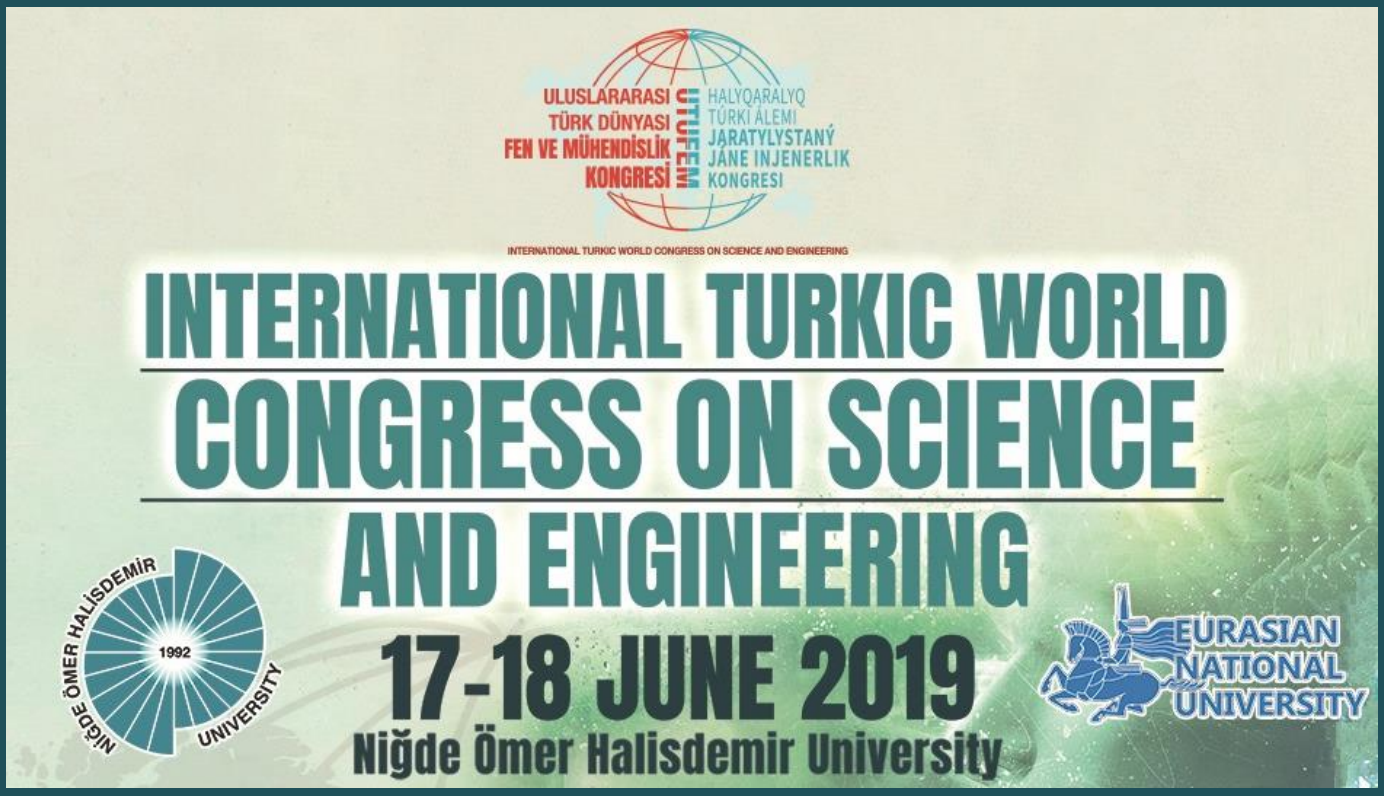

BOOK OF ABSTRACTS

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INTERNATIONAL TURKIC WORLD CONGRESS ON SCIENCE AND ENGINEERING

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On behalf of Niğde Ömer Halisdemir University's academic team and administrative staff, I would like to welcome and greet all of you with peace and happiness and thank all the participants who have participated from various parts of Turkey and abroad to attend this International Turkic World Congress on Science and Engineering.

About one year ago, when the vice rector of L.N. Gumilyov Eurasian National University visited to our university, we had decided to jointly carry out projects, scientific meetings and academic exchanges. Initially we have established a research center for Kazakh culture and education supported by Eurasian National University in our university. Secondly, we have initiated academic and student exchange programmes. Now, we have organized this excellent international scientific meeting in Niğde within a very short time. We are planning to hold this congress next year in Nursultan in Kazakhstan.

The congress covers all areas related to engineering and natural sciences. I am very pleased that topics presented in the conference covers a very wide area in this meaning. Needless to say, hosting such an important and timely academic event gave us great pleasure but at the same time put on our shoulders an enormous task of making your stay enjoyable and fruitful.

We all know the importance of developments in science and technology in the welfare of the societies. Investing in education, in particular, science and technology is a very vital for the future of every country.

We, as the Turkic and Islamic World, had made important contribution to the scientific advances in the past. Research on the history of science reveals that incredible scientific advances were made in both the Muslim and Turkic worlds during the dark ages of medieval Europe. Geniuses in Otrar (Farab), Samarkand, Baghdad, Cairo, Damascus and Cordoba took on the scholarly works of ancient Egypt, Mesopotamia, Persia, Greece, India and China and contributed to the accumulation of knowledge for a long time. These efforts led the emergence of new disciplines like algebra, trigonometry and chemistry as well as major advances in medicine, astronomy, engineering and agriculture. Renaissance benefited from these scientific advancements that include the contribution of humankind to the accumulation of knowledge over the centuries from different civilizations. As far as the medieval scientists of the Muslim world is concerned, they articulated so brilliantly that science is universal and it is the common language of the human race.

However, for a long time, we, as the Muslim and Turkic World, have been following the scientific advances developed mainly in the West rather than leading. There might be

the practical and conceptual challenges of science and technology pressing for Muslim societies. In order to lead in the scientific innovation, we have to revise our approach to science and technology and treat knowledge produced in the world as a public good for humanity. We need to make a balance between science and Islam and widen our understanding to conceptualize the scientific innovation within our faith, wisdom and understanding of the universe.

One of our aim should be to provide new platforms like this conference for the scholars from all around the world, to share knowledge and wisdom, improve academic capacity in our universities, to contribute to the scientific advances once again as in the past and to increase the welfare of our societies.

We have two Keynote Speakers, Professor Mustafa Ergen and Professor Professor Ghassan Abu-Lebdeh. It is an honor to see them here.I would like to welcome and thank both of them for accepting our invitation and coming to the conference and Niğde as well. We had an opportunity to listen to these distinguished scholars to understand what is going on the IT revolution, industry 4.0, smart innovations and to comprehend what is waiting for us in the near future.

I am confident that all the participating experts in the conference had not only shared with us their precious knowledge, wisdom and experience in their respective fields but also casted their valuable perspectives and insights into the understanding of the various aspects and implications of the conference's main theme. Moreover, they offered fresh projections for prospective studies and researches to be conducted in the future.

In concluding, I wish to reiterate my heartfelt gratitude to all the guests and participants, national and international alike, for being with us in this international scientific convention, and also to the members of the Organizing Committee of the Conference who have all been working for nearly a year, day and night, behind the scene, to make this event a huge success.

Once again, I would like to thank you for participating the conference and coming to Niğde.

Prof. Dr. Muhsin KAR
Rector of Niğde Ömer Halisdemir University

Dear Participants of the 1st International Turkic World Congress on Science and Engineering,

On behalf of the entire academic family at L. N. Gumilyov Eurasian National University (ENU), Nur-Sultan, Kazakhstan, I am extremely proud and happy to welcome you to the 2019 1st International Turkic World Congress on Science and Engineering (UTUFEM) which we initiated together with the host Niğde Ömer Halisdemir University(NOHU). Although our partnership with Niğde Ömer Halisdemir University is only one year old, our ties became very strong: The ENU inaugurated Kazakh Cultural and Educational Center at NOHU; we exchanged students and faculty members. With UTUFEM our partnership will be permanent.

This congress is one of the most important events because it will fill the need for a comprehensive meeting platform for scholars of the science and engineering of the Turkic World. For the Turkic world to develop together there was a need to have a forum for the researchers, engineers, and scientists to share knowledge. We created this Congress to serve these purposes. It is also our hope that this conference will act as a motivation for researchers, engineers, and scientists to publish their ideas and researchers in an international forum.

Since our foundation in 1996 L.N. Gumilyov Eurasian National University has been acknowledged as a young, leading HEI taking its niche in the global educational arena. The University has always dedicated itself to academics, innovations and research excellence. For ENU the key objectives include the provision of qualitative education to students, which meet expectations of the labor market as well as the country's economy; implementation of innovation in teaching and research; creation of entrepreneurial mindset.

The strategic goal of ENU. L.N. Gumilev is the transition as a research center in the Eurasian space to the category of a national research university. The research work of the University is aimed at the development of fundamental, applied research and innovation in priority areas. For example, in the field of physics: nuclear, space and nanotechnologies. In the field of chemistry and biology is biotechnology. In the field of mathematical sciences: problems of mathematical modeling and information technology.

Under the priorities of the university, there are 25 scientific divisions: research institutes, research laboratories, research centers, Innovation Park, Startup Zone, and Design Bureau.

Today, ENU scientists are involved in more than 100 projects in five priority areas for

domestic science: life science, energy, deep processing of raw materials and products, information and telecommunication technologies, and the intellectual potential of the country.

One of the criteria for evaluating the effectiveness of scientific activities of scientists and university staff is the publication activity, in particular, publications in high-ranking journals included in the database of Thomson Reuters and Scopus. The number of publications has a positive trend. According to the average citation of publications, ENU ranks more than twice the figure for Kazakhstan.

International co-publishing is a significant indicator of the effectiveness of the work performed and the confirmation of international scientific and technical cooperation. The fact that the publications of scientists and staff in journals that are part of the Web of Science database are made in cooperation with foreign co-authors from 43 countries, with 30 countries, there is more than 1 joint publication testifies in favor of intensive communication of scientists.

The university is implementing several innovative projects on renewable energy sources, energy saving, efficient heating and heating systems, recycling of consumption and production waste, and others.

One of the goals in the field of education and science is to attract young people to science. A number of activities are being carried out at the university in this direction: the Council of Young Scientists (SMU) functions, the main function of which is to stimulate the activities of young scientists; a 25% threshold has been established to attract undergraduate and graduate students for the implementation of funded research, a Student Scientific Society has been created.

In modern conditions, scientific periodicals are one of the main tools for the formation, storage, and dissemination of scientific knowledge. Eurasian Mathematical Journal, published by our university has been indexed by Scopus since 2015, and by Thomson Reuters database since 2016. Starting in 2017, another journal, Eurasian Journal of Mathematical and Computer Applications, has been indexed by Scopus. The works of these journals contribute to the entry of our scientists to new frontiers of science and education, attracting young talents to science.

I wish you all a fruitful congress this year and I welcome you all to the capital city of Kazakhstan, Nur-Sultan in 2020 as a host of 2nd International Turkic World Congress on Science and Engineering.

Prof. Dr. Yerlan SYDYKOV
Rector of L.N. Gumilyov Eurasian National University

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CONTENTS

INVITED TALK

Managing Urban Traffic to Serve Public Health: the Case of Traffic Congestion and Beyond

Ghassan Abu-Lebdeh

Department of Civil Engineering/Transportation
American University of Sharjah, UAE

In the context of transport systems, traffic congestion is always presented as an operational issue with negative socio-economic impacts. Rarely in engineering research and curricula is congestion portrayed as a public health issue, a stress causing factor, as in fact it is. It is accepted that repeated and prolonged driving in congested traffic conditions is a form of chronic stress and a serious health risk in the long run. Managing stress in difficult traffic conditions is a multifaceted activity in which proper traffic control can play a significant part. In this talk I will explain the human health side of traffic congestion and connect that to known and quantifiable traffic phenomena that, for modeling purposes, may be used as stress markers. Traffic control can thus be optimized with explicit consideration of stress. A case of a "health-sensitive" control algorithm for congested signalized systems will be presented where control parameters are optimized to explicitly reduce the occurrence and intensity of unhealthy traffic stress-inducing conditions. Implications of this outlook and findings to practice and research, and need of future work will be highlighted. As congestion is but one urban traffic menace, I will demonstrate other transportation/traffic management and control strategies explicitly aimed at modulating other (non-congestion) adverse health impacts in planning, design and operations of transport facilities. Results from case studies, both real-world and simulated, will be presented.

ORAL PRESENTATIONS

BIOLOGY

Study of The Elemental Composition of Fruitsof Needle Rosehip (Rosacea Acicularis)

Bakytbekova A.Zh.[1], Ibatayev Zh.A.[1], Polezhayev S.N.[2]

[1]S. Seifullin KATU, Astana, Qazaqstan
[2]D. Serikbaev EKSTU, Oskemen, Qazaqstan
ZharkynAstana@gmail.com

Rosehip is a perennial, wild-growing plant of the Rosacea family. There are 25 species in Kazakhstan, four of them are endemic. Rosehip fruits contain organic and inorganic minerals. The content of vitamin C in fruits can reach up to 1800 mg, for example it's 40-50 times more than in the fruits of black currant, or 500 times more than in the fruits of lemon.

In the fruits there is not only vitamin C, but also vitamins such as B1, B2, E, K, P, etc. There is also a significant amount of salts of vital elements: iron, potassium, calcium, magnesium, manganese, phosphorus, etc. It is, in fact, a health laboratory.
The chemical composition of the fruits of different types of rosehips varies greatly not only within the species, but also depending on the environmental conditions – the place of growth, the degree of maturity of the fruit and other conditions.

The chemical composition of rosehips of the same species, but collected in different areas are different. So we have studied the chemical composition of ash of needle rosehip fruit collected at the foot of the mountains near the village of Berel, Katon-Karagay district of East Kazakhstan, in the second decade of August 2018.

According to the data, rosehip fruits contain large amounts of potassium, calcium, magnesium, phosphorus, sodium, iron, aluminum and other elements. That is, the hips can replenish the body not only with vitamins, but also with the necessary macro- and microelements.

The content of heavy metals does not exceed the permissible amounts, i.e. rosehips are not only good for the health but also safe.

Keywords: Rosehip, Rosacea acicularis, fruit, chemical composition, vitamin

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Molecular breeding to enhance yield potential and stress tolerance in wheat through exploitation of genetic resources

Seyyed Abolghasem Mohammadi

Center of Excellence in Cereal Molecular Breeding, University of Tabriz, Tabriz, Iran
mohammadi@tabrizu.ac.ir

Wheat is an important crop and staple food globally and producing sufficient wheat for the growing population is a major challenge. Therefore, achieving significant grain yield in wheat is essential to fulfill 70% increase in wheat production by 2050. However, narrow genetic base and continued pressure from abiotic and biotic stresses pose a tough challenge to achieve the expected increase in wheat production. This shows the need to accelerate wheat improvement by introducing alleles from elite cultivars, landraces and wild relatives conferring host plant resistance, abiotic stress adaptation, and high yield potential. The aim of this study was to exploit the phenotypic and genomic variations of wheat genetic resources for development of high yielding and environmental stresses tolerant wheat genotypes. The quantitative trait loci (QTL) were mapped for various traits and nucleotide diversity of yellow (Yr) and leaf (Lr) rusts genes and resistance gene analogues in resistance and susceptible wheat cultivars and vernalization genes in Iranian wheat landraces were evaluated to develop gene specific SNP markers. Population structure of wheat landraces were assessed using microsatellites, vernalization, leaf rust resistance and low molecular glutamine subunits genes. Based on the identified genes and markers toolkit and genomic breeding values, QTL isogenic recombinant inbred lines and genotypes and varieties with multiple genes and QTLs were selected and crossed for development of multi-parental populations. Selection of desirable genotypes was started from F3 generation based on grain yield and its components, yellow rust resistance under natural infection, shape and size of flag leaf. The selected genotypes at different generations were evaluated under normal irrigation and rainfed conditions along with checks and superior genotypes were planted for variety registration.

Keywords: Genomic Breeding value, Multi-parental population, Quantitative trait loci, Wheat, Yield-related traits**.**

Effects of Sunflower and Wheat Exudates on Germination and Early Seedling Growth of *Papaver rhoeas* and *Sinapis alba*

Ali Aydemir, Bengu Turkyılmaz Unal

Niğde Ömer Halisdemir University
aydemirali@gmail.com

The study was carried out in order to protect the environment and to contribute to the economy and organic agriculture by using plant exudates. Plant materials were purchased from commercial companies. After treatments of sunflower and wheat exudates (20 seedlings.100mL^{-1}distilled water and 40 seedlings.100mL^{-1} distilled water), commercial herbicide (Gromstor) (1g.da^{-1} and 2g.da^{-1}) and exudate herbicide mixtures weed seeds in petri dishes was allowed to germinate at fixed humidity (50± 5 %), 16: 8 photoperiod and 23±2 °C. The germination rates (GR), indices (GI) and average germination times (AGT) were determined and radikula-plumula lengths and fresh-dry weights were measured in the seedlings. Decreases in GR and GI values were found in all treatments to the control in *Papaver rhoeas* (red poppy). The highest decrease was in the treatment of 1g^{-1} herbicide in GR (70.27 %) and in GI (78.18 %). In the AGT, increases was detected in all groups except ½ wheat 40 seedlings.100mL^{-1}dw + ½ 2g.da^{-1} herbicide treatment. The highest AGT is in 1g^{-1} herbicide treatment with 25 days. In *Sinapis alba* (white mustard), there was a decrease in all groups except sunflower 20 seedlings.100mL^{-1} dw and wheat 20 seedlings.100mL^{-1} dw treatments in GR and GI. The highest decrease was found in GR (11.96%) and GI (18.86%) in ½ sunflower 20 seedlings.100mL^{-1}dw + ½ 1g.da^{-1} herbicide treatment. The highest value of the AGT is in the same group with ~ 8 days. Radicula-plumula length and fresh-dry weights increased and decreased compared to the control. The lowest values were determined in radicula length in red poopy (0.43 cm) and white mustard (0.35 cm) at ½ wheat 40 seedlings. 100mL^{-1} dw + ½ 2g.da-1herbicide treatment, in plumula length in red poppy (0.75 cm) at ½ sunflower 40 seedlings.100mL^{-1} dw + ½ 2g.da^{-1} herbicide and in white mustard (1,05 cm) at ½ wheat 40 seedlings.100mL^{-1} dw + ½ 2g.da^{-1} herbicide treatments. Fresh and dry weight results are parallel too. It has been determined that sunflower and wheat root exudates have allelopathic effect in germination and early seedling growth of white mustard and red poppy seeds, and they have potential to use as bioherbicide.

