05$) higher than that of FG (41.54 µg TE/100mg). The ABTS radical scavenging activity of BG increased approximately 4-fold, from 78.73 µg TE/100mg on the FG to 333.85 µg TE/100mg on the 21st day, and then slightly decreased to 264.59 µg TE/100mg until the 35th day of aging. FRAP value (30.84 µg TE/100mg) of FG reached the highest value (526.38 µg TE/100mg) on the 21st day of the aging and decreased slightly after 35 days. Disk diffusion assay results showed that the antimicrobial activity of FG is significantly higher than that of BG ($p < 0.05$). According to these results, black garlic, especially aged for 21 days, can be used instead of fresh garlic as an antioxidant and functional food additive.

Acknowledgement: This study was supported by “Ordu University Scientific Research Projects Coordination Unit” (Project code; AR-1642).

Keywords: Black Garlic, Total Phenolic Content, Aging Period, Antioxidant Activity, Antimicrobial

**Biochemical Properties, Biological Activities and Usage of Truffles**

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Abstract: Edible mushrooms are considered and consumed as valuable foods in many cultures due to their unique flavor, taste, nutritional properties and biological activities. Amongst all the edible mushrooms, the truffles (Genus *Tuber*) have a number of distinctive characteristics. In general, they have no stalk, no gills, and its mycelium grows underground. Truffles are in association with lots of tree species such as oak, hazelnut, linden, beech, poplar, chestnut, walnut and pine. Today, the most popular species of truffles are *Tuber magnatum*, *T. melanosporum* and *T. aestivum*. Truffles are famous with their flavor and taste in all over the world. They are highly regarded in the gourmet culinary world, evident from the sobriquets “underground gold” and “diamond of the kitchen”. They also have a high economic value and amongst all other mushrooms, they are the most expensive mushrooms of the world. Each kilogram of truffles is sold on the open market from 600-6000 € (Euros) depending on species. Some popular delicacies using truffles include pasta, pizza, risotto, omelette, salads oil, jams and biscuits. Fresh black and white truffles are supplied in the season or they become truffled products either as a sliced food on the dishes (red and white meats, pasta, rice, entrees etc.) and soups or as sauces (truffle sauce, ketchup, mustard, barbecue sauce etc.), pastes (with different vegetables or other mushrooms), spice (truffle salt) and truffle juice. They are also used as an additive in dairy products (butter, cheese spread, Burrata, Boschetto al Tartufo, Sottocenere, Caciotta and Pecorino cheeses etc.), burger patties, caviar and truffle flour. In addition, truffled bonbons, honey and pasta (tagliatelle etc.) are available in the market. Furthermore, they can be found commercially processed as truffle balsamic vinegar, truffle olive oil, truffle vodka, etc. and preserved as in brine and canned. It has previously been reported that truffles are rich in protein, essential amino acids, fatty acids, ash, carbohydrates, dietary fiber, minerals and vitamin D. In addition, they have different sense of smells such as earthy, musky and pungent, coming from their volatile organic compounds including alcohols, aldehydes, alkanes, esters, ketones, terpenes, etc. Furthermore, truffles have antioxidant, antiviral, antimicrobial, hepatoprotective, anti-mutagenic, and anti-inflammatory bioactivities. It is stated in the recent researches that the bioactive compounds existed in truffles could be used as potential therapeutic agents. In this review, general information on the nutritional profile, aromatic composition and biological activities of some truffles and their usage in foods will be given.

Keywords: Truffles, Nutritional, Aromatic, Bioactivity, Therapeutic, Food, Additive



Mushroom Foreign Trade of Turkey in the Last Decade

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Abstract: Turkey is one of the most favorable countries in the world for the production and trade of edible wild and cultivated mushrooms and processed mushroom products due to its advantages such as its climatic characteristics, proximity to major markets, cheaper raw materials and labor. In this study, it was aimed to determine the edible mushroom species and processed mushroom products which are traded in our country and to make a general evaluation intended for edible mushroom export. Within the scope of the study, some mushroom exporter companies were interviewed in the years of 2016-2017, and data of The United Nations Food and Agriculture Organization (FAO), Turkey Statistical Institute (TUIK) and the Exporters' Associations were used. The most important exported mushroom species have been determined as *Agaricus* spp., *Amanita caesarea*, *Boletus* spp., *Calocybe gambosa*, *Cantharellus cibarius*, *Craterellus cornucopioides*, *Hydnum repandum*, *Lactarius* spp., *Morchella* spp., *Rhizopogon* spp., *Terfezia* spp., *Tricholoma* spp., and *Tuber* spp. These mushrooms are exported as fresh/cooled, frozen, pickled, canned and dried. Foreign trade of edible mushrooms is mainly done with European countries, Middle East, East Africa, Japan, USA, Canada, the Turkish Republic of Northern Cyprus and Georgia. Turkey has earned approximately 171 million \$ (USD) income from the foreign trade of edible mushrooms and mushroom products between the years of 2007 and 2017. It will be provided to increase the income obtained from foreign trade of these products through consciousness-raising of the public about the collection of wild mushrooms, provision of state support and mechanization in the production of cultivated mushrooms, use of actual processing methods in mushroom processing plants and provision of modernization, increase of competition power with foreign competitors and use of modern export marketing methods in foreign trade.

Keywords: Edible Mushroom, Processed Mushroom, Foreign Trade, Turkey, Exportation, Importation

**Consumer Preferences of Market-Branded Products (The Case of Kırklareli Province)*****Bilge GÖZENER¹, Halime DERELİ^{1*}***¹*Gaziosmanpaşa University, Faculty of Agriculture, Department of Agricultural Economics, 60240 Tokat, Turkey***Corresponding Author: halimedereli@outlook.com*

Abstract: Market-Branded products are defined as the products produced by the retailers themselves or on behalf of them and put up for sale under their own name or the brand of which they proved to have. This study was conducted in Lüleburgaz town of Kırklareli province to investigate the consumer preferences for market-branded food products. The data gathered through the questionnaires conducted with the consumers living in Lüleburgaz town of Kırklareli province constituted the primary material of the study. Rational scaling method was used to determine the sample size and the study was conducted at 95% confidence interval and 10% error margin. Sample size was identified as 96 individual consumers. Monthly average household income of participant individuals was 3110.63 TL and monthly average market expenditure was 743.23 TL. Of the participant consumers, 88,5% preferred to make shopping from supermarkets and 87.5% preferred market-branded products. The shopping chart of the consumers preferring market-branded products was mostly composed of foodstuffs (dry and frozen). Besides foodstuffs, consumers buy cleaning materials in the second place (71.4%), dairy products in the third place (61.9%). Beverages (54.4%) and personal care products (34.5%) were also included in their shopping chart. Of the participant consumers, 79.8% indicated that they were satisfied with the products they purchased and 2.4% indicated dissatisfaction. Almost half of the consumers (48.8%) found the prices of market-branded products cheaper and quality of them better than the competitor products. Thus, they mostly preferred market-branded products. Consumers also cared about food safety in these products.

Keywords: Market-Branded, Consumption, Food Safety, Kırklareli Province



Erzincan Tulum Cheese Production and the Imagery from the Plateaus Related to the Original Production Process

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Abstract: Beyaz, Kaşar and Erzincan Tulum cheeses are the most popular varieties in Turkey. The name “tulum” means “goat’s or sheep’s skin bag” in Turkish, in which the fresh cheese is pressed and ripened in it. Recently, plastic barrels are also used as container due to its cheap and easy to find. However, the flavour of the cheese is ripened in tulum is better than plastic barrel. Erzincan Tulum cheese has a white or cream colour, a high fat content, a crumbly- semi-hard texture, a buttery and pungent flavour. It was the first cheese to receive a geographical indication by the Turkish Patent and Trademark Office in 2000. The cheese is manufacturing in plateaus around Erzincan, Erzurum, Tunceli, Bingöl and Elazığ and in the East Anatolian regions by the Şavak tribe using Akkaraman sheep milk between May and September. Home-made rennet is usually used. Especially Kemah salt is used (Kemah is a county of Erzincan province, Turkey). The cheese was originally ripened in caves; however, it is now ripened in cold deposits.

Tulum cheese is produced from raw sheep milk and ripened in tulum or plastic bag. During the last 15 years, a number of studies have been carried out on the chemical composition, biochemistry, microbiology and volatile composition of Tulum cheeses during the ripening. In this study, Erzincan Tulum cheese production and the original production process are presented with original images from the Erzurum plateaus. Its popularity has been increased increasingly; however, there is some problems during its production and ripening conditions, e.g., hygienic conditions in production, packaging ripening and marketing stages. However, use of Tulum in manufacture, not in marketing, as packaging material and animal rennet as clotting agent should be maintained with strict hygienic conditions. These problems should be discussed in “Tulum cheese festival” organized by the government and private supporters to increase its popularity in domestic and international marketplaces. Growing of sheep and sheep’s milk production geographical around for Tulum cheese and life conditions or standards for producers’ should be granted by government. Also, further studies should be performed by universities by collaborating with different laboratories.

Keywords: Erzincan Tulum cheese, Traditional cheeses of Turkey, original production method, Erzurum plateaus

**Thermally resistive PV glazing (TR-PVG) systems****Erdem CÜCE*¹, Pinar Mert CÜCE¹, Tamer GÜÇLÜ¹, Ahmet B. BEŞİR¹**¹*Bayburt University Mechanical Engineering Faculty, Bayburt-TURKEY***Corresponding Author: erdemcuce@bayburt.edu.tr*

Abstract: Windows are useful elements of buildings which provide air ventilation and passive solar gain. Besides, owing to their transparent structure, they enable residents to view the outside. However, the role of windows in total energy losses from building envelope is unequivocal. This can be attributed to the poor thermal resistance characteristics of conventional fenestration products. When the glazed area is noticeably large in a building envelope like in case of glass curtain walls, the dramatic role of windows in total energy loss from buildings becomes much more remarkable. In this respect, alternative solutions are considered to mitigate window-oriented energy losses in buildings, and photovoltaic (PV) glazing systems are of significant relevance. PV glazing is highly utilised in modern architecture owing to aesthetic features as well as being capable of generating electricity. However, thermal insulation performance of traditional PV glazing products is even worse than ordinary single glazing. Therefore, advanced PV glazing systems are required to provide clean energy generation and attractive thermal insulation in a single fenestration product.

Within the scope of this research funded by The Scientific and Technological Research Council of Turkey (TUBITAK) through the project (216M531) entitled “Development of a novel, energy-efficient, eco-friendly and multi-functional glazing technology for low/zero carbon buildings: An experimental, numerical and statistical investigation”, a novel PV glazing (thermally resistive PV glazing – TR-PVG) is developed. It is reported in previous literature that the overall heat transfer coefficient (U-value) of air filled double glazed window, air filled double glazed window with low-e and argon filled double glazed window with low-e is 2.53, 2.10 and 1.90 W/m²K, respectively. It is also clear from the state-of-the-art building codes that these values are not sufficient to meet the 2030 and 2050 low/zero carbon building standards. TR-PVG is expected to have a U-value below 0.60 W/m²K as a consequence of thermally resistive composite structure behind the semi-transparent amorphous silicon (a-Si) PV cell consisting of inert gases and liquids with low thermal conductivity and high specific heat capacity. TR-PVG is predicted to generate about 100 W electricity per m² PV cell area. Moreover, TR-PVG has a self-cleaning feature owing to a nano-coating on the PV cell surface. The whole structure is also attractive in terms of sound insulation. The cost of TR-PVG is estimated to be lower than €250.00, which is also promising and competitive with the PV conventional glazing products in market.

Keywords: PV Glazing, TR-PVG, U-value, Thermal Insulation, Clean Energy Generation, Buildings



Performance Comparison of Different Release Devices for Barotrauma Treatment During Fishing Operations

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Abstract: Demersal fish species are subject to sudden pressure drop in the fishery when they come to the surface from the bottom. Fish affected by barotrauma often do not survive when release in to the sea again. In this study, different release devices were used to barotrauma treatment and performance of these devices were compared according to depth and fish size. For this purpose, experiments were carried out during angling, longline and trawl fishing operations using by different release devices. These devices are named fish release line, release clamp and release box. Different fish species caught from different fishing operation were released to 30 m depth. After, these species were escaped after 30 meters and survived. Because, when barotrauma treatment is applied, fishes can do swimming behavior. According to results, while fish release line and release clamp are suitable for angling and longline fishery, fish release box is suitable for trawl fishery.

Keywords: Fish Release Device, Barotrauma Treatment, Iskenderun Bay, Pressure



The Investigation of the Effect of a Newly Planned Junction on Regional Traffic and Air Pollution

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Abstract: The increase in the number of vehicles causes the existing road network to be inadequate. The inadequate roads increase the traffic density, therefore, the air pollution will increase inevitably. This situation leads investors to find new solutions. Predicting the efficiency of planning or a regulation in transportation engineering is extremely important. In this sense, micro-simulation modeling is widely used to analyze traffic network in different modes of transportation. Since simulation is a safe, cheap and easily-applicable method, alternative solutions can effectively be analyzed in simulation modeling. Several traffic micro-simulation programs such as VISSIM, PARAMICS, AIMSUN, ARTEMIS etc. provide an opportunity to assess the impact of transit signal priority. The parameters such as delay, queue length, volume/capacity ratio, CO, CO₂, NO_x exhaust gas amount determination can be examined with microsimulation studies. In this study, a junction planned by the 12th Regional Directorate of Highways was investigated. This junction, intersects Atatürk University - Bingöl State Highway - Education and Research Hospital and Yıldızkent in Erzurum. The current transportation between these areas is provided by long routes and the travel time is very long. Furthermore, this area has one of the busiest and fastest traffic of Erzurum. The existing condition and the planned junction was compared with the most used micro-simulation software VISSIM and AIMSUN. The delay, travel time, queue lengths, CO, CO₂, NO_x exhaust emission gases were taken into account of the evaluation parameters. This study is supported by Erzincan University, Scientific Research Projects Coordinator FBA-2016-305 Nolu Project and we thank the Rectorate and the Coordinator.

Keywords: Traffic Engineering, exhaust emissions, micro-simulation, VISSIM, AIMSUN



Low Velocity Impact Behavior of Aluminum-Polyurethane-Aluminum Composites

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Abstract: In this study, low velocity impact behavior of laminated aluminum composite plates was investigated. Three layered aluminum-polyurethane-aluminum composite plates which have 3 mm and 4 mm thicknesses were subjected to low velocity impact tests. Composite panels which were cut in 150 mm x 150 mm dimensions were constrained from all degree of freedoms (Fig. 1(a)). Mass of impactor was 6.35 kg and had semispherical punch which is 24 mm in diameter. Impact tests were applied to middle of the specimens at 10 J, 20 J, 30 J, 40 J, 50 J and 56.25 J energy levels. After impact tests force-time, velocity-time and force-displacement graphics were drawn and evaluated. Failure analysis was done for each impacted specimen. For same energy levels, displacement values for the specimens which have 3 mm thickness were higher than the specimens which have 4 mm thickness, due to high stiffness of 4 mm thick composite plates. Failures of specimens were investigated and any fixation or puncture was observed (Fig. 1 (b) and (c)). Displacement values were increased as impact energy increased. Maximum displacement was occurred on the specimen that has 3 mm thickness and impacted at 56.25 J energy level.

Keywords: Aluminum Layered Composite, Impact behavior, Failure



Determination of Seed Yield and Yield Components of Some Common Vetch Varieties (*Vicia sativa* L.) in Bilecik Ecological Condition

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Abstract: This study was conducted to determine the seed yield and seed yield related components of some common vetch (*Vicia sativa* L.) genotypes under Bilecik ecological conditions. The research was carried out the planting in winter in 2016-17 of Bilecik Şeyh Edebali University in the field of Agricultural Biotechnology Application and Research, with four (4) replications, according to the Randomized Blocks Experimental Design. In this research, 8 variety of common vetch (Kralkızı, Dicle, Görkem, Özveren, Cumhuriyet-99, Yücel, Alnoğlu, Kubilay) and 5 lines of common vetch (Line-1, Line-7, Line-8, Line-13, Line-17) used.

According to the research results, the differences between the varieties in terms of physiological seed maturity number of days, number of pods per plant, number of seeds per pod, seed yield, biological yield, straw yield and harvest index were found statistically significant. The number of days of physiological seed maturity was 190.00-200.00 days, the number of pods per plant was 7.93-35.00 and the number of seeds per pod was 3.33-6.40, the seed yield was 108.30-203.70 kg da⁻¹, the biological yield was 344.30-1189.00 kg da⁻¹, the straw yield was 169.7-1021.0 kg da⁻¹ and the harvest index varied between 10.6% and 40.0%. However, the highest seed yield was obtained from the genotype Line 13 common vetch with 203.7 kg da⁻¹. The highest biological yield and straw yield was obtained with 1189.00 kg da⁻¹ and 1021.00 kg da⁻¹ values respectively, from Kralkızı common vetch genotype.

Acknowledgement: This study is supported by Scientific Activities Support Program of Bilecik Şeyh Edebali University

Keywords: Common Vetch, Seed Yield, Yield Components, Adaptation



Smart Factory with Internet of Things

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Abstract: In this study, it is explained design concepts of smart factory with Internet of things. By using computers in many ways and spreading internet usage at every possible environments, many computer applications have been developed for production processes in industry. Industry 4.0 is more flexible, increase automation, and maintain good production. All computer controlled machines for the production process are connected via internet of things. Industry 4.0 has four design principles. Those are interoperability, information transparency, technical assistance and decentralized decision making. Machines, sensors, devices, and people are connected via internet of things for interoperability. Information systems collect virtual copy of physical World sensor data for information transparency. Supports humans to visualize information comprehensively for technical assistance. Physical systems make their own decisions to perform task autonomously for decentralized decisions. Beyond the Industry 4.0, smart factory designs have novel challenges in the new feature. There are many opportunities for developing countries to compete with developed countries. It will be explained guidance and suggestions for smart factory designs.

Keywords: Distributed Systems, Industry 4.0, Smart Factory, Internet of Things



Global Necessity to Nearly Zero-energy Buildings (nZEB)

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Abstract: With the beginning of industrial revolution, world population living in urban areas and industrial developments cause an enormous amount of energy consumption globally. Based on reports, there is a correlation between global energy consumption and economic growth of countries. While the level of social-welfare develops, environmental issues such as depletion of natural resources, climate change and global warming based on human activities increase continuously. Moreover, the increase in energy consumption leads to greenhouse gas (GHG) emissions. It is underlined in the state-of-the-art reports that the average rise in CO₂ concentration in atmosphere is about 40% compared to pre-industrial revolution. Therefore, the largest part of GHG emissions is attributed to uncontrolled energy consumption. Depending on studies, it is predicted that the rise in CO₂ emissions will be about 52% between 2005 and 2050 if no decisive precautions are taken. Electricity and heat generation sectors are called as CO₂ emission sectors and these fields are responsible for 42% of total CO₂ emissions in 2015. The increase in total energy demand between 1971 and 2015 is also given to be 150%. On the other hand, it is reported that the building sectors are responsible for 40% of total energy consumption. For this reason, major contributor of GHG emissions is expressed as building sector. CO₂ emissions due to buildings in US, China and UK are reported to be 43, 50 and about 50% respectively. On the other hand, final energy consumption in residential-buildings located in EU member countries is given to be 290 million tons of oil equivalent (mtoe) in 2012.

The building sector plays a leading role in mitigating energy consumption with energy-efficient building concept which also reduces the amount of CO₂ emissions. The potential reduction in CO₂ emissions from the building sector is expected to be 30% by 2020. For this reason, through the directives of 2010/31/EU, the EPBD suggests the concept of nearly zero energy buildings (nZEBs) to improve energy performance with insulation properties, HVAC systems, the building orientation and comfortable indoor quality for both new and existing buildings in Europe. In the literature, zero emission buildings can be defined as near zero energy, zero energy, passive house, 100% renewable, carbon neutral, climate positive and positive advancement, energy plus and zero net energy. Therefore, the newly constructed buildings are aimed to have high energy performance and to generate their own energy to consume on site. The retrofitting of existing buildings toward nZEBs is really important than the newly constructed buildings since the energy efficient materials for the new buildings are commercially available on market. By looking into reports, the buildings existed from the 1960s in Europe are about 40% of all buildings in Europe today. It is widely believed that the retrofitting of the existing buildings will comprise wide range of developments including thermal insulation of building facade and roofs, upgrading the space heating and cooling systems, renovation of electrical and electronic appliances and utilising renewable energy technologies (RETs) on-site or nearby. The retrofitting of buildings reduces the GHG emissions by 40%. The increase in thermal performance of buildings with regarding to roof and facade would mitigate the emissions proportionally. Also, the reduction in the fuel consumption in the built environment with applying energy-efficient measures is expected to be about 22% and 46% (compared to 2005) in 2020 and 2030, respectively. In addition, annual savings based on benefits achieved from the renovation of the existing buildings in Europe is estimated to reach approximately €104-175 billion by 2020. The savings are divided into three categories such as lower energy bills, reduction of CO₂ emissions and enhanced indoor quality to provide healthier indoor and outdoor environments. The corresponding saving amounts for the said categories are reported to be €52-75 billion, €9-15 billion and €42-88 billion respectively.

Keywords: nZEB, Energy-efficient Building, Energy Demand, GHG, Renewable Energy Technologies



A Study on Autistic Spectrum Disorder for Children Based on Feature Selection and Fuzzy Rule

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Abstract: Autistic Spectrum Disorder is a mental disorder that impedes the acquisition of linguistic, communication, cognitive, and social skills and abilities. It occurs within the first three years of children and shows different symptoms. Early recognition of this disease can significantly reduce the health problems that it caused. Unfortunately, waiting times for diagnosis of the disease are lengthy and hence the procedures are not effective. In order to improve the decision making, different machine learning algorithms are applied to autism-related datasets. In this study, the predictive models constructed using Fuzzy Rule algorithm for the detection of Autism Spectrum Disorder in children. The dataset, which is taken from the University of California Irvine Machine Learning Repository, consists of 292 instances and each instance include 21 attributes. But, the pre-processed dataset consists of 247 instances since the instances which include missing values in *ethnicity* or *relation* attributes are removed from the raw-dataset. Nominal values in the dataset such as no/yes, m/f are converted to 0/1 categorical values. *Ethnicity* attribute includes nominal values like Middle Eastern, White-European and Black. In the same way, *country_of_residence* attribute includes nominal values such as Jordan and United States. The categorical transformation of nominal values is deployed for these attributes. The significances of questions asked to patients and attributes such as *ethnicity* for the disorder are investigated by utilizing Logistic Regression based feature selection method. This method calculates the probability of an event occurring and over the probability of an event not occurring. So, the effect of each independent attribute is usually explained in terms of the odds ratio. This ratio is a score of the effect of an attribute. Experimental results clearly show that the *result* attribute that sum of patients' answers to questions quite important. Also, *relation*, *country_of_residence*, *age* and *ethnicity* attributes, and *Question 4 and 10* are found important but not as much as *result* attribute. The performances of the predictive models are evaluated within the frame of Accuracy (Acc) and Sensitivity (Sen) performance measures. According to the results, the combination of Logistic Regression and Fuzzy Rule is better than applying only by Fuzzy Rule. Because the Acc and Sen metrics are 97.33% and 97.44% respectively for the best attributes dataset while these metrics are 93.33% and 84.38% respectively for the pre-processed dataset.

Keywords: Autistic Spectrum disorder, Feature Selection, Logistic Regression, Fuzzy Rule, Machine Learning



Investigation of the Acceptance and Use of Online Social Networking Sites for Instructional Purposes

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Abstract: Online Social Networking Sites (SNSs) are the whole of social-based activities carried out by a group of users with the help of online information and communication technologies (ICT). Information technology (IT) teacher candidates' behaviors related to acceptance and use of the SNSs for teaching purposes are analyzed by gender, class, daily use times of SNSs, daily use times of SNSs for educational purposes, SNSs types used daily, SNSs type used in educational activities. The sample of the research consists of 75 students who are studying at the Kastamonu University BÖTE department. In the collection of data, scale of the acceptance and use of SNSs for instructional purposes (SNS-IAU) developed by Bugra, Demir and Akbulut (2017) were used. The performance expectancy factor in the scale is defined as the level of belief that the individual's use of the SNSs for instructional purposes will help to improve the business performance. The social influence factor is the level of appreciation of IT teacher candidates by the individuals they attach importance to the views of the acceptance and use of SNSs for teaching purposes. The behavioral intention factor measures the degree to which IT teacher candidates tend to use SNSs for teaching purposes and integration them into their lessons in their future professional lives. The effort expectancy factor is considered as the level of physical, mental and emotional effort that IT teacher candidates predict will spend while using SNSs for instructional purposes. According to the results of the study, the attitudes of IT teacher candidates to use SNSs for teaching purposes are positive ($\bar{X} = 3.91$). When a detailed evaluation is made according to the factors, participants' intentions to use SNSs for instruction purposes ($\bar{X} = 4.03$) are at a high level and they think that they can accomplish these intentions very easily ($\bar{X} = 4.05$). Both the performance expectancy ($\bar{X} = 3.85$) and social influence ($\bar{X} = 3.69$) factors affect the intention of participants to use SNSs for teaching purposes. That is, the main reasons why IT prospective teachers want to use SNSs for teaching purposes are (i) they think they will increase their business performance, and (ii) they think that people in their social environment will find it important. Forty of the participants were girls and thirty-five were male. According to gender, there is no statistically significant difference in all factors between acceptance and use behavior scores of instructional purposes of SNSs ($p > .05$). Twenty-six of the participants are second class, twenty-one are third class and twenty-eight are fourth grade students. Grade 3 students ($\bar{X} = 4.18$) have adopted the idea that they will increase their professional performance when they use SNNs for teaching purposes more than students in grade 2 ($\bar{X} = 3.52$). Approximately 73% of IT teacher candidates use SNN less than 1.5 hours for education purposes. This rate is 37% for non-educational purposes. This ratio is 37% for non-educational purposes. There were no significant differences between the acceptance and use behaviors of SNNs for teaching purposes and the duration of daily SNN use and duration of daily use of SNN for educational purposes. IT teacher candidates most use Instagram (84%), Youtube (81.4%), Google+ (52%) and Twitter (25.4%). Correlation analysis was conducted to determine the direction and severity of the relationship between the SNS-IAU scale and social media types. There is a positive and weak relationship between performance expectancy factor and Facebook ($r = 0.23, p < 0.05$). There is also a positive and weak relationship between YouTube and social influence ($r = .265, p < 0.05$) and effort expectancy ($r = .279, p < 0.05$) subscales. IT teacher candidates use the most Google + (57.3%) and YouTube (53.3%) SNNs in educational activities. There is a positive and weak relationship between YouTube and performance expectancy ($r = 0.266, p < 0.05$) and social influence subscales. ($r = 0.321, p < 0.01$). There is also a positive and weak relationship between Google+ and social influence subscale ($r = 0.27, p < 0.05$). In addition, there is a positive and weak relationship between Facebook and the effort expectancy subscale ($r = 0.27, p < 0.05$). The social media they are most eager to using educational activity for IT teacher candidates are YouTube (57.3), Google+ (44) and Instagram (36%).

Keywords: Social Networking Sites (SNS), Acceptance and Use of SNS, Scale of SNS, Attitude Towards the Social Media, Social Media



Find the Lost One

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Abstract: A human being is a social entity and faces with the various risks throughout his/her life. On the one hand, while a person keeps living his/her life, on the other hand he/she has to be cautious about the risks that he/she can encounter. One of the encountered problems in a daily life is that we cannot find what we lost. Sometimes it can be a birth certificate, sometimes a pet and the most importantly it can also be one of our relatives. The majority of the loss rates in our country consist of children. According to a study carried out by Turkish Statistical Institute in 81 cities in Turkey, the number of the children who come or are brought into law-enforcement authorities in 2016 increased by 10% compared to 2015. Within this framework, it is aimed to find the lost/missing people, pets or objects as quickly as possible before something bad happens and also to keep his/her family informed with this study which was developed in order to be able to provide a solution to a gradually increasing problem of missing people events nowadays and to provide assistance for people. The Firebase was used for database operations in this mobile application developed with the Java programming language in the Android Studio platform. The user, who is registered and uses the application developed, enters a photograph, description information, degree of kinship and contact information into the system. It is ensured that many people are informed more easily and quickly by sharing the notification which was sent to the users who are near the location of the missing people in social media, therefore, it is provided that the missing person can be found faster. This application can also be used for missing pets and objects besides the missing people.

Keywords: Android, Java, Firebase, Find the Lost One, Missing Person, Location Information



Follow-up Control System for Elderly and Lonely People

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Abstract: The number of people living alone, elderly and orphan is increasing day by day. These people could not know whom to consult and what to do in case of an urgent need. Taking into consideration the fact that there is no such work in literature, it is aimed to ensure that elderly and lonely people are more secure, the control of whether they are at home, prevent a negative situation and fulfillment of urgent needs of these people in this study. The Firebase was used for database operations in this mobile application developed with the Java programming language in the Android Studio platform. The developed application notifies people who routinely use drugs to ensure healthy and conscious drug consumption at certain times of the day such as morning, noon, evening. Thus, it is thought that it will prevent the emergence of more advanced health problems. Person's feedbacks to the message inquiries sending as automatically for control purposes are saved to the system. These feedbacks provide a deduction about the status of the person. If the person is in bad condition "The person sitting in the address is not safe." notification and location information are transmitted to the system administrator. In this context, it is thought that the developed application provides an opportunity for the control of the safety of the elderly and on the other hand, it will allow the person to feel more comfortable in urgent need situations. Further, it is aimed the system administrator redirects the negative situations to this center by integrating the application developed and the call center 112.

Keywords: Elderly People, Lonely People, Follow-Up Control System, Urgent Need Situation, Android, Java

**Effect of Nanofluids on Strength Behavior of a CH Clay****Fatih İŞİK^{1*}, R. Kağan AKBULUT¹, Doğan ÇİLOĞLU¹, A. Şahin ZAIMOĞLU²**¹Ataturk University Technical Vocational School of Higher Education, Erzurum-TURKEY²Ataturk University Faculty of Engineering, Erzurum-TURKEY**Corresponding Author: fatih.isik@atauni.edu.tr*

Abstract: It is well known that nanotechnology attracts the attention of the whole world. Many studies have been performed by the researchers to improve nanotechnology and developed new nanomaterials for decades. It is fact that the usage of nanomaterials in civil engineering application is quite late due to their high costs. In recent years, parallel with the development of nanotechnology, nanomaterials can be produced at lower prices. Because of cost efficiency and reachability of nanomaterials, the researchers have started to use nanomaterials in civil engineering applications, also in geotechnical applications.

The aim of this study was to investigate the effect of nanofluids on a high plastic (CH) clay. In the experiments, SiO₂ and Al₂O₃ nanoparticles were used for preparing nanofluids. The nanofluids having 0.5, 1 and 2 wt% were prepared by using two-step method. For this purpose, the nanoparticles with certain weight were firstly added to the de-ionized water and this suspension was continuously stirred for 10 min at magnetic stirring. Then, the nanofluids was gently mixed with CH clay. The prepared nano-mixtures (i.e., SiO₂-CH clay and Al₂O₃-CH clay mixtures) were compacted at their own optimum water content in accordance with ASTM D-698. In order to determine the strength parameters of the nano-mixtures, the unconfined compression test (UCS) was performed on all mixtures. It was assumed that nanoparticles filled the pores between clay particles and have a positive effect on strength behavior CH clay. However, the results showed that the addition of nanofluids into CH clay decreased the UCS values of the nano-mixtures. As a result, both SiO₂ and Al₂O₃ nanofluids had no effect on strength parameters of the mixtures.

Keywords: Nanofluid, Nanoparticle, Nano-mixture, CH Clay, Unconfined Compression Strength



A New Method for Turkish Medical Text Parsing

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Abstract: This study explores the application of a Turkish medical text parser that morphologically analyzes the structure of clinical text data to recognize medically valuable assets. The challenge is the decomposition of complex Turkish grammar rules on medical text context by preserving semantic integrity. To apply the Turkish grammar rules on freely typed medical text data and extract the medical entities, a custom Turkish medical parser was developed. This parser analyzes the medical text data syntactically, morphologically and semantically. It normalizes the misspellings and assigns the appropriate part of speech tagging by using Viterbi algorithm and a Turkish language model to decide the best parse. It also lemmatizes the words by not losing the semantic character of them. Therefore, inflected forms are not lemmatized as morpheme form, some suffixes that obviously change the meaning of a word are preserved. Finally, lemmatized word or word groups are semantically tagged and associated with their collocations by referencing the medical corpus and lexicon. The used medical corpus is based on medical narrative records, the assigned diagnosis and hospital departments related to these records. Moreover, the referenced medical lexicon consists of clinically precious terms that specify and distinguish diseases. Additionally, this parser is able to match the correspondence of medical terms in the folk speech by supporting with custom local lexicons. This implemented parser provides to perform a comprehensive analysis of Turkish texts in terms of medical and agglutinative linguistic approach. Consequently, this medical parser also provides a technological basis for analytics of patient records stored on hospital information management systems and some useful applications like diagnosis recommendation service for doctors, real-time detection of epidemics of infectious diseases and hospital department recommendation service for patients to be integrated on online appointment systems.

Keywords: Medical Text Parsing, Turkish Morphological Analysis, Medical Lexicon, Medical Corpus



A Research on the Usability of Forest Roads for Ecotourism

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Abstract: Functionally based management plans are being implemented in our country to provide multi-purpose benefits from forest areas. Today, with the increasing demand for recreational use of forest resources, the General Directorate of Forests distinguishes socio-cultural functional areas for the benefit of nature. The forest roads, which are the most important infrastructure facilities for the success of these plans, provide a great social and cultural benefit by transporting the raw materials of wood, personnel, materials and equipment, meeting the road needs of the forest villages, serving also to meet recreational demands. In addition to providing access to a variety of cultural and natural resources, the use of these forest roads for walking, running, strolling, horse riding, cycling and similar recreational purposes will contribute positively to ecotourism.

Within the scope of this study, usability forest roads that can provide transportation to ecotourism-oriented areas such as nature parks, recreation areas, wetlands, natural monuments, forest resting places and urban forests, bird and wildlife observation points, has been examined in order for this purpose, designed with different standards and specifications.