Keywords: Bioherbicide, *Helianthus annuus*, Red poppy, *Triticum aestivum,* Weed, White mustard

Acknowledgments: This study was supported by the Scientific and Technical Research Council of Niğde University (FEB 2018/02 HIDEP) and we thank them for their support.

Effects of Sunflower and Wheat Root Exudates on *Papaver rhoeas* Growth, Relative Water Content and Photosynthetic Pigment Amounts

Ali Aydemir, Bengu Turkyılmaz Unal

Nigde Omer Halisdemir University
aydemirali@gmail.com

The study was carried out to determine the effects of sunflower and wheat root exudates on the development of *Papaver rhoeas* (red poopy) from common weeds and their bioherbicide potential. Plant materials were purchased from commercial companies. Red poppy seeds were allowed to grow at constant humidity (50 ± 5%), 16: 8 photoperiod and 23 ± 2 ° C in pots filled with peat. In the three-week seedlings, distilled water was applied to the control group and, sunflower and wheat exudates (20 seedlings.100mL^{-1}distile water and 40 seedlings.100mL^{-1} distilled water), commercial herbicide (Gromstor) (1g.da^{-1} and 2g.da^{-1}), exudate herbicide mixtures to other groups as foliar. In the harvested one-month seedlings root-shoot lenght, fresh and dry weights were measured, relative water content was calculated and photosynthetic pigment substances (chlorophyll a, chlorophyll b, total chlorophyll, carotenoid) were analyzed. The data were evaluated statistically. According to control root length increased in all groups except 1g.da^{-1} herbicide, 2 g.da^{-1} herbicide, ½ wheat 20 seedlings.100ml^{-1} distilled water + ½ 1g.da^{-1} herbicide and wheat ½ 40 seedlings.100ml^{-1} distilled water + ½ 2g.da^{-1} herbicide treatments, shoot length decreased in all treatment groups. Root and shoot weights increased and decreased. Relative water content decreased in all treatment groups except wheat 20 seedlings.100 ml^{-1} distilled water treatment compared to control and the highest decrease occurred in 2 g^{-1} herbicide treatment. The total chlorophyll and carotenoid levels were increased and decreased according to the treatment group. The maximum reduction for both pigments was found in ½ exudate ½ herbicide treatments. In the light of the data obtained, it was found that sunflower and wheat root exudates had allelopathic effect on red poppy. We think that their use with low doses of herbicides will be more effective and economical and will cause less harm to nature and health.

Keywords: Bioherbicide, Photosynthetic pigment, Red poppy, Relative Water Content, Weed

Acknowledgments: This study was supported by the Scientific and Technical Research Council of Niğde University (FEB 2018/02 HIDEP) and we thank them for their support.

Two new records of the genus *Titanoeca* Thorell, 1870 from Turkey (Araneae: Titanocidae)

Aydın Topçu[1], Nurcan Demircan[2]*

[1] Ömer Halisdemir University, [2] Bayburt University
*nurcandemircan@bayburt.edu.tr

The Titanoecidae Lehtinen, 1967 is currently represented by 53 species belonging to 5 genera all over the world (World Spider Catalog, 2019). A total of 6 species in 2 genera are known in Turkey (Topçu *et al*., 2005; Bayram *et al*., 2017; Demir and Seyyar 2017). In this study, specimens collected from Antalya and Karaman provinces were studied. Specimens were collected by means of hand aspirator from stony ground and preserved in 70% ethanol. SZX16 Olympus binocular stereomicroscope were used during identification. The examined specimens were deposited in the Arachnology Museum of Niğde Ömer Halisdemir University (NOHUAM). The genus *Titanoeca* Thorell, 1870 includes 4 species in Turkey. In this study, *Titanoeca spominima* (Taczanowski, 1866) and *Titanoeca tristis* L. Koch, 1872 are recorded for the first time from Turkey. Therefore, the known species of the genus *Titanoeca* Thorell, 1870 is raised to 6 in Turkey. The total number of titanoecid recorded from Turkey is now 8 species.

Keywords: Araneae, new record, *Titanoeca*, Titanoecidae, Turkey.

Investigation of some physiological changes of *Euphorbia macroclada* in Fındıkpınarı plateau roadside and inner part

Huseyin Turker[1*], Zeynep Duzelten Balli[1], Bengu Turkyılmaz Unal[2]

[1]Niğde Ömer Halisdemir University, Graduate School of Natural and Applied Sciences, Department of Biotechnology, Niğde, Turkey
[2]Niğde Ömer Halisdemir University, Faculty of Arts and Sciences, Department of Biotechnology, Niğde, Turkey
[*]huseyinturker013@gmail.com

The population of Fındıkpınarı, which is located in the borders of Mezitli district of Mersin, increases rapidly in summer and reaches 45.000-50.000 people. Roadside plants are significantly affected by highland road traffic. The aim of the study is to examine the degree of influence of the Euphorbia, which are naturally distributed in the Fındıkpınarı plateau and which are ethnobotanically important from roadside stress factors. Spurge (*Euphorbia macroclada* Boiss) plants collected from the roadside and inner side of the Fındıkpınarı plateau were transported to the laboratory by applying the cold chain. Photosynthetic pigment (chlorophyll a, chlorophyll b, total chlorophyll and carotenoid), total protein, proline amounts and antioxidant enzyme activity (superoxide dismutase-SOD, catalase-CAT) analyzes were performed and evaluated statistically. Total chl (37.39 %), carotenoid (23.59 %) ($p<0,05$) and total protein (39.10 %) amounts were higher in inner side samples than in roadside samples. The amount of proline (6.56 %) SOD activity (31.74 %) ($p<0,05$) and CAT activity (22.15 %) are lower in inner side samples. When the changes in physiological activities were evaluated, it was concluded that the samples collected from the roadside were subjected to stress. It is thought that roadside stress factors can be determined by additional studies.

Keywords: Antioxidant Enzyme, Euphorbia, Photosynthetic Pigment, Proline, Protein

The effects of sunflower and wheat root exudates on the development of Rumex acetosella and Rumex crispus

Huseyin Turker[1]*, Zeynep Duzelten Balli[1], Bengu Turkyilmaz Unal[2]

[1]Niğde Ömer Halisdemir University, Graduate School of Natural and Applied Sciences, Department of Biotechnology, Niğde, Turkey
[2]Niğde Ömer Halisdemir University, Faculty of Arts and Sciences, Department of Biotechnology, Niğde, Turkey
*huseyinturker013@gmail.com

In this study was carried out to determine the allelopathic effects of sunflower and wheat root exudates on *Rumex crispus* and *Rumex acetosella* and to determine bioherbicide potentials. *R. crispus* (curly dock) Niğde Ömer Halisdemir University was collected from the campus area and identified from various sources of flora. *R. acetosella* (sorrel) was purchased from a commercial company. Sunflower and wheat root exudates (20 seedlings.100mL-1distilled water and 40 seedlings.100mL^{-1} distilled water) and both mixture were applied to the curly dock and sorrel seeds and then they were planted in 28x15 cm pots with peat in them. It was allowed to germinate at fixed humidity (50 ± 5%), 16: 8 photoperiod and 23 ± 2 °C. Emergence percenteages (EP), indices (EI) and average emergence times (AET) were determined and radicula-plumule lengths and fresh-dry weights were measured in the growing seedlings. In *R. crispus*, emergence percentages and emergence indices decreased while average emergence times increased in all application groups compared to control. The highest value of AET (16,53 days) and the lowest values of EP (53%) and EI (63,64) was found in wheat 40 seedlings.100mL^{-1} distilled water application. Radicula length decreased in all application groups, plumule length, radicula fresh and dry weight, plumule fresh and dry weight increased. In *R. acetosella*, emergence percentages and indices increased while average emergence times decreased in all application groups compared to control. The highest values were found in EP (94,08%) and EI (184,08) in wheat 40 seedling.100mL^{-1} distilled water, and the lowest value in AET (14,44 days) in 20 seedling.100mL^{-1} distilled water application. Radicula length and plumule length increased in all application groups, radicula fresh-dry weights and plumule fresh-dry weight generally decreased. The results showed that wheat and sunflower root exudates had allelopathic effect in curly dock and sorrel and had bioherbicide potential.

Keywords: Allelopathy, Bioherbicide, Emergence, Curly dock, Sorrel

Klebsiella Pneumoniae Suşlarının GSBL(+) VE GSBL(-) Dağılımlarının İncelenmesi

İhsan Obalı[1], Ahmet Uysal[2], Emine Arslan[1]

[1]Biyoloji Bölümü, Fen Fakültesi, Selçuk Üniversitesi, Konya, Türkiye,
[2]Sağlık Hizmetleri Meslek Yüksekokulu, Tıbbi Laboratuvar Bölümü, Selçuk Üniversitesi, Konya, Türkiye,
obalihsan@gmail.com

Klebsiella pnemoniae bakterileri üriner sistem ve üst solunum yolu enfeksiyonlarının önemli bir nedenidir. Gram (-) olan *K. pneumoniae,* fırsatçı bir patojen olup kapsüllü ve mukoid fenotiptedir. Tıbbi olarak oldukça önemlidir. Dünyada gün geçtikçe bu enfeksiyonlarla mücadele zorlaşmaktadır. Çünkü bakteri suşları en önemli direnç mekanizmalarını B-laktamaz denilen enzim üretimi ile Beta-laktam antibiyotiklerini inaktive ve hidroliz ederek geliştirirler. *K. pneumoniae* izolatlarının dirençleri sıklıkla geniş spektrumlu β-laktamazlar (GSBL) üretimi ile ilişkilidir.Bu çalışmada, klinik örneklerden izole edilen *K. pneumoniae* suşlarının fenotipik olarak GSBL üretip üretmediklerinin belirlenmesi amaçlanmıştır. Konya ilindeki bazı hastanelerin mikrobiyoloji laboratuvarlarında, Ocak- Aralık 2017 tarihleri arasında çeşitli klinik örneklerden (idrar, kan, yara vb.) izole edilen 192 *K. pneumoniae* suşu çalışma materyalini oluşturmuştur. Suşların tanımlanması Vitek2 identifikasyon kartları ile yapılmıştır. GSBL(+) belirlenmesi için Çift Disk Sinerji Yöntemi kullanılmıştır. Fenotip olarak GSBL üreten suşlar belirlenmiştir.

Uygulanan Çift Disk Sinerji Yöntemi sonucunda petrinin merkezine yerleştirilmiş Amoksisilin klavulanik asit ile etrafına yerleştirilmiş sefalosporin grubu antibiyotiklerle sinerji oluşturup oluşturmadıklarına göre değerlendirilmiştir. Toplam 192 *K. pneumoniae'*nin 36 suşunun GSBL ürettiği, 156'sının ise üretmediği belirlenmiştir. Bu çalışmada GSBL üreten ve üretmeyen suşlar belirlenmiştir. GSBL üreten *K. pneumoniae* suşlarıyla oluşan enfeksiyonlar ciddi bir sorun oluşturmaktadır. Çünkü GSBL üreten bakteriler çoklu ilaç direnci olan bakteriler arasında önemli yer tutar. Bu nedenle GSBL pozitif suşların belirlenmesi gereksiz antibiyotik kullanımını önleyerek etkili tedavi sağlayacaktır.

Anahtar Kelimeler: *Klebsiella pneumoniae*, antibiyotik dirençliliği, GSBL(+), hastane, Konya.

The Textile Dye Removal Study with Algae Isolated from Akkaya Dam Lake

Özge ÇETİN, Tuba ARTAN ONAT, Hacer BOZKURT, Çağla Aslı ÇALIŞKAN, Hatice ÇEVİK, Burcu KÖSE

Niğde Ömer Halisdemir University, Faculty of Arts and Sciences, Department of Biotechnology, Niğde, Turkey
tubaartan@ohu.edu.tr

Environmental pollution in the world and in our country is one of the biggest problems. The most important causes of environmental pollution are industry and wastes. Synthetic dyestuffs developed in 19th century and later have gained great importance in textile industry. With increasing population and industrialization, waste rates have increased and reached serious dimensions. Dyestuffs are mainly used in textile industry, cosmetics, food, pharmaceutical industry, leather industry, printing industry. The paints used in the textile industry cause serious environmental problems and therefore their removal is important. Physical, chemical and biological methods can used in dye removal; biological methods have advantages such as less toxic waste and less cost. The number of researches on biological methods is increasing day by day since it is economical and eco-friendly. Plants, fungi, algae and bacteria used in biological systems. The aim of this study is to investigate the textile dye removing capacity of algae culture isolated from Akkaya Dam Lake.

In this work algae culture isolated from Akkaya Dam Lake water, and the removal of Maksilon Red textile dye from Birko Factory was investigated. The pH value of the medium prepared in the study did not change and dye removal study has been performed at the pH value of the mineral medium. In the study, Maxilon red textile dye was added after one-week incubation period was completed and algae started to growth, at 100-ppm final concentration of and dye removal rate was calculated as percent removal value depending on time in incubation period.

Keywords: Textile Dyes, Decolorization, Algae, Maxilon Red

Determination of Some Metabolic Properties of Lactic Acid Bacteria Isolated from Dairy Products

Elif CANPOLAT[1], Tuba ARTAN ONAT[2], Özge ÇETİN[2], Emre AKSOY[2], Çiğdem AYDOĞMUŞ[2], Mustafa Alp KOÇDEMİR[2]

[1]Niğde Ömer Halisdemir Üniversitesi, Tarım Bilimleri ve Teknolojileri Fakültesi
[2]Niğde Ömer Halisdemir Üniversitesi, Fen Edebiyat Fakültesi, Biyoteknoloji Bölümü
tubaartan@ohu.edu.tr

Lactic acid bacteria (LAB) have been used to fermented dairy products since ancient times. These bacteria are generally regarded as safe (GRAS) and take place in food preservation. Beside known fermented foods, products classified as probiotic foods, which help maintain balance for human gastrointestinal microflora, have an increasing consumption as time goes by. In this study, it was aimed to determine antimicrobial activity, lactic acid production, antibiotic susceptibility, hemolytic activity and exopolysaccharide (EPS) production of LAB isolated from fermented dairy products. Colony morphology, Gram reactions, and catalase activity were investigated after incubation of isolates at 37°C for 24-48 h in de Man Rogosa Sharpe (MRS) medium. Pure cultures of the colonies with a shape of rod and coccus, without spores, Gram-positive and catalase negative were obtained. Percentage of the lactic acid amount and EPS production of the isolates were determined. Antibiotic susceptibility of the isolates was examined international standards of Clinical and Laboratory Standards Institute (CLSI). Disk diffusion method was used antibiotic susceptibility. After the incubation period, zone diameters were measured and compared with international measures define susceptibility or resistance of the isolates. Isolates, which inoculated to Colombia-agar including sheep blood, were not formed any zones and evaluated as γ-hemolytic. Thus, these bacterial strains selected to further studies.

Keywords: Dairy products, Lactic acid bacteria, EPS, antibiotic susceptibility

A Comparison of Floristic and Ecological Characteristics of the *Orthotrichetum striati* according to the Regions in Turkey

Tülay Ezer[1], Mevlüt ALATAŞ[2], Nevzat BATAN[3]

[1]Niğde Ömer Halisdemir Üniversitesi, Fen-Edebiyat Fakültesi, NİĞDE
[2]Munzur Üniversitesi, Mühendislik Fakültesi, Biyomühendislik Bölümü, TUNCELİ
[3]Karadeniz Teknik Üniversitesi, Maçka Meslek Yüksekokulu, TRABZON
tezer@ohu.edu.tr

In this study, floristic and ecological characteristics of the *Orthotrichetum striati* wich was determined from four different regions of Turkey (Marmara, Black Sea, Central Anatolia and the Mediterranean) were compared according to the Regions in Turkey. Relevés were taken from different tree species in different habitats in these regions.

The floristic composition of the *Orthotrichetum striati* which was determined using the Braun-Blanquet method and the ecological characteristics of the taxa within the association such as moisture demand, light demand, acidity, tree preference and habitat trends were compared.

As a result of the present study, it was determined that the floristic composition of the association varies depending on the region and habitats where it is distributed. And also, it was determined that ecological requirements of the taxa belonging to the association differed according to the characteristics of epiphytic habitat, especially moisture and tree preference.

Keywords: Bryophyte, Epiphytic, *Orthotrichetum striati*, Vegetation, Turkey.

Effects of *Palustriella decipiens* (Bryophyta) on the development of pepper and corn

Bengü Türkyılmaz Ünal[1], Tülay Ezer[2]*, Cemil İşlek[1], Zeynep Düzelten Ballı[3]

[1]Niğde Ömer Halisdemir University, Faculty of Arts and Sciences, Department of Biotechnology
[2]Niğde Ömer Halisdemir University, Faculty of Arts and Sciences, Department of Biology
[3]Niğde Ömer Halisdemir University, Graduate School of Natural and Applied Sciences, Biotechnology Department
*tezer@ohu.edu.tr

The bryophytes are primitive plants that have survived since the early Paleozoic period and adapted to the terrestrial life. In this study, in order to evaluate the allelopathic effects of bryophytes *Palustriella decipiens* on different solvent (distilled water and ethanol) and concentrations (0, 25 and 50 mg.mL^{-1}) extracts on pepper (*Capsicum annuum*) and corn (*Zea mays*), morphological measurements, relative water content (RWC), photosynthetic pigment [chlorophyll a (kla), chlorophyll b (clb) total cl and carotenoid] and protein amounts of pepper and corn seedlings that have reached physiological maturity were determined. When the results of these measurements and analyzes are evaluated according to their controls; pepper in all treatments increased root size, body length decreased. In corn, the root length was increased in all other treatments except ethanol and 25 mg.mL^{-1} *P. decipiens* distilled water application, shoot length was decreased in other treatments except 50 mg.mL^{-1} *P. decipiens* ethanol treatment. RWC was reduced in all applications except the 25 mg.mL^{-1} *P. decipiens* distilled water treatment in pepper, decreased in all tretaments in maize and the highest decrease was in 50 mg.mL^{-1} *P. decipiens* ethanol in both plants ($p < 0.05$). The amount of kla, clb, total cl and carotenoid in pepper seedlings increased in all treatments and the highest increase was determined in 25 mg.mL^{-1} *P. decipiens* ethanol treatment. Kla, klb, total cl and carotenoid amounts of corn seedlings decreased in all treatments and the highest decrease was observed in 50 mg.mL^{-1} *P. decipiens* ethanol treatment. The total amount of protein increased in all treatments except 25 mg.mL^{-1} *P. decipiens* distilled water treatment, the highest increase in the treatment of 25 mg.mL^{-1} P. decipiens ethanol ($P < 0.05$). In corn, it was decreased in all treatments and the highest decrease was determined in 25 mg.mL^{-1} *P. decipiens* ethanol treatment ($p < 0.05$). These increases and decreases in morphological measurements and physiological analyzes of pepper and corn seedlings were caused by allelopathic effect of *P. decipiens* extracts on pepper and corn.

Keywords: *Capsicum annuum*, Photosynthetic pigment, Relative Water Content, Total Protein, *Zea mays*

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The effects of gallic acid on ascorbate-glutathione cycle and its redox state in wheat leaves (*Triticum aestivum*) exposed to cadmium toxicity

Ceyda OZFIDAN KONAKCI

Necmettin Erbakan University, Faculty of Science, Department of Molecular Biology and Genetics, Meram, KONYA, TURKEY
cozfidan@erbakan.edu.tr

Biological functions and roles of gallic acid (GLA), distributes as a phenolic, need to be supported by further studies. This work was conducted to define the efficacy of gallic acid on growth, water management, ROS content, the antioxidant capacity including ascorbate-glutathione cycle and their redox state and lipid peroxidation (TBARS) in wheat grown under cadmium (Cd) toxicity. Germinated wheat was hydroponically grown for 21 days (d) and was treated the combination form and alone of GLA (25 and 75 μM) and Cd stress (100 and 200 μM) for 7 d. The decrement on growth (RGR), water content (RWC) and proline (Pro) content was observed under stress. The decreases were reversed by GLA applications. Despite of the increased superoxide dismutase (SOD) activity, stress caused an inactivation of catalase(CAT), peroxidase (POX), glutathione reductase(GR) and NADPH oxidase(NOX) but, only ascorbate peroxidase(APX) activity was induced. APX activity was not enough for scavenging of Cd-induced hydrogen peroxide(H_2O_2) content. Therefore, in stress-treated wheat, the enhancement in TBARS content detected. After GLA application to plants exposed to stress, the increased H_2O_2 content by the activation of SOD and NOX was eliminated by the activities of APX, GR, monodehydroascorbate reductase and dehydroascorbate reductase rather than CAT and POX enzymes. However, 25 μM GLA was more effective against the damages produced by both Cd treatments that TBARS content decreased and the scavenging activity of hydroxyl radical increased. Also, the redox state of non-enzymes and enzymes including ascorbate-glutathione cycle was induced and 100 μM Cd-triggered H_2O_2 was removed by GLA2.

Keywords: Antioxidant enzymes, Asada-Halliwell pathway, Gallic acid, Heavy metals, *Triticum aestivum*

Determination of the Vespinae species and their population density by using the trap method

Nil BAĞRIAÇIK

Niğde Ömer Halisdemir University, Faculty of Arts and Sciences, Department of Biology

nil@ohu.edu.tr

Vespinae species, commonly known as yellow jackets, can cause harm by attacking honey bees, nibbling fruits, stinging human and animals. Especially after mid-summer and towards the end of the season, colonies grow very large by the increase of the number of individuals. The adult wasps prefer nutrients containing protein and carbohydrates, and feed their larvae with animal protein and vegetable-derived carbohydrates (nectar and honey). They can visit many different feeding habitats. In this study, it was aimed to determine common species during summer by using trap and bait in different habitats. For this purpose, the chicken and sugary water traps were hanged on the trees in different habitats and were periodically checked between June and September in Kalecik district of Ankara province. The species of Vespinae found in the traps were determined along with their population density. At the end of the study, *Vespula germanica* (F.) and *Vespa orientalis* L. were found in the traps. While these species were abundant in chicken traps, a fewer number was observed in sugary water traps. It was determined that the highest number of individuals in population density was identified in August. *Vespula germanica* species were found in each habitat, while *Vespa orientalis* was found only near honeybee hives and the vineyards. The female wasps of both species were found in the traps. The trap method can be used as an alternative to chemical control in the fight against wasps.

Keywords: Vespinae, *Vespulagermanica, Vespaorientalis*, trap, population.

The Ecological Relationships between Members of Bryophyta and Gammarus

Nil BAĞRIAÇIK, Tülay EZER

Niğde Ömer Halisdemir University, Faculty of Arts and Sciences, Department of Biology
nil@ohu.edu.tr

The members of Gammaridae (Crustacea: Malacostraca: Amphipoda), are the most important crusted arthropods which spread inland waters of Tukey. One of the largest genus of this family is *Gammarus*. While most *Gammarus* members live in surface waters, few have been reported to spread in wells, caves and other groundwater. They live between stones, sand, gravel, and dead organisms, usually in the fertile areas of water and among the plants where they can hide from predators. Gammarides are important components of the food chain in rivers. They also play a role as a detritivor in the aquatic ecosystems, decomposing organic matter (detritus cycle).

The most primitive group of plants living on earth are bryophytes. The bryophytes are the most important elements of many ecosystems in terms of preserving soil moisture, keeping water and nutrients, and providing shelter for microfauna. Unlike other habitats, the moss ecosystem is full of life. They contribute significantly to the faunal diversity in aquatic habitats and serve as a habitat, shelter and food source for the members of Protozoa, Rotifera, Nematoda, Turbellaria, Tardigrada, Oligochaeta, Amphipoda and Acari.

Bryofites and Gammarides prefer clean water as a habitat because they are very sensitive to environmental changes, metal and toxic compounds and they are also used as bioindicators in determining ecotoxicity in aquatic ecosystems.

In this study, a large number of the members of *Gammarus* were found among the aquatic species such as *Fontinalis antipyretica, Rhynchostegium riparioides, Palustriella falcata* and *Plagiomnium undulatum* during the collection of the bryophyte samples from the field.

Keywords: Bryophyt, *Gammarus*, Habitat, Ecology

Drassodes lapidosus (Araneae: Gnaphosidae) Türünden Kitin İzolasyonu

Albulene EMİNİ, Osman SEYYAR

Niğde Ömer Halisdemir Üniversitesi, Fen-Edebiyat Fakültesi, Biyoloji Bölümü
oseyyar@ohu.edu.tr

Kitin ve türevleri son zamanlarda endüstri alanında oldukça dikkat çekmektedir ve ilaç endüstrisi, eczacılık, gıda mühendisliği, biyokatalizör, atık su temizliği gibi pek çok alanlarda kullanılmaktadır. Kitin, daha çok yengeç, karides ve istakoz gibi deniz ürünlerinden endüstriyel olarak üretilmektedir ve son yıllarda böcekler, mantarlar, mercanlar, yarasa guanosu ve kabukluların yumurtaları kitin kaynağı olarak önerilebilmektedir. Bu amaçla yeni kitin kaynakları önerebilmek için bir örümcek türü olan *Drassodes lapidosus* 'tan kitin izole edilmiştir. Kitinin saf bir şekilde izole edilip edilmediğini anlamak için FTIR analizi yapılmıştır.

Anahtar Kelimeler: Gnaphosidae, *Drassodes lapidosus*, Kitin, Örümcek, Araneae

Erciyes Dağı'nda Yayılış Gösteren Bazı Yer Örümceklerinin (Araneae: Gnaphosidae) Seta Morfolojileri

Durmuş OK[1,2], Osman SEYYAR[1], Hakan DEMİR[1]

[1]Niğde Ömer Halisdemir Üniversitesi, Fen-Edebiyat Fakültesi, Biyoloji Bölümü
[2]Nevşehir Hacı Bektaş Veli Üniversitesi, Avanos MYO, Bitkisel ve Hayvansal Üretim Bölümü
oseyyar@ohu.edu.tr

Örümceklerin vücutlarının dış kısmı seta adını verdiğimiz kıl benzeri yapılarla kaplıdır. Yer örümceklerinde bu yapıların cins düzeyinde farklılıklar gösterdiği bilinmektedir. Bu çalışmada, Erciyes Dağından toplanmış olan 4 gnaphozid cinsine ait bazı türlerin seta morfolojileri üzerine odaklanılmıştır. *Gnaphosa opaca*, *Zelotes solstitialis*, *Nomisia exornata* ve *Haplodrassus signifer* türlerinin prozoma, opistozoma ve bacakları üzerinde yer alan setaların morfolojileri Scanning Electron Microscopy (SEM) kullanılarak belirlenmeye çalışılmıştır.

Anahtar Kelimeler: Gnaphosidae, Seta, Erciyes Dağı, Örümcek, Araneae

Chaetopelma olivaceum (C.L. Koch 1841) (Araneae: Theraphosidae) Türünün Kitin Yapısının Karakterizasyonu

Hüseyin YÜRTMEN, Osman SEYYAR

Niğde Ömer Halisdemir Üniversitesi, Fen-Edebiyat Fakültesi, Biyoloji Bölümü
oseyyar@ohu.edu.tr

Mevcut çalışmada, *Chaetopelma olivaceum*'dan kitin izole edilerek FTIR, SEM, TGA ve XRD cihazları kullanılarak kitin karakterize edilmiştir. Elde edilen kitinin TGA değerlerine göre termal kararlılığının yüksek olduğu, XRD değerine göre Crl değerinin %70.1 olduğu, FTIR analizi sonucuna göre kitinin alfa formunda olduğu gözlemlenmiştir. Ayrıca kitinin yüzey morfolojisi SEM ile incelendiğinde porlar içeren iç içe geçmiş karmaşık liflerden oluştuğu görülmüştür. Tüm bu fizikokimyasal özelliklerden dolayı daha önce çalışılmamış olan bu örümcek türünün alternatif bir kitin kaynağı olabileceği düşünülmektedir.

Anahtar Kelimeler: *Chaetopelma olivaceum*, Kitin, Araneae

Karyological review of belonging to the some cyprinid genera (*Cyprinus*, *Carassius*, *Ctenopharyngodon* ve *Garra*) species in Turkey and other countries III

Atilla ARSLAN[1], Ahmed Sadeq Jaber DOORİ[2], Zafer ALPASLAN[2]

[1]Department of Biology, Science Faculty, Selcuk University, Konya, Turkey
[2]Science Institute, Department of Biology, Selcuk University, Konya, Turkey
ahmedsdoori@gmail.com

Purpose and Method: In this study, the karyological studies of *Carassius*, *Ctenopharyngodon*, *Cyprinus* and *Garra* species in Cyprinidae (cyprinids) family current have been compiled. Based on the current literature data, the similarities and differences between the species were examined.

Findings: According to data obtained from karyological studies at different localities, of *Carassius* species diploid chromosome number (2n) 98,100,104,150 and fundamental chromosome arms the number (NF) value varies from 146 to 162. Study in Iranian, the diploid chromosome number (2n) of the *Ctenopharyngodon idella* species, known as the Grass Carp, is 48 and NF value 82 and 84. The diploid chromosome number (2n) of *Cyprinus carpio*, which is the only species of *Cyprinus* genus, was found as 98 and 100 while the number of fundamental chromosomal arms (NF) value has been identified as to be 148 and 156. In different populations of *Garra rufa*, diploid chromosome number (2n) is 44, 46 and 50, while NF value varies between 84 and 96. Diploid chromosome number (2n) of *Garra variabilis* has been identified to be 102 and NF value 185 in studies in Turkey.

Results: According to data from the literature; the diploid chromosome number of other species other than *Garra* species is similar in different localities, while it is understood be variable the diploid chromosome number of *Garra rufa* in Turkey.

Keywords: *Cyprinus*, *Carassius*, *Ctenopharyngodon*, *Garra*, Karyotype

Karyological review of belonging to the some cyprinid genera (*Alburnus*, *Squalius*, *Phoxinus, Barbus*, *Capoeta* and *Chondrostoma*) species in Turkey and other countries I

Atilla ARSLAN[1], Zafer ALPASLAN[2], Ahmed Sadeq Jaber DOORİ[2]

[1]Department of Biology, Science Faculty, Selcuk University, Konya, Turkey
[2]Science Institute, Department of Biology, Selcuk University, Konya, Turkey
zfralpaslan@gmail.com

Purpose and Method: In this study, located within the family of Cyprinidae (cyprinids) and showing distribution in freshwaters of Turkey karyological review of 25 species belonging to 6 different genera is made. The karyological characteristics of endemic and non-endemic species of belong to these genera are compared with the results of some other countries. In study, belong to species number of chromosomes (2n), karyotype formula, number of fundamental chromosome arm (NF) value, localization of the study and the source used are include.

Findings: According to the literature data, the chromosome number of *Alburnus*, *Squalius* and *Phoxinus* species is 2n = 50; of *Barbus* species 2n = 48, 100, 125 and 150; of *Capoeta* species 2n = 148 and 150 *Chondrostoma* species 2n = 50 and 52 expressed as. In the karyological studies of the species belonging to these genera, in addition to standard giemsa staining, C bandind, NOR banding, CMA3 and FISH techniques have been performed.

Results: As well as studies in Turkey karyological studies of some species belonging to this genus, Iran, China, Germany and also has been studied in Yugoslavia. In the studies, it is explicitly stated that sexual chromosomes in species do not detectable.

Keywords: *Cyprinidae,* Karyotype, Chromosomes, Turkey

Importance of Aphid Studies In Turkey

Gazi GÖRÜR[1],*, Özhan ŞENOL[1], Hayal AKYILDIRIM BEĞEN[2]

[1]Niğde Ömer Halisdemir University, Department of Biotechnology, Niğde - Turkey
[2]Artvin Çoruh University, Health Services Vocational School, Artvin - Turkey
*ggorur@ohu.edu.tr

There are about 5100 aphid species determined which are placed in 510 genera. About 300 aphid species thought serious pest. Aphids are one of the economically most important groups of insects as they directly and indirectly damage various host plants by sucking plant phloem and transmitting about 60 % the plant viruses. Despite application of the various management strategies, it has been shown that they still cause tremenendous amount of crop loose (about 30-40 %). There are about 12.000 plant species determined and about 31 % are endemic for Turkey. Despite that, so far only about 6-8 Turkey originated aphid species have been recorded and 570 species listed for Turkey aphid fauna. Recently there are a lot of studies carried out at the different localities of Turkey and added many species to Turkey aphid fauna. There is no database about how much aphid caused agricultural crop loose and there are still large unexplored areas waiting for to be studied. Moreover, Aphids are promising group of insect to study impacts of global warming and recent climatic changes are going to influence both composition and agricultural damage level of the aphid species. There should be more studies conducted to find out real composition of Turkey aphid fauna and it should be integrated with neighboring countries.

Keywords: Aphid, Fauna, Turkey.

Determination of Total Protein, Total Phenolic Substances and Antioxidant Enzyme Activities of Some Mushroom Species Collected from Abant Nature Park and Belgrad Forest

Şükrü CANPOLAT[1], Cemil İŞLEK[2], Ilgaz AKATA[3], Bengü TÜRKYILMAZ ÜNAL[2]

[1]Niğde Ömer Halisdemir University, Central Laboratory
[2]Niğde Ömer Halisdemir University, Faculty of Science and Arts, Department of Biotechnology
[3]Ankara University, Faculty of Science, Department of Biology
sukrucanpolat@ohu.edu.tr

Mushroom species forming the materials of the study were collected from Abant Natural Park (Bolu) and Belgrad Forest (İstanbul) in autumn (September, October, November) of 2014. Collected species were photographed in their nature and morphological and ecological properties (properties of growing area, altitude, geographical positions via GPS) were recorded. Identification of the species were performed according to morphologies of their microscopic (spores, hyphens) and macroscopic (stalk, hymen, cap) structures via various sources. Total protein ingredients, SOD, PPO, CAT activity, prolin amounts and amount of total phenolic compounds of mushrooms, identified as *Butyriboletus regius, Clitocybe nebularis* and *Rhizopogon luteolus*, were determined by spectrophotometric analysis. It was found that *Butyriboletus regius* had the highest values of total protein amount (0,290 mg/mL FW), total phenolic compounds (89,171 µg GAE/mL) and the highest values of proline (59,313 µmol/g FW). Total protein amounts and amount of total phenolic compounds vary due to species, climate and growing conditions. While *Butyriboletus regius* had the highest SOD enzyme activity (462,752 EU/g FW), *Rhizopogon luteolus* had the highest PPO enzyme activity (6800±700 EU /g FW) and *Clitocybe nebularis* had the highest CAT enzyme activity (0,471 EU /g FW). Enzymatic and non-enzymatic antioxidants, which alter the reactive oxygen species into harmless compounds, protect plants against oxidative stress conditions. Examination of these parameters is important in terms of determining the response of mushroom species to the stress conditions in their environment.