The technical standards of the forest roads to be used for recreational purpose are determined by topographic structure, estimated usage intensity, usage pattern (walking / cycling etc). In addition, drainage is important on these roads and weak ground conditions should be avoided as much as possible. It should be safe, comfortable, relaxing, entertaining, informative and attractive according to its aesthetic properties. In this direction, identification plate and signs should be placed on the roads. The forest roads in this property, which can also provide access to natural resources and cultural assets within the forest, should offer opportunities for activities such as scenic views, resting points, camping and picnicking. The roads should be connected to the roads by means of highways and other roads and the parking areas should be planned for these areas and the existing forest roads should be contributed to the ecotourism of the country.

Key Words: Socio-cultural Function, Forest road, Recreation, Ecotourism



Alternative to Antibiotic Use in Livestock: Probiotic Microorganisms

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Abstract: Probiotics are defined as “viable microorganisms that provide health benefits to the host on consumption in a sufficient quantity”. They are non-pathogenic, mono- or mixed-culture preparations that could be formulated in different products, i.e. foods, drugs, and dietary supplements, and could favourably influence the host health by improving the stability of microorganisms residing in gastrointestinal tract when consumed in any form at high concentrations.

The primary intended use of antibiotics as feed additives are *prevention* and *treatment* of the infections of the livestock besides usage as growth-promoters. However their residues are potential health hazards for human consumers. Therefore, in search of better alternatives to antibiotics or antibiotic growth promoters, the focus is rather on probiotics for addressing safe animal produce as well as improving growth and productivity in the animal industry.

Probiotics can be used in the food and feed industry to substitute in-feed chemotherapeutics in order to enhance the animal health, improve resistance to specific pathogens, increase production parameters (increased growth, carcass weight, protein content, milk and egg production; enhanced quality of animal products, and reduced cholesterol content). Since being known as “health friendly bacteria” they exhibit several beneficial properties by modulation of the “gut-brain”; such as development of the intestinal microbial balance, prevention of gastrointestinal disorders and pre-digestion of anti-nutritional factors present for higher feed efficiency and improved utilisation of nutrients, contribution to immune system stimulation. The primary function of the gastrointestinal tract is to digest and absorb nutrients, thus a well-balanced stable gastrointestinal microflora that could serve as a vital barrier to prevent the entry of potentially harmful pathogens and other environmental antigens is a “must” for optimal animal welfare.

Lactobacillus and Bifidobacterium species are currently characterized and used bacteria as probiotics. However, different microorganisms like *Enterococcus faecalis*, *E. faecium*, *Sporolactobacillus inulinus*, *Propionibacterium freudenreichii* and *Saccharomyces cerevisiae* are also known to exert probiotic activities, especially in animal products. Probiotics can be supplemented to livestock through either direct addition to feed or water or by oral gavage.

The aim of this study is to give an overview of the main areas of recent *agricultural applications of probiotic microorganisms as alternatives to antibiotics, particularly in organic livestock for improvement of animal welfare.*

Keywords: *Probiotic, Agriculture, Organic Livestock, Animal Welfare*



Phytochelatin and Proline-Related Genes Expression in Tomato Exposed to Heavy Metals

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Abstract: Heavy metals are one of the abiotic stress factor for plants, they effect the plant life cycles binding to sulfhydryl groups in amino acids and proteins. The presence of heavy metal in plant tissues changes the plant's molecular, biochemical and physiological responses such as variations in gene expression, enzyme activities and amino acid content. This study aimed to determine the expression of *P5CS* and *PCS* genes to investigate their roles in the leaves of tomato plants subjected to increasing doses of heavy metals.

The cultivars of tomato (*Solanum lycopersicum* cv.) were cultivated in plastic pots containing peat and garden soil (1:1) under greenhouse conditions. Three weeks after the plantings, the tomato plants were exposed to 10, 20 and 50 ppm doses of CdCl₂, CuSO₄ and Pb(NO₃)₂ salts. The leaves of tomato were harvested for sampling two weeks after the treatments and total RNA was extracted by using the Plant RNA Mini-Preps Kit. The first-strand cDNA was synthesized from the isolated RNA; the expression of the selected genes was detected by using RT-qPCR with SYBR Green RT-PCR kit. Also, free proline content and metal-chelating ability was identified spectrophotometrically.

The application of heavy metals significantly increased the expression of *PCS1* gene in the leaves of tomato compared to control plants. The most evident expressions were observed in plants given the high doses of heavy metals. Transcript expression of *P5CS1* changed depending on heavy metal doses; treatments of Cu (20 and 50 ppm), Cd and Pb (10 and 20 ppm) remarkably increased *P5CS1* expression. The metal-chelating potency of the extract of tomato leaves exposed to Pb and Cd was higher than that of untreated plants. The proline content in the leaf extract significantly increased with the addition of 10 and 20 ppm of Pb and Cd, but significantly decreased at high doses (50 ppm) ($p < 0.05$). The metal-chelating activity was higher in intervention plants cultivated in Pb and Cd-containing soils than in control plants ($p < 0.05$). The results showed that the proline content had a positive correlation with *P5CS1* transcript expression when the tomato plant is subjected to the three heavy metals. In addition, there was a positive relation between the *PCS* gene expression and metal-chelating ability of Cd-stressed plants.

In this context, the gene expressions of *PCS1* and *P5CS1* related with the PCs and proline content, respectively were correlated in the leaves of tomato under heavy metal stress. To further define and elucidate the responses of plants under stress conditions, the expression of genes and their corresponding enzymes associated with PCs and proline metabolisms, such as *P5CR*, *P5CDH*, *PDH*, *POX*, *ProT*, γ -*ECS*, and PC synthase, should be studied together to reveal the depth of responses in tomato subjected to various environmental conditions.

Keywords: Gene Expression, Heavy Metal, Phytochelatin Synthase, Proline, Tomato



The Impact of some Abiotic Factors on the Vegetation of Akdağ (Tokat)

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Abstract: Today, the shaping effect of human beings on nature is increasing. This is particularly fast and dynamic process of change in which the impact on geographical location will need vegetation in Turkey and shows significant changes in land use patterns. This rapid change is causing significant damage to the ecological characteristics of Turkey.

In this study, the relationship between vegetation and soil, topography (slope, elevation), and abiotic factors, which are climate characteristics, have been evaluated in Tokat/Akdağ, which has a great influence on the social and economic activities of people. In the study, the data obtained from the field studies conducted between 2011 and 2013, as well as the Tokat meteorological station (1960-2013) data were used.

Akdağ, which has a surface area of 100000 ha, is located between 40°11'42"-40°16'23" northern latitudes, 36°16'12"-36°21'32" between 681-1850 m between the longitudes of Pazar district of Tokat province. Akdağ is located in the transition zone between the Central Black Sea Region and Central Anatolia Region. The soil temperature regime of Akdağ was determined as Mesic humidity regime Ustic.

The annual average minimum temperature of Akdağ is 1.96-3.55°C, maximum temperatures are 7.49-15.92 °C, and the average annual temperatures range from 1.1-9.5°C. Relative humidity was estimated to be 62.89-64.96%, sunshine 60.92-62.30, water vapour pressure 7.70-7.95 hPa, and wind speeds of 1.63-1.69 m / s and potential evapotranspiration values of 69.95-71.46 mm in Akdağ.

The forests covered by forests are 60.06% of the land use of Akdağ, covering the widest area. At the same time, these forests, which make up the large land group, are located on large brown forests and brown forest soils without limes. The ratio of agriculture areas in Akdağ where irrigated agriculture is done in Kaz Ovası outside of the research area is 1.58%. According to this, total land cover of Akdağ; (4.7%), Alpine vegetation (2.85%), oak forest (2.4%), mixed forest (46.51%), corrupt forest-stone (16.28%), forest land (12.1% (1.58%), Deer forest (1.01%), Beech forest (0.76%), Black pine forest (0.42%), Water surface (0.24%) and Stony rock (0.18%).

Agricultural land from land-use mainframes causes the vegetation period to shorten as it is often reduced due to elevation and elevation of the slope. Thus, while Alpine is less affected by raising pastureland, it tends to expand around agricultural areas and higher regions. At the same time in the Alpine region at the upper reaches of the forest, pasture lands at the top of the most fertile pasture areas show a fragmented distribution in the form of stains at every altitude ranging from the Akdağ base to the alpine areas.

Keywords: Land Cover Usage, Climate, Slope, Soil, Altitude



Identification of Factors Responsible for Inhibiting Germination of Protein Rich Crop Amaranth (*Amaranthus hypochondriacus* L.) using Vigor Test

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Abstract: Increasing world population, and world climatic changes have affected growing pattern of many plant species. There is need to improve existing plant base locally and search for alternative agricultural new crop plants with high produce, quality and resistance to environment stress under these conditions. Crop *Amaranthus hypochondriacus* L. with high amounts of protein (13%–19%) is rich in lysine and methionine; number of minerals, and vitamins A, C, and E. The study aimed to understand the potential of seed germination under vigor test (accelerated aging test). The results showed that the seeds of the plant could withstand three different temperatures variably. The 40°C temperature treatment was the most stable for 24, 48, 72, 96 and 120 h each did not show any significant effect on germination percentage (75-85%) of the seeds. The seed germination percentage dropped to around 43-60% at 45°C and showed significant differences among germination percentage in different durations of treatments. The least germination percentage (2-4%) was noted at 50°C for all durations of treatments. Final germination count was made after 14 days in each experiment. The general temperature of Central Anatolia and the Mediterranean region never exceeds beyond 40°C. These results signify that the amaranth seeds could be evaluated under these temperature conditions positively.

Key Words: Crop Amaranth, Vigor Test, Seed Germination, Accelerated Aging Test



High Temperature Effect on Pressure Resistance of Heavy Concrete Including Polypropylene Fiber Produced with Siderite Aggregate

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Abstract: Concrete is still an indispensable building material for humanity. However, concrete can not maintain its physical, chemical and mechanical properties in any environment. One of the harmful factors for concrete is high temperature. The damage caused by the high temperature effect on the betonda is clearly visible in fire situations. The decline in the strength of the concrete under high temperature conditions indicates that the behavior of the high temperature effect of the concrete should be examined. Because of these; the investigation of the damages of the concrete exposed to the high temperature effect and the examination of the properties of the concrete after the high temperature have become an important subject.

In this study, the changes of compressive strengths of polypropylene fiber heavy concrete produced with siderite aggregate and high temperature effect of polypropylene fiber normal concrete produced with crushed aggregate were investigated.

Production was realized in all concrete mixtures with a dosage of 450 kg / m³ for cement, 3 kg / m³ for polypropylene fiber, 1.3% for fluidizing additive cement and 0.40 for water / cement ratio. The specimens were cured for 28 days in a curing pool filled with water at 20 ± 2 ° C inside. Prior to high temperature application, samples (48 hours) were stored in the sample (105 ± 5 ° C). The samples were then exposed to high temperatures of 300, 600, 900 and 1300 ° C for 3 hours. Samples after high temperature effect; (22 ± 2 ° C) for 5-24 hours in the air until the temperature drops to the temperature of the laboratory environment. Pressure resistance test and ultrasound transit speed test were then applied.

As a result; the samples which were not exposed to high temperature were determined to have a compressive strength of 64.04 MPa and a compressive strength of 58.78 MPa for normal concrete with siderite aggregated heavy concrete. At 300 ° C, the compressive resistance of heavy concrete with siderite aggregate is 58,72 MPa and the compressiv resistance of normal concrete is 54,9 MPa. At 600 ° C, the compressive strength of heavy concrete with siderite aggregate is 24,64 MPa and the compressive strength of normal concrete is 24,52 MPa. As the temperature increases, the compressiv resistance decreases. Under high temperature effect, siderite aggregate heavy concrete has better compression strength values. The compressive strengths could not be determined because the samples at 900 and 1300 ° C were crushed. The high temperature effect has affected the compressiv resistance in the negative direction.

As can be seen from these values, the effect of high temperature effect on the concrete in the negative direction, the pressure resistance values decreased. When the pressure resistance test results are examined; large amounts of loss were detected in the strengths of samples exposed to high temperature impacts, compared to samples which were not exposed to high temperature effects. It has been determined that the high temperature has an adverse effect on the mechanical properties of concrete.

Keywords: Concrete, Siderite Aggregate, High temperature Effect



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Evaluation of Sunflower Oil Addition on Contact Angle of Whey Protein Isolate Based Edible Films

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Abstract: Hydrophilic and/or hydrophobic characteristic of a film related with its constituent. It is important to specify packaging film according to its aquatic approach for determining its best compatible food material. The water contact angle is one of the indicators for direct determination of the hydrophilicity or hydrophobicity of films. A composite hydrocolloid/lipid film or coating is particularly desirable due to form an acceptable structural integrity imparted by the hydrocolloid materials in the food industry to protect the quality and extend the shelf life of foods. Lipid compounds commonly used for the preparation of the lipid-based edible films and coatings include neutral lipids, fatty acids, waxes, and resins. The efficiency of lipid materials in composite films and coatings depends on the nature of the lipid used, and in particular on its structure, chemical arrangement, hydrophobicity, physical state (solid or liquid), and lipid interactions with the other components of the film, such as proteins and polysaccharides. Edible emulsified films were prepared through emulsion technique by dispersing three different ratios of sunflower oil (as 0.00% (control), 0.05%, 0.10% and 0.15%) in whey protein isolate based medium and plasticized with glycerol to modify the functional properties of the films. Surface properties as contact angle measurements for both air and support film sides of whey protein emulsified films were determined. The obtained results mainly revealed that sunflower oil used enhanced the hydrophobic character of the whey protein films and have a good potential for incorporation into whey protein isolate to make edible films for some food applications.

Keywords: Whey Protein Isolate, Sunflower Oil, Contact Angle, Edible Film, Emulsified Film



Determination of Color and Whiteness Index of Emulsified Protein Based Film

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Abstract: Nowadays, packaging science research is receiving attention due to the development of eco-friendly materials made from natural polymers such as protein, polysaccharide, lipid and/or their combinations. Packaging film that covering the foodstuff, effect the color parameter which make a great contribution to the consumers' willingness to buy a particular food product. In this study, effect of lipid incorporation into a protein film's color was investigated. Sunflower oil-lipid source were used in a range of 0.00 to 0.15% in whey protein isolate films. To evaluate acceptability of whey protein/sunflower oil blend films, color parameters L^* , a^* , b^* were analysed with HunterLab Colorimeter, the total color difference (ΔE) and whiteness index (WI) were calculated. L^* is the vertical coordinate of a three-dimensional system of colors, which has from black to white; a^* is the horizontal coordinate of which from green red and b^* is the horizontal coordinate of which from blue to yellow. The formed films show high lightness (L^*) values, which remained fairly constant. They all showed negative values of parameter a^* and positive values of parameter b^* . Nonetheless, the presence of sunflower oil in whey protein matrix caused some equivocal changes in the value of those parameters. Values of total color difference (ΔE) slightly showed increasing tendency due to addition of lipid, no significant impact on the values of total color difference was observed. All films presented a visual appearance rather translucent; however, measurements of whiteness index showed very slight differences depending on oil content. Results pointed out that the incorporation of sunflower oil has potential for using the developed blend edible films.

Keywords: Whey Protein Isolate, Sunflower Oil, Color, Whiteness Index



The Effect of Calf Blanket on Thermoregulation in the Neonatal Period

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Abstract: In this study, it is aimed to give information about the benefits and conditions of use of the calf blanket which is thought to be useful as an auxiliary material for thermoregulation in the neonatal period.

The high calf mortality especially in the neonatal period lead to economic losses in the animal farm. One of the most important causes of calf mortality in the neonatal period is that the animal is insufficiently thermoregulated. The control of thermoregulation in the calf can be achieved by increasing in metabolic activities compare to the foetal life and by postpartum body temperature decrease. Inadequate thermoregulatory mechanism in newborn calves causes the animal to become hypothermic and mortality.

In order to protect the calves from the cold during the neonatal period, abundant dry bedding material, calf blanket, low air movement and comfort temperature zone should be provided. The calves that can not provide thermoregulation, body temperatures are lowered to below 37 ° C, so body temperature is tried to be regulated by many different methods such as hot box, hot water bath, thermostatic air control system, heat lamps.

From these methods, calf blanket is preferred in order to support the immune system after birth, to prevent some health problems, to protect against unforeseen weather conditions and to minimize the supplemental energy needs of the calf. It can also be used when the temperature of the body decrease in the sick calf. Calf blankets are materials that can be used typically 3 or 4 weeks at temperatures below 10 ° C (for longer periods of time when necessary), to prevent excessive sweating, waterproof, washable and with air-permeable structure. Calf blanket is preferred to individual breeding rather than collective animal breeding.

As a result, it is more difficult to achieve thermoregulation in newborn calves, especially in cold climates. In these regions, the use of calf blanket and good management practices during the winter months can contribute to the survival and health of the newborn calf.

Keywords: Calf, Blanket, Thermoregulation



Development of Aquaculture Cage Systems in Turkey

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Abstract: Aquaculture is presently the fastest growing food production industry with an average yearly growth rate of more than 6% over the last 20 years in all world. Similarly, the rapid growth trend of the aquaculture industry in Turkey is based on the production of a few fish species, such as gilthead seabream (*Sparus aurata*), European seabass (*Dicentrarchus labrax*) and rainbow trout (*Oncorhynchus mykiss*). The aim of this study, explain of the development of aquaculture cage systems in Turkey with samples.

Usage of cage system was started at early 1980 with 5x5 m wooden cage in Turkey. At the 1990s, larger octagonal wooden cages are beginning to be used to reduce the cost of production. The HDPE (high-density polyethylene) cages of 8-16 m in diameter, which began to be used in the 2000s, began to pick up cages 50 m in diameter after 2004.

Today, depending on the development of the technology, computer and camera systems also integrated into cage systems and production of about 140.000,00 tons at the 425 marine farms continues.

Keywords: Cage System, Aquaculture, Fish Culture, Off-Shore, Open Ocean



Analysis of the Misalignment Losses in Fiber Optic Cables

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Abstract: In this paper is explained the misalignment losses in fiber optic cables and the amount of loss that can occur in the optical cable for three different states of instability is determined by the MATLAB Simulation program.

Mechanical alignment is a major problem when combining two fibers due to their microscopic dimensions in fiber optic cables. The standard multi-mode graded index fiber core is 50-100 μm in diameter and roughly the thickness of the human hair, whereas the monomodal fibers have diameters in the order of 9 μm . Radiation losses are due to mechanical misalignments because the radiation content of the emitting fiber does not match the acceptance of the receiving fiber. The magnitude of radiation loss depends on the degree of misalignment.

Fiber-optic alignment automation is critical to the development of cost-effective fiber optic component manufacturing technologies. However, while angular alignment automation is not readily available or limited to relatively limited packaging and fastening conditions, angular alignment is inevitable in practical alignment. For this reason, it is of great importance to identify and evaluate the possible angular alignment effects in the fiber optic connection and in the alignment process.

In this paper, two different configurations of low priced microstrip patch antenna which is used in radar-based systems such as blind spot detection in automobiles, detection before the crash and of emergency braking are presented.

Keywords: Fiber Optic Cables, Mechanical Alignment, Angular Alignment, Mono-Modal Fiber, Multi-Mode Fiber



Multiband Microstrip Patch Antenna for Automobile Radars

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Abstract: In this paper, two different configurations of low priced microstrip patch antenna which is used in radar-based systems such as blind spot detection in automobiles, detection before the crash and of emergency braking are presented.

The radars used in automobiles are defined as Short Range Radar (SRR) and Long Range Radar (LRR). Nowadays, 24 GHz and 79 GHz are the most frequently used frequencies in automobile radar systems. The proposed antenna is designed on FR-4 substrate with dielectric constant of 4.3 and thickness of 1.6 mm. Size of the antenna is 25 x 20 mm. Antennas presented in this study are working at 10-11GHz, 22-26GHz and 75-81GHz frequency bands. By the results of the simulation of first antenna; for 24 GHz return loss value is -10.42 dB, bandwidth is 3532 MHz, for 79GHz return loss value is -16.50 dB, bandwidth is 6 GHz and for 10.20 GHz return loss value is -33.58, bandwidth is 700 MHz. In order to enhance the performance, second antenna is designed by changing the first antenna. The results of the simulation of second antenna; for 24GHz return loss value is -12.60 dB, bandwidth is 4000MHz, for 79GHz return loss value is -18.00 dB, bandwidth is 6000 MHz and for 10.20 GHz return loss value is -19.10, bandwidth is 535 MHz. Designed antennas were produced and its seen that simulation results of return loss were coherent with measurements at 10-11 GHz and 22-26 GHz bands. Measurement results of first antenna; for 10.5 GHz return loss is -21.60 dB, bandwidth is 630 MHz and for 24 GHz return loss is -15.66 dB, bandwidth is 4000MHz. Measurement results of second antenna; for 10.5 GHz return loss is -23.34 dB, bandwidth is 1245 MHz and for 24 GHz return loss is -19.46 dB, bandwidth is 4000MHz.

Currently, 24 GHz is more common than 79 GHz. However, when 79 GHz radar studies access sufficient maturity, systems will use that frequently. According of the results of this study, second antenna is more reliable than first for automobile radars.

Keywords: Patch Antenna, Microstrip Patch Antenna, Automobile Radar, Autonomous Automobile, K Band Antenna



Ultrasound: As a Pre-treatment in Fruit and Vegetable Processing

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Abstract: Thermal processes are the main methods used in food preservation which enable the microbiological and enzymatic inactivation. However, high process temperatures have negative effects on colour, nutritional value, taste and sensorial properties of foods. Therefore, manufacturers and consumers demand to obtain more nutritious and natural foods by an alternative non-thermal processing techniques in recent years. The principle aims of these technologies are to reduce the processing times and improve the process conditions. Furthermore they have greater inactivation effect on microorganisms and enzymes when used in combination with thermal processes.

Ultrasound is a technique generated by sound waves with frequency above the limit of human hearing. In addition to prolonging shelf life of foods, ultrasound also offers advantages in term of processing time, quality and energy. Nowadays, applications of ultrasound and its effects on food components have been studied rapidly. In food industry ultrasound could be used as a pre-treatment for drying, enzyme inactivation, filtration, freezing, extraction, microbial inactivation, production of emulsions and etc. These applications of ultrasound as a pre-treatment are still in consideration and its efficiency needs to be evaluated. Thus, the aim of this review is to explain the principles of ultrasound system and outlines the effects of ultrasound as a pre-treatment in fruit and vegetable processing.

Keywords: Non-Thermal Processes, Ultrasound, Pre-Treatment, Fruit, Vegetable



Morphological and Molecular Characterization of Common Bean Genotypes Collected from Ordu Province

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Abstract: This study was conducted for phenotypical and molecular characterization and determination of genetic relationship among 5 commercial varieties and 33 local common bean genotypes which were collected from Ordu province. Genotypes were evaluated for 3 phenological and 28 morphological characters. Average number of days to the first blooming was 43.42 while the first bean formation was found to be 48.55 days after sowing. Meanwhile the time to the first harvest was observed 67.85 days. Majority of the genotypes (93.93 %) showed indeterminate growing types. While bean length values of the genotypes were varied from 10.93 to 23.23 cm, bean width values varied between 9.39 and 22.73 mm. PCA applied to morphological data resulted in 22 component axis. The first 3 PC axis explained 55.48 % of the total variance. Seed coat color was the main characteristics to distinguish the genotypes. Eighteen SSR primers were found to be polymorphic among genotypes. SSR-IAC116 primer gave the highest (0.90) PIC value among the 18 SSR primers. On the other hand, BM210 primer generated the highest allele number per locus. UPGMA analysis based on molecular data divided the genotypes into 4 groups in the cluster. Dice similarity index ranged between 0.41 and 0.97 in dendrogram. OZF16_ALT and OZF26_1_ÇAY genotypes formed different two groups in the cluster while majority of the genotypes fell within the group 4. OZF32_AKK together with OZF01_5_ALT and OZF32_AKK together with OZF34_AKK were found to be more closest genotypes.

Keywords: Common Bean, Morphological Characterization, SSR, Diversity, *Phaseolus vulgaris*



Speed Control of DC Motor Driven by a DC/DC Buck Converter: a Robust Back-Stepping Design

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Abstract: In this work, the control issue for a cascaded Buck converter DC permanent magnet motor system, which is widely used with high control requirements, is considered. The hierarchical control approach is employed to track the trajectory of the velocity or the DC permanent magnet motor driven by the DC/DC Buck converter. The controller consists of two level controls, which are designed with a robust back-stepping approach. The former, the high-level control is belongs to the DC permanent magnet motor and the latter; the low-level control is assigned to the DC/DC Buck converter. The DC permanent magnet motor angular velocity to track the desired trajectory is provided by the high-level control, and also the desired voltage profile that must be tracked by the output voltage of the DC/DC Buck power converter is obtained by the low-level control. In order to achieve the aforementioned tasks, both the high-level and the low-level controller are designed using a robust back-stepping control method. To ensure the most effective control, nonlinearities and uncertainties in the system must be taken into account in the control design. In particular, the controllers with a differential compensation term are propounded to accomplish the negative effects of the parametric uncertainties in both the DC permanent magnet motor and DC/DC buck converter. The proposed methodology ensures that the permanent magnet DC motor velocity tracking error is limited within a small bound where the tracking achieved. Stability of the overall system is ensured by Lyapunov-based arguments. Finally, simulation results are provided to illustrate the effectiveness, feasibility, and efficiency of the proposed controller.

Keywords: Backstepping Control, Buck Converter, DC Permanent Magnet Motor



***In Vitro* Inhibition of Vancomycin and Colistin Used as Anti-infective Drug on Human Serum Paraoxanase 1 Enzyme Activity**

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Abstract: We studied *in vitro* effects of two different drugs (vancomycin and colistin) which are often used as anti-infective drug on human serum paraoxanase1 (PON1) enzyme activity. The drugs decreased the *in vitro* PON1 activity. The inhibition mechanism of colistin was competitive whereas vancomycin was a noncompetitive inhibitor. The IC₅₀ values for vancomycin and colistin were calculated to be 3.73 mM, and 13.59 µM, respectively, and the Ki constants were calculated to be 5.08 mM, and 17.01 µM, respectively. These results showed that colistin is more effective than vancomycin. We propose a prediction scheme for the interaction of colistin with the PON1 active site because we thought that colistin interacts with the amino acids which are in the PON1 enzyme active site. Our results showed that these drugs *in vitro* inhibit the activity of the enzyme with different inhibition mechanisms at low doses.

Keywords: Vancomycin, Colistin, Paraoxonase1, Enzyme, Inhibition

**The Effect of Some *Vitis vinifera* ssp. *vinifera* Extracts on Huh7 Hepatocarcinoma Cells*****Ash UĞURLU*^{*}, *Laila Radwan Abdalla ALFOGOHI*¹, *Seda ÇİÇEK*¹, *Kutlu SALİHOĞLU*¹, *Talip ÇETER*¹**¹*Kastamonu University, Faculty of Arts&Sciences, Department of Biology, Kastamonu-TURKEY****Corresponding Author:** *a.z.ugurluz@gmail.com*

Abstract: *Vitis vinifera* ssp. *vinifera*, known as grape, is among the most widely consumed fruits worldwide. It contains several biologically active compounds including flavonoids, polyphenols, anthocyanins, proanthocyanidins, procyanidins, and the stilbene derivative resveratrol. Grape seed extracts have been shown to exhibit antioxidative, anti-inflammatory, antimicrobial, as well as cardioprotective, hepatoprotective, and neuroprotective effects. Furthermore, it was reported that *Vitis vinifera* has anticancer effect against breast, prostate, skin and colorectal cancer cells. The present study was carried out to evaluate the effect of two different *Vitis vinifera* ssp. *vinifera* cultivars (Narince, Boğazkere) on Huh7 human liver cancer cells. *Vitis vinifera* ssp. *vinifera* samples used in this study were collected from from Kırşehir-Toklumen vineyard of Kavaklıdere Company. The plant material of each sample was extracted with ethanol and distilled water. MTT assay was performed to determine cell viability. Huh7 cells were treated with Narince and Boğazkere extracts at different concentrations (0.1, 1, 10, 100, 1000 µg/ml) and incubated for 24, 48, and 72 hours. Tested extracts were found to have slight inhibitory effect against Huh7 cells. Our results demonstrated that Narince and Boğazkere extracts were not efficient in killing Huh7 cancer cells. Further investigations with different cultivars should be performed to find a strong candidate as the potential anti-cancer agent.

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Keywords: *Vitis vinifera* ssp. *vinifera*, Natural Products, Liver, Cancer, Cell Culture



Cr(VI) Removal from Wastewater by Using SiO₂, NaY-Zeolite and Molecular Sieve Supported NiO Composed Metal Oxides Adsorbents

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Abstract: In this study, the removal of Cr(VI) ions from wastewater by using the metal oxide adsorbents at room temperature was studied. Metal oxides including nickel oxides provide high surface area for heavy metal adsorption from aqueous systems. The impregnation of metal oxide to porous and high surface area supports improves to metal oxide dispersion in the porous structure and this lead to high adsorption capacity.

Among the heavy metals, hexavalent chromium (Cr(VI)) is one of the most poisonous one that is highly toxic to humans, animals, plants and microorganisms, and widely exists in aquatic, terrestrial, and soil systems, generated from tannery operations, chemical manufacturing, mining, and ore processing. According to the literature, chromium pollution is the third among the top 10 most toxic pollution problems in the world.

For this aim, NiO/SiO₂, NiO/NaY-Zeolite and NiO/ Molecular Sieve metal oxides prepared by the impregnation method. In order to see the effect of the adsorbent morphology on the adsorption, all adsorbents were calcined at three different calcination temperatures (300°C, 500°C and 700°C). Adsorption experiments were done at three different solution which have different Cr(VI) concentration and at room temperature. To see the effects of the catalysts morphology on the adsorption, all adsorbents characterized by using different characterization techniques. X-Ray diffraction analysis was used to find the crystal phases present in the adsorbents and to calculate the average crystal sizes. The N₂ physisorption analysis used to observe the surface area, pore volume and average pore diameter present in the adsorbents.

Adsorption experiments showed that adsorbed Cr(VI) amount was increased by increasing the solution concentration that was used in the experiments. All adsorption experiments showed that all adsorbent has adsorption capacity which is higher than 180 mg adsorbed Cr(VI)/mg adsorbent. The best adsorption capacities were observed over the SiO₂ supported NiO adsorbent. Calcination temperature has negative effect on the adsorption capacity.

Keywords: Metal Oxides, Heavy Metal, Adsorption



Geomorphological Features of Kanal Istanbul (Istanbul Canal) Project Area (NW Turkey)

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Abstract: A large volume of global trade today is still seaborne. Thus, natural or artificial straits and channels, through which the transport of passengers and goods takes places, have achieved a geopolitically and geostrategically major-power position in maritime transport. However, a number of problems have arisen especially from the intensity of transportation operations in these areas. In recent years, many countries have been planning different solutions on the one hand and looking for alternative solutions on the other hand in order to reduce the growing intensity of maritime transportation. Kanal Istanbul (Channel Istanbul) considered an alternative to the Bosphorus and called as the “Crazy Project” is one of Turkey’s huge investment plans within the scope of the 2023 vision. The waterway planned for this project follows a route from Avcılar, Küçükçekmece, and Başakşehir to Arnavutköy. The channel is planned to be about 150 m wide, 25 m deep and 45.2 km long; the project cost is estimated at 65 billion Turkish Liras. The channel project has many precedents across the world. The construction of the channel is planned to start in 2018 and be completed in five years. After the project is completed, various changes are expected to occur in both the natural and the human environment. The purpose of this study is to evaluate the geomorphological features of the master project area covering the route of Kanal Istanbul and its immediate surroundings. This study presents information about the geomorphological properties including elevation, slope, the degree of dissection, and landforms affecting the selection of the channel area. It also provides information about the planning and use of the area. The study used 5 m resolution digital elevation model (DEM), topographic maps of various scales, and Geographic Information System (GIS) techniques. First, the study data obtained using the maps were organized and checked through fieldwork. The study results indicated that there are slopes of 10 to 20% and 50 m height with a degree of dissection of 50 to 100 m in the project area of the planned waterway.

Keywords: Geomorphological Features, Elevation, Slope, The Degree of Dissection, Landforms, Kanal Istanbul (Channel Istanbul)



Automatic Correction of Multiple-Choice Exams Using Image Processing

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Abstract: This study aimed to develop a system used for correction multiple choice questions based on digital image processing. The system was developed using Visual Basic (VB) programming language. The proposed system will help the teachers to capture and score responses of the multiple choices-answer sheets with accuracy and efficiency. It is also a new and fast method of processing of hundreds or thousands of OMR answer sheets. The proposed method is also able to detect more than one or no selected choice. The methodology used in our system is based on creation of template answer sheet and for keypoint detection (start point and end point). All OMR sheets are entered into the computer using the scanner and given as input to the software system. The proposed consists of four stages. Firstly, we have created the template by selecting coordinates (search field of the starting point and end point, length and width of the starting point and end point, the size of bubble and groups regions). All coordinates are stored in the Visual Basic file .Secondly, we implemented the keypoint detection algorithm. Next, the regions are automatically cropped into three interest region (student id, student name and multiple choice questions) and calculate black pixel each bubble in column and row using projection profile and thresholds techniques the projection profile. And thresholds are used to describe all information on the answer sheet. The results are then saved to the file. Finally, the exam paper will be compared with already stored file answer key and automatically compute the number of correct answers and give statistics for the student. We have tested on more than 100 exam papers. The average accuracy was 100% for over five different formats of the multiple choices-answer sheets and processing time for each exam paper less than 1 second. The performance of the proposed system compared with three various studies. These comparisons focused on processing time and an accuracy. All the tests forms used in these studies contained from 50 to 100 questions. The processing time was more than one second for each exam paper and the accuracy was from 97.6% to 100% depended on the study.

Keywords: Image Processing, Optical Mark Recognition, Multiple Choice Questions, Threshold, Key Point Detection



Drying Characteristics of Microwave Dried Couscous Produced by Bulgur Flour

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Abstract: The aim of this study is the modeling of microwave (180 and 360 W) drying operation of pasta-like couscous produced by using bulgur flour. It was found that the drying time was reduced 56.25 % with increasing power intensity from 180 to 360 W for the microwave drying. The drying rate decreased continuously with time as the moisture content decreasing. Additionally, drying periods decreased with increasing microwave intensity. Mass and heat transfers through the samples were faster at higher microwave power intensity. The whole drying occurred in the falling-rate period; which suggests that the material surface was not saturated with water and the drying rate was controlled by internal diffusion. The effective moisture diffusivities at 180 and 360 W were found as 0.89×10^{-8} and $1.27 \times 10^{-8} \text{ m}^2\text{s}^{-1}$, respectively. The effective moisture diffusivities increased with increasing the power intensity of microwave. The dimensionless moisture ratio against drying time for the experimental data at two different drying power intensities was fitted to Silva and others, Wang and Singh and Peleg models. The correlation coefficients were obtained between 0.9676-0.9939. Due to the highest values of R^2 (correlation coefficient), the lowest values of RMSE (root mean square error) and χ^2 (reduced chi-square), it was found that Wang and Singh model was suitable for the experimental data of microwave dried couscous. This study revealed that the microwave dryer is a suitable drying method to prevent the breaking down of couscous particles. The obtained model was also suitable and well-fitted model to control the drying process.