Keywords: Total phenolic compounds, total protein amount, antioxidant enzymes, *Boletaceae*, *Rhizopogonaceae*

Preliminary Study on Genetically Modified Organisms (GMO) and Biosafety Perception II

Aysel KEKİLLİOĞLU[1], Berrin KELOĞLU[2]

[1]Nevşehir Hacı Bektaş Veli Üniversitesi, Fen Edebiyat Fak. Biyoloji Bölümü, Türkiye
[2]Nevşehir Hacı Bektaş Veli Üniversitesi, Fen Bil. Enst. Biyoloji A.B.D., Türkiye
akekillioğlu@hotmail.com, berrinkeloglu@gmail.com

All of the methods used to obtain a new organism using all or a part of plant, animal or microorganisms, or to make changes in the desired direction in the genetic structure of an existing organism are called Biotechnology. Plants, animals and microorganisms whose genetic structure is modified with the addition of foreign genes to their structures by the biotechnologic methods are defined as genetically modified organism (GMO). Genetically modified organisms are also referred to by genetically modified products, genetically modified organisms, transgenic organisms, bio-engineering organisms in the literature. In recent years with new modern biotechnological applications; the increasing of concerns and confusion on this issue depend on that the fact of GMO's place in our lives is expanding even more and more without us being aware of it, there are not enough studies about the effects on other creatures and nature and also the lack of systematic social information on this issue.The aim of this study is to investigate the knowledge levels of university students about genetically modified organisms (GMO) and their attitudes towards biotechnology. Basic study is planned to be carried out on a random sample of ≥300 students in Nevşehir Hacıbektaş Veli University campus . However; in order to be able to make a preliminary evaluation, the questionnaire questions were prepared as a pilot in a group of 30 students from the 3rd and 4th year students of the Department of Biology, Faculty of Arts and Sciences, Nevşehir Hacıbektaş Veli University. This application data and reviews are presented in the form of tables and inferences.

Keywords: Biosafety, Biotechnology, GMO, Food, Health, Agriculture, Environment

Muscidae (Insecta:Diptera) Türlerinin Yüzeysel Gömülerde Eko-Faunistik Bakımdan Araştırılması

Aysel KEKİLLİOĞLU[1] Mukaddes BAŞAR[2]

[1]Nevşehir Hacı Bektaş Veli Üniversitesi, Fen Edebiyat Fak., Biyoloji Böl.
[2]Nevşehir Hacı Bektaş Veli Üniversitesi, Fen Bil. Enst., Biyoloji ABD
akekillioglu@hotmail.com, bsrmkdds@gmail.com

Çalışmamız ile Nevşehir ili kapsamında adli öneme sahip olan Muscidae (Insecta:Diptera) familyasına ait bireylerin belirlenmesi amaçlanmıştır. Muscidae türleri, geniş dağılım göstermeleri, hemen hemen her ortamda bulunmaları ve insanlara yakın olmalarından dolayı adli öneme sahiptirler. Çürüme sürecinde dişi bireyler, yumurtalarını vücut üzerindeki doğal boşluklara, açık yaralara veya kanlı kıyafetlerin üzerine bırakmaktadırlar. Çalışmanın deney ve uygulama kısmı, Nisan-Ekim 2017 tarihleri arasında yaklaşık 6 aylık sürede gerçekleştirilmiştir. Çalışmada, Ankara Üniversitesi Tıp Fakültesi Deney Hayvanları Laboratuvarında atıl bulunan, Yeni Zelanda cinsi tavşan kullanılmıştır. Karkaslar Nevşehir Hacı Bektaş Veli Üniversitesi arazisinde yer alan etrafı tel örgülerle çevrili korunaklı bir alana gömülmüştür. İkili grup halinde kıyafetli ve kıyafetsiz şekilde, 30 cm derinlikteki toprağa gömme işlemi yapılmıştır. 10, 20, 30, 60, 90, 120 ve 180 olarak belirlenen günlerde ceset üzerinden örnekler toplanmıştır. Toplanan örneklerin değerlendirilmesi sonucu, Adli entomolojik bakımdan, ekolojik süksesyon sürecinde yer alan, Muscidae familyasından 3 tür tespit edilmiştir. Bu türler; *Musca domestica, Hydrotaea capensis, Stomoxys calcitrans'tır.*

Anahtar Kelimeler: Muscidae, Adli entomoloji, Ekoloji, Fauna, Çürüme, Nevşehir

Diptera (Arthropoda:Insecta) Türlerinin Adli Entomoloji Bakımından Önemli Davranış Özelliklerinin İncelenmesi

Aysel KEKİLLİOĞLU[1], Ülkü Nur NAZLIER[2]

[1]Nevşehir Hacı Bektaş Veli Üniversitesi, Fen Edebiyat Fak. Biyoloji Bölümü, Türkiye
[2]Nevşehir Hacı Bektaş Veli Üniversitesi, Fen Bil. Enst. Biyoloji A.B.D., Türkiye
akekillioğlu@hotmail.com, unazler@gmail.com

Bu çalışma, Nisan 2018- Ağustos 2018 tarihleri arasında Kayseri ili Yahyalı lokalitesinde yürütülmüştür. Çalışma kapsamında adli bakımdan öneme sahip Diptera (Arthropoda: Insecta) türleri Faunistik, ekolojik ve davranış özellikleri bakımdan araştırılmıştır. Adli entomoloji, böcek-eklem bacaklılara ait biyolojik bilgi ve verilerin suç olaylarında ve hukuk davalarında kullanıldığı bilim dalıdır. Eklembacaklıların kriminal araştırmalarda kullanılmasının en temel nedeni, cesedi en kısa sürede tespit edip bulan canlı türlerinden olmaları, çürümenin her evresinde var olmaları ve bazı böcek türlerin özellikle belli ortamlara ve yaşam alanlarına spesifik olmasıdır. Olay yeri incelemelerinde böceklerin dağılımı, biyolojisi, davranışı bilgisinden yararlanarak ölümün, ne zaman, nasıl ve nerede gerçekleştiği bulunmaya çalışılmaktadır. Çalışma kapsamında, yürütülen araştırmada; aylık periotlar da 5'er adet *Rattus rattus* (sıçan) örneği korunaklı açık alana çürümeye bırakılarak, Diptera bireylerinin, çürüme sürecinde ve ekolojik süksesyon çerçevesinde gerçekleştirdiği davranış özellikleri incelenmiştir. Burada, aynı zamanda taksonomik – ekolojik bakımdan değerlendirmeler yapılarak, adli entomolojik araştırmalara ve adli vakaların çözümlenmesine katkı sağlanması amaçlanmıştır.

Anahtar Kelimeler: Diptera, Davranış, Ekoloji, Fauna Süksesyon, Kriminoloji, Yahyalı

The Basic Evaluations on Environmental Ethics and Awareness of Earthling in The Contemporary Society

Aysel KEKİLLİOĞLU[1], O. Bahadır ÇAPAR[2]

[1]Nevşehir Hacı Bektaş Veli Üniversitesi, Fen Edebiyat Fak. Biyoloji Bölümü, Türkiye
[2]Nevşehir Hacı Bektaş Veli Üniversitesi, Fen Bil. Enst. Biyoloji A.B.D., Türkiye
akekillioğlu@hotmail.com, bahadircapar@gmail.com

Nowadays, there is no longer any guarantee of the continuity of natural movements that will ensure the continuance of the ecological balance in any part of the world. Natural environment and biodiversity are under the threat of civilization in many areas such as marine pollution, nuclear threat, ozone issue and global warming, and especially deforestation, overfishing, intensive pesticide use, mining activities in the last century every change in the aged face of the Earth such as the extinction species and destroyed natural habitats has long been revealed this painful reality – together with its proofs. Contemporary social order and human behavior have to be quarried more than ever due to this damaging table. Generally, in all ethical approaches developed in terms of implicitly or explicitly, there is a desire to escape from polluted cities brought by industrialization, and return to a clean nature. However, there are various ethical approaches that have different priorities to quench this common longing. In this context, the main purpose and content of our study is to evaluate the awareness of earthling, which started in the process of industrialization and has been carried out by today's societies, in terms of environmental ethics.

Keywords: Environment, Ethics, Earthling, Ecology, Economics, Industrialization

Biomarkers of patients with ischemic stroke in Sétif, Algeria

Romyla Bourouba[1]*, Soumia Rahmani[1], Soumaya Rahem[1], Selma Rouaa[1]

[1]University of Ferhat Abbas Sétif 1, Faculty of Nature and Life Sciences, Department of Biology and Animal Physiology, Sétif, Algeria
*brromyla@yahoo.fr

Ischemic stroke is a serious condition that affects the nervous system, and presents the 3rd leading cause of mortality in the world. Risk factors and biochemical parameters were evaluated in relation to ischemic stroke in Sétif region, Algeria on patients admitted on the first day to the service of Neurology at Sétif University Hospital compared to healthy age-matched controls. Biomarkers of venous blood were analyzed by standard methods. Statistical comparison was made between study groups with Student's t test, the significance was $p < 0.05$.

The results showed an average age of (44.29±3.57 years) for patients, compared to 51.29 ±3.14 years for control group. Stroke was significantly associated with arterial hypertension (140.00±4.69 *vs* 127.65±2.50 mm Hg) and (91.18±2.69 *vs* 72.94±1.87 mm Hg), as well as the increase of blood glucose levels (1.54 ±0.11 *vs* 0.91±0.02), leukocytes (9.39±0.63 *vs* 6.35±0.55 $x10^3/mm^3$), platelet count (293.47±32.46 *vs* 210.18±11.91 $x10^3/mm^3$), and uric acid levels (50.90 ± 3.77 *vs* 29.13 ± 1.80 mg/l) compared to controls respectively. Moreover, significantly elevated total cholesterol, triglycerides and LDL levels were reported (1.88 ± 0.33 g/l), (1.79 ± 0.07 g/l) and .22 ± 0.03 g/l). However, creatinine levels did not differ significantly from the control values.

In conclusion, it seems that stroke causes a significant derangement in lipid parameters and uric acid levels. The best prevention of risk factors, especially hypertension, diabetes and hypercholesterolemia remains effective measures for ischemic stroke in our region.

Keywords: Algeria, lipid parameters, risk factors, Sétif, Stroke, uric acid.

Kör farede tümör baskılayıcı gen p53 ve hedef geni p21'in genetik varyasyonlarının anti-kanser özelliği açısından araştırılması

Dilara Fatma BALI [1], Teoman KANKILIÇ[2]

[1]Niğde Ömer Halisdemir Üniversitesi Tıp Fakültesi, Tıbbi Biyoloji ABD, Niğde
[2]Niğde Ömer Halisdemir Üniversitesi Fen-Edebiyat Fakültesi, Biyoteknoloji Bölümü, Niğde
dilarafatmaakin@gmail.com

Karsinogenezin aydınlatılmasında son zamanlarda model olarak seçilen Spalacidae, spontan kanser ve kimyasal karsinojenlerle uyarılmış tümör oluşumuna karşı direnç gösteren, hipoksik ortam koşullarına uyumlu ve uzun yaşam süresi ayrıca birçok organizmada bulunmayan eşsiz tümör baskılama mekanizmasına sahip memeli ailesidir. Tümör baskılayıcı olarak hücrenin çoğalma davranışında anahtar rol üstlenen p53 proteini ve hedef genleri, transkripsiyon kontrolü, DNA tamiri, hücre döngüsü kontrolü, genomik stabilite, kromozom segregasyonu, senesens, anjiyogenez, apoptoz ve tümör baskılanması gibi hücresel süreçlerde sahip olduğu moleküler etkileşimler yolu vasıtasıyla birçok görevi yerine getirmektedirler. p53 ve hedef geni p21'in DNA boyutunda analizi ve özellikle genlerin nihai ürünü olan proteinlerin fonksiyonlarında önemi yüksek domainleri kodlayan bölgelerinin taranmasının insan ve diğer organizmalar ile karşılaştırılması ile kansere direnç özelliklerinin araştırılması için zemin oluşturulması amaçlanmıştır. Nanospalax farklı sitotiplerine sahip 30 körfare örneği dâhil edilmiştir. Mutasyon analizi için örneklerde p53 ve hedef geni p21 geninde bulunan olası varyantları saptamak için DNA Dizi Analizi kullanılmıştır. Elde edilen bulgular evrimsel süreçte organizmalar arasında ve somatik tümöre sahip insan örneklerine ait sonuçlar ile karşılaştırılmıştır. TP53 ve transkripsiyonel aktivasyonu sağlanan siklin bağımlı kinazların inhibitörü p21 de 38 varyant tespit edilmiştir. Homolog Gene-Multiple alignment tool kullanılmasıyla aminoasit dizilerinin karşılaştırılması sonucunda tespit edilen değişimlerin evrimsel süreç boyunca türler arasında korunmuş olan kritik önemdeki noktalarda bulunduğu belirlenmiştir. TP53 ve p21'de tespit edilen değişimlerden polyphen-2 programı ile in-silico analizi sonucunda skorlamasının 1'e yakın olması nedeniyle insan üzerinde patojenik özellikte olduğu tespit edilen değişimler mevcuttur. Tespit edilen varyantların körfarenin hipoksik ortama adaptasyonunu ve apoptozdan kaçabilme özelliği sağlamasında katkıda bulunduğu düşünülmektedir.

Anahtar Kelimeler: Nannospalax, p53/p21, mutasyon, polimorfizm, anti-kanser, hücre döngüsü

p53 Mutations in Bladder Urothelial Carcinoma Affect Chromatin Structure

Burcu BİTERGE SÜT

Nigde Omer Halisdemir University, Faculty of Medicine, Department of Medical Biology
bbitergesut@ohu.edu.tr

Bladder cancer is one of the most frequently encountered cancer types in the world. More than half of each bladder urothelial carcinoma case carry mutations in their p53 gene. Although several studies have indicated the clinical significance of p53 mutations in bladder urothelial carcinoma, there are no studies up to date that investigate the epigenetic alterations p53 mutations might induce within the cell. Therefore, this study aims to understand the alterations within epigenomic landscape in relation to p53 mutations.

DNA sequencing and mRNA expression data for 411 bladder cancer patients were acquired from The Cancer Genome Atlas (TCGA). p53 mutations within the study cohort were examined and the patients were separated into two groups according to their p53 mutation status. In order to evaluate the gene expression enrichments, mRNA expression data was analyzed using algorithms on CBioPortal interface. Statistical analyses were performed using Student's t-test and Pearson coefficients were calculated.

We found that 204 patients (51%) carried p53 mutations. When we compared the two sub-groups that we formed according to the mutational status of p53, we found that histone methyltransferases EZH2, SUV39H1, SUV39H2 and PCMT1 were significantly overexpressed in the patient samples bearing p53 mutations ($p<0.05$). Furthermore, DNA methyltransferases DNMT1, DNMT3A and DNMT 3B were significantly upregulated. Altogether, these results indicate differential expression patterns for chromatin modifiers which strongly imply distinct chromatin states and transcriptional regulation.

Keywords: p53, Bladder urothelial carcinoma, epigenetic regulation, chromatin

Histopathological Analysis of the Visual System in the Blind Mole Rat *Nannospalax xantodon*

Ayşe İKİNCİ KELEŞ[1], Burcu BİTERGE SÜT[2], Teoman KANKILIÇ[2]

[1]Nigde Omer Halisdemir University, Faculty of Medicine, Department of Histology and Embriyology
[2]Nigde Omer Halisdemir University, Faculty of Medicine, Department of Medical Biology
[3]Niğde Ömer Halisdemir University, Faculty of Science and Literature, Department of Biotechnology
ayse_ikinci@hotmail.com

The blind mole rats (genus *Nannospalax*) are subterranean rodents that are highly adapted to living underground. They spend most of their lifetime within underground galleries they dig using their teeth. Their ocular development results in a non-functional visual system as their eyes remain subcutaneous, which renders them blind. Furthermore, the visual system of subterranean mammals is assumed to be undeveloped or gradually degenerate due to lack of light stimulus. This study aims to explore the histologic organization of the visual system in the blind mole rat to determine structural differences compared to other mammals that could have arisen during their evolution.

Wild-type specimens of *Nannospalax xantodon* (2n=54) were obtained, eyes and optic nerves were harvested. Tissues were embedded into paraffin blocks following histological procedures. 5 micron sections were stained using cresyl violet and hematoxylin-eosin. The images were evaluated in terms histological changes.

We detected cornea, sclera, iris, suspensor ligament, lacrimal gland and ducts, adipose tissue, as well as vascular structures in the eye. We also observed a space around iris, which we suspect could be the vitrous body. We did not encounter structures similar to retina or neuronal cells within the eye. Although the optic nerve, which connects the eye to the brain, has been atrophied, no pathology has been observed histologically.

Keywords: Histopathology, blind mole rat, *Nannospalax xantodon*, visual system

Yeni Nesil Antibiyotik Teknolojisi: Bakteriyel İletişim Sistemi İnhibitörü Olarak Kontrollü Salımlı Biyopolimerik Nanopartikül Uygulaması

Sedef İlk[1], Tuğba Arslan Gülen[2], Necdet Sağlam[3]

[1]İmmünoloji Anabilim Dalı, Tıp Fakültesi, Niğde Ömer Halisdemir Üniversitesi, 51240, Niğde
[2]Klinik Mikrobiyoloji Anabilim Dalı, Tıp Fakültesi, Niğde Ömer Halisdemir Üniversitesi, 51240, Niğde
[3]Nanoteknoloji ve Nanotıp A.B.D, Fen Bilimleri Enstitüsü, Hacettepe Üniversitesi, 06800, Ankara

Günümüzde bakteriyel enfeksiyonlarda antibiyotik kullanımı sonucunda zamanla antibiyotiklere karşı dirençli bakteri popülasyonları oluşmakta ve dolayısıyla tedavide güçlükler yaşanmaktadır. Yeni bir strateji olarak bakterilerin hücresel faaliyetlerini doğrudan engellemek yerine aralarındaki haberleşme sistemini bloke etmek klasik antibiyotik uygulamalarına göre daha etkili bir yaklaşım sunmaktadır. Nanoteknoloji ile üretilen antibiyotik özellikli yapılar ile geniş yüzey alanı/hacim oranı sayesinde yüksek verim ile bakteriyel kontrol sağlanabilmektedir. Bu kapsamda yapılan çalışmada ilk aşamasında meyvelerde bolca bulunan antioksidan özellikteki flavonoid olan kuersetin bileşiği sodyumtripolifosfat (TPP) çapraz bağlayıcı ile birlikte kitosan nanopartiküllere hapsedilmiştir. Daha sonra elde edilen nanopartiküllerin boy-boy dağılımı, morfolojik özellikleri, kimyasal özellikleri incelenmiştir. Çalışmanın ikinci aşamasında sentezlenen nanopartiküllerin depolanma süresine (1., 5., 10., 20. ve 30., gün) bağlı *in vitro* anti-quorum sensing aktivitesi için; *Chromobacterium violaceum* 026 biyosensör suşu ortamda iletişim molekülü olan N-Hexanoyl-L-homoserin lakton (C6-AHL) viyolasin pigmentini üretimindeki inhibisyonu disk difüzyon testi ve viyolasein inhibisyon(%) testi kullanılarak belirlenmiştir. Çalışma kapsamında kuersetin yüklü TPP çapraz bağlı kitosan nanopartiküllerin hidrostatik etkileşimle bağlanarak, boyutlarının 167.27-188.12 nm arasında ve morfolojik açıdan oldukça düzgün küresel forma sahip olduğu tespit edilmiştir. Sentezlenen nanopartiküllerin depolama sürecinin *in vitro* viyolasin pigment üretimi inhibisyonu üzerindeki aktivite çalışmalarında kuersetin 10. depolama gününde inhibisyon sergilemezken kuersetin yüklü kitosan/TPP nanopartiküller 30. depolama gününde bile anti-quorum sensing zon göstermiştir. Kuersetinin nanopartiküller içerisine hapsedilmesi antioksidan aktivitenin çevre etkenlerden korunmasını sağladığından kuersetin yüklü kitosan/TPP nanopartiküller bakteriler üzerinde uzun süre antiquorum sensing aktivite sergilemişlerdir. Gerçekleştirilen çalışmaya göre antioksidan özellikteki flavonoidlerin hapsedilmesi ile oluşturulan nanopartiküller sürdürülebilir olarak kontrollü salım ile uzun süre etkili anti-quorum sensing aktivite sergilemektedir ve C6-HSL gibi Gram negatif patojen bakteriler tarafından sıklıkla kullanılan bakteriyel iletişim molekülünün sentezlenmesini bu yolla engelleyebilmektedir.

Anahtar Kelimeler: Quorum Sensing, *Chromobacterium violaceum,* Kitosan-TPP Nanopartikül, Yeni Nesil Antibiyotik

The effect of 900-MHZ radiofrequency electromagnetic fields during the adolescence on the of rat testis: A histopathological and biochemical study

Fatih Mehmet GUR[1], Ayse IKINCI KELES[1], Huseyin Serkan EROL[2], Celal GUVEN[3], Eylem TASKIN[4,5], Hatice Emel GUR[6], Sema TIMURKAAN[7]

[1]Niğde Ömer Halisdemir University, Faculty of Medicine, Department of Histology-Embryology, histolog44@gmail.com
[2]Kastamonu University, Faculty of Veterinary Medicine, Department of Biochemistry
[3]Niğde Ömer Halisdemir University, Faculty of Medicine, Department of Biophysics
[4]Niğde Ömer Halisdemir University, Faculty of Medicine, Department of Physiology
[5]Çukurova University, Department of Biophysics, Faculty of Medicine
[6]Erciyes University, Faculty of Medicine, Department of Histology-Embryology
[7]Fırat University, Faculty of Veterinary Medicine, Department of Histology-Embryology

In parallel with the rapid developments in mobile phone technology, the use of this devices that emitting RF-EMF, especially by the young people, increases day by day. Some studies have shown that radio frequency-electromagnetic field (RF-EMF) has negative effects on testes. Therefore, in this study was researched the effects of 900-megahertz (MHz) the radio frequency-electromagnetic fields (RF-EMF) upon the rat testis throughout the adolescence.

Twenty-one days old animals (twenty-four male rats) were randomly divided into RF-EMF group, sham group and control group (n=8 in each group). Although RF-EMF group rats were exposure to 900 MHz RF-EMF in a cage, sham group rats placed in the same cage were not exposure to RF-EMF. In control group was not applied any procedure. When the experimental processes are completed, the testes were removed for biochemical and histopathological analysis. Hematoxylin and eosin (H&E) staining, TUNEL assay and immunohistochemistry techniques were used for histopathological analyses. For biochemical analysis, oxidative stress markers such as malondialdehyde (MDA), glutathione (GSH), catalase (CAT), superoxide dismutase (SOD) levels were measured.

Histopathological alterations were not detected among the RF-EMF, sham and control groups. The frequency of TUNEL-positive cells in testicular tissue and apoptotic index (AI) were similar in all three groups. Also, the staining properties of androgen receptor (AR), estrogen receptor alpha (ERα) and estrogen receptor beta (ERβ) in the testis are almost same in all of the groups. Moreover, in RF-EMF group, MDA and CAT level was significantly higher than other group whereas, GSH level was lower than other groups. Between the SOD levels of the groups were not a meaningful difference. These results may be interpreted that exposure to RF-EMF during the adolescence can causes oxidative stress in the testis but, the level of occurred testicular damage result from oxidative stress is too minor to be detected with histological technics used in this study.

Keywords: Apoptosis, electromagnetic field, estrogen receptor, androgen receptor, oxidative stress

CHEMISTRY

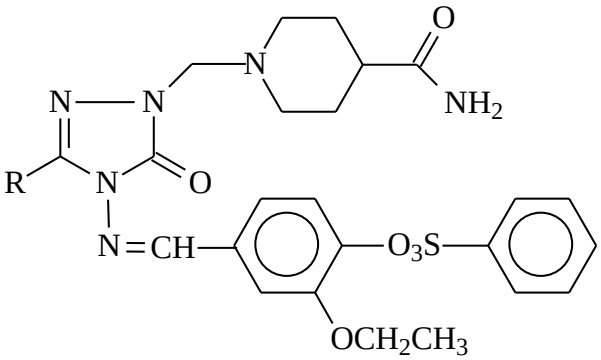
Synthesis and Characterization of Some Novel 1-(4-Piperidinecarboxyamide-1-yl-methyl)-3-alkyl/aryl-4-(3-ethoxy-4-benzensulfonyloxybenzylidenamino)-4,5-dihydro-1*H*-1,2,4-triazol-5-ones

Haydar Yüksek, Gül Özdemir

Kafkas University, Department of Chemistry, 36100 Kars – Turkey
hyuksek61@gmail.com

Considering the development of new hetero moieties by combining potential biological active scaffolds, an attempt was made here to obtain 1,2,4-triazoles bearing 4-piperidinecarboxamide ring. In this regard, five new Mannich bases; 1-(4-piperidinecarboxyamide-1-yl-methyl)-3-methyl-4-(3-ethoxy-4-benzensulfonyloxy-benzylidenamino)-4,5-dihydro-1*H*-1,2,4-triazol-5-one, 1-(4-piperidinecarboxyamide-1-yl-ethyl)-3-methyl-4-(3-ethoxy-4-benzensulfonyloxybenzylidenamino)-4,5-dihydro-1*H*-1,2,4-triazol-5-one, 1-(4-piperidinecarboxyamide-1-yl-methyl)-3-benzyl-4-(3-ethoxy-4-benzensulfonyloxybenzylidenamino)-4,5-dihydro-1*H*-1,2,4-triazol-5-one, 1-(4-piperidinecarboxyamide-1-yl-methyl)-3-*p*-methylbenzyl-4-(3-ethoxy-4-benzen-sulfonyloxybenzylidenamino)-4,5-dihydro-1*H*-1,2,4-triazol-5-one and 1-(4-piperidine-carboxyamide-1-yl-methyl)-3-*p*-chlorobenzyl-4-(3-ethoxy-4-benzensulfonyloxy-benzylidenamino)-4,5-dihydro-1*H*-1,2,4-triazol-5-one were synthesized and characterized from the mass, IR, ^{1}H-NMR, ^{13}C-NMR spectral data with elemental analysis.

Keywords: Synthesis, 1,2,4-Triazole-5-one, Mannich base



No	R
1	CH_3
2	CH_2CH_3
3	$CH_2C_6H_5$
4	$CH_2C_6H_4.CH_3$ *(p-)*
5	$CH_2C_6H_4.Cl$ *(p-)*

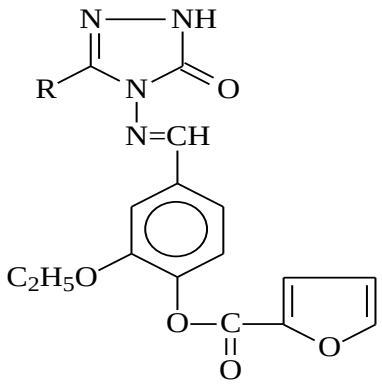
Synthesis and Characterization of New 3-Alkyl(Aryl)-4-[3-ethoxy-4-(2-furylcarbonyloxy)-benzylidenamino]-4,5-dihydro-1*H*-1,2,4-triazol-5-ones

Onur AKYILDIRIM[1*], Haydar YÜKSEK[2], Sevda MANAP[2]

[1]Kafkas University, Faculty of Engineering and Architecture, Department of Chemical Engineering, Kars, Turkey
[2]Kafkas University, Faculty of Science and Letters, Department of Chemistry, Kars, Turkey
*onurakyildirim@gmail.com

1,2,4-Tiazole ring is one of the active components found in many drugs. This ring is known to increase pharmacological activity. The antibacterial, antifungal and antituberculosis activities of various previously synthesized 1,2,4-triazole derived compounds were investigated. Some triazole-derived compounds have been shown to exhibit promising antimicrobial activities. At the same time, the cytotoxic effects of some 1,2,4-triazole-derived compounds was investigated. Schiff bases have wide range of applications, especially in chemistry, medicine, pharmacy and industry. In this study, nine novel 3-alkyl(aryl)-4-[3-ethoxy-4-(2-furylcarbonyloxy)-benzylidenamino]-4,5-dihydro-1*H*-1,2,4-triazol-5-ones (1) were synthesized. Their structures were elucidated using spectroscopic techniques, such as IR, ^{1}H NMR, ^{13}C NMR.

Keywords: Synthesis, 1,2,4-Triazole, Schiff base, Characterization.



1

R	1
a	CH_3
b	CH_2CH_3
c	$CH_2CH_2CH_3$
d	$CH_2C_6H_5$
e	$CH_2C_6H_4CH_3(p\text{-})$
f	$CH_2C_6H_4OCH_3$ (*p*-)
g	$CH_2C_6H_4Cl(p\text{-})$
h	$CH_2C_6H_4Cl(m\text{-})$
i	C_6H_5

This study was supported by the Kafkas University Scientific Research Projects Coordination (Project Number 2018-FM-86)

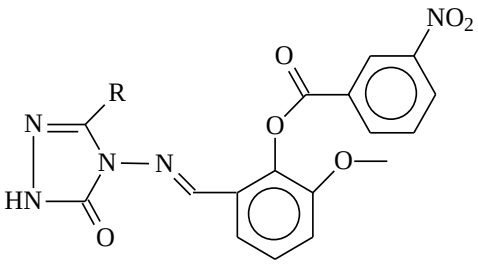
Synthesis and Investigation of Antimicrobial and Antioxidant Activities of Some New 2-Methoxy-6-[(3-alkyl/aryl)-4,5-dihydro-1*H*-1,2,4-triazol-5-one-4-yl)imino-methyl]phenyl 3-Nitrobenzoates

Haydar Yüksek[1], Özlem Gürsoy Kol[1], Sevda Manap[1], Gül Özdemir[1], Erdost Ceylan[1], Kabil Tozak[1], Kemal Barış Genç[1], Muzaffer Alkan[2]

[1]Kafkas University, Department of Chemistry, 36100 Kars – Turkey
[2]Kafkas University, Faculty of Education, 36100 Kars – Turkey
muzafferalkan61@gmail.com

A large number of heterocyclic compounds, containing the 1,2,4-triazole ring, are associated with diverse biological properties such as antifungal, antioxidant, antimicrobial, anti-inflammatory and antiviral activity. In the present study, due to a wide range of applications to find their possible antimicrobial and antioxidant activity, eight new 2-methoxy-6-[(3-alkyl/aryl)-4,5-dihydro-1*H*-1,2,4-triazol-5-one-4-yl)imino-methyl]phenyl 3-nitrobenzoates were synthesized. The titled compounds characterized by IR, ^{1}H NMR and ^{13}C NMR spectral data. In addition, the newly synthesized compounds were screened for their antimicrobial activities. Furthermore, the antioxidant properties of the compounds were studied and evaluated using different three antioxidant assays; including reducing power, free radical scavenging activity, and metal chelating activity.

Keywords: 4,5-Dihydro-1*H*-1,2,4-Triazol-5-one, Schiff Base, Antimicrobial activity, Antioxidant activity



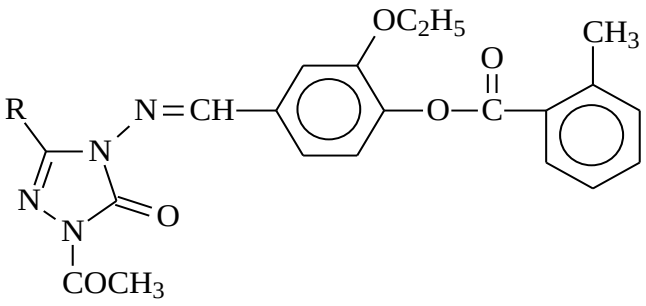
Synthesis and Characterization of Some New 1-Acetyl-3-alkyl(aryl)-4-[3-ethoxy-4-(2-methylbenzoxy)-benzylidenamino]-4,5-dihydro-1*H*-1,2,4-triazol-5-ones

Haydar Yüksek[1], Bahar Bankoğlu[2], Sevda Manap[1]

[1]Kafkas University, Department of Chemistry, 36100 Kars - Turkey
[2]Iskenderun Technical University, Science and Technology Application and Research Laboratory, 31200, Hatay - Turkey
bahar.bankoglu@iste.edu.tr

1,2,4-Triazole derivatives have drawn considerable attention for the past few decades because of their diverse biological properties. Many 1,2,4-triazole derivatives are found to be a potent antioxidant, anti-inflammatory, antimicrobial and antiviral agent. In this study, due to of their possible biological properties, five new 1-acetyl-3-alkyl(aryl)-4-[3-ethoxy-4-(2-methylbenzoxy)-benzyliden-amino]-4,5-dihydro-1*H*-1,2,4-triazol-5-ones (1) were synthesized by the reactions of 3-alkyl(aryl)-4-[3-ethoxy-4-(2-methylbenzoxy)-benzylidenamino]-4,5-dihydro-1*H*-1,2,4-triazol-5-ones, which were obtained according to the literature, with acetic anhydride. The structures of five new compounds were established from the spectral data.