Keywords: Drying; Microwave Dryer; Pasta-like; Couscous



Sugar Cane Molasses

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Abstract: The molasses is a traditional product that is widely consumed in the east and inner regions of our country. It is generally preferred together with the sesame past (Tahini) in breakfasts, and made by boiling down the saccharine juice of any of various fruits such as mulberries and grapes without the addition of sugar and other additives. Molasses has got a long shelf life since it is a concentrated product and it is also a good energy source because of the significant levels of carbohydrates, vitamins and minerals such as iron and calcium.

Molasses is mostly produced by the technique of outdoor boiler in rural areas and its production method has generally unchanged until the present day. It is generally used in fruits such as grape mulberries, fig and apple in its production; on the other hand, it is frequently made from sugar cane in the Adapazarı province of our country. Because sugar cane has the high amount of sugar and is commonly grew in this region.

The overproduction of sugar cane is a significant advantage to convert the molasses. For this processing, sugar cane is firstly selected and then is passed through medium-sized rollers and obtained sugar cane juice (syrup). The syrup is sieved wire cloths or filtrated in a strainer and then transferred to the boiler and is left to boil on the wood fire. The boiling syrup is continuously mixed in order to prevent the bottom sticking and burnt smell during the boiling. In addition, the foam forming on the side and surface of the boiler is taken with a spoon. When the boiling syrup reaches the desired consistency, the red foam forming and phenomenon event perform. The molasses obtained by this technique is quite clear and its color is also too dark. If the thickening processing carefully is done, the typical light caramel occurs. If not so, a final product obtained in dark brown color, the burnt taste and odor.

Keywords: Molasses, Sugar Cane, Grape, Mulberry



Physico-Chemical and Sensory Properties of Sucuk Produced By Using Water Buffalo Meat

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Abstract: In this study, the effects of using different proportions of water buffalo meat / beef (0/100 %, 25/75 %, 50/50 %, 75/25 % and 100/0 %) on physico-chemical and sensory properties of the final product were investigated. *Lactobacillus plantarum* GM77 and *Staphylococcus xylosus* GM92 strains isolated and identified from traditional sucuk were used as starter cultures while beef fat / sheep tail fat (1/1) were used as fat in production. Initial temperature of 22±1°C was applied at the beginning of ripening. pH, a_w, TBARS and non-protein nitrogenous substance amounts were measured during ripening (0, 1, 3, 5, 7, 9 and 12th days) In addition, the final product was also tested for sensory properties. Very significant (P < 0.01) changes were observed in pH, a_w, TBARS and non-protein nitrogenous substance amounts of the product during ripening. A decrease in a_w value was observed as ripening progressed. Higher TBARS values were measured for sucuk samples containing water buffalo meat at the end of ripening (12.day) in comparison with sucuk group produced using only beef. However, even the highest TBARS value was found to be under 1mg/kg of MDA value. Use of 50% or more water buffalo meat in production resulted in significant (P < 0.05) decrease in pH value. The lowest pH value was observed in sucuk group produced using only water buffalo meat. Use of water buffalo meat did not cause a significant change in a_w value and non-protein nitrogenous substance amount (P > 0.05). On the other hand, use of water buffalo meat did not result in a significant change in sensory parameters (color, odor, taste, texture, general acceptability) of the samples (P > 0.05).

Keywords: Water Buffalo Meat, Sucuk, Volatile Compound, TBARS, NPN-M



Anthropogenic Biomes (Anthromes) of Turkey

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Abstract: Today's landscape has transformed into a complex system due to the interaction of natural processes and human activities. This transformation stemming from anthropogenic pressures of human and human activities in the last century has put pressure on terrestrial ecosystems and given rise to the emergence of the notion of anthromes defined as anthropogenic biomes or human biomes. This notion put forward by Anthromes Working Group has been invented to understand the ecological patterns and interactions of biomes in terrestrial ecosystems. Thus, anthromes provide information about the change of classical biomes through human influence, shed light on the intensity of man-made changes and help to model and evaluate global biotic or ecological footprints from the past to the future. The purpose of this study is to detect and map current anthromes in Turkey. To this end, the study used the anthromes classification system developed by Anthromes Working Group and cartographic methods based on Geographic Information System (GIS) techniques. Turkey's anthropogenic biomes map was created through the comparative analysis of previous research data and the current satellite imagery in the dataset obtained from the Copernicus land monitoring service. The study sought to answer the research questions about the detection and spatial distribution of anthromes classes, thereby significantly and directly contributing to the understanding of Turkey's anthropogenic geography. The study results demonstrated that used anthromes constitute a larger part in the anthromes classification of Turkey compared to the smaller rate of wild anthromes, while seminatural anthromes spread on Turkey's land at a ¼ rate. Thus, the results indicate a day-by-day decline in natural areas due to the current anthropogenic activities in Turkey compared to the increase in artificial areas. Unless wild anthromes are prevented from disappearing, it may soon lead to serious problems including biomedical crises or intensified degradation of natural ecosystems. In order to avoid such problems, careful planning should be done to protect natural areas and work should be carried out to regularly monitor anthromes.

Keywords: Anthropogenic Biomes, Used anthromes, Anthromes anthromes, Wild anthromes, Turkey



Test Methods of Determining Slurry Surfacing Performance for Highways

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Abstract: Pavement preservation methods are highly important in extending service life of flexible pavements. Slurry surfacing system is one of these methods. In order to extend the service life of pavements, appropriate and acceptable performance of slurry surfacing system is required. To be able to determine the performance of slurry seal, there are several test methods. In this study, importance of current slurry seal test methods are studied and explained briefly.

Wet Track Abrasion (ISSA TB 100) test is one of the important tests of slurry surfacing systems. In this test, the minimum bitumen emulsion content is determined. Under wet abrasion conditions, the wearing quality of slurry seal system is measured. Also, with the use of six-day soak application, long term moisture susceptibility of slurry seal is revealed. Another significant test of slurry seal is Measurement of Excess Asphalt in Bituminous Mixtures by Use of a Loaded Wheel Tester and Sand Adhesion (ISSA TB 109) test. In this experiment, the excess bitumen content is determined by using a wheel tester containing certain loads. If the bitumen content ratio is too high in the mixture, it causes significant problems in the performance of slurry seal system. Determining set and cure development of slurry surfacing systems by cohesion tester (ISSA TB 139) is considered as another important test. By a torquemeter, the initial set and cure development of slurry surfacing systems as a function of time is determined. Moreover, Classification of Slurry Surfacing Materials Compatibility by Schulze-Breuer and Ruck Procedures (ISSA TB 144) test is required to determine the compatibility between asphalt residue and aggregate fines in specific gradation. This test method gives a rating system for adhesion characteristics, integrity and abrasion loss of a specified aggregate-asphalt residue. Furthermore, Test Method for Measurement of Stability and Resistance to Compaction, Vertical and Lateral Displacement of Multilayered Fine Aggregate Cold Mixes (ISSA TB 147) is regarded as another significant test. With a simulation of rolling traffic compaction by Loaded Wheel Test, this test makes it possible to determine the compaction or displacement amounts of multilayered, dense graded, fine aggregate cold mixtures such as slurry seal or cold microasphalt bituminous surfaces. Test Method for Preparation of Microsurface and Slurry Seal Specimens for Evaluation by Hot Mixed Asphalt Design Methods (ISSA TB 148) also provides the preparation of slurry seal and microsurface samples to be evaluated with different design parameters used for hot mix asphalt concrete. Additionally, Test Method for Boiling Compatibility of Slurry Seal Mixes (ISSA TB 149) is another test method of slurry seal performance. In this test method, slurry seal specimens are placed into a boiling water and kept for 15 minutes to determine the resistance to stripping. As a result, test methods mentioned in this study are extremely necessary to evaluate the performance of slurry seal systems used in extending service life of flexible pavements.

Keywords: Highway Surface Treatment, Slurry Seal, Service Index



Bioactive Properties and Sugar Contents of Different Standart Apple Cultivars Grown in Çarşamba District (Samsun/Turkey)

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Abstract: This study was carried out to determine total phenolics, total antioxidant activity (according to DDPH and FRAP⁺ antioxidant tests), total flavonoids, glucose, sucrose, fructose and total sugar contents of ‘Granny Smith’, ‘Galaxy Gala’, ‘Royal Gala’ and ‘Fuji’ apple cultivars (*Malus communis* L.) grafted on M9 in Çarşamba district of Samsun province, Turkey, in 2015 - 2016 years. In results of study, while the highest total phenolic content was observed in Fuji cultivar (2305.1 mg kg⁻¹), the lowest was observed in Galaxy Gala cultivar (1242.0 mg kg⁻¹). According to DPPH test, the highest value of antioxidant activity was determined in Granny Smith cultivar (2.48 µmol g⁻¹) and the lowest was found in Galaxy Gala cultivar (0.98 µmol g⁻¹). FRAP test was found similar results in terms of antioxidant activity. Fuji cultivar (558.4 mg kg⁻¹) had the highest total flavonoids content and Galaxy Gala cultivar (323.7 mg kg⁻¹) had the lowest one. While the highest glucose content was obtained in Fuji cultivar (43.0 g 100 l⁻¹), the lowest was obtained in Galaxy Gala cultivar (12.7 g 100 l⁻¹). The highest sucrose content was observed Granny Smith cultivar (44.8 g 100 l⁻¹) and the lowest was observed in Fuji cultivar (19.9 g 100 l⁻¹). Fuji cultivar (403.5 g 100 l⁻¹) had the highest total sugar and Royal Gala (183.7 g 100 l⁻¹) cultivar had the lowest one. While the highest fructose content was obtained in Fuji cultivar (340.6 g 100 l⁻¹), the lowest was obtained in Royal Gala cultivar (140.3 g 100 l⁻¹). Consequently, in terms of biochemical and sugar contents, Fuji and Granny Smith cultivars had higher values than other cultivars.

Keywords: Apple, Total Phenolics, Antioxidant Activity, Total Flavonoids, Total Sugar

**Assessment of Thermal Insulation Materials in the Buildings**

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Abstract: Energy consumption is increasing due to industrialization, urbanization, technological developments and population growth. This increase in energy consumption has led our country to save energy. A large part of the energy needed for Turkey are imported. That is why our country has turned to alternative energy sources. It also works to reduce energy consumption. When we look at the rates of total energy consumption in our country, an important share is the energy that is spent heating and cooling the houses. When we look at the total energy consumption rates in our country, a significant part is used for heating and cooling houses. This suggests that heat insulation is very important for our country.

Thermal insulation can be defined as the prevention of heat loss and gain. Correct thermal insulation application also protects human and environmental health, prevents noise pollution, creates comfortable living spaces and protects building exterior walls against adverse atmospheric conditions. There is no perfect insulation material within the insulation materials to meet all needs. In this case the choice of material is very important for the best performance. In addition, for effective thermal insulation application, the regulations must be fully implemented and the correct insulation material must be selected at the appropriate thickness. In this study, thermal insulation materials and their effects on thermal insulation were evaluated.

Keywords: Energy Consumption, Energy, Thermal Insulation, Insulation Material, Turkey



Some Fruit Characteristics of Cornelian Cherry Genotypes in Niksar (Tokat) District, Turkey: First Year Results

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Abstract: Cornelian cherry (*Cornus mas* L.) fruits are widely grown in different regions of Turkey. In this present research was conducted to determine some fruit quality characteristics of cornelian cherry genotypes, which natively growing from seed, in Niksar district of Tokat province of Turkey. For this purpose, 33 genotypes were selected with field surveys in 2016. Some physical and chemical analysis were carried out on fruit samples taken from selected genotypes. In this scope, fruit weight, fruit length, fruit width, seed weight, seed length and seed width were measured as physical characteristics. In addition to physical features, some chemical properties such as soluble solid contents (SSC), titratable acidity (TA) and pH values have been determined of fruit samples. According to the research findings, physical attributes of examined cornelian cherry genotypes were determined between 1.23 g (60 NK 27) and 3.95 g (60 NK 24) fruit weight, 9.24 mm (60 NK 30) and 14.92 mm (60 NK 21) fruit width, 14.76 mm and 21.42 mm (60 NK 24) fruit length, 0.24 g (60 NK 18) and 0.46 g (60 NK 13) seed weight. Chemical properties of examined genotypes were showed change from 2.0 % (60 NK 16) to 6.0 % (60 NK 3) soluble solids content, 0.89 % (60 NK 20) to 2.84 % (60 NK 32) titratable acidity and 3.10 (60 NK 2 and 60 NK 24) to 3.53 (60 NK 9) pH value. As a result of the research, it has been determined that the Niksar district has a rich population in terms of cornelian cherry genetic resources.

Keywords: *Cornus mas* L., Native Resources, Pomology, Selection, Soluble Solid Contents



Mapping of the Ecosystem Services of the Maamora Forest Stands: Capacity, Supply and Accounting Balance Sheets

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Abstract: Understanding the flow of ecosystem services and the capacity of ecosystems to generate these services is critical to understanding the sustainability of ecosystem use and the development of ecosystem accounts. We conduct spatially explicit analyzes of some services in the Maamoura forest. Ecosystem services included include hunting, cattle grazing, logging, carbon sequestration and storage, recreational home equipment, recreational hikes, and zones without technical interference. Conceptually distinguishing the ability to provide ecosystem services from their actual use (demand), and evaluating them both empirically. Capacity and flow differ both in spatial extent and in quantity. We discuss five conditions for "establishing a significant balance of capacity and flow spatially. These are (1) a conceptual difference between capacity and flow, (2) the spatial presentation of capacity and flow, (3) having the same spatial extent, (4) rivalry or congestion, and (4) 5) common measurement indicators. Research in this emerging field of ES mapping should focus on developing compatible indicators for capacity and flow. The distinction between capacity and flow of ES provides a parsimonious estimate of over- or under-utilization of services. The respective assessment of capacity and flow in a spatially explicit manner can therefore support the monitoring of the sustainability of ecosystem use, which is an essential element of ecosystem accounting.

Keywords: Ecosystem Services, Maamora, Mapping, Ecosystem Accounting



The Effects of Natural Weathering on the Heat Treated Fir Wood Properties

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Abstract: Uludağ fir wood obtained from Kastamonu was applied heat treatment at 150, 180 and 200°C for 2, 4 and 6 hours with linseed oil. Also, this wood was impregnated with CCA (copper, chrome, arsenic). According to AWP A E07-09 standard heat treated and impregnated positive control samples were placed forestland and agriculture areas in Kastamonu University Campus.

These samples were exposed to outdoor factors during 1-year natural aging test. At the end of the natural weathering test, weight changes occurring in the wood samples were determined. The weight loss of the control fir wood in agricultural land was detected as 1.76%, forestland as 3.79%. The weight loss of the impregnated fir wood samples was determined as 0.14% in agricultural land and 0.42% in forest land. The weight loss of oil heat treated samples was lower compared with its control samples. In addition, the weight loss of oil heat treated samples was higher compared with CCA impregnated samples.

Generally, increasing of the heat treatment temperature and time decreased weight loss of heat treated samples. However, impregnated samples showed more resistance than heat treated samples against outdoor factors. The reason of this was the impregnation chemicals having high toxicity. On the other hand, during to heat treatment process is not used any chemicals. For these reasons, it will be important to support to the research regarding heat treatment that is environmentally friendly method. Moreover, using of heat treatment of wood was suggested building siding, garden furniture, window frames and floor coverings.

Keywords: Oil Heat Treatment, Linseed Oil, Impregnation, Fir Wood, Natural Weathering, Mass Loss

Reproduction of Bushymouth Catfish in Aquarium Conditions

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Abstract: Bushymouth catfish (*Ancistrus dolichopterus*) which belongs to the genus *Ancistrus* is generally consumed as aquarium fish. They have omnivorous feeding regime but they also like blood worms, gammarus and dead fish on tank conditions. Because of this attribute, the fish is called “tank cleaner”.

The observation of the fish during the reproduction period is difficult. They reproduce at night, mostly in hiding spots and shaded areas. Firstly, the male individuals prepare the nest which is called pseudo-nest then female can spawn on the clean area. During the embryonic development, male is responsible for nursing the egg clutch. On average, 30 to 100 bright orange large-eggs are spawned by female and the male fish start taking care of them with cleaning, dusting and guarding.

2 pairs of bushymouth catfish were observed in an aquarium and natural spawning behavior was monitored for 4 months. The water parameters were analyzed during the study. Temperature (Temp.), dissolved oxygen (DO), salinity, pH, total dissolved solids (TDS) and electrical conductivity (EC) were measured in situ with multiparameter device (WTW 3420i SET). Analysis of nutrient elements which are ammonium nitrogen (indophenol blue method), nitrite nitrogen (diazotization method), nitrate nitrogen (cadmium reduction method), phosphate phosphorus (phosphomolybdenum method) have been performed using spectrophotometer.

The mean values of temperature, salinity, dissolved oxygen (DO), pH, total dissolved solids (TDS) and electrical conductivity (EC) were found as 26.05 ± 0.250 °C, 0.65 ± 0.150 ‰, 7.50 ± 0.100 mg/L, 7.49 ± 0.260 , 1310.00 ± 272.000 mg/L, 1.311 ± 0.273 mS/cm respectively. The mean concentrations of nutrients were 0.048 ± 0.001 mgNH₄⁺-N/L, 0.097 ± 0.005 mgNO₂⁻-N/L, 0.167 ± 0.012 mgNO₃⁻-N/L, 0.991 ± 0.013 mgPO₄³⁻-P/L respectively. Reproduction behavior of one of the economically important ornamental fish specie was observed in this study. Further research is needed to understand and develop an efficient production cycle.

Keywords: Bushymouth Catfish, Aquarium Fish, Reproduction Behaviour, *Ancistrus dolichopterus*, Water Parameters

**Effect of Nano and Bulk Forms of Zirconium Oxide Nanopowder to *Artemia franciscana*****Mehmet ATEŞ¹, İsil Canan ÇİÇEK ÇİMEN^{2*}, İlkay ÜNAL¹, İlnur KARS DURUKAN³ Corneliu BOGATU⁴**¹Department of Bioengineering, Faculty of Engineering, Munzur University, Tunceli, Turkey²Department of Aquaculture, Fisheries Faculty, Munzur University, Tunceli, Turkey³Department of Physics, Faculty of Sciences, Gazi University, Ankara, Turkey⁴Center for Environmental Technology, Timisoara, 300666, Romania* **Corresponding Author:** isilcanancek@gmail.com

Abstract: Nanotechnology depends in part on exploiting the size-specific properties of nanoscale materials, which in some cases includes an expression of quantum effects that are unique to nanoparticles. By the same token, these size dependent properties also lead to the possibility of size-dependent biological activity. In this study, we used *Artemia franciscana*, crustacean filter feeders, as a test aquatic biological model to investigate the toxicity of zirconium oxide nano (ZrO_2 , 99.9%, 20-30nm) and bulk size particles (ZrO_2 -3Y 99.9%, 0.3-0.5 μm) on marine microorganism *A. franciscana* to determine the toxicity, uptake and elimination profiles of these particles. Acute exposure was conducted in seawater for 24 h and 96 h. *A. franciscana* larvae were exposed to four different concentrations (5, 10, 50 and 100 mg/L) of ZrO_2 and ZrO_2 -3Y nanopowders. A control group was also set up without the target compound. Characterization of nano and bulk size ZrO_2 was performed using TEM, XRD, FT-IR, DLS, Zeta Potential analyzes. According to the analysis results, the mortality rate of *A. Franciscana* is parallel with the oxidative stress results. The highest toxicity rate (25%) was measured with the small-sized nanoparticles. Depending on the dose increases, despite there is an increase in accumulation ratio for both ZrO_2 particle sizes, the highest amount of accumulation occurred in the groups exposed to larger size ZrO_2 particles. Although there are differences in the elimination rates based on ZrO_2 particle sizes, average eliminations in 24 hours were measured between 10% and 15%. The results show that the nano-sized ZrO_2 particles cause more toxic effects on aquatic organisms than their bulk forms.

Keywords: Zirconium Oxide, Nanoparticles, Toxicity, Accumulation, Elimination, *Artemia franciscana*



Lerneosis in Rainbow Trout (*Oncorhynchus mykiss*) Cage Culture

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Abstract: Lerneosis which is caused by an anchorworm, *Lernae cyprinacea* is a worldwide disease that reported from many countries in time. This parasitic specie is commonly observed from crucian carp, goldfish and common carp but it can infect other fish species and cause major loss especially on pond-raised species such as *Salmo* spp. and rainbow trout. This copepod is feeding on blood and tissue debris and if the vital organs are penetrated by the anchors, mortality may be seen with high rates.

L. cyprinacea infestation was determined from a rainbow trout farm in a reservoir cage farm in Antalya, Turkey between May-September 2017. The prevalence of the infestation was detected 60%. This parasite was detected in the pond system regularly during the spring and summer months in this study. Deep ulcers, abscess, lesions and fistulas were observed from different parts of the body, especially around the bases of dorsal and anal fins. For scanning electron microscope images, samples were dehydrated according to Eisenback (1986) and sputtered with gold with Quorum Q150Res, examined in Carl Zeiss 300VP scanning electron microscope from Izmir Katip Celebi University General Research Laboratory.

Fish can survive this infestation but chronic conditions continue during the life period. The intense inflammation can lead to secondary bacterial and fungal infections and cause further mortality in farms. In addition, the scar tissue on the flesh causes quality problems during the processing period. Both scenarios elicit economic losses. It is a considerable problem for the natural environment, aquaculture production and processing facilities in Turkey but more studies are needed to eliminate and minimize this problem

Keywords: Lerneosis, Rainbow Trout, Parasite, Fish Diseases, Electron Microscopy



Determination of Bioactive Properties of Alişar Pear Clones Grown in Şebinkarahisar (Giresun) District

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Abstract: This study was carried out in order to determine some biochemical characteristics known to have beneficial effects on human health in Alişar pear clones (*Pyrus communis* L.) that growing locally in Şebinkarahisar district of Giresun province, Turkey. Within the scope of the research, 29 Alişar pear clones were determined in the district in 2015 and investigations were carried out on fruit samples taken from these clones. Total phenolic contents, total antioxidant capacities (DPPH and FRAP assays) and total flavonoid contents of the fruit samples were determined. As a result of study, while the highest total phenolic content was observed in 28 ŞA 19 clone (147.38 mg / 100 g), the lowest was observed in 28 ŞA 11 clone (72.61 mg / 100 g). According to DPPH test, the highest value of antioxidant activity was determined in 28 ŞA 06 clone (0.76 mmol / kg) and the lowest was found in 28 ŞA 06 clone (0.18 mmol / kg). In FRAP test, the lowest of antioxidant activity was found in 28 ŞA 01 and 28 ŞA 09 clones (2.61 mmol / kg) and the highest was found in 28 ŞA 23 clone (4.27 mmol / kg). 28 ŞA 18 clone (18.01 mg / 100 g) had the highest total flavonoids content and 28 ŞA 18 clone (3.05 mg / 100 g) had the lowest one. In conclusion, Alisar pear clones were found to have a rich biochemical content. Also, the results from this study will provide new insights into farming, fresh fruit consumption, industrial food processing and future research studies.

Keywords: *Pyrus communis* L., Genetic Resources, Total Flavonoids, Antioxidant Activity, Total Phenolics

Textural Characteristics of Heat Treated Sucuk Produced by Using Different Salt Mixtures

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Abstract: In this research, effects of different salt mixtures usage (100% NaCl, 50% NaCl + 50% KCl, 50% NaCl + %30 KCl + 20% MgCl₂, %50 NaCl + 30% KCl + 20% CaCl₂, 50% NaCl + 30% KCl + 10% MgCl₂ + 10% CaCl₂) on the textural properties of heat-treated sucuk (semi-dry fermented sausage) production were investigated. *Lactobacillus plantarum* GM77 strain, isolated and identified from sucuk (Turkish dry fermented sausage) was used as a starter culture in the production. After fermentation (at 22 °C ±1 for 24 hour), heat treatment was applied to samples such that the core temperature was 68°C. Samples were consequently dried at 16 °C. The samples taken from the production stages (sucuk batter, after fermentation, after heat treatment and after drying) were subjected to texture profile analysis. Different salt mixture factor had a very important effect (P < 0.01) on hardness, resilience, cohesiveness, gumminess and chewiness. The group with 50% NaCl + 30% KCl + 20% MgCl₂ showed the highest values in terms of hardness, gumminess and chewiness. The presence of 20% MgCl₂, 20% CaCl₂ and 10% MgCl₂ + 10% CaCl₂ increased cohesiveness and resilience values. Adhesiveness and springiness were not affected by different salt mixture factor (P > 0.05). The production stage factor had a very significant effect on all of the investigated textural parameters at P < 0.01 level. The hardness, gumminess and chewiness values increased in the production stages and the highest values were determined in the drying stage. The interaction of different salt mixture and the production stage affected hardness and gumminess at P < 0.01 level, while the resilience, cohesiveness and chewiness were also affected by the interaction at P < 0.05 level.

Keywords: Heat Treated Sucuk, NaCl, KCl, MgCl₂, CaCl₂, Texture



A Traditional Product: Hiz Fat

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Abstract: Hiz fat, which is a traditional product of Southeastern Anatolia region, is a variety of butteroil produced from yayıkaltı butter. Yayıkaltı butter is obtained at the end of the churning of the yoghurt, which is produced from sheep milk, at a temperature not exceeding 60 °C. Yayıkaltı butteroil is produced as a result of separating from the foam, sediment and water after melting the yayıkaltı butter. Hiz fat is produced by filling yayıkaltı butteroil into goat skin which is obtained from healthy small cattle and storing at least 2 months in a cool place. Inner part of the goat skin is cleaned from fat tissue whereas the outer part is cleaned from hairs and then the inner part is covered by molasses, sugar syrup or honey before the filling. Hiz fat is preferred by the people of the region for the preparation of dishes; especially rice in terms of taste, flavor and aroma properties and it is also preferred in desserts prepared by high heat treatment such as baklava. As nomadic life culture was dominant in the Southeastern Asia, transportation and shelf life of food gain importance. Therefore, storing food in a pre-cleaned and dried animal skin is one of the traditional food preservation methods. Thus, the transportation of food becomes easier, the shelf life of food is prolonged and food gains specific aromatic taste and smell as a result of storing into animal skin. In this study, a traditional product will be introduced by presenting information about the production and consumption of Hiz fat which is known in Karacadağ region of Şanlıurfa.

Keywords: Hiz Fat, Yayıkaltı Butter, Goat Skin, Molasses, Butteroil



Development of Titanium Dioxide Doped Polypropylene Based Composite Membrane for Proton Exchange Membrane Fuel Cell

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Abstract: Membranes are regarded as the heart of the Polymer Electrolyte Membrane Fuel Cells (PEMFC). Perfluoro sulfonic acid membranes especially Nafion is the most widely used membrane. But due to its some disadvantages such as its low proton conductivity at high temperatures due to the evaporation of water and its very high cost, studies are focused on the development of an alternative membrane. Aim of this study is to develop an alternative membrane that combine the organic and inorganic materials in its structure so that having better physical and chemical properties than the Nafion that is the most widely used membrane as electrolyte in Polymer Electrolyte Fuel Cells (PEMFC). For this purpose Polypropylene based membranes containing hypophosphorous acid (H_3PO_2) as additive and Titanium dioxide in different ratios (%1, %5, %9) were synthesized by means of classical sol-gel method. Synthesized membranes were subjected to a set of characterization experiments such as water uptake capacity, swelling, ion exchange capacity (IEC), FT-IR, and electrochemical impedans measurements. As a result of these studies it was found that addition the TiO_2 to the membranes is increase the proton conductivity without any swelling. It was observed that, water uptake capacity of membranes are constant with the increasing titanium dioxide content of the membrane as expected. This phenomenon may be explained by the hydrophobic nature of the titanium dioxide. These properties indicates that these membranes are suitable for usage in fuel cells. Characterization experiments results are close to the values reported for the perfluorosulfonic acid membranes and hence promising for the use of these membranes in fuel cells.

Keywords: PEMFC, Polypropylene, Titanium Dioxide, Composite Membrane, Impedance Analysis



Methanation of Carbondioxide Over the NaY-Zeolite and Molecular Sieve Supported NiO Composed Catalysts

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Abstract: Methane is an energy carrier of significant importance to the industry, energy, and transportation sectors worldwide. Its existing distribution infrastructure in many countries makes it a constitutive element of modern economies. The major share of industrially used methane comes from fossil natural gas resources. However, the debate of the finiteness of fossil resources and climate change caused the research expenditures relating to catalytic and biological methane production from carbon oxide-rich gases (methanation) to increase over the last years. Research into catalytic methanation processes focuses on two options, CO methanation and CO₂ methanation. Methanation processes aim to produce methane from hydrogen and carbon oxides. The conversion of carbon monoxide is referred to as CO methanation, the conversion of carbon dioxide as CO₂ methanation, respectively. ($\text{CO} + 3\text{H}_2 \rightarrow \text{CH}_4 + \text{H}_2\text{O}$ $\Delta H = -206.28$ kJ/mol; $\text{CO}_2 + 4\text{H}_2 \rightarrow \text{CH}_4 + 2\text{H}_2\text{O}$ $\Delta H = -164.12$ kJ/mol)

In this study, methanation of carbondioxide over the molecular sieve zeolite and NaY-zeolite supported NiO catalysts were studied. Catalysts were prepared by using two different impregnation methods. The first one is traditional impregnation method and second one is surfactant assisted impregnation method. Surfactant used in order to improve the average pore size, pore volume and distribution of active component in the porous structures of the support. All catalysts characterized by using different characterization techniques. X-Ray diffraction analysis used to find the crystal phases present in the catalysts and to calculate the average crystal sizes. The N₂ physisorption analysis used to observe the surface area, pore volume and average pore diameter present in the catalysts. CO₂ methanation were done between the 300°C and 600°C temperatures by using 25% CO₂, 50% H₂ and remain He feed condition.

CO₂ methanation activity studies showed that molecular sieve supported NiO catalysts are most active catalysts in comparison with the NaY-Zeolite supported catalysts. NiO/MS-S catalyst prepared by the surfactant assisted impregnation method gave 50% CO₂ conversion to methane above the 500°C and NiO/MS catalyst prepared by the traditional impregnation method gave maximum 23% CO₂ conversion to methane at 600°C temperature. Activity results showed that preparation of catalysts by using surfactant lead to increase the activities of the catalysts for the CO₂ methanation reaction.

Keywords: Methanation, Hydrogenation, Carbondioxide, Catalysts



Synthesis and Characterization of Silver Nanoparticles with Chemical Method

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Abstract: Silver nanoparticles (Ag NPs) are widely studied due to their unique properties. Ag-NPs are obtained by using physical, chemical and biological techniques. In this work, Ag-NPs were synthesized using two different chemical reduction methods. First of these methods is based on the reduction of Ag with citrate and the other one is based on reduction of Ag ions with sodium borohydride. In order to determine the physical and chemical properties of the obtained Ag-NPs, their characterizations were conducted by means of executing TEM, FT-IR, EDX, SEM, XRD, DLS and Zeta Potential analyses. According to TEM analysis results of Ag-NPs obtained by different chemical synthesis methods; it was determined that particles of two different sizes (10-20 nm and 30-60 nm) were synthesized and that these particles were homogeneously distributed and almost all were spherical or similar in structure. It was observed by FTIR analysis that silver nanoparticles contain traces of carbonate and organic content on their surface, and these suggest carbonate-silver complexes formation. The presence of carbon was recorded in EDX spectrum: 93.64% silver and 6.36% carbon, by weight. SEM images revealed individual spherical nanoparticles with sizes about 5 – 12 nm, clusters of 80-250 nm linked together by acicular forms of 120 –160 nm. The XRD analysis of Ag NPs revealed diffraction peaks assigned to face centered cubic crystal structure, that match very well with those from standard file. The computed size of nanoparticles ranged between 12.44 – 20.36 nm. There is possible the carbon content in Ag NPs to influence their computed size. According to the results of DLS analysis, the hydrodynamic diameter values of the Ag NPs were found to be 20 times higher compared to their true sizes and the polydispersity index value of the Ag NPs was found to be 0.540. In the Zeta potential analysis, surface load values were -25.0 mV and they were found to be moderately stable.

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Keywords: Silver, Nanoparticle, Chemical, Synthesizing, Characterization



The Determination of γ –Ray Transmittances of GaSe and GaSe:Cd

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Abstract: The γ –ray transmission factors (T) for GaSe and GaSe:Cd semiconductor crystals have been measured by using an extremely narrow collimated-beam transmission method in the energy 59.5 keV. The semiconductor crystals were grown by using the Bridgman/Stockbarger method. Gamma-rays of ²⁴¹Am passed through crystals were detected with a high-resolution Si(Li) detector and using energy dispersive X-ray fluorescence spectrometer (EDXRF). The data were collected into 4096 channels of a multichannel analyzer and the spectra were collected for a period of 1800 s. The structure and lattice parameters of the GaSe and GaSe:Cd semiconductors have been analyzed using a X-ray diffractometer (XRD) and scanning electron microscopy (SEM). Cd doping caused a significant decrease in the XRD peak intensity and increase in the γ –ray transmission factor. Results are presented and discussed in this study.

Keywords: EDXRF, GaSe, Semiconductor Crystals, SEM, Transmission Factors



New Results of Phenological Variability of Pedunculate Oak (*Quercus Robur L.*) in Bosnia and Herzegovina

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Abstract: Our research of Phenological variability of 28 provenances of pedunculate oak in the Bosnian and Hercegovinian test of provenances in Zepce. The experiment is based in the accidentally random block system with three (3) repetitions, where each provenance in each block is represented by 36 plants. We observed the process of foliation during years 2012 and 2013 and from the end of March to beginning of May. We followed six (6) phenofazes of foliation that were developed for beech by Forstreuter (2002). The analysis of Phenological phases has shown that there are statistically important differences between the investigated provenances. The differences have been confirmed for the start, duration and end of certain Phenological phases during foliation in the provenances and it points to a genetic variability between the populations and the dependence of Phenological phases on the weather conditions.