Keywords: Synthesis, 1,2,4-Triazole-5-one, Schiff base, acetylation



1

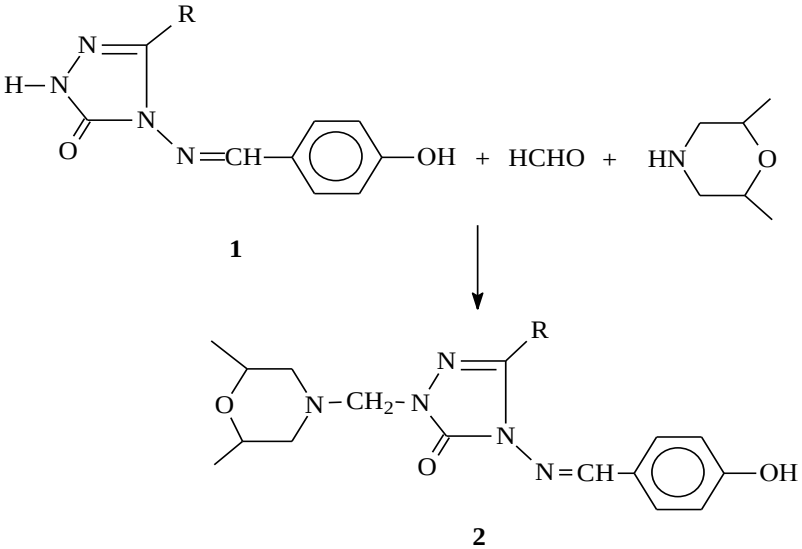
Synthesis And Antioxidant Activities of Some New 1-(2,6-Dimethylmorpholine-4-YL-Methyl)-3-Alkyl-4-(4-Hydroxybenzylidenamino)-4,5-Dihydro-1h-1,2,4-Triazol-5-Ones

Songül BOY[1], Özlem GÜRSOY KOL[2], Haydar YÜKSEK[2]

[1]Kafkas University, Atatürk Health Services Vocational High School, Kars, Turkey
[2]Kafkas University, Department of Chemistry, Kars, Turkey
songulboy36@hotmail.com

Triazoles are heterocyclic compounds that contain three nitrogen atoms. 1,2,4-Triazole and 4,5-dihydro-1*H*-1,2,4-triazol-5-one derivatives are reported to possess a broad spectrum of biological activities such as antioxidant, analgesic, antibacterial, and antiparasitic properties. In this study, 3-alkyl-4-(4-hydroxy-benzylidenamino)-4,5-dihydro-1*H*-1,2,4-triazol-5-ones (1) were treated with 2,6-dimethylmorpholine in the presence of formaldehyde to synthesize eight new 1-(2,6-dimethylmorpholine-4-yl-methyl)-3-alkyl-4-(4-hydroxybenzylidenamino)-4,5-dihydro-1*H*-1,2,4-triazol-5-ones (2). The newly synthesized compounds were characterized using IR, ^{1}H NMR and ^{13}C NMR spectral data. In addition, the antioxidant properties of the newly synthesized compounds were investigated using reducing power, free radical removal activity and metal chelate activity methods and the results were compared with the standard antioxidant compounds. The results showed that the metal chelating activity of the new compounds yielded very good results.

Keywords: 1,2,4-Triazol-5-one, Synthesis, Mannich base, Antioxidant activity.



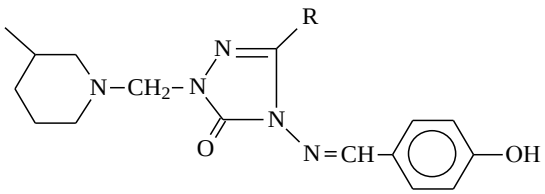
Antimicrobial Properties Of Some 1-(3-Methyl-Piperidine-1-Yl-Methyl)-3-Alkyl(Aryl)-4-(4-Hydroxybenzyliden-Amino)-4,5-Dihydro-1h-1,2,4-Triazol-5-Ones

Haydar YÜKSEK[1], Songül BOY[2], Muzaffer ALKAN[3]

[1]Kafkas University, Department of Chemistry, Kars, Turkey
[2]Kafkas University, Atatürk Health Services Vocational High School, Kars, Turkey
[3]Kafkas University, Education Faculty, Kars, Turkey
songulboy36@hotmail.com

1,2,4-Triazoles derivatives have used as an antioxidant, anti-inflammatory, antimicrobial and antiviral agents in drug chemistry. The identification of triazole derivatives and determination of their antibacterial activities are of considerable interest because of their role in pharmacological properties. In this study, antimicrobial properties of nine 1-(3-methylpiperidine-1-yl-methyl)-3-alkyl(aryl)-4-(4-hydroxy-benzylidenamino)-4,5-dihydro-1*H*-1,2,4-triazol-5-ones (1) were investigated against six different microorganisms (*B. substilis*, *B. cereus*, *P. aeruginosa*, *K. pneumonia*, *S. aureus* and *E. coli*) with agar well diffusion method and the results obtained were evaluated. The antimicrobial activities of new compounds, especially 2b and 2c, were observed significant results.

Keywords: 1,2,4-Triazol-5-one, Synthesis, Mannich base, Antimicrobial properties



1

1	**R**
a	CH_3
b	CH_2CH_3
c	$CH_2CH_2CH_3$
d	$CH_2C_6H_5$
e	$CH_2C_6H_4CH_3$(*p*-)
f	$CH_2C_6H_4OCH_3$ (*p*-)
g	$CH_2C_6H_4Cl$(*p*-)
h	$CH_2C_6H_4Cl$(*m*-)
i	C_6H_5

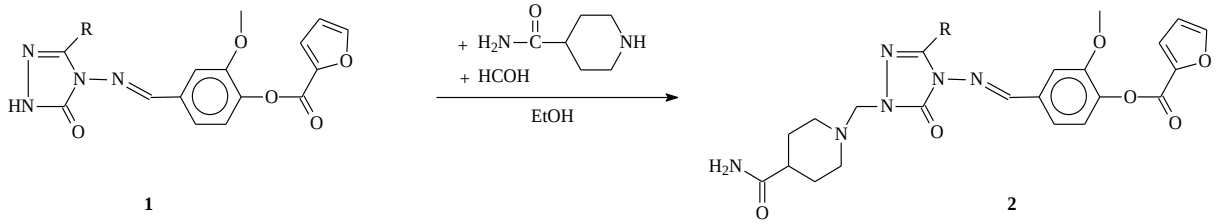
Synthesis, *in vitro* Antioxidant and Antimicrobial Activities of Novel 1-(4-Piperidinecarboxamide-1-yl-methyl)-3-alkyl(aryl)-4-[4-(2-furylcarbonyloxy)-3-methoxy]-benzylidenamino-4,5-dihydro-1*H*-1,2,4-triazol-5-ones

Sevda Manap, Özlem Gürsoy-Kol, Fevzi Aytemiz, Haydar Yüksek

Kafkas University, Department of Chemistry, 36100 Kars - Turkey
ozlemgursoy@gmail.com

1,2,4-Triazole derivatives have drawn considerable attention for the past few decades because of their diverse biological properties. Many 1,2,4-triazole derivatives are found to be potent antioxidant, anti-inflammatory, antimicrobial and antiviral agents. In this regard, the identification of triazoles and determination of their antibacterial activities are of considerable interest. In the study, 3-alkyl(aryl)-4-[4-(2-furylcarbonyloxy)-3-methoxy]-benzylidenamino-4,5-dihydro-1*H*-1,2,4-triazol-5-ones (1) were treated with 4-piperidinecarboxamide in the presence of formaldehyde according to the Mannich reaction to synthesize five novel 1-(4-piperidinecarboxamide-1-yl-methyl)-3-alkyl(aryl)-4-[4-(2-furylcarbonyloxy)-3-methoxy]-benzylidenamino-4,5-dihydro-1*H*-1,2,4-triazol-5-ones (2). The structures of synthesized new compounds were characterized by using spectroscopic methods. In the second part, the antioxidant properties of the title compounds were analysed and evaluated using three antioxidant assays, including reducing power, free radical scavenging and metal chelating activity. In the last part of the study, antibacterial activities of the compounds were evaluated against six bacteria according to agar well diffusion method. All of the compounds demonstrated significant activity for metal chelating effect and also antimicrobial activity.

Keywords: 1,2,4-Triazol-5-one, Mannich Base, Antimicrobial activity, Antioxidant activity



1 2

a) R = CH_3, b) R = CH_2CH_3, c) R = $CH_2C_6H_5$, d) R = $CH_2C_6H_4CH_3$ (*p*-), e) R = $CH_2C_6H_4Cl$ (*p*-)

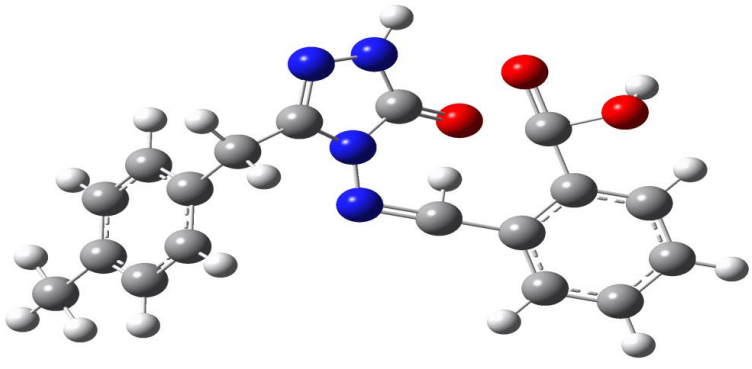
Experimental (FT-IR, NMR) And Theoretical (DFT/B3LYP, HF) Analyses of 2-(3-P-Methylbenzyl-4,5-Dihydro-1h-1,2,4-Triazol-5-On-4-YL)-Azomethine)-Benzoic Acid Molecule

Gül KOTAN[1], Haydar YÜKSEK[2]

[1]Kafkas University, Kars Vocational School, Kars, Turkey
[2]Kafkas University, Department of Chemistry, Kars, Turkey
gulkemer@hotmail.com

2-(3-*p*-Methylbenzyl-4,5-dihydro-1*H*-1,2,4-triazol-5-on-4-yl)-azomethine)-benzoic acid molecule has been optimized using the 6-31++G(d,p) basis set of DFT (B3LYP) and HF methods. Thus, the most stable geometrical comformer of compound with different methods was obtained. Proton Nuclear Magnetic Resonance (^{1}H-NMR) and Carbon-13 Nuclear magnetic Resonance (^{13}C-NMR) spectral values according to GIAO method was calculated using Gaussian G09W program package in gas phase and in DMSO solvent. Theoretical and experimental values were plotted according to δ exp=a+b·d calc. Theoretical spectral values of molecule were calculated and compared with experimental values. Experimental data obtained from the literature. The veda4f program was used in defining Infrared (IR) data. The standard error values were found via the Sigma plot with regression coefficient of a and b constants. The vibrational frequency values of this molecule have been calculated by using 6-31++G(d,p) basis set with DFT (B3LYP) and HF methods. Then, these values are multiplied with appropriate scala factors. In addition, thermodynamics properties (heat capacity CV^0, entropy S^0 and enthalpy H^0), electronic properties (electronegativity (χ), electron affinity (A), global hardness (η), softness (σ), E_{LUMO}-E_{HOMO} energy gap (ΔEg) and ionization potential (I), HOMO-LUMO energy, geometric properties (bond angles, bond lengths), dipole moments, mulliken atomic charges, total energy of the molecule were calculated.

Keywords: B3LYP, HF, Veda4f, HOMO-LUMO.



The Gaussview structure of the molecule

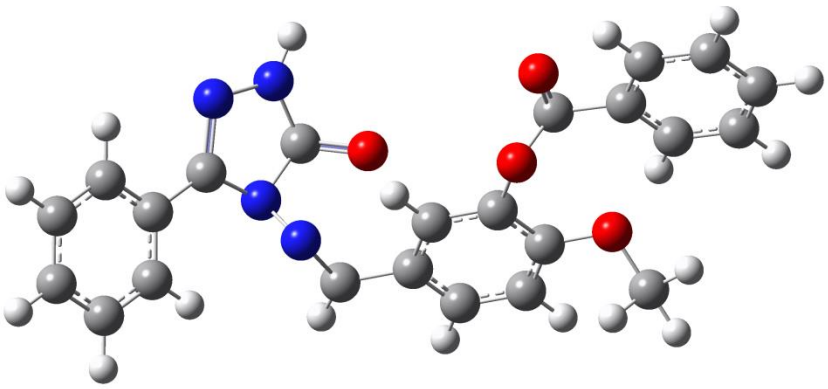
Investigation Of Spectroscopic And Theoretical Properties Of 3-Phenyl-4-(3-Benzoxy-4-Methoxybenzylidenamino)-4,5-Dihydro-1h-1,2,4-Triazol-5-One Compound

Gül KOTAN[1], Haydar YÜKSEK[2]

[1]Kafkas University, Kars Vocational School, Kars, Turkey
[2]Kafkas University, Department of Chemistry, Kars, Turkey
gulkemer@hotmail.com

The moleculer geometric optimization of 3-phenyl-4-(3-benzoxy-4-methoxybenzylidenamino)-4,5-dihydro-1*H*-1,2,4-triazol-5-one compound was obtained using B3LYP functional in DFT and HF method at the 6-31++G(d,p) basis sets. The experimental spectral investigations of molecule performed using ^{1}H-NMR and ^{13}C-NMR chemical shifts and FT-IR values. Thereotical ^{1}H-NMR and ^{13}C-NMR isotropic shift values were calculated in DMSO solvent according to GIAO method. In the identification of calculated IR data was used the VEDA4f program. The experimental spectral values were compared with computed data. Experimental data obtained from the literature. Also, electronegativity (χ), electron affinity (A), chemical hardness (η), chemical softness (σ), ionization potential (I) parameters were determined with HOMO-LUMO energies calculations. Furthermore, thermodynamics properties, geometric properties (bond angles, bond lengths), dipole moments, mulliken atomic charges, total energy were calculated and the molecular surfaces such as the the electron spin potantial (ESP), molecular electrostatic potential (MEP), the total density, the electron density, the electrostatic potential of the molecule were designated.

Keywords: B3LYP, HF, Veda4f, GIAO, HOMO-LUMO.



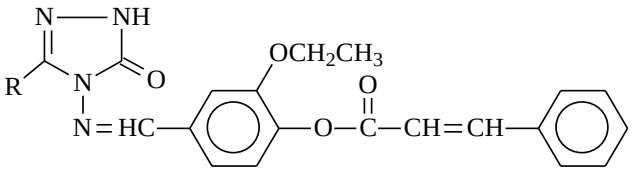
The Gaussview structure of the molecule

Potentiometric Titrations of Some 3-Alkyl(Aryl)-4-(3-ethoxy-4-cinnamoyloxy)-benzylidenamino-4,5-dihydro-1*H*-1,2,4-trİazol-5-ones

Gül Özdemir, Sevda Manap, Elif Kar, Şengül Kar, Mehmet Savrık, Haydar Yüksek

Department of Chemistry, Kafkas University, Kars, Turkey
manapsevda@gmail.com

Although water is an extraordinarily versatile solvent in which to carry out acid-base titration, there are occasions when a nonaqueous solvent may be necessary or preferred. Such as when the analyte is not water soluble and the neutralization reaction is not sufficiently complete in water. It is known that 4,5-dihydro-1*H*- 1,2,4-triazol-5-one ring has weak acidic properties and very low solubility in water. In this study the acidic properties of eight known 3-alkyl(aryl)-4-(3-ethoxy-4-cinnamoyloxy)-benzylidenamino-4,5-dihydro-1*H*-1,2,4-triazol-5-ones (**1**) were investigated in non-aqueous media. In non-aqueous medium, isopropyl alcohol and *tert*-butyl alcohol among the amphiprotic type, and acetone and *N,N*-dimethylformamide among the dipolar aprotic type were preferred as solvent. The potentiometric method used in determining the end-points in titrimetric analyses was utilized for the determination of acidity. The acidity constants of the compounds in the solvents chosen were calculated using the graphs and the data obtained with half-neutralization method. The acidity strength of the compounds was observed to differ from the information obtained. Results show that solvents and the molecular structure of titrated compounds affect p*K*a values..



1

Comp.	R
a	CH_3
b	CH_2CH_3
c	$CH_2CH_2CH_3$
d	$CH_2C_6H_5$
e	$CH_2C_6H_4.CH_3$ (*p*-)
f	$CH_2C_6H_4.OCH_3$ (*p*-)
f	$CH_2C_6H_4.Cl$ (*p*-)
h	C_6H_5

Keywords: 4,5-Dihydro-1H-1,2,4-triazol-5-one, Schiff Base, Potentiometric Titrations.

Potentiometric Titrations of 3-Alkyl(Aryl)-4-(2-benzensulfonyloxybenzyliden-amino)-4,5-dihydro-1H-1,2,4-triazol-5-ones in Non-aqueous Media

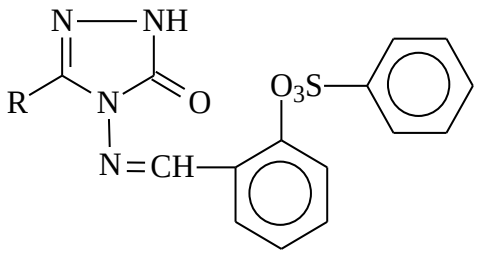
Gül Özdemir, Sevda Manap, Haydar Yüksek

Kafkas University, Department of Chemistry, 36100 Kars - Turkey
gulozd91@gmail.com

Determination of pK_a values of the active constituent of certain pharmaceutical preparations is important because the distribution, transport behaviour, bonding to receptors, and contributions to the metabolic behaviour of the active constituent molecules depend on the ionization constant.

In the present study; eight 3-alkyl(aryl)-4-(2-benzensulfonyloxybenzylidenamino)-4,5-dihydro-1*H*-1,2,4-triazol-5-ones, which were synthesized according to the literature, were titrated potentiometrically with tetrabutylammonium hydroxide in four non-aqueous solvents such as acetonitrile, isopropyl alcohol, tert-butyl alcohol, and *N*,*N*-dimethylformamide. The half-neutralization potential values and the corresponding pK_a values were determined for all cases.

Keywords: 1,2,4-Triazole-5-one, Potentiometric titration, pK_a



No	R
1	CH_3
2	CH_2CH_3
3	$CH_2CH_2CH_3$
4	$CH_2C_6H_5$
5	$CH_2C_6H_4.CH_3$ *(p-)*
6	$CH_2C_6H_4.OCH_3$ *(p-)*
7	$CH_2C_6H_4.Cl$ *(p-)*
8	C_6H_5

Acidic Properties of 3-(3-Alkyl/Aryl-4,5-dihydro-1*H*-1,2,4-triazol-5-on-4-yl-azomethine)-phenyl Benzenesulfonates

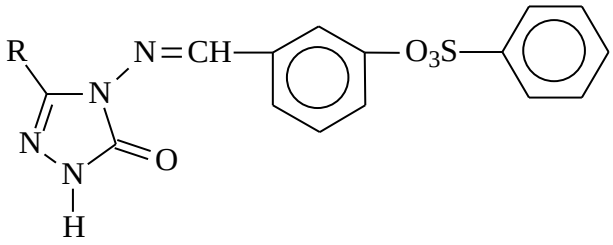
Yonca Yılmaz, Sevda Manap, Murat Beytur, Ahmet Harmankaya, Haydar Yüksek

Kafkas University, Department of Chemistry, 36100 Kars - Turkey
yoncaylmz36@gmail.com

It is known that 1,2,4-triazole and 4,5-dihydro-1*H*-1,2,4-triazol-5-one rings have weak acidic properties, so that some 1,2,4-triazole and 4,5-dihydro-1*H*-1,2,4-triazol-5-one derivatives were titrated potentiometrically with TBAH in non-aqueous solvents. Determination of pK_a values of the active constituent of certain pharmaceutical preparations is important because the distribution, transport behaviour, bonding to receptors, and contributions to the metabolic behaviour of the active constituent molecules depend on the ionization constant.

In the present study, nine known 3-(3-alkyl/aryl-4,5-dihydro-1*H*-1,2,4-triazol-5-on-4-yl-azomethine)-phenyl benzenesulfonates were titrated potentiometrically with tetrabutylammonium hydroxide in four non-aqueous solvents such as acetonitrile, isopropyl alcohol, tert-butyl alcohol, and *N*,*N*-dimethylformamide, and the half-neutralization potential values and the corresponding pK_a values were determined for all cases.

Keywords: 4,5-Dihydro-1*H*-1,2,4-triazol-5-one, Schiff base, Acidity, pK_a



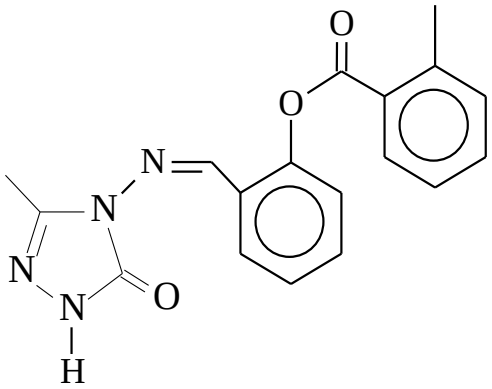
Quantum Chemical Studies of Molecular, Electronic And Spectroscopic Properties of 2-[(3-Methyl-5-Oxo-1h-1,2,4-Triazol-4 (5h)-YL)-Iminomethyl] Phenyl 2-Methyl Benzoat Molecule

Murat BEYTUR, Haydar YÜKSEK

Kafkas University, Faculty of Sciences and Letter, Department of Chemistry, Kars, Turkey
muratbeytur@kafkas.edu.tr

In this study, 2-[(3-methyl-5-oxo-1H-1,2,4-triazol-4(5H)-yl)-iminomethyl]-phenyl 2-methylbenzoate molecule optimized using *ab* initio Density Functional Theory (DFT/B3LYP), (Becke-3-Lee-Yang-Parr (B3LYP) hybrid density functional), and Hartree-Fock (HF). Titled compound has been calculated the ground state geometrical parameters, the dipole moment (μ), polarizability (α), the hyperpolarizability (β). calculated IR data of compound were calculated in gas phase by using of 6-311+G(2d,p) basis sets of B3LYP and HF methods and are multiplied with appropriate adjustment factors. Theoretical infrared spectrums are formed from the data obtained according to B3LYP and HF methods. Experimental IR values and theoretical values were compared. In the identification of calculated IR data was used the veda4f program. The ^{1}H and ^{13}C NMR chemical shifts were calculated by GIAO approach by using B3LYP/6-311+G(2d,p) and HF/6-311+G(2d,p) level of theory. The obtained theoretical data were compared with experimental results. Also, using the calculated the highest occupied molecular orbital energies (E_{HOMO}) and the lowest unoccupied molecular orbital energies (E_{LUMO}), electronic properties of the studied molecules such as energy gap ($\Delta E=E_{LUMO}-E_{HOMO}$), chemical potential (μ), electrophilic index (ω), ionization potential (IP), electron affinity (EA), electronegativity (χ), molecular softness (S), molecular hardness (η) were obtained. Spectroscopic parameters of title molecules compared with the experimental data in the literature. All computational studies have been performed with the Gaussian 09W program.

Keywords: 1,2,4-Triazole, Hyperpolarizability, Electronic and Spectroscopic Properties.



Synthesis And Antioxidant Activities of New 1-Acetyl-3-Alkyl(Aryl)-4-(3-Methoxy-4-Cınnamoyloxy)Benzylidenamino-4,5-Dihydro-1h-1,2,4-Triazol-5-Ones

Songül ULUFER[1], Haydar YÜKSEK[2], Sevda MANAP[2], Özlem GÜRSOY-KOL[2]

[1]Kafkas University, Kağızman Vocational School, Kars, Turkey
[2]Kafkas University, Department of Chemistry, Kars, Turkey
sngulufer@gmail.com

1,2,4-Triazole derivatives have drawn considerable attention for the past few decades because of their diverse biological properties. Many 1,2,4-triazole derivatives are found to be potent antioxidant, anti-inflammatory, antimicrobial and antiviral agents. The identification of triazoles and determination of their antioxidant activities are of considerable interest because of the role they play in pharmacological actions. In this study, five novel 1-Acetyl-3-alkyl(aryl)-4-(3-methoxy-4-cinnamoyloxy)benzylidenamino-4,5-dihydro-1*H*-1,2,4-triazol-5-ones (2) compounds were synthesized from the reaction of 3-alkyl(aryl)-4-(3-methoxy-4-cinnamoyloxy)benzylidenamino-4,5-dihydro-1*H*-1,2,4-triazol-5-ones (1) compounds registered in the literature with acetic anhydride (Figure 1). The new compounds were characterized using spectral data. Following the study, the antioxidant properties of the 2 type compounds were analyzed for their in vitro potential antioxidant activities in three different methods; reducing power, free radical scavenging and metal chelating activity

Keywords: 1,2,4-Triazole, Synthesis, Acetylation, Antioxidant activity.

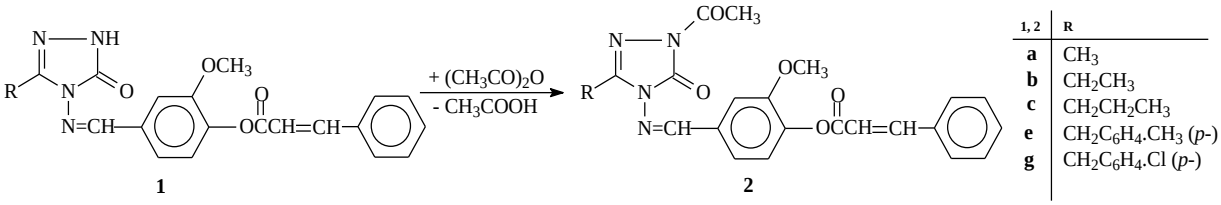


Figure 1. Synthesis route of compounds **2**

Preparation and characterization of activated carbon produced from Coconut Shell by $ZnCl_2$ and KOH activation

Hatice Karaer Yağmur[1], İsmet Kaya[2]

[1]Dicle Üniversitesi, Fen Fakültesi, Kimya Bölümü, Diyarbakır, profhatice23@hotmail.com
[2]Çanakkale Onsekiz Mart Üniversitesi, Kimya Bölümü, Polimer Sentez ve Analiz Lab., Çanakkale
kayaismet@hotmail.com

Activated carbon is a material with large surface area and high porosity obtained from raw materials containing carbon by chemical or physical activation methods (1). Activated carbon is usually produced from lignocellulosic materials such as coconut shell, hazelnut shell, olive core, sawdust, palm shell and chestnut tree. Activated carbon is obtained by the carbonization and activation process of carbonaceous structures, especially of plant origin(2). The carbonization process is the process of heating carbonaceous materials in airless medium at 400-900 °C. In the activation process, chemical substances can be used to give the activated carbon a large surface area and high porosity besides the thermal treatment (3).

In this study, it was aimed to produce activated carbon by chemical activation by using $ZnCl_2$ and KOH reagents from coconut shell which is a vegetable waste. The coconut shells were ground and impregnated with $ZnCl_2$ and KOH. Carbonization process was carried out at 500 ^oC for 1 hour with an impregnation (chemical / raw) ratio of 0.5. The raw coconut shell samples were subjected to carbonization under the same conditions In order to determine the effect of chemical activation on the surface area and pore formation. BET, FT-IR, SEM and TGA measurements were made for structure and characterizations of the activated carbons.

Keywords: Activated carbon, coconut, activation, carbonization

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Synthesis and Characterization of Thermally Resistant Polyurethane Based Chitosan

Hatice Karaer Yağmur[1], İsmet Kaya[2]

[1]Dicle Üniversitesi, Fen Fakültesi, Kimya Bölümü, Diyarbakır,
profhatice23@hotmail.com
[2]Çanakkale Onsekiz Mart Üniversitesi, Kimya Bölümü, Polimer Sentez ve Analiz Lab., Çanakkale
kayaismet@hotmail.com

Polyurethanes (PUs) are the most versatile class of polymers because of to their diverse applications such as coatings, elastomers, foams, adhesive-based products, textile finishing, thermal insulation etc. Chitosan is a crystalline polysaccharide. It is the deacetylation form of chitin, the second most abundant natural polymer next to cellulose, which can be obtained from crustaceans or fungal cell wall. The amino groups in chitosan allow the polymer to be dissolved in acids, so chitosan films can be easily prepared from solution.Chitosan is a nontoxic, biodegradable, and biocompatible cationic natural polymer as well as exhibit antimicrobial properties.

Recently, there is a great interest in modification of PUs with natural polymers making them more attractive and environmentally friendly. Natural polymers improve PUs biocompatibility and affects biodegradable properties.
In this paper was studied on the grafting of polyurethane onto chitosan and polyurethane based chitosan (PU-CS) emulsion was synthesized. The synthesis was accomplished by using a two-step emulsion polymerization process.

Polyurethane was obtained by condensation reactions between poly(ethylene glycol) (PEG) and toluene 2,4 diisocyanate(TDI). Characterization of graft copolymers was performed by infrared spectroscopy (FTIR-ATR), SEM-EDX and TGA-DSC. Based on results showed that chitosan enhanced thermal stability.

Keywords: Polyurethane, chitosan, poly(ethylene glycol),TGA

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Electrochemical Synthesis and Characterization of Containing Bodipy Conductive Polymer Composite Film

Esra Kılavuz[1], Ersen Turaç[1], Ertuğrul Şahmetlioğlu[2], Ersen Göktürk[3]

[1]Niğde Ömer Halisdemir University
[2]Kayseri University Mustafa Çıkrıkçıoğlu Vocational School
[3]Hatay Mustafa Kemal University
ersenturac@ohu.edu.tr

The electron transfer ability is key to the reactivity of organic compounds. Molecular electrochemistry, photovoltaic devices, organic dye solar cells, such as the direction of the development of renewable energy technologies. Electrochemistry is a powerful tool to illuminate reactions involving electron transfer. Electrochemistry correlates the chemical change in the flow of electrons with physical changes. Cyclic voltammetry (CV) has become an important and widely used electrochemical technique in many areas of chemistry. This Account is an attempt to describe comprehensively the electrochemical and electrogenerated chemiluminescence (ECL) properties of the BODIPY dyes. BODIPY dyes or boron pyrromethene or bora-indacene dyes are useful materials that have been proposed for applications in biological sensing, energy light harvesting, catalysis, optical devices, and laser materials of light emitting diodes (LEDs), solar energy materials, transistors and electrochromic devices. In this study, we synthesized a new electroactive ligand containing BODİPY which is not found in the literature and we performed electropolymerization in acetonitrile solution and characterization studies. The aim of this paper is to provide the readers with the tools necessary to understand the key features of a BODIPY cyclic voltammogram. Finally, a detailed description of electron flowing, semi reaction equbilirium, doped-undoped forms in cyclic voltammetry will be given. Despite the increasing popularity of cyclic voltammetry, it is quite complex to explain the reduction peaks of oxidation on a voltamogram. Here, we focus on cyclic voltammetry to help in data collection and interpretation.

Keywords: Bodipy, conductive polymer, cyclic voltammogram, polymer film

Acknowledgments: This study was supported by the Scientific and Technical Research Council of Niğde University (FEB 2018/12)

Physicochemical examination of a newly synthesized imine compound as an anti-corrosion agent for mild steel electrode by electrochemical and surface analysis techniques

Demet ÖZKIR*[1]

[1]Niğde Ömer Halisdemir University, Faculty of Arts & Sciences, Dept. of Chemistry, Niğde / TURKEY
*dozkir@ohu.edu.tr

In existing study, electrochemical impedance spectroscopy was used to examine the inhibitor effect of a new imine compound synthesized to the corrosion of mild steel. With this technique, mild steel electrodes were immersed at different immersion times in 1.0 M HCl solutions containing various concentrations of imine compound and spectra were recorded. According to this measurement result, the newly synthesized imine compound has been shown to have a high protective effect against the mild steel electrodes, even if the immersion time increases. it has been seen that the resistance of the solution boosted, as the inhibitor concentration increased. In order to determine the type of interaction between inhibitor and mild steel, physicochemical parameter values such as adsorption equilibrium constant and free energy were calculated. In light of these values, it was defined that the inhibitor strongly interacted on the metal surface. In addition, at the longest exposure period, surface analyses of the mild steels which were immersion in 1.0 M HCl solutions with and without the optimum inhibitor were investigated by field emission scanning electron microscopy (FESEM). The electrode surface in the solution containing the imine compound is further supported by FESEM, which has a smoother structure.

Keywords: Imine, adsorption, EIS, FESEM.

Synthesis of Complex of Schiff Base Containing 4-Methoxysalicylaldehyde

Selma Yıldırım Uçan

Department of Chemistry, Faculty of Arts and Sciences, Niğde Ömer Halisdemir University, Niğde, Turkey
selma.y.ucan@gmail.com

Schiff bases and their complexes have a variety of applications including biological, clinical and analytical. A new Schiff base ligand was synthesized by 4-Methoxysalicylaldehyde and aniline. The complex was synthesized by adding Zn(II) acetate salt dissolved in alcohol to the Schiff base ligand. The compounds obtained have been characterized by their elemental analyses, FT-IR, ^{1}H-NMR, TG/DTG, conductometric measurements and magnetic sussceptibility. The NMR and IR spectra showed that the ligand coordinated with metal ion through two phenolic oxygen atoms and two azomethine nitrogen atoms. The Zn(II) complex is soluble in DMF and DMSO and is insoluble in ethanol, methanol, acetone and chloroform. The molar conductance data reveal that the complex is non-electrolytes. The Zn(II) complex is diamagnetic as expected for d^{10} metal ions in a tetrahedral geometry.

Keywords: Schiff bases, Metal complexes, Molar conductance, Thermogravimetric analysis

The Synthesis of Novel Asymmetric Bisbenzimidazole Microwave Assisted And Investigation of Metal Complexes

Gülcan FERİÇOK, Ziya Erdem KOÇ

Selcuk University, Science Faculty, Department of Chemistry, Konya 42075, Turkey
zerdemkoc@gmail.com

Benzimidazoles and their derivatives are important classes of heterocyclic molecules in several field of organic chemistry. They contain a phenyl ring fused to an imidazole ring. They are a common heterocyclic scaffold in biologically active and medicinally significant compounds and are found in a large number of natural products. Moreover, these groups of heterocyclic compounds exhibit a wide range of pharmacological properties, which include antiviral, antimicrobial, antitumor, antifungal, anti-inflammatory activity and many others anti-parasitic, antibacterial, properties. Some noteworthy benzimidazole derivatives gain crucial importance because of their widespread pharmaceutical importance and biological activities such as anti-microbial, anti-inflammatory, potential anti-tumor, anti-parasitic, antibacterial, anthelmintic, antifungal, anti-inflammatory, anti-viral and analgesic properties. Benzimidazoles derivatives have been chosen as target molecules; benzimidazole derivatives have several medicinal uses, such as antiviral, anticancer, antihypertensive, antihistamines and antiulcer. The compounds with imine group in their structure are known as heterocyclic compounds, which are synthesized by the condensation reaction of amines and carbonyl groups. The study of Asymmetric Benzimidazole containing heterocyclic compounds is also of interest as some of them have shown the ability to anticancer. The formation of 2-aryl-substituted benzimidazoles, by the polyphosphoric acid-catalyzed condensation of a carboxylic acid is described. The structures of the substances obtained FT-IR, 1H NMR, elemental analysis and magnetic susceptibility analysis methods were illuminated.

Keywords: Benzimidazole, Microvawe, Metal Complexes

The Synthesis of s-Triazine Schiff Bases And Investigation of Some of Their Salen Metal Complexes

Ziya Erdem KOÇ

Selcuk University, Science Faculty, Department of Chemistry, Konya 42075, Turkey
zerdemkoc@gmail.com

An important class of compounds consists of substituted s-triazine derivatives which have anticancer, antitumor, antiviral and antifungal activity. These compounds have been used in the treatment of depression and hence gained a considerable importance. These are valuable bases for estrogen receptor modulators and also used as bridging agents to synthesize herbicides and in the production of drugs or polymers. s-Triazine is definitely an excellent starting compound for the straightforward preparation of highly structured multitopic molecules. Indeed, each substitüe atom of 1,3,5-triazine can be substituted by any nucleophilic reactant. As a result, a careful control of the temperature during the substitution reactions will allow the synthesis of 2,4,6-trisubstituted-triazines by sequential and very selective addition of amines. We have reported here that a s-triazine and its Schiff bases have been syntheses to be a new template. The reaction of 2,4,6-trisubstituted-triazines has given the desired imine in a single step, coded to be monopodal, dipodal, tripodal Aromatic imine was then reacted under -5 ^{o}C, room temperature, reflux with aldehyde and 1,3,5-triazine. It may be useful to stress at this point that the new products mentioned above are the main result of this work. These are the first in the literature and we call them “s-triazine-Schiff Bases Metal Complexes” due to literature. The magnetochemical properties of the μ-oxo-bridged complexes [{Fe(salen)}O_2].