In this research, based on the earliest appearance of the phases no differentiation between any of the provenances could be made. Bijeljina provenance entered phase B slightly earlier in 2012, while in 2013 it entered phase B at the same time as all the other groups. With the Bosanska Dubica provenance we observed lateness with all the phases in both years, however when compared to the other groups it averages a delay of 7-10 days and considering the location is in a mountainous conditions we can safely confirm that it is a matter of late form.

The obtained results should be used for planning, repopulation and reintroduction of pedunculate oak in Bosnia and Hercegovina. This research should be done further and in more depth to obtain an even more details picture about the phenology of Common oak and further research would help to establish the early and late forms while taking the weather and its effects into consideration.

Keywords: Phenology, Provenances, Pedunculate Oak, *Quercus robur*



From Rapid Rural Appraisal to Participatory Rural Appraisal: Similarities, Differences and Advantages

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Abstract: Rural areas are places where the population density is low, agricultural activities are dominant, natural conditions and traditions shape life, and social facilities are insufficient. Today, people living in rural areas are changing their way of life due to factors such as rapid urbanization, population growth, modernization, ethnic conflicts and environmental degradation. In addition to the difficulties faced by rural people, the inadequacies of rural development efforts and approaches are seen as another important problem. At this stage, it is important that to achieve the same goal in order to understand the problems and processes of development in rural areas by the researchers, development agencies and local people work together. Rapid changes that take place in the countryside also reveal the need for information from these areas. Negativities--time consuming, excessive cost, etc. caused by the particular data collection and analysis methods used for this requirement--are the main reason for the development of a number of new methods that are including the local people. The Rapid Rural Appraisal (RRA) is one of the most effective methods for rural development in the 1970s. The multidisciplinary approach is one of the main features of this method. In this method, which is more advantageous in terms of time, local people take information by taking part in themselves. Participatory Rural Appraisal (PRA), which is another method, is a method that has started to develop since the early 1990s. The aim of this method is to help villagers strengthen their capacity to plan, make decisions and act to improve their situation. The basic idea of the method is to learn from the people in rural areas. In this study, an evaluation will be carried out in terms of basic characteristics, similarities, differences and advantages by considering the two important methods related to the topic, RRA and PRA methods.

Keywords: Rural Area; Rural Development; Participation

Keywords: Rural Area, Rural Development, Participation



Wastewater Treatment Water Plants in the World and Turkey

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Abstract: The purpose of this study is to prepare an inventory and the importance of the water plants that are used for waste water treatment in Turkey and all around the world.

The use of advanced technological equipments in wastewater treatment is causing high costs as it requires qualified human power and maintenance. For this reason, many countries conduct a large number of research into the use of various aquatic plants in wastewater treatment. Generally, water plants are used for waste water treatment in pool systems where waste water is collected. Water plants are easy to find, economical and sustainable. Purification mechanisms such as sedimentation, adsorption, bacterial decomposition and vegetal use in the treatment process with water plants. The fact that the construction and operation costs of water plants and natural treatment systems are low; there is no need for any chemicals or mechanical equipments; they work with a completely natural mechanism and in addition to this, the organic wastes are transformed into protein rich plant biomass in a rich environment of nutrients such as domestic wastewater, are making these systems attractive. In addition to wastewater treatment, protein content can be utilized in animal feed production or biogas production. The growth of aquatic plants depends on the availability of nutrients in their ammonium and phosphate forms. Nitrogen compounds, such as ammonium, are removed from wastewater treatment pools with water plants by metabolic use, precipitation of suspended solids with organic nitrogen, and nitrification-denitrification. Phosphorus is removed from the water by means of adsorption, chemical precipitation and sludge removal on the plant uptake,

According to the results of the research, the most used water plants in the world are from floating water plants; water lettuce (*Pistia sp*), water hyacinth (*Eichhornia crassipes*), emergent aquatic plants phragmites (reed) and typha. Aquatic plants in Turkey are submergent plants, floating plants and emergent plants. The most common species are *Pistia sp*, *Eleocharis sp*, *Eichhornia crassipes*, *Lemna minor* and Phragmites. However, there are plenty of water plants available in this area and other types of water plants that can be considered in this study are also given.

Keywords: Water plants, Submergent Plants, Floating Plants, Emergent Plants, Wastewater Treatment



The Using Possibilities of Whey in Animal Feeding

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Abstract: Whey is the liquid part of the cheese which separated from the solid part after the cheese made process. It is the most important by-product of the dairy industry. For decades, whey products have been successfully used in feed for young animals including calves, lambs and goat kids and also pigs. Whey is an acceptable liquid protein supplement for ruminants. Moreover, whey products are increasingly being used in animal feed for both breeding and fattening purposes. Dried whey in non-ruminant rations increase weight gains, feed efficiency, protein digestibility, and fat digestibility, as well as mineral absorption and retention. It can be utilized well when fed to animals in a variety of forms such as liquid whey, condensed whey, dried whey, or dried whey products. Whey are used in the feeding of farm animals by direct drinking or added to their roughage. Ruminants can consume up to 30% of their dry-matter intake as liquid form of whey. However, when whey is given in liquid form and large quantities to animals, swelling problem can occur in the animal. For this reason, it is better to mix whey into animal feed as powder form. In studies carried out on ruminants, it was determined that the digestibility of the dry matter components increased in dried grass using the animal feed when it was mixed with whey instead of water. It was also found that protein and phosphorus utilization ratio increased when 5% whey was added to the animal feed. On the other hand, whey products are highly palatable and digestible feed components that stimulate appetite, feed intake, gut health and animal performance. In the 21st century whey was converted a wide range of powders with key physical and functional properties as well as specific nutrient values using high technologies. These nutrients are available to the animal feeding, making whey products ideal for diets of animal puppies.

Keywords: Whey, Animal Feding, Diet

**Response of Turnip Plants to *Turnip mosaic virus* (TuMV)**

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Abstract: *Turnip mosaic virus* (TuMV), a member of the genus Potyvirus, is one of the most important viruses infecting a wide range of plant species, primarily from the Brassicaceae family. The family includes a large variety of economically important crops belonging to different genera. Turnip (*Brassica rapa* var. *rapa*) is an important cole crop in Turkey. The tuberous root of turnip is used as food, and forage. TuMV has adapted to such diversified cruciferous crops.

The study was designed and carried out to detect the response of turnip plants to TuMV in a greenhouse at Faculty of Agriculture, the University of Ondokuz Mayıs, during late autumn season. Seeds of turnip were germinated in plastic pods. The experiments were performed in four replications with positive and negative controls. Twenty seedlings were grown for each experiment and were inoculated with sap from TuMV-infected plants. Weekly observations were recorded according to the disease rating scale (0-9) throughout the 8-weeks duration of each experiment.

In turnips, TuMV showed chlorotic or necrotic local lesions, systemic vein clearing and veinal flecking developing into severe mosaic. Host reaction studies showed that the mean weekly scales were 0, 0.1, 0.2, 0.2, 0.4, 0.5, 1.1, and 2.0, respectively. Average infection rate was detected as 27.3% using DAS-ELISA after eight weeks.

Keywords: *Brassica rapa*, Mechanical Inoculation, Response, TuMV, Virus

**Reaction of White Head Cabbage Cultivars to *Turnip mosaic virus******Talat GÖKTEPE¹, Feride ALPER¹, Nuran CANSIZ¹, Mehmet Ali SEVİK^{1*}***¹ *Department of Plant Protection, Faculty of Agriculture, University of Ondokuz Mayıs, Samsun-TURKEY***Corresponding author: malis@omu.edu.tr*

Abstract: White head cabbage (*Brassica oleracea* var. *capitata* subvar. *alba* L.) is an important cool season crop in the Black Sea Region of Turkey. Species of the Brassica genus may be infected by various viruses. *Turnip mosaic virus* (TuMV) is one of the most important viruses infecting a wide range of plant species, primarily from the Brassicaceae family.

Experiments were carried out to evaluate the reaction of white head cabbage cultivars to mechanical inoculation with isolate of the TuMV from Samsun province, the Black Sea Region of Turkey. The experiments were performed in four replications with positive and negative controls. The saps obtained by grinding TuMV-infected white head cabbage leaves in 0.01 M phosphate buffer (pH: 7.0) were mechanically inoculated to white head cabbage plants using carborundum powder as abrasive. The inoculated plants were maintained in a greenhouse for eight weeks and the symptoms were visually scored according to the disease rating scale (0-9). The average weekly scales were 0, 0.1, 0.5, 1.1, 2.1, 2.7, 4.1, and 5.4, respectively.

The course of symptom expression was assessed and the results of virus detection in symptomless leaves were documented using DAS-ELISA. The mean percentage incidence was 77.3% after eight weeks. All tested cabbage cultivars showed a similar level of susceptibility.

Keywords: *Brassica oleracea*, Cabbage, Reaction, TuMV, Virus

**Evaluation of Radish (*Raphanus sativus* L.) Plants Reaction to *Turnip mosaic virus***

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Abstract: *Turnip mosaic virus* (TuMV; genus Potyvirus) is one of the most destructive viruses the Brassicaceae family. Objective of the present study was to determine the the reactions to TuMV of radish (*Raphanus sativus*) plants.

A study was conducted in greenhouse at Faculty of Agriculture, the University of Ondokuz Mayıs, Samsun in 2018. The saps obtained by grinding TuMV-infected leaves in 0.01 M phosphate buffer (pH: 7.0) were mechanically inoculated to radish plants using carborundum powder as abrasive. Observations were recorded according to the disease rating scale (0-9) throughout 60 days of each experiment.

The results of study showed that the incidence of virus in radish crop was 27.3%. Radish plants showed *systemic symptoms* (mosaic, mottle) developed at 3 weeks post inoculation (wpi). For eight weeks, the average weekly scales were 0, 0.1, 0.2, 0.2, 0.4, 0.5, 1.1, and 2.0, respectively. The virus infections were detected in radish plants using double-antibody sandwich enzyme-linked immunosorbent assay (DAS-ELISA) method.

Keywords: *Brassica*, Radish, Reaction, Virus, TuMV



Identification and Treatment of Cow's Milk-Based Protein Allergy

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Abstract: Although cow's milk has high nutritional value, cow's milk protein allergy (CMPS) is one of the most common food allergies. It is particularly common during childhood and can be reduced by the development of the immune system in later ages. The increase in the consumption of convenience food today, the spread of dairy protein-based foods, and the reduction of consumption of milk and dairy products have not prevented the decrease of allergenicity. Apart from regulation of diet any more appropriate treatment has not yet been developed to overcome cow milk protein allergy. Technological approaches aim to reduce or eliminate allergen by developing new techniques during food processing. The major allergen proteins in the cow's milk are casein (CN), beta-lactoglobulin (β -lg), and alpha-lactalbumin (α -la). These protein fractions are identified by SDS PAGE, capillary electrophoresis, and chromatography. Some techniques applied during the processing of milk can lead to reduce or control milk protein allergy. This research aims to identify milk protein fractions causing allergy and to investigate the reduction or elimination of allergenicity through food processing techniques. Various methods reducing allergenicity are naturally involved in food processing such as heat treatment, enzyme activity and fermentation. Occurrence of the allergenicity due to given protein fractions can be characterized by their specific allergen sites. The antigenic marker epitope is a part of the antigen recognized by IgE and IgG antibodies and allows the antigen to bind to its specific antibodies. Due to processing the disappearance or modification of the conformational epitopes occur, thus the antibody does not recognize allergen and the allergic reaction can be inhibited.

Keywords: Cow's Milk Allergy, Allergen Protein Fractions, Casein, Dairy Protein-based Foods, Epitopes



Usage of Natamycin as Preservative in Dairy Foods

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Abstract- Natamycin is a natural antimicrobial agent produced by *Streptomyces natalensis* and related species. It has broad spectrum of activity against yeasts and molds, whereas it has no antimicrobial activity against bacteria and viruses. It is commonly used in food industry for preservation of dairy-based foods. Natamycin is defined as colorless, odorless and tasteless material, and its activity is affected by temperature, pH, light, oxidants, acidity and heavy metals. It has low solubility in water, and this property makes it appropriate for the surface treatments of foods. As it specifically inhibits the growth of molds and yeasts, it is favored as preservative for surface treatment of some cheeses. Incorporation of natamycin into cellulose-based edible films and coatings also provided improved properties in packaging applications of dairy and other food products. It is reported that coating of cheese with natamycin containing films lead to the logarithmic reduction in the number of molds at the end of a storage period. Natamycin has also significant importance in food processing technology because of not leading changes in shelf-life and organoleptic properties of foods, while it significantly affects various species including *Aspergillus*, *Penicillium* and *Geotrichum*. In comparison with the chemical preservatives and other antimicrobials, the activity of natamycin is high as much as 50 - 100 times. According to Turkish Food Codex, natamycin is also regarded as natural preservative with legally allowed limits. Natamycin or other preservatives used in foods can be detected by various instrumental methods including chromatography and spectroscopy. The aims of the presented study are to investigate the use of natamycin in dairy products for preservation purposes and screening alternative approaches for innovative preservation applications.

Keywords: Natamycin, Antifungal, Antimicrobial, Edible Films, Dairy Foods, Preservative

**Full Controlled Production and Sex Control of Wels Catfish (*Silurus glanis*)****Hülya SAYGI¹, Fatih GÜLEÇ^{1*}**¹Ege Üniversitesi, Fisheries Faculty, Aquaculture Department, İzmir-TURKEY

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Abstract: This study aims to fully controlled production and sex control of wels catfish (*Silurus glanis*) and to increase fertilization and survival rates using different solutions and methods, enrichment of natural stocks with the obtained larvae and to provide participation as a new species in addition to species cultivated in Turkey. Experiment was carried out in Gürle Trout Farm in Manisa province. Eggs and sperm, that had been obtained from the broodstock, exposed to various fertilization methods and the fertilized eggs were put in the zuger jars and made triplicate trials.

As a result, under the light of the findings obtained from different fish that was captured in different times and from three different regions; eggs that were treated with the urea-salt solution fertilization, eying and survival rates were higher than only salt solution application. Urea-salt solution for 10 minutes were more successful than only salt solution for 10 minutes. In the second part of the study, an experiment for the sex control of the wels catfish had been tried to conduct. But, the time problem of working with living materials had become one of the biggest obstacles to this work. And the other problems were related with the environmental conditions of experimental area. For this reason in order to obtain healthier results, it is necessary to carry out again the study in a suitable experimental area that has optimum environmental conditions and technical infrastructure.

Keywords: Wels Catfish, *Silurus glanis*, Fully Controlled Production, Sex Control, Fertilization Media

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Viral Disease Infecting Garlic Crops in Samsun, Turkey

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Abstract: Garlic (*Allium sativum* L.) is one of the most important allium crops cultivated throughout the world. The viruses infecting garlic plants have a big influence on the yield and the quality of bulbs. A survey for viruses infecting garlic was carried out in Samsun, Turkey. The aim of the research was to check which viruses occurring most often garlic plants. A total of seventy samples were collected and checked by biological and serological methods for the presence of *Onion yellow dwarf virus* (OYDV), *Leek yellow stripe virus* (LYSV), *Garlic common latent virus* (GCLV), *Shallot latent virus* (SLV), and *Iris yellow spot virus* (IYSV) using virus-specific antiserum.

OYDV was the only virus detected by double antibody sandwich-enzyme linked immunosorbent assay (DAS-ELISA) in garlic (5.7%) samples collected from Samsun province. Other viruses (LYSV, GCLV, SLV, and IYSV) tested were not detected in this study.

Keywords: Allium, Garlic, OYDV, Survey, Viruses



Soybean mosaic virus and Cucumber mosaic virus Infections on Soybean in Samsun Province of Turkey

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Abstract: The soybean (*Glycine max* L. Merr.) is one of the most important legume crops for seed protein and oil content. Soybean plants may be infected by a number of viruses, and they cause yield reductions. This study aimed at investigating viral pathogens on soybean plants in Samsun province of Turkey. A total of 444 symptomatic and asymptomatic soybean leaf samples were collected from Samsun province of Turkey in 2014-2017. Samples were tested for *Alfalfa mosaic virus* (AMV), *Cucumber mosaic virus* (CMV), *Soybean mosaic virus* (SMV), *Tobacco ringspot virus* (TRSV), and *Tomato spotted wilt virus* (TSWV) using Double antibody sandwich- Enzyme-linked immunosorbent assay (DAS-ELISA). Absorbance values were read at 405 nm using a microplate reader. Samples were determined to be positive for the virus at three times the average absorbance of the negative controls included on each plate. Serological test results showed that samples were infected with SMV, and CMV. In the present study, AMV, TRSV and TSWV were not detected in tested soybean plants from Samsun province. SMV was the most common virus, with an average of 13.9%, followed by CMV (3.6%) and SMV+CMV (0.9%) in this study. To our knowledge, this is the first comprehensive study to determine viruses on soybean in Turkey. This study revealed that the spread situation of SMV and CMV infection on soybean needs to be investigated in detail in Turkey.

Keywords: Samsun, Soybean, Viruses, SMV, CMV

**Place of Historical Development and the World of Tea Industry Tea Industry in Turkey****Muzaffer AYDEMİR***Business and Administration Phd**Corresponding Author: aydemirma67@gmail.com*

Abstract: Beyond being a tea beverage in Turkey, the plant itself determines the fate of the its geography and livings where it grows. Unfortunately, the superiority and sensitivity of the tea and tea industry, which is a strategic value for our country, have not been adequately addressed. Agricultural studies of tea, which was started in the last years of the Ottoman Empire, have been industrialized until 1947 despite intense struggles. Between the years of 1947 and 1984, depending on the conditions of the period, the tea sector, operating in state monopoly, was later included in the private sector. Despite the high competitiveness of Turkey, the country had not received adequate share of world tea exports some exceptions years. On the basis of this ground, there is a lack of organizational structures that will provide competitive advantage despite the advantage of production conditions. The Turkish tea industry, which has to be exist in the globalizing world conditions, has to fulfill the necessary conditions to survive. The tea sector, which has a different purpose and process than its counterparts in the world, effects the country's economy directly and the world economy indirectly. Examining the processes of the Turkish tea industry in the context of its historical transformation will provide positive contributions to the administrative science of Turkey and the world, besides tea farming.

In this research, the historical development of the tea industry in Turkey and its implications in the organizational dimension have been examined. The organizational effects of the Turkish tea industry in terms of the periods and process conditions in the sector have been investigated at the national and global scale through historical transformation methodology. The development of tea cultivation in Turkey has put forward its place in the world tea industry.

Keywords: Tea Agriculture, Industry, Historical Transformation, Organizational Transformation



Diptera and Odonata Nymphs of Nif Stream (İzmir)

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Abstract: Nif Stream, the gediz River and Izmir is one of the vital rivers that feed into the main source. The study was conducted in Nif Stream (İzmir) and the aims of the study are to determine the Diptera and Odonata nymphs composition of the stream, to determine environmental features of the stream.

Samplings of Diptera and Odonata nymphs were performed seasonally at eight stations between October 2013 and September 2014 in addition to measuring environmental variables of the localities. Diptera ve Odonata samples were collected by kicking benthic material with a 500 µm mesh sized kick-net.

As a result, 6 taxa of the Diptera order (*Atherix* sp., *Tabanus* sp., *Syrphus* sp., *Tipula* sp., *Limonia* sp., *Simulium* sp.) and 13 taxa of Odonata (*Ophiogomphus reductus*, *Aeshna affinis*, *Onychogomphus forcipatus albotibialis*, *Enallagma cyathigerum*, *Onychogomphus* sp., *Epallage fatime*, *Ophiogomphus carolus*, *Lestes* sp., *Calopteryx virgo festiva*, *Libellula depressa*, *Enallagma* sp., *Gomphus schneldem*, *Calopteryx splendens*) were determined.

Keywords: Diptera, Benthic, Taxa, Nif, Odonata



Effect of Pectin-Wax Coating and Its Incorporation with Pistachio Hull Extract on the Quality of Fresh-Cut Apples

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Abstract: The increased consumer demand for high quality, shelf life extended, ready to eat foods has initiated the development of several innovative techniques to keep their natural and fresh appearance as long as possible and at the same time render them safe. Packaging is an important factor in these preservation concepts for providing the appropriate protection to the commodity. Since synthetic packaging materials contribute to the environmental pollution, edible coatings and packages have been proposed to replace conventional packaging. In this study, efficacy of different coating materials, including citric acid (CA) as a control, pectin-wax (PW) mixture and pectin-wax mixture containing pistachio hull extract (PWE), was investigated using fresh-cut apples by considering the browning index (BI), weight loss and color parameters (L^* , a^* and b^*). The samples were stored under two different temperatures at 5 °C for 8 days and at 20 °C for 32 hours. Changes in weight, color, total phenolic content, were examined at different time points along storage time. Results indicated that the apple pieces coated with PWE showed the lowest increase in browning index followed by samples coated with PW. The applications of coatings were effective on delaying the degradation of samples' colors. The effect of coating fresh-cut apples with PWE is more pronounced on a^* values than on L^* and b^* values at 20 °C. Weight loss was observed significantly in uncoated samples comparing to those prepared with coating, over time of storage at both temperatures. The coatings were effective in maintaining phenolic components where losing in phenolics was higher in non-coated samples.

Keywords: Fresh-cut Apple, Browning, Colour Parameters, Pectin, Wax, Pistachio Hull Extract



Yeast Biodiversity in Organic Wines

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Abstract: The aim of this study was to investigate yeast biodiversity of Montepulciano d'Abruzzo organic wine. Vinifications were carried out in an organic cellar located in Torano Nuovo (Teramo, Italy), during the vintage 2008–2009 starting from organic grapes of Montepulciano d'Abruzzo cultivar. Organic wine samples were collected at different stage of fermentation (1, 2, and 7, 14 and 30 days), serially diluted in sterile peptone water (0.1% w/v) and plated in duplicate to enumerate yeasts on Wallerstein Laboratory Nutrient agar (WLN). Plates were incubated at 25°C for 3–5 days. This study highlighted the utility of WLN medium for monitoring yeast population during wine fermentation. Total yeasts of Montepulciano organic must on WLN medium showed values ranging from 4.3×10^4 to 7.9×10^6 cfu/ml. The highest counts were found after 14 days, in fact after 30 days a decrease of about 1 log was observed. On WLN agar plates, six different yeast morphotypes were observed; *S. cerevisiae*, *S. bacillaris*, *H. uvarum*, *M. pulcherrima*, *B. bruxellensis* and *Issatchenkia terricola*.

Keywords: Organic Wine, Biodiversity, Yeast, Biotechnology



Assessment of Mineral Element and Heavy Metal Levels of Cheeses Produced in Bayburt (NE Turkey)

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Abstract: Rapid increase of the world population in recent years, energy and food insufficiency, irregular urbanization and people's excessive consumption are causing environmental pollution. Industrial establishments play an important role in increasing environmental pollution and degrading ecological balance. These organizations use a variety of heavy metals (such as mercury, zinc, cobalt, copper, iron, lead, chromium, arsenic and silver) and as a result they cause air, soil and water pollution. Intake of polluted water, nutrients and air into the body directly affect living organisms.

Today, milk and dairy products are consumed very widely. Because of this, studies about milk worldwide are very important. It is also extremely important to determine the amounts of minerals and heavy metals in milk and dairy products that have biological effects on human health. Unbalanced uptake of these elements disturbs cellular functions and causes diseases. In addition to exposure to industrial influences, it has been found that the source of toxic elements in general is food. Investigations on animals and humans have shown that the toxic elements found in the body are related to the amount of food taken.

Bayburt is one of Turkey's famous cheese-producing provinces. In this study, it was aimed to determine the concentrations of certain metals (Na, K, Ca, Mg, Fe, Cu, Mn, Zn, Co, Ni, Cr, Pb and Cd) in different types of cheese, which are important nutrients in dairy products, consumed especially at breakfast each day and also a rich mineral source. Eight varieties of cheese samples (Civil, göğermiş peynir, lor, kerti lor, karın kaymağı, tortum pişmiş peynir, tulum and gravyer) were collected from various parts of Bayburt province. These cheeses are produced by the public and are usually sold in public markets. The elemental contents of cheeses were determined by microwave plasma-atomic emission spectrometry (MP-AES). The data obtained are compared with each other and with the results reported in the literature. It was also investigated whether there is any metal contamination due to environmental factors, production and storage conditions.

From the results it was found that the metal contents of different types of cheese were different from each other and some samples contained high amounts of heavy metals. In addition, heavy metal quantities may vary depending on different geographical regions, differences in production steps, equipment used during the process, and contamination from the surroundings.

Keywords: Cheese, Minerals, Heavy metals, Bayburt, MP-AES



The Importance of Forest Transport Planning to Wood Harvesting

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Abstract: The need for wood in our country is increasing day by day. Accordingly, wood production also increases. The wood harvesting is a very important subject for forestry. Especially, productivity of machine, the quality of wood and environmental effects are tied due to forest transport plans. When the transport planning is made incomplete, various mistakes are occurred during wood harvesting. The importance mistake inside these situation is decreasing of wood quality. The forest transport structures in Turkey forestry are forest road, skid road, skid trail, chute system and skylines. Forest roads are main facilities which provide access to forest lands for extraction, regeneration, protection, and recreation activities. The forest roads should cover the forest areas in the form of a network system. In our country, is located in the forest areas of the mountainous regions often. Therefore, the construction of forest roads is very difficult and expensive. The skid roads and trails are helped for movement of tractors and animals within harvesting areas. There are some rules in the constructions of skid roads and skid trails. Besides, chute systems and skylines are used to wood harvesting. These systems are more sensitive for environmental effects and also, these systems are productivity. In this study, the importance the forest transport planning operations and wood harvesting for my country are investigated. The prepare rules of forest transport planning are determined.

Keywords: Wood, Forest Road, Skid Road, Planning, Chute System, Skyline System



Use of Rice Husk Ash in Civil Engineering

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Abstract: In the world, rice is the most produced grain after wheat and corn in agriculture. The rice, which is a member of the wheatgrass family, needs plenty of water. Rice production is common in tropical, subtropical and temperate regions. Major rice-producing countries in the world are China, India, Bangladesh, Indonesia and Thailand. The world needs 500 million tons of rice annually. In our country, annual production is 165 thousand tons. While, Marmara Region produces approximately 70 percent of Turkey's rice, Trakya Region produces approximately 47 percent of rice. During the rice production, 20% of the rice comes from the rice husks waste. In short, approximately 60,000 tons of rice husks per year appear in our country as waste, and these wastes can not be used. In the rice husk ash, there is about 92% by weight of silica and there is alumina, iron oxide, calcium oxide, magnesium oxide and alkalis in small percentages. When the rice husk is burned in the range of 400 ° C - 600 ° C and then the cooling process is carried out rapidly, the silica in the rice husk ash has an amorphous structure. Silica with a high amount of amorphous structure is a pozzolanic material. Pozzolanic materials are frequently used in concrete production and soil improvement in Civil Engineering. The pozzolanic materials have positive contributions to the strength and durability properties of the concrete. The rice husk ash can be added to the concrete mix at the rate of 50% of the cement weight and the use of rice husk ash instead of cement contributes economically because it reduces the use of cement. In addition, in the design of projects related to civil engineering (road, railway, etc.), the superstructure analysis is directly related to the characteristics of subgrade on which it is built. As the superstructures are constructed in very different lands, the characteristics of subgrade in which these superstructures are constructed also vary. For this reason, it is important to improve the subgrade encountered in the field by using various methods in order to provide the desired strength values. One of shallow soil rehabilitation methods is to improve the subgrade in place by adding different additives to the soil. The rice husk ash improves the engineering properties of the soil when mixed with the soil. In this study, usage areas in the civil engineering of rice husk ash which occurred as waste of rice that produced in Turkey were investigated. Using the waste of rice, the contribution to our country in terms of time, economy and environment has been examined.

Keywords: Rice Husk Ash, Soil Stabilization, Use Of Waste, Concrete, Civil Engineering



***In Vitro* Inhibition of Sultamicilin and Ceftinex Used as Anti-infective Drug on Human Serum Paraoxanase 1 Enzyme Activity**

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Abstract: We studied *in vitro* effects of two different drugs (sultamicilin and ceftinex) which are often used as anti-infective drug on human serum paraoxanase1 (PON1) enzyme activity. The drugs decreased the *in vitro* PON1 activity. The inhibition mechanism of sultamicilin was noncompetitive whereas ceftinex was a uncompetitive inhibitor. The IC₅₀ values for sultamicilin and ceftinex were calculated to be 34.7 mM, and 0.86 mM, respectively, and the Ki constants were calculated to be 38.3 mM, and 0.59 mM, respectively. These results showed that ceftinex is more effective than sultamicilin.. Our results showed that these drugs *in vitro* inhibit the activity of the enzyme with different inhibition mechanisms at low doses. We advise that patients used these drugs should be more carefully.

Keywords: Sultamicilin, Ceftinex, Paraoxanase1, Enzyme, Inhibition



Toxicology of Fipronil

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Abstract: Fipronil, a broad spectrum insecticide, is found in the group of pesticides called phenylpyrazoles or fiproles. It is used in agricultural fields to protect crops (e.g. rice, cotton, maize) and it is effective against many pests (e.g. fleas, ticks) and insects (e.g. cockroaches, mosquitos). Fipronil acts by targeting the γ -aminobutyric acid (GABA) receptor and has higher selectivity toxicity towards insects rather than mammals. Accidental exposure, incorrect or widespread use of fipronil may lead to contamination of water and soil and poisoning on non-target species. There is increasing evidence that fipronil may cause a variety of toxic effects on non-target species, such as hepatotoxic, neurotoxic, nephrotoxic, reproductive effects. A number of studies have reported that fipronil and its metabolites cause increasing levels of reactive oxygen species and give rise to oxidative stress however there are other mechanism involved in toxicity. This review addressed that the toxicity caused by fipronil and its main metabolites (fipronil sulfone and fipronil desulfinyl) and mechanism of toxicity.

Keywords: Insecticide, Fipronil, Toxicity, Fipronil Sulfone, Oxidative Stress



Pollution in the Black Sea Coast of Turkey: An Assessment of Current Situation

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Abstract: Approximately 170 million people live in the Black Sea Basin, and up to twelve million tourists visit the region annually. The Black Sea is one of the most important European seas; it contributes significantly to the regional economy as a source of fisheries, tourism business, oil production and transport. Being semi-enclosed, and often having slow rates of water renewal, the Black Sea does not have the same cleansing capacity as the open oceans. Because of its high rates of slow rate of water renewal, the Black Sea is particularly vulnerable to pollution, the contaminants tending to accumulate without degrading.

In this review is aimed to make a general assessment of the pollution sources of the Black Sea coast of Turkey. The Black Sea Basin is under the various pollution effects and pollution is usually associated with anthropogenic activities. Aquatic pollution may be defined as to cover a multitude of human activities that in some way degrade the environment, from unsightly rubbish tips to the less obvious addition of chemical and organic waste to rivers and seas. The population of municipalities in the Black Sea coast of Turkey is approximately 24 million and the total amount of solid waste in the region is 9 million ton and also 100 thousand cubic meters of wastewater is discharged to the sea. The unsuitable use, storage and transport of all types of waste, including toxic and dangerous materials, are growing problems all around the Black Sea. Also uncontrolled discharge of waste caused by mineral deposits, industrial plants and fertilizers and pesticides used in agriculture in Black Sea coast of Turkey cause serious problems. Rain flushes the toxins into the soil, contaminating the earth and ground water and from there they find their way into the rivers and eventually into the sea. Marine ecosystem is threatened by oil spillages, the disposal of domestic, agricultural and industrial waste, including the discharge of pesticides, warm water and heavy metals. They cause serious problems in the Black sea and can be lethal to marine life.

However it can be seen that there is no any considerable pollution in the Turkish Black Sea coasts. The present lack of comparable data on the Black Sea coast countries would reach it unfeasible to evaluate future trends in pollution or to adequately save ecosystems and human health. Even available data, they outcome from different investigations using methodologies are not inter-comparable. It is concluded that this status is important and warrants urgent action. The act of the European Community in developing environmental regulation has focused the advices of pollution control and decision makers on the need for, and the evidence to support, Marine Strategy Framework Directive. This is particularly so for the Dangerous Substances Directive which has led to European standards for contaminants including heavy metals. Turkey has also published standards for pollutants. The best solution to the problem of hazardous wastes lies in reducing their production.

Keywords: Black Sea, Turkey, Pollution, Waste, Environment, Marine Strategy Framework Directive



Heavy Metal Levels of *Mytilus galloprovincialis* Lamarck, 1819 in the Black Sea Coasts: A review

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Abstract: The pollution of marine coastal environment with contaminants mainly heavy metals has become one of the most critical environmental problems of the century. Heavy metals tend to accumulate in advanced organisms through bio-magnification effects in the food chain. Thus they can enter into human body and accumulate in the human tissues to pose chronic toxicity. *Mytilus* spp. have been successfully studied as biomonitors of heavy metal contamination in marine coasts.

In this review the coasts of the Black Sea countries, heavy metal levels in *M. galloprovincialis* were evaluated with the current literature data. Big disparities in heavy metal levels in mussels were seen among different regions. The maximum values of the metals are taken into consideration, the order of the metal values obtained in all studies conducted in the Black Sea countries were examined. Metal levels of these countries are given below; Russian coast is as follows; Fe> Zn> Cr> Cu> Pb> Mn> As> Cd> Ni> Hg. Ukraine and Romania are as follows Cu> Ni> Cd> Cr> Pb. Romanian coast is as follows: Fe> Mn> Zn> Cd> Cu> Cr> Pb> Ni> Hg. The Bulgarian coast is as follows Zn> Fe> Cu> Mn> As> Cd> Cr> Ni> Pb. In Turkish coasts of the Black Sea are listed as Fe> Zn> Cu> Mn> Pb> Ni> As> Cr> Cd> Hg. Unfortunately there was not found available literature in Georgian coasts of the Black Sea.

In general, the average heavy metal amounts in the Black Sea mussels are below the acceptable values, but in some studies the maximum values are well above this value. However these amounts were quite down the limit founded by European Union legislation for non-essential heavy metals. Thus, the mussels' consumption in the Black Sea countries diet doesn't pose a risk for population in terms of these studied heavy metals.

Keywords: Black Sea, *M. galloprovincialis*, Heavy Metal, Mussel, Biomonitor



Accurate Modeling for Photovoltaic Modules

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Abstract: Because the deficiency of conventional energy sources, the renewable energy technologies are increasingly attracting attention to various level of applications. Among the renewable energy systems, the solar electricity or photovoltaic (PV) system is the best candidate for reliable supplying of energy demands. The biggest advantage of PV system is that it can be constructed as standalone system to give outputs from microwatts to megawatts.

The PV module manufacturer provides a datasheet of the module's performance. However the information given by the datasheet is not enough for a complete accurate modeling of the PV module because parameters such as intrinsic resistances of the PV module are unfound. Using PV models without defining these resistances result in modeling inaccuracy because the behavior of PV module is strongly influenced by these resistances.

This paper presents a method to determine series and shunt resistances of the photovoltaic (PV) module for accurate modeling. The method used in this work uses only the data commonly provided by the PV module manufacturer. The method is based on the fact that the maximum power obtained by adjusting series resistance and shunt resistance, is equal to the maximum power given by the datasheet. The model of three different type of PV technology are developed and simulated in Matlab/Simulink environment. These three type of PV technology are monocrystalline silicon (SINEFO SFM050), polycrystalline silicon (KYOCERA KC50T) and thin-film technology, which is copper indium diselenide (SHELL ST40) based solar cells. The simulation results showed the importance of considering the effect of intrinsic resistances for accurate PV module modeling.

Keywords: Photovoltaic Module, Photovoltaic Modeling, Series Resistance, Shunt Resistance, Matlab.



Effect of Tarragon (*Artemisia dracunculus*) on Sensory and Oxidative Properties of Kavrurma

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Abstract: Kavrurma, a traditional cooked meat product, has 30-40% animal fat content. One of the most important problems encountered with high- fat content is lipid oxidation. In recent years, the intensity of health problems has led people to change their eating habits. People are starting to get away from chemical additives. Increasing consumer awareness has focused on the identification of alternative natural additives to chemical additives. The use of medicinal and aromatic plants as a spice in foods is very ancient. Tarragon (*Artemisia dracunculus*), a member of the Asteraceae family, is well known in the world among these spices and is used for gastric disturbance, diabetes, parasitic or bacterial infections. Due to its antioxidant properties, Tarragon is thought to be a good alternative to chemical additives in food preservation. In this research, kavrurma samples with different tarragon content (0.5, 0.75, 1%) stored at refrigerator conditions for 30 days. TBARS and sensorial properties of these samples were determined. It was determined that the addition of tarragon does not have a significant effect on the sensory properties of the samples and reduces the oxidation level of the samples during storage.

Keywords: Kavrurma, Tarragon, TBARS, Sensory, Oxidative



Physicochemical Properties of Liquorice Extract Added Ice-cream

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Abstract: The production of ice cream with liquorice was a tradition which started to be served at the festivals and weddings in the villagers of the town of Gorele about 200 years ago while, this ice cream was offered for sale in the city for commercial purposes after it was demanded more. No chemicals are used in the ice-cream. The reason why it is more relaxing and more refreshing than the other ice creams is the fact that it is not only in the milk but also in the water in a certain amount. Instead of emulsifier and stabilizer additive, a natural antibacterial extract was obtained from the liquorice roots and used in the production of ice cream. In this study, the effect of physicochemical properties of liquorice on ice-cream was investigated.

As a result of the study, the amount of dry matter and ash in the ice-cream was determined as 32.44 % and 0.50 %. The viscosity of the ice cream mixture was measured to be 306.69 cP (7 ° C). As a result of the color analysis, it was determined that the ice-cream sample was light (L, 81.12) and slightly yellow (b, 17.74) color. it was found that the liquorice increased resistance against the melting according to the results of the first drop period (16.13 min) and the melting rate (28.43%). As a result, the use of the liquorice extract in the production of ice cream as a stabilizer has improved the properties of ice cream positively. It may be advisable to use the liquorice extract as a natural stabilizer additive in the production of ice cream.

Keywords: Liquorice, Ice-cream, Gorele, Stabilizer, Liquorice Extract

**Effect of Nitrate and/or Nitrite on Free Amino Acid Composition of Pastırma*****Emel ÖZ^{1*}, Mükerrerem KAYA¹****¹Atatürk University, Agriculture Faculty, Erzurum-TURKEY***Corresponding Author: emel.oz@atauni.edu.tr*

Abstract: The aim of the research was to determine the effect of nitrate and / or nitrite on the free amino acid composition of pastırma, a traditional Turkish meat product. For this purpose, four different curing mixtures (I. 150 mg/kg KNO₃, II. 300 mg/kg KNO₃, III. 150 mg/kg NaNO₂ and IV. 150 mg/kg KNO₃ + 150 mg/kg NaNO₂) were used and pastırma production was carried out under traditional conditions. *M. longissimus thoracis et lumborum* was used as raw material in production and production was repeated twice. After production, pastırma samples from each group were examined for free amino acid composition. The free amino acid composition of the samples was determined by HPLC using a fluorescence detector and the results were expressed as mg / 100g dry matter. The usage of different curing mix had a significant effect (P<0.05) on aspartic acid, histidine, arginine, trosine, phenylalanine and proline, while it had a very significant effect (P<0.01) on serine, glycine, cystine and valine. On the other hand, the usage of different curing mix had not a significant effect (P>0.05) on glutamic acid, threonine, alanine, methionine, isoleucine, leucine and lisin amino acids. Alanine, glutamic acid, arginine, leucine and lysine were predominant amino acids in pastırma samples. In addition, the highest total amino acid amount was determined in the pastırma group produced using 150 ppm KNO₃ while it lowest in the pastırma group produced using 150 ppm KNO₃ + 150 ppm NaNO₂ combination.

Keywords: Pastırma, Free Amino Acid, Curing, Nitrate, Nitrite



Investigation of Energy Usage in Cement Production Process by Performing Exergy Analysis

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Abstract: The biggest share of energy consumption belongs to the industrial sector with higher energy costs. One of the most energy-consuming industries is the cement industry. Increasing demand for cement industry in the rapidly developing world as a natural result, the energy used in this sector also increases. In addition, the effective use of energy is becoming more important. For this reason, it is important to follow the energy produced and consumed in the cement sector. The cement sector in Turkey as well as in other countries of the world uses large amounts of energy. Energy efficiency has great importance in determining how much of the energy entering the total system is being used effectively. If energy efficiency is determined, more controlled and conscious energy use will be achieved. In order to save energy effectively, the phase in which the energy losses has to be determined, so alternative proposals will be presented for the recovery of these lost energies. This study focuses on making thermodynamic analysis including energy and exergy analysis of a rotary klin in a cement factory. For this reason mass and energy balances of the cement production process were calculated. The total energy entering the system includes the calorific heat and the energy from the reactions basically. All data evaluated for per hour basis. According to the calculations, 51.4% of the total input energy was used for clinker production. In addition, it has been determined that some energy loss occurs in the system. Accordingly, about 10% of the total input energy is released from the surface into the atmosphere.

Keywords: Analysis, Cement, Energy, Exergy, Rotary Klin



Lifegenmon–Development of A National, Regional and European Forest Genetic Monitoring System

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Abstract: Sustainable forest management is based on the long-term adaptability of forest ecosystems and starts at the lowest, namely the gene level. Forest genetic monitoring (FGM) is therefore a crucial component of any sustainable forest management as it gives a possibility to detect potentially harmful changes of forest adaptability before they are seen on higher levels. Forest genetic resources face a large number of increasing threats. By introducing genetic monitoring into conservation programmes and sustainable forest management one has the tool in hand to assess information on relevant changes of a species and/ or populations' adaptive and neutral genetic variation through time. Based on indicators and their verifiers it can serve as an early warning system to aid the assessment of a species response to environmental change at a long-term temporal scale. The team, comprised of six partners from Slovenia (coordinating partner Slovenian Forestry institute), Germany and Greece, and experts – national focal points from the transect countries and delegated members from EUFORGEN, have already established:

- the draft proposal for optimal indicators and verifiers for monitoring of genetic diversity changes in time across a transect from Bavaria to Greece for two selected target species, a stand forming broadleaf (*Fagus sylvatica*) and a stand forming coniferous species-complex (*Abies alba* – *Abies borisii-regis*);
- starting with preparation of guidelines for forest genetic monitoring for these two and additional five forest trees species, which differ in their biology and distribution, for implementation of FGM at a national, regional and EU scale;
- which shall lead to preparation of a Manual for Forest Genetic Monitoring for implementation at the EU level, and of a Decision support system for an optimal choice of the level of FGM based on needs and means;
- Discussed and disseminated the FGM among different target audiences and stakeholders to promote the use and results of this early warning system as a tool for sustainable forest management, which is leading currently to the establishment of a portal and is aiming in enlarging the active dissemination actions to other countries.

The team has started to organize series of workshops / trainings for the forestry sector to be capable of implementing FGM according to standardized procedures in their territories, and to prepare background professional documents / guidelines for policy makers at the national, regional and the EU level for supporting development of possible new regulations at the national level, the FOREST Europe process and future European Forestry and Biodiversity Conservation policies and strategies.

All these activities contribute to establishing a well-functioning, internationally linked team of forestry professionals working in and for FGM.

Keywords: Lifegenmon, Monitoring, Genetic Diversity, Climate Change, Sustainable Forest Management



Orchids of Yenice Wildlife Development Area

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Abstract: The Orchidaceae Juss. (Salepgiller) family, which has a special use in the food and drug industry as well as its use as an ornamental plant with flashy flowers is one of the top families with more than 800 genera and about 35 thousand species in the world. The family that can naturally grow in almost all regions in Turkey, majority of the North Anatolian (Kastamonu), South Anatolia (Mugla, Antalya, Silifke), Southeastern Anatolia (Kahramanmaraş, Adıyaman Malatya), the East (Van, Muş, Bitlis) and the Eastern Mediterranean Region are represented by 26 genera and 230 taxa. The number of endemic taxa is 60 and the rate of endemism within the family is 26%. Various orchid species, especially taxa belonging to the genus *Orchis* L., *Ophrys* L., *Serapias* L., *Platanthera* Rich., *Anacamptis* Rich. and *Dactylorhiza* Necker ex Nevski in our country are threatened by natural harvesting for industrialization, urbanization, extension of agricultural areas, overgrazing, tourism activities, agricultural activities, fires. In this study, 16 taxa belonging to Orchidaceae family naturally grown within the borders of Yenice Wildlife Development Area in Karabük province has been determined and the information on their distribution, habitats and protection statutes has given.

Keywords: Karabük, Yenice, Orchidaceae, Flora, Salep, Protection



Management and Determination of Hazardous Occupational Health and Safety Risks in the Recirculating Aquaculture Systems (RAS)

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Abstract: Fisheries and aquaculture are some of the most important actions accompanied by the globalizing world and increasing population. Since fish and other aquatic creatures are important sources of nutrition for humans, people have gone to fishing first and then to controlled aquaculture. Aquarium fish culture, a popular hobby in recent years, has become more controlled and easier to manage in RAS. Recirculating Aquaculture Systems are currently being used in broodstock breeding, larvae growing, marketable size rearing, health and feeding research experiments, aquaponic systems and aquarium fish culture. Recirculating aquaculture systems frankly constitute an important part of aquaculture. Despite qualified work force and modernization in RAS, occupational health and safety applications stay in the background. Since comprehensive data collection system is not yet established in Turkey, exact number of workers are not known in the aquaculture industry. Also the number of occupational accidents and diseases can not be determined. According to FAO estimates (Food and Agriculture Organization of the United Nations), more than 12.000 employees work in the industry and related activities; and about 2000 people are working in RAS. Aquaculture in RAS is one of the most dangerous fields when the working conditions considered. In addition, when the risk assessment is made and the risks are scored by various methods, the risks that are scored at "unacceptable" level are both too much and too diverse. As the variety of techniques and devices used increases, the risks of occupational health and safety increase and the probability and severity of risks scales up. Occupational diseases also began to emerge along with fatal and non-fatal accidents. The high number of employees increases the importance of occupational health and safety applications. Considering the potential hazards and risk factors, one of the most important issues of RAS is the health problems and working environments of employees. In the present study, three different Recirculating aquaculture systems were examined and many predetermined criteria were evaluated according to the "5X5 L Type Matrix" method.

Keywords: Aquaculture, Recirculating, Fish, Risk, Safety at Work



The Effect of Slaughter Age on Carcass Traits in Anatolian Water Buffaloes

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Abstract: Consumer demand for water buffalo meat is low in Turkey due to textural traits thick fiber and dark colored meat. In general, water buffalo that are bred for milk production in Turkey are usually slaughtered after completing their productive life. This study was carried out to investigate the effect of slaughter age on carcass traits in Anatolian water buffalo managed under extensive conditions in Turkey.

The slaughter and carcass traits and the amounts of valuable meat of Anatolian water buffalo were determined by forming two groups (young-mature adult) of water buffalo according to their slaughter ages. A total of 21 water buffalo were divided into two groups: under 4 years old (young) and older than 5 years (mature adults). In this study, they were starved for 24 hours, live weights determined and then slaughtered. Their heads, legs, skins, lungs, livers, hearts, kidneys, inner fat and carcass weights after slaughter were determined. After slaughter and carcass measurement, some muscles were dissected out to determine the weight of worthy meat. The student-t test was applied to compare slaughter and carcass traits.

In this study, slaughter weight and hot and cold carcass weights were 397.88 kg, 216.71kg and 205.22 kg, respectively in younger and 484.54 kg, 249.41kg and 235.66 kg, respectively for mature adults ($P < 0.05$). In addition to, the ratio of skin, head and four leg weights to the live-weight ($P < 0.05$) were found significantly higher in younger in than in adults buffaloes.

The results of this study determined that the increased carcass weights parallel to the rise in the slaughter age; however slaughter in the older ages affected the dressing percentage negatively.

Keywords: Cold Carcass Weight, Meat, Slaughter Age, Water Buffalo



Evaluation of *in vitro* Cytotoxicity of Permethrin in HepG2 Cell Line

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Abstract: Permethrin (PER) was first synthesized in 1973 and marketed in 1977 as a synthetic pyrethroid insecticide, which targets voltage-gated sodium channels of neurons. It has been effectively used for the control of insects in stored grain, agriculture, forestry and public health. Limited information is available about the *in vitro* cytotoxic action of PER. In this study, cytotoxicity of PER in HepG2 cell line was evaluated. The WST assay was carried out to assess the cytotoxicity of PER at nine different doses between 1 and 10000 μM for 24 hours and the LC_{50} value was calculated. There was no significant difference between cell viability of vehicle-treated (DMSO) and control cells. PER caused a significant reducing in the cell viability in a concentration-dependent manner compared with the control group. The LC_{50} value was calculated as 1111 μM for PER. The obtained findings will be a baseline data for further studies on the cytotoxic effects of PER in HepG2 cell line.

Keywords: Permethrin, *In Vitro*, Cytotoxicity, WST, HepG2



Effect of Salt Stress on Germination and Growth Parameters of *Pisum arvense* L. Population and Cultivar

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Abstract: Salinity is a major abiotic stress factor leading to crops yield and quality failure. In recent years, the responses of some forage pea cultivars to salinity have studied but the studies about forage pea populations are very insufficient. The objective of this study was to identify the changes on germination and growth parameters of *Pisum arvense* population and cultivar under salinity stress.

In the study, population called O6 and cultivar called Tore were chosen from previous studies as a choice quality for forage in the Black Sea Region. The salinity stress applications were made in petri dishes with eleven NaCl concentrations (0, 30, 60, 90, 120, 150, 180, 210, 240, 270, 300 mM). In the study, germination rates, the plant growth parameters of lengths and dry weights of shoots and roots of the *Pisum arvense* population and cultivar were investigated.

For both of the samples, the root and shoot lengths and dry weights were negatively affected by salt treatment, and significant reductions were observed, depending on the salt concentration. At the end of the experiment, the growths belong to cultivar were significantly decreased with the 60 mM salinity and 120 mM in the population. So it is determined that the population is more tolerant to salinity than cultivar. In cultivar, there was no germination after 210 mM however in population only the germination was observed except 300 mM.

The results of the present study indicated that the *Pisum arvense* population can be cultivated on salinity soils which contain less than 120 mM NaCl for Black Sea Region of Turkey.

Keywords: Field Pea, Forage Pea, Landraces, NaCl Stress, Stress Factors

Effects Of Seed Orientation and Sowing Depths on Germination, Seedling Vigor of Bottle Gourd, *Lagenaria Siceraria* (Molina Standl)

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Abstract: Grafted seedling production in our country and the world for greenhouse and field production is always important. In particular, the use of grafted seedlings has increased due to the advantages such as resistance to diseases in tomato and cucurbit plants, rapid development of the cultivated variety, increase of yield, strong root development, higher water and nutrient availability. Watermelon rootstocks used especially in watermelon cultivation are generally grafted with species belonging to pumpkin genus and there are differences in practical use among them. Imported hybrid seedlings are predominantly preferred for this purpose. Because of the high price of these hybrids and the increase in the unit price of seedling, which is caused by external dependency, our country is also working on alternative rootstocks that can be used in overgrown seedling production and trying to reduce dependency on external sources. For this purpose seeds of *Lagenaria spp.* or *Luffa cylindrica* are used (Yetişir ve Sarı 2003). *Lagenaria siceraria* is most prized in Africa, but its production remains low because of low rate germination and seedling vigor. Use of a good sowing technique could be increase germination rate and seedling vigor. For good germination, rapid emergence and good performance, seeds must be placed in a position and in an environment that ensures the availability of nutrients and water from the soil (Bowers,1972). Seed orientation generally affect seedling emergence and sowing depth can greatly influence especially cucurbits ability to emerge and homogen stand. It is important to achieve good germination, emergence and high plant population (Srivastava,2006). This study aimed at investigating the effects of seed orientation and sowing depth of different genotypes of bottle gourd on germination (%), emergence (%), normal/abnormal seedling (%) and wet-dry weight (gr). This work was carried out to with nine *Lagenaria siceraria* genotypes which were collected for TOGTAG-3216 project from Southeast and Mediterranean parts of Turkey. The seed samples were sown at 2 cm, 6 cm depths and four sowing orientations were designed; vertical orientation with the extremity of the seed upward (VU), Vertical orientation with the extremity of the seed downward (VD), Horizontal orientation with the seed on the side (HS), Horizontal orientation with the seed on the flattened face (HF). The experiment was conducted with petri dishes (between paper) and viol (peat-moss media) test at 25 °C in the research laboratories of Uşak University Agriculture and Natural science faculty. According to the results; mean germination rate was found between %92 and 79% in three genotypes. At seedling test results; for the depth of 6 cm, VD, VU and HF orientations showed the best emergence performance, although they differed according to the genotypes. Besides this for 2cm sowing depth, VD and HS sowing orientation was found suitable for some genotypes.

Keywords: Bottle Gourd, Grafted Seedling, Sowing Depth and Orientation

Determined The Viability Parameters in Pepper Seeds With Different Maturation Period Which Separated By Chlorophyll Fluorescence Method

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Abstract: Peppers are among the species which are commonly cultivated in both greenhouses and fields. Seed quality and healthy seedlings are essential for a successful cultivation. Seed quality depends on high viability rate, seed vigor and physical and genetic purity (Bewley, 1997). Quality losses especially in seedling production can be considered as maturity variation depending on different harvest periods, a decrease in seed viability because of storage and aging and seed vigor losses derived from the overall production and production-related factors. It is inevitable that the seeds harvested from the fruits with different maturation time are in the same seed lot, because pepper species have a permanently flowering structure. As a result of flowering stages, fruits have in different maturation and this affects the maturity level of the seeds. Less maturity seeds germinate slowly and occur weak seedlings decrease the overall performance of the population. The Chlorophyll Fluorescence (CF) method is based on the separation of good quality and low quality seeds without any change in seed moisture and without water uptake any seeds (Jalink 1999). In this study, it was aimed to determine the germination performance (total-normal germination rate %), protein amounts (crude protein) and presence of fungal agents of 8 year old seeds of Çarliston, 11B14, Yağlık and Kandil Dolma pepper species which were harvested in two different maturity periods and their maturation stages were identified as underripe (high chlorophyll), overripe (low chlorophyll) by CF separation technique. The most normal germination rate (30%) in control group of first harvest was determined in Yağlık species, however, the viability rate was seriously decreased depending on storage period. While no significant viability was found in the groups with high chlorophyll rate by CF separation, Yağlık species again partly germinated in the group with low chlorophyll rate. However, in seed groups of 4th harvest Kandil Dolma and Yağlık species had the highest normal germination performance (88-89 %) in control groups. Higher viability rate was determined in the groups with high chlorophyll rate through CF separation compared to 1st harvest seeds and the outstanding species was Kandil Dolma seeds with 63% rate. Because maturity was higher in the group with lower chlorophyll rate, the viability was generally determined between 62-95%. In protein analysis results, higher values were obtained in 4th harvest seeds with lower chlorophyll rates especially in Çarliston and Yağlık species compared to the others groups. The determined fungal agents were *Cladosporium* spp., *Aspergillus flavus*, *Rhizopus stolonifer*, *Penicillium* spp. No pathogen was identified in the groups determined high and low chlorophyll values through chlorophyll separation in 4th harvest seeds in Çarliston, Kandil Dolma and Yağlık pepper species.

Keywords: Pepper, Harvest Periods, Chlorophyll Fluorescence Separation Technique, Fungal Agents, Protein Amount



The Reaction of Kale Plants Infected to *Turnip mosaic Virus*

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Abstract: Kale (*Brassica oleracea* var. *acephala* L.) is a leafy herbaceous, biennial or perennial, plant in the Brassicaceae family. Kale growing has not been common in the other regions of Turkey, but it is widely grown as a leafy green vegetable in the Black Sea Region of Turkey. Species of the Brassica genus may be infected by various viruses. Although several viruses are known to infect cruciferous plants, *Turnip mosaic virus* (TuMV) is one of the most important viruses infecting a wide range of plant species, primarily from the Brassicaceae family.

The objective of this study was to assess the reactions to TuMV of kale cultivars grown in Samsun, Turkey. Kale plants were screened under greenhouse conditions by sap inoculation method. The number of infected plants and average intensity of symptoms expressed in the nine-degree scale was detected during eight weeks. The grade of reaction to TuMV in kale plants was evaluated using a combination of biological and serological assays.

Kale plants showed mosaic, mottle, necrosis, yellowing, and symptoms developed at 15 days post inoculation (dpi). Data for disease severity were recorded weekly after inoculation in TuMV-inoculated plants and the average weekly scales were 0, 0.2, 0.4, 0.7, 0.9, 1.1, 1.2, and 1.3, respectively. The virus infection was detected as 76.4% using DAS-ELISA by the end of the 8th week.

Keywords: Bioassay, Disease Severity, Kale, TuMV, Virus



Assessment of Heavy Metal Pollution in the Sediments Along the Southern Black Sea: A Review

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Abstract: With the rapid industrialization, uncontrolled urbanization and economic development in the coastal region, heavy metals are continuing to be introduced to coastal environment along the Black Sea. The growths in catchments and coastal areas of the Black Sea have increased the anthropogenic effects on these systems due to increased amounts of land-based chemicals like heavy metals. Heavy metals continue to be introduced into the Black Sea coasts through rivers, runoff and land-based point sources, mining and smelting operations, fossil fuel combustion, processing and manufacturing industries, and atmospheric inputs and thus, heavy metal contamination is still one of the major environmental problems. They are one of the serious pollutants in coastal environment because of their toxicity, abundance, typically cumulative, persistence and bioaccumulation during biogeochemical recycling. Avoiding and decreasing inputs to the marine ecosystem with a view to phasing out pollution, is intelligibly stated as one of the main goals of the Marine Strategy Framework Directive (MSFD), in line with international commitments at global and regional level. The assessment of achievement of Good Environmental Status (GES) under the MSFD 2008/56/EC Descriptor 8 “Concentrations of contaminants are at levels not giving rise to pollution effects” should be based upon monitoring programmes covering the concentrations of chemical contaminants and also biological measurements relating to the effects of pollutants on marine organisms. One of the main purposes is to assess the concentrations of contaminants in water, sediment and/or biota, and the occurrence and severity of pollution effects, should not be increasing. Sediments are an important repository for heavy metals. Moreover, heavy metals can be adsorbed from the water column onto fine particles surfaces and move thereafter towards sediments. Sediments are a habitat and a major nutrient source for marine organisms. Sediments have always been considered as an indicator for marine coastal pollution.

The aim of the present review is to the following: (1) to report the contents and distribution of heavy metals in sediments of the Southern Black Sea coasts; (2) to assess the degree of pollution with these metals; (3) to discuss the changes in the metals compared with available studies from 1992 to 2018.

Keywords: Heavy metals, Sediments, The Southern Black Sea Coasts, Marine Strategy Framework Directive



Heavy Metal Risk Quotient Assessment in Benthic Fish in the Black Sea Coast: Using *Mullus barbatus* Linnaeus, 1758 and *Merlangius merlangus* (Linnaeus, 1758)

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Abstract: Major pollution in the Black Sea is caused by domestic wastes and industrial wastes and these contaminants enter the sea via main rivers. The basin of the Black Sea tend to retain these material and here bacteria feed on it and break it down, using up life-giving oxygen as they do so. In the worst situations, very much treatment sewage is discharged into the sea that the bacteria remove the oxygen from the water, killing life here and on the seabed. Any remaining organic material sinks to the bottom of the Black Sea, and it is causing the shortage of oxygen and contains high amounts of hydrogen sulphide. In this case, most benthic organisms including fish are affected. It is very important to determine the heavy metals concentrations in commercial benthic fish (*Mullus barbatus* and *Merlangius merlangus*) in order to evaluate the possible risk of fish consumption for human health.

Comparisons of heavy metal studies on the coasts of the Black Sea are made in the Risk Quotient (RQ) assessment. For this aim if heavy metal levels in *M. barbatus* and *M. merlangus* are given as dry wt., they were transformed to wet wt. dividing by 5 as factor and all outcomes are given on a wet weight basis as µg/g wet wt. Health risk from metals intake via diet may be estimated using a RQ as the ratio of the calculated metal dose and the reference dose. It is concluded that estimated RQ of Cd, Pb, Hg, Fe, Zn, Mn and Cu in the *M. barbatus* and *M. merlangus* do not hazard any apparent threat to human, where the total hazard index were below the value of 1.

Keywords: Heavy Metals, Fish, Black Sea, Risk Assessment, *Mullus barbatus*, *Merlangius merlangus*



Biochemistry of Warm-Over Flavor in Muscle Foods

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Abstract: Warmed-over flavor (WOF) which was first introduced by Tims and Watts in 1958, mainly result of reheating cooked and chill stored meat products due to lipid and protein oxidation. Although, WOF is occurred in reheated meat and meat products, it is included frozen stored meat and meat products since oxidation of lipids continues during frozen storage. It is believed that autoxidation of phospholipids is the primarily responsible for the WOF development. These membrane lipids are important component for structure and function of cells but due to their high polyunsaturated fatty acid content they can be easily oxidized resulting in the development of specific off-flavors in meat products. The warmed of flavor is associated mainly hexanal, hexanal, heptanal, octanal, nonanal and 2,3-octanedione. WOF is described as “stale”, “wet”, “rancid”, “painty” and “cardboard-like” flavors which are not desirable for consumers. Since WOF is an important factor for eating quality of meat and meat products, food researchers have been working on the inhibition of the WOF. For this purpose, several strategies have been investigated. Adding natural antioxidants, nitrites and nitrates, smoke curing and active packaging are known more effective prevention methods of WOF in cooked meat products. This study focuses on the biochemistry of WOF and its formation mechanism in muscle foods. The major strategies for prevention of WOF in meat products were also discussed.

Keywords: Warm Over Flavor, Lipid Oxidation, Rancid, Cooked Meat, Sensory Analysis



Cereal and Legumes Protein Hydrolysates and Their Functional Properties

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Abstract: Cereals and legumes have an important role in human nutrition. They provide high protein with essential amino acids, complex carbohydrates and dietary fibre. They are also low in fat and have no cholesterol. Recent studies showed that protein hydrolysates from cereals and legumes have potential physiological effects in human body such as antioxidant activity, angiotensin converting enzyme inhibitory activity and cholesterol-lowering effect. Today, several cereals and legumes hydrolysates are used as major ingredients in some functional foods due to their low costs, safety, and inherent high nutritional values. Soy protein hydrolysates, rice bran hydrolysates, pea protein hydrolysates, oat and barley protein hydrolysates are remarkable instances. Enzymatic hydrolysis is widely used for the production cereals and legumes hydrolysates. This process is large – scale commercial available, moderate cost and gives the high quality products. Basically, enzymatic hydrolysis improves nutritional characteristics of specific peptides generated by selective proteases from native cereals or legumes proteins. Protein hydrolysates produced by enzymatic hydrolysis also have technological properties in terms of food processing such as high solubility and stability, improved foaming and emulsifying characteristics and high bioavailability.

This study deals with the production of cereals and legumes protein hydrolysates and their technological properties in terms of the food science. Moreover, the importance of cereals and legumes protein hydrolysates in human nutrition was reviewed.

Keywords: Enzyme Hydrolysis, Protein Hydrolysates, Functional Properties, Bioactive Peptides



The Effects of Using Olive Oil on Textural and Sensorial Properties of Heat – Treated Beef Sucuks

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Abstract: In this study, it is aimed to determine the textural and sensorial changes in beef fat replaced heat-treated beef sucuk (HTS). Due to negative effects of consuming high fat and saturated fatty acid, consumers prefer meat products with less fat and healthier lipid profile. For this purpose, meat industry has been working on healthy meat product formulations and using vegetable oil is one of the options of this goal. In our study, besides control group (C - 100% beef fat), sucuk samples were produced by replacing 15% (Z15) and 30% (Z30) of beef fat with olive oil since olive oil is rich in unsaturated fatty acids and has antioxidants such as vitamin E.

It is known that, using vegetable oils in meat product formulations can affect textural behaviour and sensory properties of products. To observe the textural behaviour of products texture profile analyses (TPA) was applied. Using olive oil resulted lower hardness scores compared to C. Due to higher fat content and characteristics of beef fat, C samples showed better results for chewiness, cohesiveness springiness and gumminess.

Sensory properties were observed in terms of appearance, slice appearance, color, texture, flavor and overall acceptability. During the heat treatment (68° C core temperature), olive oil migration from sucuk matrice to casing surface developed oil ring. Thus, the lowest appearance and slice appearance scores were observed in Z30. C samples had higher scores for texture, similar to TPA results. Olive oil addition resulted light and yellow in color and also olive oil yielded characteristic taste therefore, Z15 and Z30 had lower scores for color and flavor. As overall, C samples had higher scores and more preferable for consumers.

As a conclusion, using olive oil effects textural and sensory properties of fermented-heat treated sausage. As a suggestion, using vegetable oil in pre-emulsions can be a better option to achieve healthier meat products with better textural and sensory properties.

Acknowledgment: The authors thank to TÜBİTAK – TOVAG (Project Number: 214O181) for financial support.

Keywords: Heat-treated Sucuk, Texture, Sensory Properties, Olive Oil, Fat Replacement



Effect of Using Sheep Tail Fat on some Physicochemical and Sensory Properties of Heat Treated Sucuk

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Abstract: In this study, some physicochemical and sensory properties of heat treated sucuk produced with using different proportions of beef meat fat/sheep tail fat combination (beef meat fat/sheep tail fat: 100/0, 50/50 and 0/100) were investigated. The moisture content, pH, aw and TBARS values of the samples taken during the production stages (batter, after fermentation, after heat treatment and after drying) were determined. In the final product, colour values (L*, a* and b*) were detected and sensory analysis was performed. Beef meat fat/sheep tail fat combination had a very significant effect on moisture content, pH and aw values ($P < 0.01$). The mean value of pH increased, while aw value decreased with using sheep tail fat. On the other hand, moisture content, pH, TBARS and aw values were very significantly affected by the production stage factor ($P < 0.01$). During the production, moisture content and aw value decreased, but TBARS values of the samples increased. However, pH values of the samples decreased during the fermentation and then increased in the heat treatment and drying stages. The interaction of beef meat fat/sheep tail fat combination and production stage had also a very significant effect on moisture content, pH and aw values ($P < 0.01$). In final product, it was determined that beef meat fat/sheep tail fat combination had no significant effect ($P > 0.05$) on L*, a* and b* values while it had a very significant effect ($P < 0.01$) on sensory properties. The highest mean values of the sensory properties (colour, texture, odour, flavour and overall acceptability) were detected in the group with 100% beef meat fat ($P < 0.05$).

Keywords: Sucuk, Heat Treatment, Sheep Tail Fat, pH, a_w, TBARS

Some Physicochemical and Textural Properties of Commercial Vakfikebir Bread

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Abstract: Vakfikebir bread (VB), a special kind of bread, is produced in Turkey, especially in Trabzon, Black Sea region. It has a hard and thick crust, big crumb pores with high volume and weight. It has higher quality and aromatics and also has longer processing and cooking times with higher tolerance and late staling compared to regular breads. The hard crust texture that covers the bread crumb, causes fresher and moister crumb and thus has a long shelf life. VB is produced by the sourdough method, which is an indirect dough method such as sponge dough. Since dough is necessary for fermentation, it has been used in bread production since ancient times. Traditional sourdough was simply a piece of dough from the previous baking, which was mixed with flour, salt and water to make the bread dough. The main aim in modern dough fermentation is to improve the aroma character and extend the shelf life of breads. In this study, various properties of traditional Trabzon Vakfikebir bread were investigated. Totally 20 bread samples were collected in Çavuşlu district from 4 different bakery and transferred to the laboratory on the same day. pH, acidity, crumb color, diameter of bottom, height of bread, crust thickness on bottom, crust thickness on top and textural profile analysis were performed. It was found that the minimum and maximum values of the specified recordings as pH (4.33-6.05), acidity (0.10-0.51), diameter of bottom (15.12 cm – 16.55 cm), height of bread (125.30 mm – 151.45 mm), crust thickness on bottom (4.07 mm – 5.72 mm) and crust thickness on top (2.25 mm – 4.19 mm). According to the textural evaluations it was established that the average values were determined as hardness (937.56±113.02), springiness (2.24±0.17), cohesiveness (0.82±0.01), gumminess (725.60±74.80), chewiness (1518.88±118.51), resilience (0.49±0.01). According to the results it can be concluded that VB has a thick and hard crust. This property of VB came to the point of migrating water from the crumb to the crust. The use of sourdough in VB production can provide more elastic gluten and bread structure and thicker cell walls, which results in more firm, strong and elastic bread crumbs. In addition, moisture losses from the crumbs due to thick and hard outer coatings are very low on VB breads. Here, in VB breads, there is a restricted water movement due to thick crust. It is known that starch-based systems have a high correlation between water movement and the firming process.

Keywords: Vakfikebir Bread, Sourdough, Bread Crump, Bread Crust, Textural Profile



The Effect of Sheep Tail Fat on Textural Properties of Heat Treated Sucuk

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Abstract: This study was conducted to determine the effects of substitution of beef meat fat with sheep tail fat on textural properties of heat treated sucuk. The heat treated sucuk groups containing different levels of sheep tail fat (beef meat fat/sheep tail fat: 100/0, 50/50 or 0/100) were produced twice and analyzed in terms of instrumental texture parameters (hardness, adhesiveness, cohesiveness, springiness, chewiness, gumminess and resilience) at different production stages (batter, after fermentation, after heat treatment and after drying). It was observed that the substitution of beef meat fat with sheep tail fat had a very significant effect on hardness, gumminess and chewiness values ($P < 0.01$). The lowest mean values of these parameters were detected in the group with 100% sheep tail fat. The use of sheep tail fat in the production also affected the adhesiveness values of the samples significantly ($P < 0.05$). The mean value of this parameter decreased with increasing sheep tail fat level. On the other hand, all of the textural parameters were affected very significantly by the production stage factor ($P < 0.01$). While the mean values of hardness, springiness, gumminess and chewiness increased during the production, the mean values of adhesiveness, cohesiveness and resilience decreased. However, the interaction of beef meat fat/sheep tail fat combination and production stage had a very significant effect on hardness, adhesiveness, cohesiveness, gumminess and chewiness. These results showed that beef meat fat and sheep tail fat can be used together in the production of heat treated sucuk, taking into account the textural properties.

Keywords: Sucuk, Texture, Heat Treatment, Sheep Tail Fat, Hardness



Occurrence of Entomopathogenic Nematodes (*Steinernematidae* and *Heterorhabditidae*) in Hazelnut Orchards in Ordu Province, Turkey

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Abstract: Entomopathogenic nematodes (EPNs) in the genera *Steinernema* and *Heterorhabditis* are important biological control agents against soil dwelling insect pests. A survey was conducted to investigate the presence of entomopathogenic nematodes (EPNs) in hazelnut orchards in Ordu province, Turkey. During the survey, 110 a total of soil samples were taken from 17 different locations. Soil samples were tested for the presence of Steinernematid and Heterorhabditid nematodes by baiting with *Galleria mellonella* larvae. EPNs were recovered from 16 of the 17 locations (94.1%). The frequency of occurrence of EPNs was highest in the soil from hazelnut orchards. From the total of 110 soil samples 70 (63.6%) samples tested were found positive for the presence of EPNs. The morphological characters of infective juveniles were used for preliminary species diagnosis. *S. feltiae* was the only and common Steinernematid recovered while Heterorhabditid nematodes were not found during this survey in hazelnut orchard. The study has showed that *S. feltiae* was the only common species and may be a potential for control of soil inhabiting insect pests in hazelnut orchards.

Acknowledgment: This research was supported in part by the Ordu University Scientific Research Project Coordination Unit (ODUBAP; Project No, AR- 1238).

Keywords: Entomopathogenic Nematodes (EPNs), Hazelnut, Ordu, Turkey

***In vivo* Antifungal Effect of Some Essential Oils Against Grape Gray Mould Disease Agent *Botrytis cinerea* in Grape**

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Abstract: Economic losses due to pre and postharvest diseases in crops may be 5–50%, or even higher in developing countries. Plant essential oils have a potential which may be alternative to synthetic fungicides in order to control postharvest fruit and vegetable diseases. Fungal infections occur in processes that develop during harvest, packaging, storing, and transportation of fresh fruits and vegetables. *Botrytis cinerea* is an airborne plant pathogen with a necrotrophic life cycle attacking over 200 crop hosts worldwide. Inappropriate use of fungicides leads to resistance among fungal pathogens. Decreasing efficacy and increasing concern over the adverse environmental effects of synthetic fungicides have brought about the need for the development of new types of selective control alternatives and crop protection methods without or with reduced use of conventional fungicides.

This study was conducted under *in vitro* conditions to determine antifungal effects of essential oils from sage (*Salvia officinalis*), thyme (*Thymus vulgaris* L.), peppermint (*Mentha piperita* L.), cinnamon (*Cinnamomum zeylanicum*), rosemary (*Rosmarinus officinalis* L.), lavender (*Lavandula officinalis* L.), anise (*Pimpinella anisum* L.) onion (*Allium cepa* L.) and origanum (*Origanum vulgare* L.) plants against factors *Botrytis cinerea* causing gray mould in grape. 8-10 day-old cultures of isolates, which were grown in Potato Dextrose Agar (PDA) medium, were used. 5-mm mycelial disks taken from the grown cultures were inoculated in PDA medium containing different concentrations (2, 4, 8, 16, 32 and 64 ppm) of essential oils and incubated for 7 days at 22 °C. For each concentration, three replicate plates were used. Petri plates containing only PDA medium were assessed as control. The experiments were conducted twice. At the end of experiment, mycelial growth of fungus was calculated. No mycelial growth was observed at all concentrations of both thyme oil and origanum oil, 32 ppm and 64 ppm concentrations of peppermint oils. Also, mycelial growth was not observed in the highest concentrations of lavender oil. All of concentrations of essential oils from sage, anise, rosemary and onion did not show a fungistatic effect on mycelial growth of *Botrytis cinerea*.

Keywords: Essential Oil, Antifungal Activity, Post Harvest Diseases, *Botrytis cinerea*, Grape

**Determination of Fungal Agents and Infection Rates in *Datura stramonium* L. Seeds****Havva DİNLER¹*, Derya ÖĞÜT YAVUZ¹, Gözde KARAHAN²**¹Uşak University, Faculty of Agriculture and Natural Sciences, Uşak-TURKEY²Uşak University, Institute of Agriculture Science, Uşak-TURKEY

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Abstract: Weeds are important plant protection problems which grow in unwanted sites and give harms rather than benefits and they problem all cultivation fields. Weeds decrease the yield over 90% in many cultivated plants. Weed seeds not only can be damaged due to the pathogens on or in themselves, but also they may serve as an agent to spread or transport these pathogens as well. *Datura stramonium* L. (Solanaceae) is an annual weed found in most temperate and subtropical regions of the world. *Datura stramonium* L. serves as an alternate host for many insect pests and diseases of Solanaceous crops, such as tomatoes, tobacco and potatoes, and has both narcotic and medicinal properties due to its production of a variety of alkaloids. *Datura* seeds and leaves are used as anti-asthmatic, antispasmodic, hypnotic and narcotic. *D. stramonium* is one of the species causing the greatest economic loss in corn, sugar beet, potato, sorghum, sunflower, soybean, vegetable and orchard and vineyards. They cause yield losses by competing with cultivated plants in terms of both nutrients and lights. It is also a potential host for plant pathogens.

This study was carried out in *in-vitro* conditions in order to determine the fungal agents and infection rates in *D. stramonium* seeds of different years taken from different cultivated plants. For that purpose, weed seeds were collected from cultivated plants (corn, cotton and citrus fields). In order to detect the fungi in seeds various methods which were especially based on direct examination of the seeds and incubation were used (ISTA,1976). In identifying the seed-borne fungal flora techniques of DFB (deep-freezing blotter) and AP (agar plate) methods recommended by International Seed Test Association (Mathur and Kongsdal, 2003; Al-Askar et.al., 2014) were used. In both methods surface-sterilized (S) and non-surface-sterilized (NS) seeds were used. For surface sterilization, weed seeds were kept in 0.5% of NaOCl for 1 min, then passed through sterile distilled water and dried between sterile drying papers. Later, each seeds were planted at equal intervals according to their species and size. For both methods the experiments were carried out as 4 replicates and 25 seeds per replicates. Hyphe, mycelium and colony growing by fungal agents in seeds and nutrient media were examined through Deep-freezing (DFB) and Agar (PDA) methods. For identification of the developing fungal agents at genus and species they were examined under x40 magnified light microscope and diagnosed according to the literatures. Generally *Aspergillus niger*, *Aspergillus flavus*, *Fusarium* sp., *Alternaria alternata* and *Rhizopus stolonifer* agents were identified in weed seeds.

Keywords: *Datura stramonium* L., Weed, Seed-Borne Fungi, Seed, Fungal Agent

Role of miRNAs in Abiotic Stress Responses of Plants and Its Use in Plant Breeding

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Abstract: Small non-coding RNAs, which consist of 21–24 nucleotides (nt), have been increasingly investigated as important regulators of protein-coding gene expression; these small RNAs function by causing either transcriptional gene silencing or posttranscriptional gene silencing.

Plant microRNAs (miRNAs) are a highly conserved class of small, non-coding RNAs that regulate gene expression by post-transcriptional degradation or translational repression. Functional analysis of conserved miRNAs revealed their involvement in multiple biological and metabolic processes in plants. They also regulate plant responses to biotic and abiotic stresses, and the miRNA pathway itself.

Abiotic stress causes plants to over- or under-express certain miRNAs or to synthesize new miRNAs to cope with stress. The level of action by miRNAs seems to be intensely wide and includes various aspects of development, adaptive responses to stresses, and the regulation of the miRNA pathway itself. Most conserved miRNAs target mRNAs encoding diverse families of transcription factors. For example, miR156, miR159/319, miR160, miR166, and miR169 target SBPs, MYBs/TCPs, ARFs, HD-ZIPs, and the NFY subunit, respectively, but miR168, miR393, miR395, and miR398 target mRNAs encoding AGO1, TIR1, ATS/APS, and CSD1/2, respectively. The level of those conserved miRNAs appears to be regulated during stress, and their target genes appear to be stress regulated as well, suggesting that plant growth and development are modulated during stress. MicroRNA has recently been appeared as a efficient tool for plant improvement and endogenous and artificial miRNAs may efficiently used in plant breeding programmes in the future. Also, they have a great potential in the regulation of secondary metabolites for medicinal crops.

In summary, given that miRNAs are crucial components of in gene regulatory networks, we believe that a complete understanding of the functions of miRNAs will greatly increase our understanding of plant tolerance to abiotic stress. Analysis of the DNA methylation profiles and the small RNA profiles will identify genes or regions that are regulated by miRNA mediated DNA methylation, which may contribute to epigenetic inheritance of stress effects.

Keywords: Abiotic Stress, Breeding, miRNA, Small RNA, Transcription



Determination of the Infection of the Brown-tail Moth, *Euproctis chrysorrhoea* in Çankırı Oak Forests

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Abstract: Oaks are substantive tree species in Turkey and may grow on soil and climatic conditions successfully where other tree species barely grow. Oaks have great importance with regard to biological richness and also oaks are included into “mixed” plantations. It is important to protect oaks from disease and insect pest in Çankırı where it is troubled with regard to climate, soil and sapling growth and pests have much greater importance in certain areas in Çankırı.

It was determined that larvae of *Euproctis chrysorrhoea* L. (Lepidoptera: Erebidae) left the overwintering nets at the third week of May (May 22nd, 2009) and feed on oak leaves about 4 weeks. The larvae of *E.chrysrrhoea* were present at the study area until June 12nd, 2009. The ratio of *E.chrysorrhoea* out of all Lepidoptera larvae was 5.26% in maximum. Neither the eggs of this pest nor the effective egg parasitoid *Telenomus euproctidis* Wilcox (Hymenoptera: Scelionidae) was observed in Çankırı (İlgaz-İndağı) in 2009 due to low *E.chrysorrhoea* population density. This result is important since it is also important various ecologies and pest population density is important with regard to the natural enemies.

Keywords: *Euproctis chrysorrhoea*, *Quercus* spp., Çankırı, Pest, Oak, Infection Rate



Determination of Prebiotic Activity During Probiosis Management

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Abstract: This study purposed of examining determination of prebiotic effect during probiosis management at gastrointestinal system.

The intestinal system is one of the most active organs of the body metabolically, and there are more than 400 bacteria in the intestinal microbiota of an adult. These microorganisms present in this microbiota are defined as "normal flora" and are basically divided into two groups as "useful" and "harmful". In a normal flora of a healthy host, these groups are in a dynamic equilibrium. This dynamic equilibrium is named as probiosis. The probiosis results from the domination of probiotic microorganisms in the intestinal microbiota. Probiotics are expressed as "live microorganisms that have a positive effect on the health and physiology of an individual when taken in sufficient quantities". Prebiotics are defined as "food constituents that can be fermented by selective bacteria (probiotic bacteria) in the colon by ingestion, reaching the colon region without digestion". There are many mechanisms that try to explain how probiotics protect the host against intestinal system disorders. These mechanisms are numbered as "producing abominable substances", "blocking of grip areas", "competing for foodstuffs", "destructing of toxin receptors" and "strengthening the immune system". There are various in vitro and in vivo approaches used to measure the efficacy of prebiotics and probiotics. While probiotic microorganisms and fecal flora of the intestine are determining by using classical and molecular methods, besides these approaches; the prebiotic effect is determined by using the equations developed in the direction of the data obtained by making various analyzes.

Keywords: Probiosis, Probiotics, Prebiotics, Prebiotic effect, Intestinal system



The Effects of Different Levels of Tarragon (*Artemisia dracunculus*) on Microbiological Properties of Sucuk (Turkish Dry Fermented-Sausage)

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Abstract: Tarragon (*Artemisia dracunculus*), is well known aromatic and medicinal plant in the world. Dry-fermented sucuk is a traditional fermented meat product which is country-specific and widely consumed in Turkey. Due to the lack of heat treatment in sucuk production, the fermentation process is very important. It is well known that tarragon has antimicrobial and antioxidative activity. The study was planned with the assumption that a functional product could be obtained by adding tarragon to the sucuk contents. It was determined whether the tarragon has a negative effect on the fermentation process. Effects of different levels of tarragon on microbiological properties of sucuk were investigated in this research. Different levels of tarragon (0.25, 0.50 and 0.75 %) added to the sucuk batter as spice. Lactic acid bacteria, *Micrococcus/Staphylococcus*, Enterobacteriaceae and yeast-mold counts of all sucuk samples were determined during ripening period (0., 3., 5., 7., 9. and 13. days). Lactic acid bacteria, *Micrococcus/Staphylococcus*, Enterobacteriaceae and yeast-mold counts were very significantly affected from ripening period while not affected from tarragon.

Keywords: Sucuk, Tarragon, Microbiological, Ripening, Dry-Fermented Sausage

Effect of Cherry Laurel (*Prunus laurocerasus*) Powders Obtained by Different Drying Methods on Textural Characteristics of Yogurt Ice-cream

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Abstract: In the last two decades, there is an increasing trend in consumption of natural, organic, healthy, low-calorie and functional foods due to growing health problems including cancer, cardiovascular diseases, obesity, and diabetes. Consumers look for not only healthy but also high-quality food products in terms of safety and texture with novel tastes and flavors. In this context yogurt ice-cream with cherry laurel introduces an alternative refreshing taste owing to the health benefits from both yogurt and cherry laurel. Yogurt ice-cream offers a lower lactose content for lactose-intolerant consumers by replacing most of the milk available in plain ice-creams. Moreover, it provides the beneficial yogurt bacteria for an easy and smooth digestion. Cherry laurel has high antioxidant activity and phenolic content (phenolic acids, flavonoids, flavonols, anthocyanin, tannins and lignin) and it is used as a dietary supplement in human nutrition and in the treatments of digestive system diseases, bronchitis, stomach ulcer, hemorrhoid and eczema. In addition to their health benefits, cherry laurel fruit powders were used to give a strong dark purple color with a sweet and astringent taste to the yogurt ice-cream in this study.

Cherry laurels were collected from Ordu, Turkey and fruits were processed to pulp after removal of the seeds. Pulp was dried using a ventilated oven (O: Nükleon, NST-120, Ankara, Turkey), a vacuum oven (V: Memmert VO 200, Schwabach, Germany) and a freeze-drier (L: Labconco Free Zone, Kansas, MO, US). Powders were added into ripened mixes at concentrations of 2%, 4% and 6%. Firmness and stickiness values were tested using a texture profile analyzer.

Firmness values varied between 5.29 N (V2, 60th day) and 1.69 N (O4, 60th day) while vacuum dried powders gave the highest (3.34 N) and lyophilized ones the lowest (2.85 N) mean firmness values. Vacuum drying increased the firmness values significantly ($p < 0.05$). The mean firmness values were highest (3.53) at 2% concentration and lowest (2.71 N) at 4% concentration of cherry laurel powder. Stickiness values varied between -0.63 (V4, 60th day) and -0.22 (O6, 1st day) while vacuum dried powders provide the highest mean stickiness (-0.47 N), the ventilated oven dried powders gave the lowest mean stickiness (-0.36 N) values. Ventilated oven dried powder added yogurt ice-creams had significantly lower stickiness values ($p < 0.05$). The mean stickiness values were highest (-0.46 N) in 2% concentration of cherry laurel powder and lowest (-0.36 N) in plain yogurt ice-creams. The stickiness values increased significantly on the 60th day of storage.

As a conclusion, cherry laurel powder was determined to be a healthy ingredient that can be used in yogurt ice-creams with no harm on its textural properties. It is plausible to use vacuum dried powders for a more firm and sticky texture.

Keywords: Lyophilization, Cherry Laurel, Yogurt, Ice-Cream, Texture



The Effects of Selected Starter Cultures on the Proteolysis Rates of Kashar Cheeses

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Abstract: Kashar cheese is a cooked-curd cheese which can be consumed as fresh or ripened. It is usually classified in the same group with Mozzarella and Kashkaval due to their similarities in the methods of production. In the traditional production, ripening is carried out relying on the native microflora hence does not involve addition of starter cultures. This way, the cheese requires long term ripening to attain its characteristic flavor, appearance and texture. The price of the final product increase remarkably due to the expenditures for storage and handling. In the last decade, manufacturers started using sodium salts of phosphates and citrates to reduce the costs of ripening and to obtain cheeses very similar to kashar in taste and texture. However the utilization of emulsifying salts is not allowed in the cheese production and it gives the manufacturers the chance for using faulty or old products in the kashar production. The main problem appears to be the cooking step causes complete or partial loss of activity of native microflora and enzymes or additional enzymes and starter cultures supplied later on. Considering starter cultures' contribution to the ripening process and their decrement due to the cooking stage, this study was designed to determine a suitable starter culture for kashar production using an immersion technique that involves kashar cheeses dipped into the starter culture solution after cooking the curd.

Three different types of starter cultures; ChoozitTM MA 11 (MA), BT 01 (BT) and Feta A (Feta) were applied to the kashar samples and they were ripened for 90 days. During the ripening period, water soluble nitrogen (WSN-TN%), trichloroacetic acid-soluble nitrogen (TCA-SN%) and phosphotungstic acid-soluble nitrogen (PTA-SN%) values were determined. In terms of WSN-TN, there were no significant differences determined ($p>0.05$) between control and starter culture applied cheeses, except the BT cheese. The mean TCA-SN values ranged between 4.18 and 4.64 % and there was no significant difference found between cheese types regarding mean TCA-SN values ($p >0.05$). While control had the lowest mean PTA-SN value, the BT- and MA-cheeses had significantly higher ($p<0.05$) PTA-SN values suggesting contribution of regarding starter cultures to the proteolysis rates. Although it needs an optimization, regarding the time of exposure and application dose, the results suggested that the immersion technique has a potential use in the production of cooked-curd cheeses.

Keywords: Cheese, Immersion, Kashar, Kaşar, Proteolysis, Ripening, Starter Cultures

**Some Properties of Fresh and Dried Oyster Mushroom (*Pleurotus ostreatus*)*****Mustafa Onur YÜZER*^{1*}, *Tuğba ELBİR*², *Hüseyin GENÇCELEP*³**¹ Bayburt University Aydıntepe Vocational School, Bayburt-TURKEY² Bayburt University Faculty of Engineering, Bayburt-TURKEY³ Ondokuz Mayıs University Faculty of Engineering, Samsun-TURKEY***Corresponding Author:** mustafayuzer@bayburt.edu.tr

Abstract: In this study, some physicochemical properties, antioxidant and total phenolic contents of *Pleurotus ostreatus*, known as poplar, beech and oyster mushroom were studied in a local family business in Rize province.

Mushroom samples used as materials in the study were grown in a specially designed mushroom breeding farms, after harvesting, they were brought to the laboratory without waiting and their stems were separated. Some of the mushroom were separated for drying and sliced into small pieces. Drying process; The work was carried out under temperature conditions of 60 ± 2 °C. Total dry matter, ash, pH, protein, total amount of phenolic substances and antioxidant activity were analyzed in fresh and dried mushroom.

Extraction of samples: 1 g of fresh and dried samples were homogenized with 10 mL of pure methanol for 2 minutes and stored at + 4 ° C for 3-6 hours. Then centrifuged at 4100 rpm for 15 minutes in the centrifuge and the accumulated phase was collected and kept at -18 ° C until the analysis. These extracts were used both in determination of total phenolic substance content and in antioxidant activity analysis. The total phenolic substance content of the samples was determined by the spectrophotometric Folin-Ciocalteu method and the antioxidant activities were determined by the CUPRAC method.

According to the analysis results; fresh mushroom was determined to be 6.45% dry matter, 2.6% protein, 0.79% ash, and pH 6.92. Dried mushroom was determined to have a 73.90% dry matter, 20.25% protein , 9.88% ash , and pH 6.88.

The total amount of phenolic compounds was determined as 0.57 mg GAE/g and 2.16 mg GAE/g in fresh and dried mushroom samples, respectively. The antioxidant activities of the mushroom samples were found to be 1.423 µmol Trolox equivalent/g and 8.013 µmol Trolox equivalent/g, respectively, in fresh and dried samples.

Keywords: Oyster Mushroom, Poplar Mushroom, Phenolic Substance, Antioxidant Activity, Chemical Properties



Some Physicochemical Properties and Emulsion Forming Properties of Wheat Germ

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Abstract: Wheat germ is a by-product of milling process which contains a high tocopherol and protein content, and high quality proteins and fatty acids. It is believed to have good emulsion-forming properties due to high protein content and other some physicochemical characteristics. In this study, some physicochemical characteristics (pH, protein content, oil content, ash content, dry matter content, water holding capacity, oil binding capacity, swelling capacity, color properties) of wheat germ was examined and influence of wheat germ addition (0-8 %) on the properties of model meat emulsion was investigated.

According to the results, wheat germ was determined to be 91.6% dry matter, 26.25% protein and pH 6.30 for %1 solution of wheat germ. Water holding capacity of wheat germ was determined as 1.853 g/g and oil binding capacity was 2.401 g/g. On the other hand, swelling capacity of the wheat germ was found as 2.33 ml/g. The color measurement with L*a*b*-System indicated that wheat germ has 53.54, 3.23 and 17.21 for L*,a* and b* values respectively.

Wheat germ addition caused regular change in the emulsion capacity and emulsion stability. Emulsion stability and capacity of wheat germ based emulsion increased with increasing the wheat germ concentration. The maximum emulsion stability (90.83 %) was obtained at 8% emulsion and the minimum emulsion stability (79.80 % and 80.15 %) was obtained at 0% (control) and 2% emulsion. The emulsion capacity results also showed the same tendency as the stability results. The maximum emulsion capacity (292.28 ml oil/g protein) was observed at 8% emulsion.

Keywords: Wheat Germ, Physicochemical Properties, Model Meat Emulsion, Emulsion Stability, Emulsion Capacity

Evaluation of Agro-Industrial Wastes as Prebiotic

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Abstract: Currently, consumers prefer to consume functional foods containing biologically active components that are beneficiary on health, as they become more aware of the links between food and health. Functional foods provide a beneficial effect on human health beyond nutritional needs when consumed at efficacious levels as part of a varied diet on a regular basis. Among the functional components, probiotics and prebiotics have a promising future. The researchers have focused on novel probiotics and prebiotics.

Probiotics, viable non-pathogenic microorganisms, contribute beneficial health effects when administered in sufficient amounts. The suggested health benefits of probiotics are managing lactose intolerance, stimulating the immune system, reducing the cholesterol and blood pressure, preventing certain cancer types, improving the gut microbial balance and inhibiting intestinal pathogens. In order to exert the positive effects on health of host, it was recommended that probiotic foods when consumed should contain probiotic bacteria at minimum levels of 10^6 - 10^9 per gram or milliliter. Lactobacillus and Bifidobacterium species, usually found in the gastro-intestinal microbiota, are the most commercially used probiotic microorganisms in foods.

Recently, prebiotics have been used to stimulate the growth of probiotics and enhance the functional properties of foods. Prebiotics are described as non-digestible food ingredients, since they are not digested in the stomach and small intestine. They are fermented by gut microbiota, stimulate the growth of the limited number of Lactobacillus and Bifidobacterium species and thus help to prevent the growth of the pathogens. To define a food component as a prebiotic; a component should i) be resistant to enzymes of gastro-intestinal tract, ii) be fermented by intestinal microbiota, iii) stimulate the growth of beneficial microorganism, iv) inhibit the growth of pathogen microorganism, and v) produce biologically active metabolites such as short-chain fatty acids (acetate, propionate, and butyrate) as result of fermentation. Fructooligosaccharides, galactooligosaccharides, soybean oligosaccharides, inulin, guar gum, resistant starch, pectins and chitosan are the widely used prebiotics derived from plants such as onions, leek, artichoke, garlic and beans through various biochemical and/or enzymatic techniques.

Agro-industrial wastes pose a serious problem of their disposal and environmental pollution, however, they contain fermentable sugars, valuable nutrient components, fibers and water. Hence the production of value-added ingredients such as novel prebiotic ingredients from agro-wastes could be very challenging for prevention of environmental pollution and waste management. In recent studies, it has been reported that different agro-industrial wastes such as almond skins, fruit peels, potato peel, wheat straw and corn cob stimulated the growth of probiotic bacteria, and thus could serve as a potential source for prebiotics.

This is a comprehensive review providing insights on the detailed current knowledge about to production of new prebiotics from agro-industrial wastes.

Keywords: Agro-Industrial Wastes, Probiotic, Prebiotic



Metal Complexes of Schiff Base: Preparation and Characterization

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Abstract: Schiff bases, characterized by an imine or azomethine group, are generally synthesized by condensation reactions of carbonyl functionalities (ketone or aldehyde) with primary amines. Owing to the easy tunability of their stereo-electronic structures, most Schiff bases are fascinating ligands, because they readily form stable complexes with most of the transition metals. The complexes make these compounds effective and stereospecific catalysts for oxidation, reduction and hydrolysis and they show biological activity, play an important role in biological systems. Schiff bases have gained considerable attention due to their remarkable biological activities (such as antiapoptotic, antifungal, antibacterial, anti-inflammatory and antiviral activities), catalytic activities, electroluminescent properties, fluorescence properties, nonlinear optical properties, applications in sensors and organic photovoltaic materials. We know that, salicylaldehyde-oaminophenol Schiff base has strong coordination ability and diverse coordination mode, because of containing many oxygen and nitrogen atoms coordination site. So other groups can be introduced to enrich their structure and improve their activity through the chemical reaction. Organotin complexes have good anticancer activity, it is a research focus in the field of anticancer drugs. Some studies have shown that the Schiff base organotin complexes are similar to cisplatin in the anticancer mechanism, they also belong to the anticancer drugs targeted to DNA, and the ligand has synergistic effect.

In this study, the ligand of 3-metoxysalicylidene-4-chloro-*o*-aminophenol was synthesized by the reaction of 3-metoxysalicylaldehyde and 4-chloro-*o*-aminophenol in the absolute ethanol at 60 °C by the catalyzed of *p*-toluenesulfonic acid. Later, the complexes of this ligand were prepared with Co(II), Ni(II), Cu(II) and Zn(II) in acetate forms in pure EtOH. The structures of ligands and complexes were identified using Elemental Analysis, FT-IR, ¹H-NMR, ¹³C-NMR, UV-Vis, Magnetic Susceptibility and Thermogravimetric Analysis as techniques. All of the Schiff bases were found to be bidentate ligands involving the imino nitrogen and phenolic oxygen atoms in the complexes and M:L ratio were found to be 1:2 for all the complexes.

Keywords: Schiff Base, Salicylaldehyde, 4-chloro-*o*-aminophenol, Complex, Spectroscopic Techniques

Investigation of Drugs Containing Active Component of Febuxostat By Spectroscopic Methods

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Abstract: Gout is a medical condition characterized by recurrent acute inflammatory arthritis. The most commonly affected area is the scallop-finger joint at the base of the toes. It can also be seen as arthritis, kidney stones or urate nephropathy. The cause of gout disease is the elevation of the blood levels of uric acid. Uric acid is a breakdown product of substances called purines. In particular, uric acid, a form of protein, is crystallized when a problem occurs or when it is produced too much, and crystals accumulate in joints, tendons and surrounding tissues. The accumulation of this substance in the joints results in the formation of inflammation. Clinical diagnosis is confirmed by observing these unique crystals in the joint fluid. Over the last 10 to 15 years, the incidence of gout has increased. This increase is thought to be due to increased risk factors such as the metabolic syndrome in the population, longer life expectancy and changes in nutritional status. Gout therapy is two-step, including outpatient treatments and attack treatments. The goal of treatment is to prevent complications of gout attacks and to keep the blood uric acid level below 6 mg/dL.

When acute gout arthritis develops, to relieve pain and inflammation; non-steroidal pain and anti-inflammatory drugs should be given with protect the stomach. Treatment with nonsteroidal anti-inflammatory drugs, steroids or colchicine improves the indication. Drugs used in gout disease; Colchicine, Allopurinol, Febuxostat, Probenecid.

The Febuxostat active substance drugs are drugs that reduce uric acid production. Febuxostat is used in the treatment of chronic gout and hyperuricemia. National Institute of Health and Clinical Excellence has concluded that febuxostation is more effective than allopurinol at standard doses but is not more effective than allopurinol at higher doses. Febuxostat is a non-purin-selective inhibitor of xanthine oxidase. The active site on xanthine oxidase, works by blocking the pterine center in an uncompetitive way. Xanthine oxidase is a combination of hypoxanthine and xanthine uric acid, which is needed to oxidize the two over and over again. For this reason, febuxostat inhibits xanthine oxidase, thus reducing uric acid production. Febuxostat inhibits the oxidized form as well as the reduced form of xanthine oxidase since fasuluclease does not readily displace the molybdenum from the pterin domain.

In this study, some physical and chemical properties (closed formulas, molecular weights, colors, melting points, conductivities, pH measurements, solubility tests and solubilities in polar and apolar solvents, hardnesses, microscopic control properties) of febuxostat active substance drugs used in the treatment of gout disease, and analyzed using spectroscopic techniques such as elemental analysis, IR, ¹H-NMR, ¹³C-NMR, UV-Vis, magnetic susceptibility, HPLC, GC-MS, thermogravimetric analysis and analysis in pharmaceutical preparations.

Keywords: Gout, Febuxostat, Uric Acid, Hyperuricemia, Spectroscopic Techniques



A Review of Heavy Metal Accumulation by Using Algae to Monitor Coastal Areas of the Southern Black Sea

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Abstract: Marine environments are polluted by heavy metals and they cause important ecological changes, due to their toxicity, persistence and accumulative behaviour in the biological indicator organisms, resulting in accumulation in biota. Algae as bio-indicators for environmental assessment in coastal areas are recommended by EU-Marine Strategy Framework Directive (MSFD). They are primary producers and have an important role for transferring of pollution to upper levels in food webs.

There is no a regulation about the usage of seaweeds for human consumption in Turkey, however concentrations of heavy metals should determine to monitor current status of pollution. For this purpose, past studies were collected to review the status of heavy metal contamination supplying GES.

In this study, the levels of elements that are taken into account for analysis of MSFD descriptors in algae tissues picked up from the coastal areas of Turkey have been compiled.

Keywords: Algae, Turkey, Pollution, Bio-indicator, Marine Strategy Framework Directive



**Assessment of The Effects of Onion and Black Radish Extracts Against
Polyphagotarsonemus latus (Acari: Tarsonemidae) on Barbania Bean Plants**

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Abstract: *Polyphagotarsonemus latus* (Banks) (Trombidiformes: Tarsonemidae) is one of the harmful pests in agricultural fields in the world. In this study, the activities of water extracts of onion (*Allium cepa* L.) and black radish (*Raphanus sativus* L. var. *niger*) were investigated against *P. latus*. The experiment was carried out on Barbania bean (*Phaseolus vulgaris* L. cv. 'Barbania') plants in a climatic room at 25°C± 2, 70-80% relative humidity and a photoperiod of 16L:8D (Light: Dark). There were four applications; onion extract, black radish extract, unsprayed control and sprayed control. Abamectin 18 g l⁻¹ was used on the sprayed control plants. Each treatment included five replicates with thirty plants per replicate. Leaf samples were taken weekly during six weeks. The leaves were chosen randomly from the young leaves on top of the plants. When the density of *P. latus* (all stages except egg) was above an average of 4 mites leaf⁻¹, the spraying was done. Abamectin was effective in reducing the mite population below this level during the experiment. Both black radish and onion extracts kept *P. latus* density below 4 mites per leaf on bean plants during 3 and 4 weeks after spraying, respectively. The results suggest that the water extracts of black radish and onion may have promise as an alternative control option for *P. latus*. However, future studies evaluating the effectiveness of these extracts against *P. latus* should be carried out under greenhouses and open fields conditions.

Keywords: Onion, Black Radish, Broad Mite, Pest Control, Extract



The Effect of Vermicompost Application on Plant Growth in Soils with Different Textures

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Abstract: This study investigated the effect of vermicompost, an organic fertilizer, on the plant growth in two soils with different textures. The experiment consisted of 2 soil types, 5 vermicompost doses (0, 2, 4, 8, 16 t da⁻¹) and 30 pots including 3 replicate pots using a randomized block design. The vermicompost doses calculated according to dry weight were applied to the pots of 5 kg and planting was carried out. No other chemical was applied during the experiment. The counts and measurements of plant properties were made on 5 plants randomly taken from each pot. *Esperia (Triticum aestivum L.)* was used as genetic material in experiment. According to the results of the experiment, the vermicompost doses led to an increase in the values of plant weight, leaf number, plant height, root weight, and root length (loam soil) in both clay and loam soils compared to the control soils. These increases were statistically significant for the number of leaves, plant weight, plant height, and root length in the loam soils and for the plant weight and plant height in the clay soils.

Keywords: Vermicompost, Clayey Soil, Loamy Soil, Texture, *Triticum aestivum L.*



Dendroflora of “Dobruşa” Protected Area

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Abstract: The purpose of this paper is to analyze the woody plants composition. We carried out taxonomic, geographic, environmental analysis and the analysis of life forms of the dendroflora in Dobruşa protected area.

The “Dobruşa” landscape reserve, covering an area of 2634,0 ha, is located in the North-East of the Republic of Moldova, with the following coordinates: 28,608192 47,804783; 28.702559 47.797013; 28,663187 47,776516; 28,631435 47,767200. The research was carried out in the Dobruşa landscape reserve between 2015 and 2017.

The investigated dendroflora represented 39 species including 24 species of trees and 15 species of shrubs from 27 genera and 18 families all belonging to the Magnoliophyta phylum. The biological range of trees and shrubs in the study area includes micro-phanerophytes (20 species) followed by the meso-phanerophytes (16 species) and nano-phanerophytes (3 species). If we refer to phytogeographical elements affinity, we can say that the European species predominate with a total of 24 species. In terms of humidity the xeromesophytes prevail (19 species) followed by the mesophytes (15 species). In terms of temperature the dendroflora is mostly characterized by mesothermal species. In Dobruşa protected area the dendroflora is predominantly represented by indigenous species, there are also two species (*Sorbus torminalis* (L.) Crantz and *Staphylea pinnata* L.) which are rare and protected by law of protected area of the Republic of Moldova, and there is also one active invasive species (*Acer negundo* L.).

In overall most of the woody plants communities are stable. These preliminary ecological data are essential and fundamental for the sustainable management and protection for these ecosystems.

Keywords: Dendroflora, Taxonomic Analysis, Geographic Analysis, Environmental Analysis, Protected Area



Evaluation of Solids Losses Quality of Macaronies Enriched with Whey Powders at Different Ratios

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Abstract: Macaroni is an important cereal product obtained by mixing of semolina and water, texturizing, shaping and drying. Because the macaroni is made by adding several raw materials such as eggs, vegetables and salt in traditional production is a very important food in cereal products, it has high consumption and importance in nutrition pyramid. According to Turkish Food Codex Macaroni Regulation, in terms of raw materials and additives that can be added to the formulation, it is named as Plain macaroni, Whole wheat macaroni, Enriched and Fortified macaroni, as well as in the case of using dairy products it is named "Macaroni with additives". The durum wheat used in pasta production should be much different from the bread wheat, the protein amount should be 14% on average and the hard grain ratio should be more than 75%. There are different quality control parameters for macaroni. The most important of them are sensory eating qualities such as amount of solid substances passing to boiling water which is named "solid losses", adhesion and fragmentation. Both the decrease in sensory quality and the high solid losses for macaroni are occurred, because of the inadequate and inappropriate gluten content of the semolina, and inappropriate wheat blend before semolina production. Also nutritional contents especially vitamins and minerals of the macaroni are passed to cooking water, removed through the water and wasted. The whey powder which is byproduct of the cheese production, is rich in lactose and minerals and is used as a natural ingredient to enrichment of the nutritional quality and fortification of the taste/flavour of the foods. Moreover, it is known that mineral substances strengthen gluten bonds during kneading of the dough. It is known that mineral substances strengthen gluten bonds during kneading of the dough. For that reason, the whey powders which have different attributes were added to macaroni samples at different ratios, and the solid losses qualities were examined, in this study. Three different whey powders were used as Standard whey powder (SWP), High protein whey powder (HPWP) and High lactose whey powder (HLWP). The amount of the solids losses was 21.47% of the control sample. The solids losses percentage were changed for SWP between 5.34-9.11%, for HPWP between 4.15-5.97%, for HLWP between 5.83-7.50%. The results show that the whey powders having different lactose and mineral contents decreased the amount of the solids losses of the macaroni. The negative correlation was obtained between usage rate (%) and solid losses. The most effective result was obtained by the usage of HPWP.

According the results, the usage of whey powder reduced the solid losses. Furthermore, whey which is rich in minerals and protein, may be a good alternative as natural additive to the fortification of the macaroni to gain functional properties.

Keywords: Macaroni, Wheypowder



Design and Implementation of Bi-directional Driver for Thermoelectric Cooler

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Abstract: This study aims to achieve thermoelectric cooler (TEC) design and implementation that is used for optical connection elements, medical equipment, chillers, computers and equipment which needs sensitive heat control.

Peltier equipment is well known as thermoelectric cooler. Peltier is silent, ecological and small-sized equipment in addition to that it has no moving parts and does not need technical maintenance. The target temperature can be set by hardware (with potentiometer) or software (with PC or embedded system). Heating and cooling function which depends on current direction is used to get stability of temperature between specified tolerances. Digital or analog feedback can be used to measure the temperature in thermoelectric coolers.

In our design, the TEC has 50 watt thermal power. It can be used to decrease the temperature to -40 Celsius and to increase the temperature to +100 Celsius. The temperature is measured by using an analog feedback and it is controlled in tolerances between ± 0.5 Celsius degrees.

The designed circuit drives peltier equipment as a bi-directional current way. Two power supplies are used in the TEC system to drive peltier equipment and controller. In the design stage, analog and digital power supplies are separated in order to eliminate the electrical distortion. Analog and digital equipment is fed by using DC-DC converters. Pulse Width Modulation (PWM) is used to increase the energy efficiency and to prevent high temperature on TEC system. LTC6992-1 integrated circuit is chosen for PWM generator and bi-directional current control is performed by the help of H-bridge (full bridge).

Keywords: Peltier, TEC, PWM, H-Bridge, Bi-directional Current



Effects of Nitrogen Source and Doses on Yield and Quality of the Sorrel (*Rumex acetosella* L.)

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Abstract: This study was carried out at the Ordu ecological condition in unheated plastic greenhouse in 2012-2013 growing season. In this experiment, effects of nitrogen treatments above the yield and quality was tested in soilless grown sorrel plants. In this experiment, treatments of two forms of nitrogen (Ammonium sulphate, Calcium ammonium nitrate) and 0 (control), 5, 10, 15, 20 kg/da doses were used. Nitrogen treatments were applied 3 times (20, 35 and 45 days after sowing). Sorrel seeds (Arzuman Tohum, Konya), which are commercially available on the market, were used in the study. Seeds were sown 2 g/m² on 14.10.2012 to a plastic pot with a size of 50x16x14 cm filled with a mixture of peat:perlite prepared at a ratio of 3:1. The plants were harvested at 70 days after sowing. In the experiment; plant yield, plant height, leaf Hue⁰ values, leaf chroma values, plant dry weight, vitamin C, plant stem length and plant chlorophyll values were determined. Calcium ammonium nitrate nitrogen resulted in increased yields compared to ammonium nitrogen treatments in the experiment. As the treatment doses increase the plant yield increased. In terms of yield values, nitrogen fertilizer treatment at 15 kg/da gave the highest yield with 2506.52 g/m². Calcium ammonium nitrate nitrogen treatments caused about 9% increase in yield compared to ammonium nitrogen. Nitrogen treatment doses in the study had significant effects on plant dry weight and dry weights varied between 6.07-8.70 (%). Depending on the increase in fertilizer doses, the amount of dry matter decreased to 15 kg/da treatment, with 20 kg/da nitrogen treatment, the amount of dry matter increased again. Treatment of ammonium nitrogen increased the vitamin C values compared to the Calcium ammonium nitrate nitrogen treatment in sorrel plants. Depending on the increase in fertilizer doses, the amount of C vitamin decreased to 15 kg/da treatment, with 20 kg/da nitrogen treatment, the amount of C vitamin increased again. Fertilizer doses have been shown to increase the amount of plant chlorophyll at significant levels.

Keywords: Sorrel, Nitrogen Treatments, Yield, Vitamin C, Dry Matter



The Comparison of Heavy Metal Uptake Capacities of the Brown Algae *Cystoseira barbata* and *Cystoseira crinita* (Phaeophyceae) Collected in Sinop

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Abstract: The aim of this study is a survey of heavy metal pollution in algae, sediments and water from Sinop coast. The levels of Al, As, Cd, Co, Cu, Fe, Hg, Mn, Ni, Pb and Zn were determined in *Cystoseira* species, widely distributed in Sinop coastal zone and dominant in the Black Sea. *Cystoseira barbata* and *C. crinita* are useful bioindicators in EU-MSFD (2000/60/EC). For this reason, these species were collected during 2015 to 2016 to monitor the current situation of pollution providing GES.

Heavy metal concentrations of algae, sediments and surrounding water were analysed by ICP-MS. The results of this study showed that bioindicator element As level was extremely high in tissue of *Cystoseira* species that was taken from water and also sediments (BSAF>1 and BCF>200). The general accumulation order was found as Hg < Cd < Co < Pb < Ni < Cu < As < Mn < Zn < Al < Fe. The mean Zn recorded higher level (66.9 mg/kg dry wt.) in the study area presented increased pollution pressure.

Although the mean concentrations of elements were less than the acceptable values suggested, the region should be monitored regularly to take necessary actions to ensure industrial, agricultural and domestic contamination.

Keywords: Sinop, Algae, *Cystoseira*, Heavy Metal, Bioindicator, Pollution



More Ecological, More Sustainable: Smart Floating Farms

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Abstract: Climate change, water and food shortages, CO₂ emissions, natural disasters, urban stresses in the cities are the most important environmental problems today. It is envisaged that 7.3 billion world population will reach 8.5 billion in 2030 and urban areas will increase by 185% in 2030. Experienced environmental problems will continue to increase in the future. The newest of these is the floating farms designed by a Spanish company. Floating Farms is an integrated system for the production of herbal and aquatic products, which can produce its own energy. Thanks to this system, the desalination water from the aquaculture production is used in the vegetal production for the fertilization and it is included again in the system as a relatively filter and the benefit is provided in both production. Thanks to the advantage of having a multi-layered structure, enabling maximum food production from a minimum area and establishing the desired region on the water, this system will meet the needs of possible vegetable and animal food in the future.

Keywords: Ecological Aquaculture, Sustainable Aquaculture, Smart Floating Farms



A Sustainable Innovative Agriculture Technology Aquaponic Systems And Potential Use In Turkey

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Abstract: Aquaponic is an innovative and growing industry that put together the production of plants with fish using hydroponics and aquaculture, respectively. Number of studies offering new and sustainable ways to produce healthy food (fish and plants such as vegetable, flower, or herb) is increasing due to the expanding significant interest in aquaponics from the scientific and commercial communities.

Studies in aquaponics began in the 1970s, and the combination of aquaculture and the hydroponic cultivation of plants continued over the last three decades with a varying system designs, plant and aquatic fish species. The most common cultivated plants are green leafy plants such as lettuce, basil, parsley, mint, tomatoes, cucumbers, cabbage, kale, celery, eggplant and okra. Regarding the most common grown fish species are tilapia, African catfish, blue gill/brim, koi, fancy goldfish, angelfish, guppies, tetras, swordfish, mollies.

In a symbiotic relationship, the waste that is produced by fish in water tanks, which could become toxic for the fish if not cleaned, is used directly or converted by bacteria into useful nutrients for plants. As plants assimilate these nutrients, the water becomes clean and is recycled back to the fish tank. Aquaponics allows the sustainable growth of two crops, while reducing the need of chemical fertilizer for plant and the discharged water. Aquaponics have also potentials to efficiently decrease the adverse effects of aquaculture on environment. In aquaponics, plants purify wastewater-containing nutrients, and then the purified wastewater is reused for farming fish.

Innovative agricultural approaches to food and water security are needed to combat with climate change, particularly in semi arid and arid countries facing water scarcity and chronic drought. In this context, aquaponics has been identified as a farming approach that, through nutrient and waste recycling, can aid in addressing sustainable development goals, particularly for semi-arid and arid regions. Nowadays, this new innovative agriculture technology is widely adopted in countries in America and Australia. Unfortunately, the number of aquaponic implementations is still scarce in Turkey.

The aim of this study is to raise awareness of scientists, investors and government agencies about aquaponics and evaluate the potential use of aquaponics in Turkey. Advantages and disadvantages of the aquaponic compare to other systems such as conventional agriculture and hydroponics will be discussed according to scientific literature.

Keywords: Water Quality, Aquaponics, Sustainability, Vegetable Production, Aquaculture



Accuracy Analysis in Seismic Acquisition By Using GNSS

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Abstract: In these seismic studies, we will examine what is important to survey applications. Since the correct description of underground geology is only possible with the correct coordinate data, seismic exploration at sea should be carried out with the latest technology navigation equipment and it is important to carry out seismic activities on land using advanced technology measurement devices (GPS and GNSS receivers). In the seismic exploration studies carried out on the land, licensing in forested areas, surveyors measurement studies, dozer works, lost and damage works are contained survey group activity. Measurement methods used in seismic studies for mining exploration, control of the measuring results, precise determination of result coordinates and especially the correct determination of elevation values are important in mining explorations.

Keywords: Seismic Data Acquisition, GPS, Energy, Topography, DGPS, RTK, Elevation Control
Accuracy Analysis in Seismic Acquisition By Using GNSS



Design and Fabrication of Biodegradable Polymer Composites

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Abstract: Thermoplastic starch that is basically obtained from plasticized starch is of great importance for many applications because of its biodegradability and sustainability. As known, starch is one of the most abundant natural polymers found on earth so, thermoplastic starch based materials can easily be fabricated. Thermoplastic starch is obtained by a plasticization process. During plasticization, starch is mixed with water and plasticizer and heated. By doing that it can be processed as traditional thermoplastics. Thermoplastic starch products can be fabricated in various forms by injection molding or high temperature compression molding and so on. Since thermoplastic starch is relatively cheaper than other commercial biodegradable polymers, it can be used for many applications including packaging films and polymeric foams. In addition to its superior biodegradability and sustainability, its inherit properties may not be enough for some applications. In this case, thermoplastic starch composites are required. In order to obtain desired morphological and mechanical properties thermoplastic starch composites can be fabricated by addition of various fillers. In order to keep its biodegradable nature, generally natural fibers are used for thermoplastic starch composites. In this study fully biodegradable biocomposites are fabricated. For the composite film production, dry mixing and compression molding processes were combined. In the first step optimization of the process at various temperatures was carried out for thermoplastic starch films. After determination of the compression molding temperature, natural fiber/thermoplastic starch composites were prepared at different filler ratios. According to outcomes, morphology of the composites are directly affected by filler ratio.

Keywords: Biodegradable Polymer Composite, Natural Fiber Composite, Thermoplastic Starch, Plasticization, Plasticizer, Compression Molding, Composite Film Production



Sustainable Polymer Composites from Waste

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Abstract: Increased environmental awareness in the society, force people to design and fabricate sustainable products. Sustainable product design could be done by using various approaches. Upcycling is a promising way of producing sustainable polymer composites from waste. It is basically a process used to convert old or discarded materials into new and useful products with new, even superior functions. As known, jute woven sacks are commonly used for storage and packaging. These woven sacks are generally thrown away after the first usage. However they can be reused for many applications because of their good mechanical and morphological properties. In addition to these jute fibers are cellulosic and biodegradable fibers that lowers the environmental impact of the products. In other words, jute fibers are renewable and sustainable fibers that make them one of the most significant bast fibers in the world in terms not only for commercial but also for technical aspects. Likewise jute sacks, polypropylene sacks are also used for storage and packaging of many products. They are also considered as disposable and thrown away after the first usage. Upcycling of polypropylene sacks become really significant when the environmental impact of polypropylene sacks are taken into consideration. In addition to those, limited fossil fuels lead to the fabrication of environmental friendly products that have some biodegradable and sustainable components in them. When the product design is evaluated from this aspect, composites come into prominence. Composites are materials that consist of at least two different components. In order to make any product more sustainable, some biodegradable components can be integrated into the structure. In this study upcycled composites were fabricated from waste sacks. For the composite film production lamination and compression molding processes were combined. In the first step optimization of the process at various temperatures was carried out for polypropylene films. After determination of the compression molding temperature, natural fiber/ thermoplastic polymer composites were prepared. According to outcomes, morphology of the composites are directly affected process conditions.

Keywords: Sustainable Engineering, Sustainable Composites, Waste Sack, Jute Fabric, Polypropylene Sack, Compression Molding, Composite Film Production



Length-Weight Relationship of Three Scorpion fishes in the Aegean Sea

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Abstract: Six (*Scorpaena elongata*, *Scorpaena loppei*, *Scorpaena maderensis*, *Scorpaena notata*, *Scorpaena porcus* and *Scorpaena scrofa*) of 222 species belonging to 26 genera of the Scorpaenidae family distributed in tropical and warm world seas are found in the Turkish seas. All of these species are distributed at the shores of the Aegean Sea. This family, which has demersal characteristics, have members with economic importance that are consumed as food. The dorsal, pelvic and anal fins of the species of Scorpaenidae family may contain poisonous rays and can be dangerous to humans. The length-weight relationship parameters calculated for fish populations vary for species depending on the region. Time-related differences in these values are often seen and expected as a result of bio-ecological (nutrition, competition, etc.) and physico-chemical changes depending on the time elapsed in a region. Therefore, the monitoring of the length-weight relation parameters of the fish species which are continuously renewed in their life cycle, which is a dynamic process, is of great importance in the management of their stocks with their control and continuity. In this study, the length and weight distributions, and length-weight relationship parameters of *S. porcus*, *S. elongata* and *S. scrofa* samples belonging to 2017 autumn and 2018 winter seasons were determined. Samples brought to the laboratory were firstly subjected to species identification and then total heights (cm) and body weights (0.1 g) were measured. $W = aL^b$ equation was utilized in the calculation of length-weight relationship. As a result, total length and weight values, and length-weight relation equations of *S. porcus*, *S. elongata* and *S. scrofa* species are as follows: 12.6-20.7 cm, 33.76-190.38 g, $W=0.0106L^{3.22}$ ($r^2=0.97$); 22-28.3 cm, 187.39-358.68 g, $W=0.1403L^{2.34}$ ($r^2=0.95$); 17.3-31.3 cm, 25.37-572 g, $W=0.021L^{2.95}$ ($r^2=0.99$).

Keywords: Scorpaenidae, *Scorpaena porcus*, *Scorpeana elongata*, *Scorpaena scrofa*, Length-Weight Relationship, Aegean Sea

The Effect of Benfluralin on Some Weeds in Green Bean (*Phaseolus vulgaris* L.)

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Abstract: Green beans (*Phaseolus vulgaris* L.) are currently grown on about 489.392 ha in Turkey (Anonymous, 2017). Weeds are one of the limiting factors for vegetable growing areas. Controlling weeds in a vegetable garden is important to plants. Green beans compete poorly with weeds as they are low growing plants and do not easily overshadow weeds. Early control is extremely important because the root system of the plant develops at this stage and some weeds secrete chemical substances which limit plant growth. Weeds are huge competitors for resources and can crown out seedlings. Weed competition can reduce yield and bean quality, affecting seed size, plant height and pod length quantity. Weed management in green beans are a combination of interrow cultivation and herbicide application. Chemical control is the most commonly used and reliable method for controlling weeds in green beans. *Amaranthus retroflexus* L. (Red rooted foxtail), *Portulaca oleracea* L. (Purslane) and *Chenopodium album* L. (Lamb's-quarters) are common weeds causing yield losses in vegetable cultivation fields. For the purpose of herbicide performance was evaluated with 25 l/da spraying volume and tap water by using and flat fan nozzle and based upon reduced doses (0%, 25%, 50%, 75%) and recommended %100 (250 g/da). The herbicide was applied separately under 3 atm pressure by using flat fan nozzle. Reduced doses of herbicide applied before sowing and it was mixed with the soil. After the spraying herbicide both weeds and cultivated plants were sown as 10 seeds in each pot. The cultivated plants and weeds are designed to be alone and together in each pot. The effectiveness of the applications in the control of beans and *A. retroflexus*, *P. oleracea*, *C. album* were evaluated under potting conditions. It was carried out and repeated twice in 2017 under Uşak University Faculty of Agriculture and Natural Sciences screen-house conditions as four replicates according to a randomized block trial design. In the effects of the applications on the growth of weeds and cultivated plants, seedling emergence-rate and the intact wet-dry plant weight were examined. According to the results, 90% and over of effect was obtained in all used doses of herbicide compared with control weeds. However, in the effects on green bean growth it was determined that wet and dry plant weight of the beans cultivated in the same pot together with weeds was lower than the ones cultivated alone. In different doses of the applied herbicide, no statistical difference was found in the mean emergence time and rate of the cultivated plant compared to the control group.

Keywords: Green bean, Benfluralin, *Amaranthus retroflexus* L., *Portulaca oleracea* L., *Chenopodium album* L.

The Effect of Some Plant Materials on Weeds in Onion Cultivation

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Abstract: Onion is a seed-to-seed three-year herbaceous vegetable species cultivated in the Aegean, Black Sea and Western Anatolian regions in Turkey. Yield loss due to weed competition in onion is around 40-60 %. Onions are very susceptible to competition from weeds because of their slow growth. Owing to its slow growth in initial stages and sparse foliage, weeds offer severe competition throughout the crop growth period. High reduction in yield of onion was observed due to weeds population. So early season competition is most critical and important for weed control. A number of studies have identified that plant waste agriculture-industrial wastes can be used in agriculture successfully. Plant-based wastes have an important potential both source of organic matter and plant nutrients which they contain. With these wastes used for agricultural purposes, both alternatives to organic plant environments which are gradually decreasing in the world will be provided and these wastes causing environmental pollution will be utilized as both cultivation environment and organic material and plant nutrients which cause environmental pollution. It is also considered as an effective method in weed struggle as an alternative to chemical struggle especially in vegetable cultivation fields. In the study the effectiveness of different plant materials in *Melilotus officinalis* L., *Galium tricoratum* Dandy and *Sinapis arvensis* L. struggle, which are problem in green onion cultivation, in the control of relevant weeds by using them in growing condition and the effect of them on emergence time and rate of onion seeds and seedling growth were evaluated. For that purpose; cabbagehead leaf (CHL), cabbage plant leaf (CPL), celery plant leaf (CPL), sugarbeet pulp (SBP), oleander leaf (OL), sugarbeet leaf+cornsilage (SBL+C) and garlic plant stalk (GPS) were dried and applied to the cultivation environment in two different doses before sowing and mixed homogeneously. It was carried out in greenhouse conditions of Uşak University Faculty of Agriculture and Natural Sciences in 2017 as four replications according to the randomized block trial design. The parameters in the experiment were determined as emergence rate (%) and emergence speed (day), normal/abnormal seedling rates (%), Chlorophyll measurement (CCI), dry-wet weights (gr) for both cultivated plants and weeds. While MELOF was suppressed with sugarbeet pulp application, GALTR and SINAR emergence rate was decreased with oleander leaf. With CHL, CPL and CPL applications decreased the emergence rates of the weeds. Growth of onion seedlings retarded with high garlic dose application. Emergence rate of GALTR reduced with both two dose application. As a result, it was determined that the control of the emergence rates of some weeds, which are problems in onion cultivation, and the seedling growth and normality stages of the cultivated plants can be achieved by using some plant materials with allelopathic effect.

Keywords: Onion, Allelopathy, Plant Materials, *Melilotus officinalis* L., *Sinapis arvensis* L.



Reproductive Strategies in the Teleosts

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Abstract: Creating of a living thing from another living thing is basically called breeding, and the breeding occurs as either sexual or asexual. However, three types of sexual reproduction (oviparous, ovovivipar and viviparous) occur in the vast majority of bony fish. Oviparous reproduction occurs in the form of egg laying. The eggs matured in the ovary of a female are released to the water, the sperm of the male individual is released and consequently the fertilization takes place in the water. Internal fertilization is observed in the viviparous animals. An animal that is viviparous gives birth to developed live young. The essential nutrients, water and mineral salts required for embryonic development are provided from the mother individual. Internal fertilization is still observed in ovoviviparous ones, although the necessary nutrients for embryo are obtained from their yolk sac, while mineral salts and water are taken from the mother. The majority of the species in teleosts display oviparous reproduction. However, ovoviviparous and viviparous reproduction are also observed in some families (Cyprinidae, Zoarcidae, Poecilidae, Scorpaenidae). It is seen that they spawn totally or partially, when the spawning strategies of bony fish are examined. In the total spawning species (serial spawner) they leave mature eggs at one time (or number of hydrated oocytes released in one spawning) during the spawning period while the multiple spawning species leave the hydrated oocytes at regular intervals throughout the reproduction. When the spawning types are taken into consideration, they are examined in three categories as pelagic spawners, demersal spawners and nest spawners. The eggs of pelagic spawners are carried freely by the currents. Some fish are nest spawners builds a nest and attracts the female to this nest to spawn. As it is seen in the members of the families Cyprinidae and Salmonidae, demersal spawners attach their eggs to a substrate such as the vegetation or the stream bed. In addition to these there are also mouthbrooders (For example; tilapia), which broods fertilized eggs or grows hatchlings in the mouth to protect them from predation. As seen in the seahorse male, so called "pregnant" male is another form of parental care include egg brooding in special pouches. Skin brooding type of parental care (e.g. pipefish) involves the attachment of eggs and developing embryos to the skin of one of the parents.

Keywords: Reproduction Strategy, Fish, Teleost, Ovipar, Vivipar

**“Paris green opal” from Taşköprü (Kastamonu), North Turkey*****Hasan KOLAYLI¹, Emin ÇİFTÇİ², Özgür BİLİCİ^{3*}, Esin YALÇIN¹, Muhammet ATAĞ¹****¹Karadeniz Technical University Faculty of Engineering, Trabzon-TURKEY**² Istanbul Technical University, Mining Faculty, Istanbul-TURKEY**³Ataturk University Oltu Earth Science Faculty, Erzurum-TURKEY***Corresponding Author: ozgurbilici@atanuni.edu.tr*

Abstract: A new deposit of “paris-green opal” has been discovered at Çambaşı, a small village 15 km east of Taşköprü, Kastamonu, N Turkey. The deposit consists of small bodies with 20-40 cm width and 150-200 cm length in a serpentized peridotite massif. Paris green opal bodies occur as pods or lenses in N70E direction-faults cutting these peridotites. Mineralogically sepiolite, diopside and chlorite discovered by XRD determination in opal occurrences. The opal probably formed thanks to the serpentization of olivine in peridotites because of water circulations along the faults. We suggest that the green colour of these opals is due to the presence of minute green, Cr-containing inclusions, most probably diopside. In this study, Paris green opal has been investigated as a gemstone, for example rosary bead, ring, necklace.

Keywords: Paris Green Opal, Gemstone, Kastamonu, Turkey

Examination of the Biocompatibility of Electrospun Pla/Sa/Ha Composite Nanofibers for the Bone Tissue Engineering Applications

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Abstract: Electrospun ultrafine fibres fabricated from biodegradable polymers are mostly functional as tissue engineering scaffolds for regenerating a variety of body tissues. Biopolymers like polyesters, polyvinyl alcohol, polyethylene oxide, and polylactic acid (PLA) have been in effect electrospun into micro- and nanofiber mats. Because of these, it is widely used in variety of biomedical applications. Sodium alginate (SA) has anti-bacterial, hydrophilicity and biocompatibility. For these reasons SA is used various applications such as environmental, clinical, biomedical and other areas. Main mineral constituent to human bones and teeth is hydroxyapatite (HA). It is biocompatible, non-toxic, and also bioactive. In this study different amount of SA as 0.8wt, 1wt. %, 1.2wt. % and 2wt. % were dissolved in distile water for 10min. 1ml of SA solution was added to 8wt. % PLA solution and this mixture was stirred to obtain uniform emulsion. Then, SA/PLA nanofibers was fabricated by emulsion electrospinning procedures were optimized at different flow rate and voltage. SA/PLA/HA nanofibers was fabricated by electrospinning. HA was obtained (*Spondylus* from orange spiny oyster seashell *Barbatus*) by hot-plate method. All electrospun nanofibers were characterized as a mechanical (Stress/Strain), morphological (SEM), and molecular structure (FTIR). In order to evaluation the behaviour of the composite electrospun nanofibers in tissue engineering, Saos-2 cells were cultured on SA/PLA/HA nanofibers to evaluate the preliminary proliferation rate on these materials. First, the simulated body fluid (SBF) in vitro was prepared to understand any possible toxic effect induced by possible ionic leach-out product from the samples into the medium. For this aim, 5 mL fresh medium was added in tubes with a piece (□0,05 g) of tested material (SA/PLA/HA nanofibers), which were kept in the incubator. One week after the SBF was extracted, and later used in cytotoxicity tests. MTT assays were performed in 96-well plates. Saos-2 (about 10⁵ cells per well) were seeded onto the UV sterilized polymers for 2h and incubated for 3 days. After 3 days, supernatants were removed, and 10 µL MTT (3-{4, 5-dimethylthiazol-2yl}-2, 5-diphenyl-2H-tetrazolium-bromide) solution was added to each well. Following incubation at 37°C for 3.5 h and kept dark in humidified atmosphere at 5% CO₂ in air. Subsequently, supernatant was discarded, and the precipitated formazan was dissolved in dimethyl sulfoxide (100 µL per well), and optical density of the solution was evaluated using a microplate spectrophotometer at a wavelength of 570 nm. For SEM investigation, the specimens were placed in the wells of 6-well cell culture plates and sterilized for 2h. Saos-2 cells were seeded in these plastic dishes and incubated for 24 hours in a humidified incubator at 37°C with 95% air and 5%CO₂. At the end of 24 hours, the media were removed, and specimens were fixed with glutaraldehyde then dehydrated with alcohol. According to the results, the cytotoxicity (MTT) tests indicated that SA/PLA/HA nanofibers had no cytotoxic compared to control. Cell attachment on SA/PLA/HA nanofibers is observed in SEM investigation. Thus, the biocompatibility tests demonstrate that these composites have suitable cytocompatibility, and can be recommended for the further development of biomedical applications.

Keywords: Polylactic Acid, Sodium Alginate, Bovine Hydroxyapatite, SEM, Biocompatibility



Biocompatibility Evaluation of Coaxial Electrospun PLA/BHA/GO Composite Nanofibers

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Abstract: Electrospinning is the most versatile and simple technique for the production of fibers with varying diameters, ranging from nano to micro scale. The electrospun nanofiber scaffolds show large high specific surface area to volume ratio, high porosity and tunable mechanical properties. Hydroxyapatite (HA), is the most popular biological ceramic material, provides bone growth and tissue adhesion. However, its poor mechanical properties and high elastic modulus limit its use in the human body. In this study, PLA/BHA/GO composite nanofibers were fabricated with amplified properties such as mechanical and thermal stability by using Graphene Oxide (GO) via Coaxial Electrospinning (CES) because of it is difficult for Bovine Hydroxyapatite (BHA) and GO to disperse in Poly Lactic acid (PLA) matrix. The electrospinning parameters; concentration (BHA, GO and PLA solutions), applied voltage (15-25 kV) and flow rate (1-4 ml/h) were optimized. In this study, natural BHA which obtained from cattle bone was used instead of synthetic HA differently from literature. In order to evaluate the behaviour of the composite electrospun nanofibers in tissue engineering, NIH/3T3 (mouse embryo fibroblast) cells were cultured on PLA/HA and PLA/HA/GO scaffolds to evaluate the preliminary proliferation rate on these materials. First, the simulated body fluid (SBF) in vitro was prepared to understand any possible toxic effect induced by possible ionic leach-out product from the samples into the medium. For this aim, 5 mL fresh medium was added in tubes with a piece (0,05 g) of tested material (PLA/BHA/GO composites), which were kept in the incubator. One week after the SBF was extracted, and later used in cytotoxicity tests. MTT assays were performed in 96-well plates. NIH/3T3 cells (about 10⁵ cells per well) were seeded onto the UV sterilized polymers for 2h and incubated for 3 days. After 3 days, supernatants were removed, and 10 µL MTT (3-{4, 5-dimethylthiazol-2yl}-2, 5-diphenyl-2H-tetrazolium-bromide) solution was added to each well. Following incubation at 37°C for 3.5 h and kept dark in humidified atmosphere at 5% CO₂ in air. Subsequently, supernatant was discarded, and the precipitated formazan was dissolved in dimethyl sulfoxide (100 µL per well), and optical density of the solution was evaluated using a microplate spectrophotometer at a wavelength of 570 nm. For SEM investigation, the specimens were placed in the wells of 6-well cell culture plates and sterilized for 2h. NIH/3T3 cells were seeded in these plastic dishes and incubated for 24 hours in a humidified incubator at 37°C with 95% air and 5% CO₂. At the end of 24 hours, the media were removed, and specimens were fixed with glutaraldehyde then dehydrated with alcohol. According to the results, the cytotoxicity (MTT) tests indicated that PLA/BHA/GO composites had no cytotoxic compared to control. Cell attachment on PLA/BHA/GO composites is observed in SEM investigation. Thus, the biocompatibility tests demonstrate that these composites have suitable cytocompatibility, and can be recommended for the further development of biomedical applications.

Keywords: Polylactic Acid, Bovine Hydroxyapatite, Graphene Oxide, SEM, Biocompatibility



Application of Isotope Ratio Mass Spectrometry in Food Authenticity Studies

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Abstract: Food adulteration is recognizable as a worldwide problem as it can cause health problems for the consumers, also it makes negative impact on authentic food producers. One of the methods, which are applicable for the food authenticity and geographical origin determination, is isotope ratio mass spectrometry. This method uses isotope “fingerprint” to track the origin of the food and revealing mislabeling of the original product composition.

The measurements of $\delta^{13}\text{C}$ values of the Lithuanian apple juices obtained from local farmers revealed that $\delta^{13}\text{C}$ values of juice sugar varied from -26.52 ‰ to -30.01 ‰, while in juices obtained from the supermarkets $\delta^{13}\text{C}$ of sugar values varied from -25.95 ‰ to -27.17 ‰.

The stable isotope ratios of light elements (carbon, nitrogen, oxygen) in Belarusian milk and farm water will be reported. $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values in the dried milk samples ranged from -30.2 ‰ to -20.0 ‰ and from +3.63 ‰ to +5.66 ‰, respectively. $\delta^{13}\text{C}$ values in the milk were different for the summer and winter seasons in the same geographical region. It can be related to the change of the diet, when cows were kept in the shelter during the winter season and had a different forage composition compared to the summer season.

Recent advances in honey, mineral water, olive oil origin identification will be discussed.

Keywords: Isotope Ratio, Milk, Fruit Juices, Origin Identification, Adulteration



Lipase Activity of Coagulase Negative Staphylococci from Fermented Sausages

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Abstract: Coagulase negative staphylococci (CNS) are an important part of microflora in fermented meat products. These microorganisms, which are technologically important, play a significant role in the product quality because of their proteolytic and lipolytic activities as well as superoxide dismutase, catalase and nitrate reductase activities in fermented meat products. The many coagulase negative staphylococci species such as *S. saprophyticus*, *S. xylosus*, *S. epidermidis*, *S. simulans*, *S. intermedius*, *S. auricularis*, *S. cohnii*, *S. equorum*, *S. arlettae*, *S. kloosii*, *S. warneri*, *S. gallinarum*, *S. haemolyticus* and *S. hominis* have been isolated and identified from traditional fermented meat products. However, *S. xylosus* and *S. carnosus* are widely used as starter cultures in industrial production due to their technological properties. In addition, studies on the use of some species such as *S. saprophyticus*, *S. equorum* and *S. warneri* as starter culture are still ongoing. Lipolysis, which is responsible for the increase in free fatty acids, precursors of lipid oxidation, is one of the important reactions in fermented meat products. Determination of the presence of staphylococcal lipases in species such as *S. aureus* and *S. epidermidis* has also led to the search for the presence of lipase in the CNS. In studies on *S. xylosus* and *S. warneri*, lipase enzymes have been purified and characterized. However, some researchers have indicated that lipase enzyme activity is limited in fermented meat products and endogenous lipases play an important role in lipolysis. In addition, it is known that microbial lipases are biotechnologically important enzymes and are used in many industries including food industry. In the present study, lipolytic activities of coagulase negative staphylococci strains isolated and identified from fermented meat products including sucuk (traditional Turkish meat product) were investigated, taking into account studies performed both in vitro and in vivo.

Keywords: *Staphylococcus*, *S. xylosus*, Lipase, Catalase, Fermented Meat



Some Ecological Properties of Complex Species *Rosularia sempervivum* in Turkey

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Abstract: Crassulaceae is represented by 32 genera and over 1400 taxa in the world. This family is spreading over a wide area including the Northern hemisphere, Western Europe, Mediterranean, North Africa, West and South Asia and the Caucasus. The general and interesting feature of Crassulaceae is that they are rich in inorganic matter, and they start night photosynthesis to resist adverse environmental conditions. The taxa of this family have improved water use efficiency as well as a significant photosynthetic carbon sequestration adaptation against Crassulaceae Acid Metabolism (CAM), defined by the capture of CO₂ at night and the assimilation of this CO₂ during the day.

Crassulaceae has very important characteristics in terms of economic use of water. Crassulaceae is represented by eight genera in Turkey. *Rosularia* (DC.) Stapf (Kayagülleri) is the third largest breed of this family. In addition to their ecological tolerance, studies on *Rosularia* are limited due to their diversity in genetic characteristics. Chamberlain and Muirhead in Turkey (1972) taxonomic from stated that by the early work that should be studied further taxonomic characteristics of this genus is controversial. Eggli (1988) monograph genus of study and twice in Turkey to come taxonomic problems cannot be solved with a few examples being collected it indicated that become even more complicated.

In this study, the relationship between abiotic (climatic, soil, topography) factors of *Rosularia sempervivum* complex species with highly complex features showing different phenotypic and genotypic characteristics in the environment of *Rosularia* genus was investigated. The specimens of *R. sempervivum*, which is the material of the study, were collected in the areas of which it has spread between 2012 and 2014. Taxonomic ecological and taxonomic data were obtained. The obtained data were compared with those of abiotic factors.

Keywords: *Rosularia sempervivum*, Complex Species, Ecology

**Current situation on Brown Bear (*Ursus arctos*) and Human Conflict in Kastamonu**

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Abstract: Human–wildlife conflict is defined by the World Wide Fund for Nature (WWF) as "any interaction between humans and wildlife that results in negative impacts on human social, economic or cultural life, on the conservation of wildlife populations, or on the environment". One of the subject of human- wildlife conflict which occurring often in Kastamonu, is bears (*Ursus arctos*). Brown bears are distributed widely on rural areas in Kastamonu. Most of the human - bear conflicts are result to injuries, death and economic losses. In this study current situation of Human - Bear conflict in Kastamonu region will be revealed. For analyzing the situation, questionnaire filled by people living in the rural areas and damage records of Ministry of Forestry and Water Management 10th District Directorate were used.

Keywords: Human - wildlife Conflict, *Ursus arctos*, Kastamonu



Investigation of Some Biochemical, Microbiological and Organoleptic Properties of Bayburt Karın Kaymağı Produced by Modern Technique

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Abstract: The purpose of this study was to find out some characteristic of the Bayburt Karın Kaymağı and to specify a standard production method for this product. For this purpose, the samples produced by the conventional method were compared with the samples produced by the alternative standard method in terms of some quality properties. In traditional methods, “karın” (rumen) and cloth bags were used for packaging, and in addition to these, a synthetic case with cellulosic content was used in standard method. Traditional production was carried out in Bayburt Ozansu Village and butter, yogurt yeast and packaging materials were obtained from this village. In the standardized method, packaging materials were cleaned and disinfected before production, in addition classical yogurt starter culture (*Lactobacillus bulgaricus*, *Streptococcus thermophilus*) and pasteurized butter were used. Maturation was carried on controlled conditions. During the 2nd, 30th, 60th and 90th days of storage, physical, chemical, biochemical and microbiological analyzes were carried out in the samples and sensory evaluations were performed on day 90th of storage. Total solid, fat, salt, total protein, acidity values increased during storage. Standardization in production had been influential on the physicochemical and microbiological qualities of the samples. Proteolysis degree of Bayburt Karın Kaymağı samples and thus the degree of maturity was found to be considerably lower than those of similar products. This situation was thought to be caused by the fact that no cheese yeast was used in production. According to the results of microbiological analysis, coliform bacteria and *S. aureus* were only observed in samples produced by the conventional method. The highest lipolysis rate was determined in samples produced by conventional methods and ripened in the cloth bag ($p<0,05$).

Keywords: Bayburt Karın Kaymağı, Standard Production Method, Lipolysis, Proteolysis, Fatty Acid



Attention to Saffron (*Crocus sativus* L.) with Various Aspects and Possibility of Growing in Kastamonu

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Abstract: Saffron (*Crocus sativus* L.) is known as one of the earliest cultivated plants (at least 3500 years). The word "saffron" originate from French term "safran", from Latin word "safranum", from Italian "Zafferano", Spanish "Azafran", from Arabic "asfar" which means "yellow". Saffron which gave Safranbolu (Turkey) its name is an important culture plant. Saffron is one of the world's highest priced medicinal and aromatic plants from which dried stigmas are used. The Mediterranean environment is recognized worldwide as the best area to produce saffron.

Saffron is cultivated mostly in Iran, India and Greece in the World. Iran is the leading exporter country in world saffron trade. Kashmir (in India) is one of the three prominent cultivating places of saffron the World. Despite the very high market price, production has also decreased, as profits have decreased as a result of the increase in labor costs.

Saffron is used in food, cosmetics, dying, medicinal and pharmaceutical uses. The researches has shown the presence of more than 150 components in the stigmas of saffron. The major components of saffron are crocins, picrocrocin and safranal. Crocins is responsible for the color of saffron, whereas picrocrocin and safranal are responsible for its bitter taste and aroma. Crocins dissolve easily in water to provide an orange-red solution. This is the reason for its application as a food colorant. Due to difficulties in its cultivation, harvesting and handling and due to value, saffron is the world's most expensive spice. For this reason, and because of stigma colour, it is known as "red gold". In addition, saffron has long been considered a medicinal plant for its therapeutic properties. Neurodegenerative diseases are less common in Asia using saffron than in the western world. Saffron contains high concentrations of bioactive compounds that can contribute to its beneficial effects. Despite the importance of safran in medicine and food industry, the prominence in paint industry is gradually decreasing. Because, it is very expensive. But its dyeing power is very high and it gives a bright yellow color, it can dye 100 thousands of its own weight.

One of the endangered endemic plants of Turkey is saffron. Its home is Anatolia and East Mediterranean regions. It has been known in Anatolia since Hittites, and that was exported to abroad during Ottoman Empire. However nowadays, plantation and production of saffron has decreased behind significantly. Today, it is symbolically produced in some villages in Safranbolu by some families. According to literarure, saffron plant has been cultivated on the two small plantations in Safranbolu, Karabük, Şanlıurfa province and in other some areas.

It is necessary to know the value and profitability of saffron to increase saffron production. For this reason, it is necessary to try different production methods in order to reproduce saffron groves and to obtain bigger onions in a shorter time. It is important to bring new incentives to the farmers and to create new production areas. In this context, knowing and acting on the economic value of saffron is crucial not only for the socio-economic development of the place where it is produced, but also for the economy of Turkey. The purpose of this review, saffron is being cultivated in Safranbolu in Turkey, in terms of climate and soil due to the similarity Safranbolu, Kastamonu is to draw attention to also bred in the region.

Keywords: Saffron, *Crocus sativus* L., Food Additives, Medicinal, Aromatic and Dye Plants



Mineralogical and Textural Zonning of Basanitic Pillow Lavas, Trabzon, Turkey

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Abstract: Basanitic volcanics develop in different structure and textures in terrestrial and marine environments. The basanites with pillow structure, which is the product of the underwater volcanoes, have been examined mineralogical and texturally. There are mineralogical and textural differences in each basanitic pillows. In this study, from center to outward of the pillow lavas, there are increasing on variolitic texture, leucite, glass, olivine and porosity. On the contrary, crystal size of microlites, iddingsitisation of olivines and secondary opaque mineral percent decrease from center to outward in pillows.

Keywords: Basanite Pillow, Mineral and Textural Zoning, Variolite, Trabzon, Turkey



An Experimental Study on Cyclone Particle Classifier

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Abstract: Separation of particles from a flow medium is an important problem in engineering such as air pollution, chemical processes, mining and particulate materials, heavy industry and power plants etc. Classification of particles according to their sizes would add an extra advantage to separation process. Various types of classifiers have been developed, mainly based on the principles of centrifugal, weight and electrostatic forces. This study concerns a cyclone classifier which uses centrifugal forces.

A special mini cyclone with a diameter of 50 mm was designed and produced by 3D printer in order to separate and classify the particles in the air flow entering the cyclone. 3 collectors can be placed inside the cyclone for classification. The location of the collectors and the distance between the collectors can be changed to see their effects on the collection efficiency and classification performance. An experimental setup was constructed for the tests. Atmospheric air was sucked tangentially into the cyclone by a blower. Calcite particles were fed into the incoming air flow. The mass flow rate of particles was about 2.5 gr/min. The particulate flow entering the cyclone gains a spiral motion due to tangential inlet. The particles were separated from the flow under the action of centrifugal forces and collected in the collectors. The cleaned air goes out from the exit pipe. Experiments were repeated for various flow rates and configurations obtained by changing the locations of the collectors. Flow rates, pressure drop and particle masses in the collectors were measured for each test. Flow rate and pressure drop measured by a digital flow meter and a differential pressure transducer, respectively. The collected particles were weighed and then analyzed by a particle size analyzer. Variations in pressure drop, total efficiency, fractional efficiencies and cut-off diameters with the flow rate and locations of the collectors were obtained from the measurements and analysed.

The results show that the designed cyclone is capable of classification particles during separation process. The coarser particles are collected in the top collector while the finest particles are collected in the bottom collectors. The pressure drop increases with flow rate or inlet velocity, however, the effects of the collector locations on the pressure drop found to be insignificant. On the other hand, the location of the collectors affects the classification performance. The results also show that the mean size of the particles collected in the collectors increases with flow rate.

Keywords: Particle Classification, Particle Separation, Classifiers, Cyclone Separator, Collection Efficiency



Polymer Foam Desing and Manufacturing with 3D Printer

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Abstract: With the development of technology in recent years, new developments are taking place in manufacturing and material technology. Porous materials are one of these. Uses of cellular structures as building materials include; construction of automotive, railway and construction industries, spacecraft, ships and sporting goods, and biomedical applications; Examples of functional usages include filtration and separation, heat exchangers, cooling systems, electrochemical applications, water treatment, fluid retention and conduction. Porous materials have high damping capacity of impact-load energy thanks to cellular structures. The combination of low weight and high damping capacity has made porous materials more attractive. According to the material they are manufactured, they are divided into classes like metal, ceramics, polymer foam. Metallic foams can be produced with closed or open porosity according to usage areas. Therefore, in this case, the mechanical properties change. Because metallic foams have a more rigid structure than polymeric materials, they are predominantly in the car body and in large accidents where higher energy absorption is needed.

The low density of polymeric materials provides important advantages when considering volume based. For this reason, as in all sectors where weight is critical, plastic materials are used as an indispensable element in space and automotive industries, for example.

Polymeric porous structures were produced with FDM (Fused Deposition Modeling) 3D printer, which is a Rapid Prototyping device. In this way, it is possible to produce the desired density material in the desired pore size.

With the completion of the work, the design of polymeric porous structures was realized. Designed model slicer software, G-Code files were extracted and produced with FDM 3D printers. During the production; Thermoplastic material called acrylonitrile butadiene styrene (ABS) is used. ABS thermoplastic material provides better mechanical properties than other thermoplastics used in 3D printers. ABS thermoplastic material has been used for the design and realization of polymeric material foam which is important in the work done.

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Keywords: Porous Constructions, 3D Printers, Additive Manufacturing, Automotive Building Materials, Polymer Foam



The Economics of Global Climate Change

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Abstract Global climate change is an urgent and serious issue which all of us will be effected. If we want to describe climate change in basic and shortest way; they are the changes happen in long run in world's weather conditions on temperatures and precipitation. The reason for this change is greenhouse gasses, which $\frac{3}{4}$ of it is carbondioxide, rest are nitric oxide and methan. On the other way, carbondioxide is the nutritional source of plants and it is valuable, but if it builds up more than the plants need, it became like an umbrella in athmosphere and cause climate change. It has been verified with scientific researches that, the biggest effect on greenhouse gas emissions are born by human activities, especially the energy sector which uses fossil fuel, deforestation, agriculture, raising livestock and transportation. For instance, coal is cheap but it is also the worst polluter in the world compare to natural gas, which only has half of carbon emission of coal. In order for us to save the World and pass on to next generations as livable place, we need to conserve the carbondioxide level as it is right now (% 0,04) in world's athmosphere.

What are the economic consequences of climate change? We must focus on the analysis that individual countries will need to assess their own policy positions, together with an analysis of how to generate strong international action. While we produce the policies to combat climate change, multi disciplinary and international researcers has to be conducted continuously together with public sector, private businesses, academicians and NGO's. In this study, we have examined the planned actions, actions which already taken and the economic results of these. According to the results; 1. Among the countries, rich ones dominate the current emissions, 2. If we don't take an action emissions will rise rapidly, 3. Emissions from developing countries likely to rise more strongly, 4. Countries must examine the adjustment costs of moving towards low-carbon economies. In recent studies different resolutions are started to discuss like "carbon footprint", "global carbon tax", "emissions trade" and "storing the waste carbon in old pits".

Keywords: Climate Change, Economics, Carbon Emission, Turkey, World



Automation Systems for Cattle Fattening Enterprises

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Abstract: The present population of livestock is 14.817 million cattle, 11 million goat and 33 million sheep (TUIK, 2017). Despite the large number of cattle available in the country, the contribution of the livestock sub-sector to the national economy is low. The growing demands for ruminants' meats from city dwellers also present opportunities for fattening as well as improved markets for the animals. Fattening of animals is a highly profitable venture with return of premium to the farmer. cattle fattening or on a large scale can be profitably undertaken. It consists of buying healthy stock, feeding and fattening them for 120 to 180 days, and selling them at anytime of the year. They are handled in such a way that maximum growth is achieved at the lowest possible cost. The growing period starts from weaning to fattening or replacement stage. Growers are usually maintained in the pasture with very little attention; they are given salt and mineral supplements. If raised in confinement, concentrates should be given in addition to grass or roughage. The small scale cattle fattening enterprise is represents an important component of the agribusiness sector of the economy with great economic, income, poverty reduction and social implications. The lifespan of operation is shorter and the return of investment is relatively higher. In beef farms which very high genetic value of breeding animals cannot be get the expected performance without the use of technology and automation systems. Beef herd management programs if can be used as effectively, farming will have many advantages for consumer, farmer and also animals. However, to obtain these advantages from this system required to have knowledge of the functions and effective use of the functions. The large amount of data in the obtained on many issues related to animals, herd management and an individual unless used in decisions about animals, ensuring the heavy data flow, record keeping or assessment will not give the expected results. In this study it has been aiming that the examined the technologic applications at Turkish beef farms for sustainable and profitable meat production

Keywords: Technology, Beef Farms, Herd Management, Profitability



The Latest Technologic Applications in Dairy Farming

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Abstract: Technology is developing rapidly. In this development, the transfer of computer systems and software to the application has made an important contribution. Technologic instruments made farmers can work more comfortable and increased animal production efficiency and profitability. Therefore, technologic developments are the main research area for animal productivity and sustainability. Many technologic equipment and tools made animal husbandry easier and comfortable. Especially management decisions and applications is effected highly ratio with these rapid development. In animal husbandry management decisions that need to be done daily are configured according to the correctness of the decisions to be made. At this point latest technologic systems give many opportunities to farmers for more accurate, reliable decisions. Milking, feeding, environmental control, reproductive performance constitute everyday jobs most affected by correct management decisions. Human errors in this jobs and decisions made big effect on final product quality and profitability are not able to be risked. This chapter deal with valuable information on the latest challenges and key innovations affecting the cattle husbandry. Also innovative approaches and applications for animal husbandry are tried to be summarized with detail latest research results.

Keywords: Latest, New, Technologic, Applications, Dairy, Farming



Analysis of Technical Ratio of Table Eggs Enterprises in Samsun Province

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Abstract: This study aimed at evaluated the technical productivity of table egg enterprises in Samsun Province. Nine of the 11 firm were volunteered to work. Some of technical efficiency analysis parameters of the study were; the total number of days the eggs were given by the table eggs, number of non-production days (cleanup, disinfection, etc.), death rate (%), number of eggs cracked-broken (day), the rate of chick survive, mortality rate before ovulation cage (%), daily feed consumption.

Table egg firm visited during 2013 to 2014 year. Observation, calculation and counting methods were used in obtaining research data. The technical ratios were found vary considerably depending on the scale of the enterprises and the professional management of the enterprise. In particular, most of the table eggs enterprises were small seize in Samsun Province. There were only two large scale table eggs enterprises with high technical efficiency in Terme and Kavak districts. From each different enterprise seize technical efficiency were evaluated and analysis results showed that there were significant differences in the average technical values.

The amount of daily feed consumption in 0-20 weeks was very variable between 64-100gr/day. It was found that the differences in the number of days when there was no production in the enterprises were caused by the management of the enterprises and capital shortage. The difference between the death rates of chicks was found very important

As a result, in order to improve the competition conditions in small-scale and large-scale enterprises, it is recommended to provide technical support, health and management training to enterprises

Keywords: Feed Cost, Input, Table Egg, Tecnical Parametres, Samsun



Evaluation of Animal Transport in Terms of Animal Welfare

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Abstract: The increase in transport distance and time of animals affects the animal welfare negatively. In this study, the welfare effects of animal transport were investigated in 2013-2016 using Samsun province, Bafra district data. A total of 269 transport data were used to evaluate the breeders' transport notifications. The distance between the farm of the animals and the slaughterhouse where the slaughter was carried out was calculated using the highway distance table. The obtained data have been evaluated in accordance with the directives of the European Union and the regulations of the transport of live animals and animal products of Turkey's.

In the study in which, the total number of animals transferred was determined as 1453. An average of 6 animals was carried on each transfer. Approximately 72% of the transfers are to the province center.

The average distance traveled between the farm and the slaughterhouse in the province center was calculated as 45 km. The average transit distance calculated as 51 km on the other district was 372 km on the other cities.

In the study, transport decisions not considered planned by the animal breeder were evaluated. It has been determined that breeders prefer rationing for breeding animals for slaughtering purposes and prefer cutting places close to the breeding farm in general.

This study has shown that transportations to the provincial center and other districts are appropriate for animal welfare standards but that long distance transport to other cities should be audited, in particular considering the distance traveled by animal transport vehicles in terms of compliance with minimum requirements.

Keywords: Animal Welfare, Distance, Regulation, Slaughterhouse, Transport



Utilization of the Daily Egg Production Method (DEPM) to Estimate Spawning Fish Biomass

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Abstract: Various methods such as the *mark-recapture*, eggs and larvae sampling, acoustic technique, the method of visual field scanning or water filtration and real population analysis are commonly used to estimate fish stocks. In recent years, the studies of eggs and larvae sampling have increasingly been used in the determination of stocks. Stock estimation methods with ichthyoplankton are (a) Egg Deposition Method (EDM), (b) Annual Larval Production Method (ALPM), (c) Daily Larval Production Method (DLPM), (d) Annual Egg Production Method (AEPM), (e) Daily Fecundity Reduction Method (DFRM) and (f) Daily Egg Production Method (DEPM). The daily egg production method, which constitutes the subject in this study, is a method developed for fish spawning in series many times during the spawning period, such as the members of the families Clupeidae and Engraulidae. The method is applied at the reproduction period of the studied species when maximum number of spawning is observed and where spawning is performed and both egg and larvae sampling as well as adult sampling are carried out simultaneously. The DEPM model was estimated according to the model described by Parker (1980); $B = kA P_0W/RFS$, where B is the spawning stock biomass in metric tons; A the total survey area (in m² per sampling units); k the conversion factor from grams to metric tons; P₀ the number of eggs per sampling unit (m² per day); W the average weight of mature females (grams); R the sex ratio (fraction of mature females by weight); F the batch fecundity (average number of eggs per mature female) and S the fraction of mature females spawning per day. There are some advantages and disadvantages of this method. The reduction of the cost due to the less time on the ship, the high reliability of the results obtained, and the more accurate results than the acoustic method can be counted among the advantages of this method. However, the disadvantages of the method are; (a) the study should only be performed during the spawning season of the species, (b) the species of which its stock to be estimated must have the multi-stage ovulation and (c) the species with pelagic eggs. There is only a single study that performed this method in our country, although it is widely used in the world.

Keywords: Daily Egg Production Method, Ichthyoplankton, Fish Eggs And Larvae, Spawning Biomass, Clupeidae, Engraulidae



Screening of Salt Stress Tolerance Level in Drought Tolerant Advanced Wheat Mutant Lines

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Abstract: Salinity is a serious problem because it limits plant growth and productivity. Wheat constitutes one of the world's major staple food crops, but accumulation of high concentration of Na⁺ inhibits its growth, productivity and yield quality. Therefore, improving wheat cultivars with high yield and better adaptability under saline environment is one of the ways to deal with this problem. The technique of induced mutations via mutagenic agents provides a new perspective on the issue of improving genotypes due to their ability to create random and novel arrangements on the genome.

In this study, obtained candidate drought tolerant advanced wheat mutant lines have been screened against salinity under in vitro conditions to detect their salt tolerance level.

Results showed that the increased transcript level of TaWRKY53 and TaWRKY44 in mutant lines than parental line contributed in salt stress tolerance as determined through improved physiological traits such as increased proline content and higher SOD, POX, CAT and APX activities.

Keywords: Wheat, Salt Stress Tolerance, Mutagenesis, Antioxidant Defence Parameters, Transcription Factors



An Overview of Turkish Galeodidae Fauna (Solifugae)

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Abstract: Turkey has a rich biodiversity due to its zoogeographical position. This position makes it rich in solifuges and other living groups. Since many studies have been carried out in Turkey to detect galeodids (Galeodidae), it was considered necessary to compile these studies in order to determine the total Galeodidae fauna. The aim was to draw up a list of galeodid species. To this effect, all available literature on the Galeodidae family in Turkey was consulted. The study revealed that the Galeodidae family is the most dominant solifuge family in Turkey, with a total of 22 species.

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Keywords: Solifugae, Galeodidae, Fauna, Turkey



Low-Fat Foods: Functionality of Fat Replacers

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Abstract: Lipids are among the three vital macronutrients of the diet since they are the primary source for energy since having a high energy density (9 kcal/g), fat-soluble vitamins (A, D, E, and K) that perform regulatory activity, and essential fatty acids, and serve as precursors for hormone-like substances. Besides being an essential component to maintain good health and the proper functioning of the human body, lipids contribute many chemical, physical, and nutritional functions in the foods such as satiety, flavour, and palatability. Fats also function as building blocks and have a thermoregulatory role.

While consumption of daily recommended values is beneficial for health the over consumption of fats could lead to various complications such as cancer, overweight, atherosclerosis, hypertension, cerebral apoplexy, and coronary heart diseases.

In recent years there has been an increasing interest for the development of fat-reduced or fat-free products as a result of consumer expectations and market requirements formulated by the introduction of specific food additives that exhibit similar functional and sensorial properties similar to those of lipids. People are willing to consume low-fat products in order to ensure overall metabolic health and reduce the risk of several types of diseases related to over consumption of calorie-rich foods. Since fat droplets are important to achieve the desirable physicochemical, textural, sensory, and physiological attributes of foods as assisting in the sensation of lubricity, creaminess, appearance, palatability in foods, and overall flavour, it is often challenging to compensate for these qualities in fat-reduced foods.

In search for fat reduction fat replacers have facilitated the development of reduced fat and fat-free foods that maintain the desirable sensory attributes and texture of high fat foods with less fat and fewer calories. Fat replacers having different chemical structures either carbohydrate- or protein-based are categorized as i) fat substitutes (fat-based) and ii) fat mimetics (protein-carbohydrate-based). Fat replacers considerably lower the energy value than lipids, however, the bioavailability of fat-soluble vitamins should not be reduced or limited by the addition of low-fat alternatives to counteract potential vitamin deficiency.

The research studies indicated that fat substitutes in short-term, carefully-controlled conditions, can decrease both dietary fat intake and percentage of calorie intake from fat, however, the long-term effects are unknown, and thus daily consumption of fat replacers should be limited in the diet.

In the present paper the specific application, functional properties and potential health effects of fat replacers will be reviewed.

Keywords: Reduced-Fat Foods, Low-Fat Foods, Fat Replacers, Fat Substitutes, Fat Mimetics



Effect of Ferulic Acid on Motility and Longevity of Rainbow Trout (*Oncorhynchus mykiss*)

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Abstract: In recent years, an increasing number of studies have been conducted on the physiological functions of ferulic acid. The ferulic acid (FA) is a phenolic compound that exhibits a wide range of therapeutic effects against various diseases due to their potent antioxidant effect. The goal of this study was to evaluate the effect of ferulic acid supplementation on sperm motility of rainbow trout *Oncorhynchus mykiss*. The sperm samples were obtained from six rainbow trout. Sperm collection was performed through gentle abdominal massage after anesthetized using 2-phenoxyethanol. The special care was provided to water, urine, avoid blood or faecal contamination in sperm collection. In the trial, we used to levels of 0 mM/l (Control), 0.5 mM, 1 mM and 2 mM ferulic acid and, motility and survival of sperm cells were assessed. Motility parameters were measured using an automated system (SCA, Sperm Class Analyzer). The spermatozoa movement was monitored using a camera coworking with SCA. Our results indicated that the increases in motility rate (90.00±0.01%) and duration (41.25±3.77 s) at 0.5 mM were statistically significant (P < 0.05). Data here reported also demonstrated that no motility was observed at 2 mM. On the basis of the results, incorporation of ferulic acid can improve sperm motility of *O. mykiss* and ferulic acid can be used as sperm motility-enhancement.

Keywords: Ferulic Acid, Antioxidant Effect, Sperm Motility, Rainbow Trout, *Oncorhynchus mykiss*



Light and Scanning Electron Microscopic Observations on *Aphanurus stossichii* (Monticelli, 1891) (Digenea: Hemiuridae) in the Black Sea Anchovy, *Engraulis encrasicolus* (Linnaeus, 1758)

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Abstract: In the present study, morphological diagnostic features of *Aphanurus stossichii* (Monticelli, 1891) in the Black Sea anchovy, *Engraulis encrasicolus* (Linnaeus, 1758) were studied in detail using light and Scanning Electron Microscope (SEM).

The specimens of *Aphanurus stossichii* were obtained from the pharynx and stomach of anchovy. The fish samples were collected from commercial fishermen in the period from September 2017 to December 2017 in Sinop, Turkey. A total of 45 anchovy was examined for digenean parasite.

Fish were subsequently examined for digenean parasite *A. stossichii* under a dissecting microscope. All fish were weighed and measured. The examination included the skin, fins, gills, body cavity and visceral organs (stomach, intestine, liver, swim bladder). Parasites recovered were either studied fresh or fixed and preserved using methods commonly applied. Morphological diagnostic features of the parasite were studied in detail using light (LM) and scanning electron microscope (SEM). Specimens for LM were dissected out from freshly caught fish. Specimens for SEM were hydrated, placed in 1% osmium tetroxide overnight, dehydrated in ethanol, air dried and mounted on stubs with double-sided adhesive tape and sputter coated with gold-palladium and examined in Jeol JSM-6510LV at an accelerating voltage of 10kV. Photomicrographs of each parts of the parasite were presented. Parasitological investigation and LM observations were conducted at the Faculty of Fisheries and Aquatic Sciences in Sinop, while specimens for SEM observations were performed at the Kastamonu University, Central research laboratory.

In the present study, detailed morphological features of *Aphanurus stossichii* is presented. This study is first record of *A. stossichii* from Turkish coasts of the Black Sea.

Keywords: *Aphanurus stossichii*, Digenea, Anchovy, Black Sea, Sinop

Analysis of Nutrition Contents in Peanut (*Arachis hypogaea L.*) Samples Grown in Adana Province, Turkey

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Abstract: Peanut (*Arachis hypogaea L.*) is one of the major oilseed crops of the world. The peanut varieties are rich in monounsaturated fats, and also protein, free amino acid, minerals but poor in carbohydrate. However, they are good sources for antioxidant compound such as vitamin a, total phenolics, flavones, carotenoid, and folate. The amount of proteins in about 25% of their weight. They can be consumed as raw, pureed, roasted or mixed with other foods or in different processed forms due to lower fat content but higher unsaturated fats, antioxidants it is used in lowering cholesterol level and preventing heart diseases. This study aimed determining the contents of free amino acid, β -carotene, phenolic, flavonoid, soluble carbohydrate, sugars (glucose, fructose and saccharose) in peanut samples which collected from various locations of Adana province in Turkey. Significant differences ($P < 0.05$) were found for the contents of total free amino acid, soluble protein, phenolic, flavonoid, soluble carbohydrate and sugars. The level of β -carotene ranged between 0.005 mg g^{-1} (samples of 36) and 0.02 mg g^{-1} (P36), but lycopene content varied between 0.10 mg g^{-1} (P11 and P36 samples) and 0.042 mg g^{-1} (samples of P39 and P42). Among the P42 peanut samples, thirty-second, thirty-eight, and twelfth samples had the highest flavonoid as 0.255 mg , 0.209 mg and 0.208 mg , while the total phenolic contents were higher in samples of eight and ninth as 7.74 mg and 7.29 mg . The level of free amino acid increased in P28, P18 and P19 samples (25 mg , 24 mg and 23.22 mg in orderly). The amount of glucose did not show differences between samples significantly. The level of fructose was the highest in the tenth sample with 78 mg , whereas it was the lowest in the P40-P42 samples by 22 mg . Saccharose content varied between 1.34 gr and 4.65 mg (samples of 37 and 15). The results in general indicated that the samples of peanuts had higher β -carotene, lycopene, free amino acid, flavonoid, phenolic, fructose and saccharose but they contained lower glucose content. However, some samples which P1, P5, P28, P34, P35 and P36 were found to be poor in terms of nutritional value. Finally, it can be said that nutrient composition of peanuts varied with locations.

Keywords: Adana, Nutritions, Peanut Samples



Development, Coding and Training of Robotic Arms in Welding Applications

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Abstract: Welding technology is an indispensable elements in the development of the world at every stage of new construction made with new metallic material produced or used in constructions. Nowadays, every step of the welding process has to be automatic as well as all the welding methods. These automated methods are supported by robot arms, resulting in robotic welding logic. Therefore, relevant standards for the use of robotic welding methods (TS EN ISO 14732) have been developed. Training and certification of welding operators in this sector has been made compulsory with respect to the standards. In our works, transfer of welding methods to robotic arms, coding and training of such systems in Vocational Schools are discussed. It is aimed at training the students of Vocational Schools toward the Welding Technology and Automation Technology in other for them to acquired knowledge about the use of robotic arms in welding applications. The graduation requirements consist of empowering the young students with the relevant skills and standards in this field. At the beginning of this welding methods, the arc coming out of the way are investigated by robotic mobility according to the welding method. The feasibility of the welding methods in robotics has been discussed and finally, the topics known as a welding system operator had been examined by considering 4 welding methods in a general scope. Furthermore, we investigated the welding of gas metal arc (TIG and MIG-MAG), submerged arc, and resistance (spot) welding. The applicability of robot arms had been compared in these welding methods. As a result, robotic welding personnel certification has been considered within the framework of the current TS EN ISO 14732 standard and the competence of welding personnel evaluated.

Keywords: Welding, Robotic, Standard, Welder, Quality



Impact of Inland and Sea Water Quality on Aquatic Food Products Safety

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Abstract: Chemical and microbiological contaminants in inland and seawater may be a hazard vehicle for transport of such as Polycyclic aromatic hydrocarbons (PAHs), heavy metal and also pathogenic bacteria strains from aquatic environment to aquatic food products. The level of PAHs in inland and seawater increase with industrialization and the traffic density. The contaminants are stored in particularly fatty tissue of raw fish, this case may affect human health with time. Heavy metal, pesticide so on are the other main chemical contaminants, which directly affect seafood quality. Concentration of domestic wastewater and not being enough household waste recycling centre and sewage treatment plant in the region play a key role for especially inland water quality. Due to these reasons, the microbial contamination risk like coliform bacteria could increase in these locations. Furthermore, water sources obtained from these regions are used for cleaning, washing and making ice in the fishing vessel and also unhygienic food processing locations. These undesired applications can affect directly public health by the reasons such as total mesophilic, psychrophilic bacteria growth and existence of pathogenic bacteria in fish flesh, so all above mentioned conditions must be monitored and taken under control for protecting public health.

In this respect, the primary aim of the study was to remark the relationship between aquatic food product and water quality in inlands and seawater.

Keywords: Water Quality, Contaminants, Seafood Quality, Public Health, Food Safety



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