Keywords: s-Triazine Schiff bases, Metal Complexes

Aniline Entrapment by High Surface Area Polymers of Intrinsic Microporosity (PIM-2) Microfibers

Bekir Satılmış

Department of Chemistry, Faculty of Arts and Sciences, Kirsehir Ahi Evran University, Kirsehir 40100, Turkey
bekir.satilmis@ahievran.edu.tr

Polymers of intrinsic microporosity (PIMs) [1], also called as polybenzodioxanes, have attracted tremendous attention due to their unusual rigid and contorted structures. They are solution-processable, high-surface-area macromolecules that can be prepared in the membrane form [1,2]. These features facilitate their usage in several applications particularly molecular separation applications. Recently, we have introduced a successful preparation of PIM-2 membranes [3]. PIM-2, was produced using commercially available 5,5′,6,6′-Tetrahydroxy-3,3,3′,3′-tetramethyl-1,1′-spirobisindane and decafluorobiphenyl monomers, which is soluble in tetrahydrofuran, chloroform and tetrachloroethane solvents. Fibrous membrane of PIM-2 could be produced using tetrachloroethane by electrospinning technique, which is a straightforward and controllable way to produce three-dimensional porous adsorbents for various applications. In this study, we have investigated the aniline adsorption ability of PIM-2 fibrous membrane from air. Adsorption capacity of PIM-2 was determined using TGA and ^{1}H NMR spectroscopy techniques. The adsorption capacity was found 486 mg g^{-1} by TGA and 500 mg g^{-1} by ^{1}H NMR spectroscopy, indicating good agreements between two techniques. The results were also compared with other fibrous membranes.

Keywords: Polymers of Intrinsic Microporosity, PIM-2, Fibers, Aniline, Adsorption.

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Synthesis And Characterization Polyimide (BPDA - DASDA) Via Condensation Polymerization Technique And Density Functional Theory (DFT) Analysis

Ümit YILDIKO[1], İsmail ÇAKMAK[2], Güneş ULUÇAY NEMLİ[1]

[1]Architecture and Engineering Faculty, Department of Bioengineering, Kafkas University, Kars, Turkey
[2]Faculty of Arts and Sciences. Department of Chemistry, Kafkas University Kars, Turkey
yildiko1@gmail.com

In this study, polymeric material having the ability to use as a membrane in the fuel cell was synthesized. For this purpose, the polyimide containing the sulfonic acid group was synthesized from the condensation reaction of 4,4'-diamino-2,2'-stilbendisulfonic acid (DASDA) with 3,3', 4,4'-biphenyltetracarboxylic dianhydride (BPDA). Due to their high energy conversion and great dynamic characteristics, important motor companies have carried out a lot of research in PEM fuel cells. The most important advantage of PEM fuel cells is that they can operate at low temperatures. The high cost of the polymer material used as a membrane is the most important disadvantage of this system. Those containing aromatic groups in the main chain or side chains are resistant to high temperatures. Polyarylenes having aromatic groups have a Tg value of greater than 200 °C and are stable at high temperatures. These polymers functionalized with sulfone groups giving the ability to be used as a membrane in the polymer electrolyte fuel cell are characterized by NMR, UV-VIS and FT-IR spectroscopic analysis and Elemental analysis technique. In addition, Density Functional Theory (DFT) study of polyimide is performed. The data obtained supports well the formation of sulfonated polyimides (BPDA - DASDA).

Keywords: Sulfonated polyimide, DFT, Fuel cell

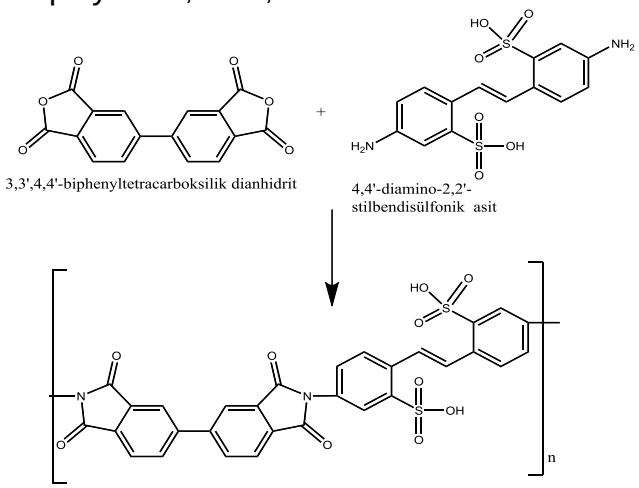

Figure 1. Synthesis of sulfonated polyimides (BPDA - DASDA)

Synthesis, Characterization And Density Functional Theory (DFT) Studies of 4,4'-Diaminotriphenylamine (DATPA) Compound

Ümit YILDIKO[1], İsmail ÇAKMAK[2], Ahmet Çağrı ATA[2]

[1]Architecture and Engineering Faculty, Department of Bioengineering, Kafkas University, Kars, Turkey
[2]Faculty of Arts and Sciences. Department of Chemistry, Kafkas University Kars, Turkey
yildiko1@gmail.com

Diamine compounds are useful intermediates for the synthesis chemistry. It is an indispensable monomer of polyimides as a result of condensation polymerization with its diamine functional groups. As the monomer, many block copolymers have been used in the graft type polyimide synthesis. Intermediate components are very important in the design of molecular architecture. Any monomer of the macromolecule to be synthesized should be well characterized. They have been used as intermediates for the synthesis of a wide range.

In this study, the synthesis of 4,4'-Diaminotriphenylamine (DATPA) compound and FT-IR and NMR characterization were carried out. We offer a detailed DFT study based on the electronic features of B3LYP/ CAMB3LYP / 6-311G + (d,p) basic set of geometric structures. In addition, molecular orbital calculations such as natural bond orbitals (NBOs), HOMO - LUMO energy gap and maped molecular electrostatic potential (MEP) surfaces were also performed. In the calculation, parameters such as energy gap (Δ), ionization potential (I) electron affinity (A), global hardness (η), chemical potential (μ), global electrophilicity power (ω), electronegativity (χ) and polarization (α) were obtained. Based on the vibration analysis, the thermodynamic properties of the compound were also calculated.

Keywords: Diamine compound,TD- DFT, NBO

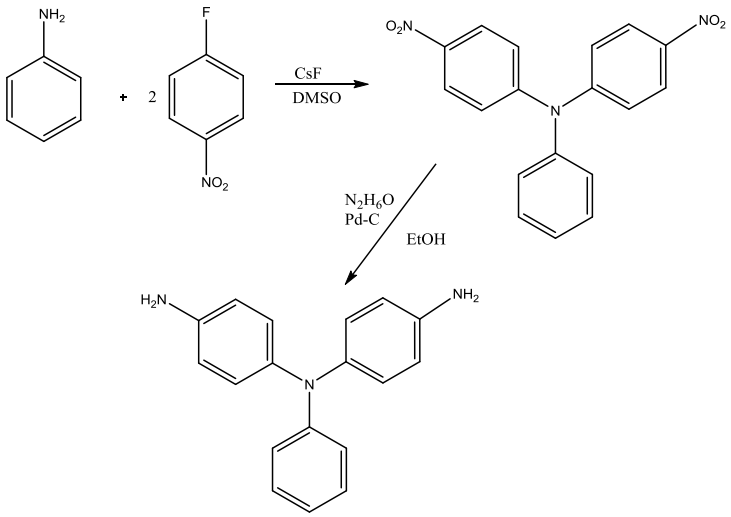

Figure 1. Synthesis of 4,4'-Diaminotriphenylamine (DATPA)

Determination of Tamarindus indica Seed Fatty Acid Components Using Microwave Assisted Extraction Method

Özlen ÖZKURT and Rifat BATTALOĞLU

Niğde Ömer Halisdemir University, Science and Art Faculty, Department of Chemistry, 51245, Campus, Niğde, Turkey
rbattaloglu@ohu.edu.tr

Tamarindus indica is a delicious, sweet and sour fruit with a wide variety of uses for both medical and culinary purposes. It is a fruit that is usually consumed by people because it is both sweet and sour. There are protein, sugar, pectin, A, B1, B2, B3, B5, B6 and C vitamins, minerals such as potassium, magnesium, phosphorus, calcium, sodium, selenium, iron and copper in the structure of this fruit. It is an antioxidant source because of its vitamins A, C and E and selenium. It also contains tartaric acid, citric acid and malic acid. Fatty acids are found as esters in fats and oils and are straight-chain double carbon mono-carboxylic acids. Fatty acids in natural oils are usually straight chain derivatives and contain double carbon atoms because they are synthesized from two carbonaceous units. Scope of this research, *Tamarindus indica* seed samples were obtained by Soxhlet extraction (SE) method which is a traditional method and by microwave supported Soxhlet extraction (MDSE) method. Fatty acid components were determined by GC-MS method. It has been seen that microwave assisted analysis method is much faster than traditional method. At the same time, this method saves the solvent. It has been determined that microwave assisted analysis increases the yield rate.

Keywords: *Tamarindus indica*, microwave assisted extraction, Soxhlet extraction.

Determination of Prunus laurocerasus Fruit Fatty Acid Components Using Microwave Assisted Extraction Method

Medine ÇOLAK and Rifat BATTALOĞLU

Niğde Ömer Halisdemir University, Science and Art Faculty, Department of Chemistry, 51245, Campus, Niğde, Turkey
rbattaloglu@ohu.edu.tr

Prunus laurocerasus is a 5-115 m long, evergreen tree species, which is also known as a black-bellied almond, which grows small white flowers from the rosaceae (Rosaceae) family and grows in more damp and shady places. It is reported that fruits are suitable for diabetic patients with good stomach and bowel diseases, and that they have a dietary fruit because of their toughness, and the core is used as a blood pressure medication. In addition, the leaves are not used in winter as leaves are used as animal feed in winter. The leaves among the people are used as cough suppressants and as antispasmodics. It is also used in the production of fruits liquor. In this research, Prunus laurocerasus fruit samples were obtained by conventional Soxhlet extraction (SE) method and microwave supported Soxhlet extraction (MDSE) method. Fatty acid components were determined by GC-MS method. When the analysis results were analyzed, it was seen that microwave assisted analysis method was performed in a shorter time compared to the traditional method. At the same time, this method saves solvent. It has been determined that microwave assisted analysis increases the yield rate.

Keywords: Prunus laurocerasus, microwave assisted extraction, Soxhlet extraction.

Sürdürülebilir Hammaddelerden Poliglikolik Asit Kopolimerlerinin Sentezi

Ersen Göktürk

Hatay Mustafa Kemal Üniversitesi Fen Edebiyat Fakültesi Kimya Bölümü
ersengokturk@gmail.com

Biyobozunur poliglikolik asit (PGA, ticari adı Kuredux) ticari olarak glikolit'in halka açılma polimerleşmesiyle (çoğunlukla tin oktanoat katalizörüyle) elde edilmektedir. Önceki çalışmalarımızda poliglikolik asit'in (PGA) formaldehit (triokzan kullanılarak) ve karbon monoksit'in (CO) Brønsted asidik koşullarda alternatif olarak polimerleşmesi neticesinde de sentezlenebileceğini göstermiştik. PGA'nın zayıf fiziksel özellikleri (çoğu çözücü içerisinde çözünmeyişi, kahverengi renkte oluşu vb.), PGA'nın endüstrideki kullanım olasılığını oldukça kısıtlamaktadır. PGA'nın fiziksel özelliklerini iyileştirmek için bu çalışmada; tıpkı PGA eldesinde olduğu gibi triokzan ve CO kullanılarak reaksiyon ortamına düşük oranlarda hekzametil siklotrisiloksan (HMSTS) komonomeri ilavesiyle PGA senteziyle aynı koşullarda kopolimerleşme reaksiyonu gerçekleştirilmiştir. Elde edilen sonuçlar, düşük oranlarda HMSTS komonomeri eklenmesiyle PGA kopolimerlerinin fiziksel özelliklerinde önemli değişimler olduğunu göstermiştir.

Anahtar Kelimeler: Poliglikolik asit (PGA), formaldehit, triokzan, karbon monoksit (CO)

Teşekkür: Bu araştırmanın bir kısmı TÜBİTAK 115Z482 numaralı proje ile desteklenmiştir.

3-Florofenol'ün Horseradish peroksidaz Nanobiyokatalizörü ile Polimerleştirilmesi: Sentez, Karakterizasyon ve Termal Kararlılık

Ersen Göktürk[1], İsmail Öçsoy[2]

[1]Hatay Mustafa Kemal Üniversitesi Fen Edebiyat Fakültesi Kimya Bölümü
[2]Erciyes Üniversitesi Eczacılık Fakültesi
ersengokturk@gmail.com

Son zamanlarda, enzimlerle katalizlenen polimerleşme reaksiyonları yeni bir yöntem olarak oldukça fazla çalışılan konulardan biri olmuştur. Poliaromatik bileşiklerin enzimatik olarak sentezlenmesi, fenol ve anilin türevlerinin oksidoredüktaz enzim katalizörleriyle oksidatif polimerleşmeleri sayesinde başarıyla gerçekleştirilmektedir. Horseradish peroksidaz enzimi kullanılarak gerçekleştirilen değişik türdeki fenolik bileşiğin polimerleştirilmesiyle yeni türlerde fenolik rezinler elde edilmektedir. Bu rezinlerin çoğunun geleneksel olarak bilinen oksidasyon veya elektroliz yöntemleriyle sentezlenmesi oldukça zordur. Enzimlerin organik çözücülerde ve yüksek sıcaklıklarda denatürasyona uğramaları, sulu çözeltilerde kararsız oluşları ve oldukça pahalı olmaları sebebiyle endüstriyel ölçekteki kullanımı sınırlıdır. Bu nedenle, enzimleri katalitik aktivitelerini ve kararlılıklarını arttırıcı immobilizasyon yöntemlerini bulmak oldukça önemlidir. Literatürde, HRP enziminin Cu^{2+} iyonları içine katılmasıyla elde edilen nano biyokatalizörler serbest enzime kıyasla oldukça yüksek katalitik aktivite ve kararlılık göstermektedir. Bu çalışmada 3-florofenol bileşiğinin, Cu^{2+} iyonlarının HRP enzimiyle oluşturdukları hibrit nano biyokatalizörler yardımıyla polimerleşmesi gerçekleştirilmiştir. Oldukça güçlü elektron çekici flor atomunun polimerleşmeye etkisi incelenmiştir.

Anahtar Kelimeler: Horseradish peroksidaz, 3-Florofenol, Enzimatik polimerleşme

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MATHEMATICS

Numerical Solution of the GRLW Equation Using Moving Least Squares Collocation Method

Ayşe Gül KAPLAN

Osmaniye Korkut Ata Üniversity
aysegulkaplan@osmaniye.edu.tr

In this paper, the Generalized Regularized Long Wave (GRLW) Equation is solved by using moving least squares collocation method. Single solitary wave motion, interaction of two solitary waves and the Maxwellian initial condition test problems are studied to show the accuracy of the method. Numerical values of the conservation of mass, momentum and energy are found for each test problems. For the single solitary wave motion whose analytical solution was known L_2 and L_∞ error norms were calculated. Obtained numerical results are compared with some results in the literature.

Keywords: Moving least squares approximation, GRLW equation.

Application of Homogeneous Balance Method to the Schamel-Korteweg-de-Vries Equation

Çiğdem Türkmen, Güldem Yıldız

Niğde Ömer Halisdemir University, Science and Art Faculty, Department of Mathematics
guldem.yildiz@ohu.edu.tr

In this study, the Homogeneous Balance Method is applied to obtain the exact solutions of non-linear partial derivative Schamel-Korteweg-de Vries (KdV) differential equation which is used in the scientific fields as engineering and physics. This equation has broad applications for plasma physics and quantum mechanics. The exact solutions obtained by applying the Homogeneous Balance Method for Schamel-KdV equation are compared with literature results and hyperbolic type functions are obtained which are compatible with literature results.

Keywords: Schamel-KdV equation, Homogeneous Balance Method

Local T_1 Semiuniform Limit Convergence Spaces

Ayhan ERCİYES[1], Mehmet BARAN[2]

[1]Aksaray University, [2]Erciyes University

ayhanerciyes@aksaray.edu.tr

A semiuniform convergence space $(X, \Im)$ is called a semiuniform limit space provided that the $\alpha, \beta \in \Im$ imply $\alpha \cap \beta \in \Im$ is satisfied. Semiuniform convergence spaces were introduced as a generalization of semiuniform limit convergence spaces. Semiuniform convergence spaces were studied by Andreas Behling and Gerhard Preuss in 1992 and 1993. There are several ways to generalize the usual separation axioms of topology to topological categories. For example, in 1992, Baran introduced local separation properties in set-based topological categories. Category SULim of semiuniform limit convergence spaces (and unifomly continuous maps) is a cartesian closed and hereditary topological category such that arbitrary products of quotients are quotients.

The main goal of this paper is to give the characterization of T_1 semiuniform limit convergence spaces at a point p.

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Keywords: Topological category, Semiuniform limit convergence space, T_1 space.

T_1 Semiuniform Limit Convergence Spaces

Ayhan ERCİYES[1], Mehmet BARAN[2]

[1]Aksaray University, [2]Erciyes University

ayhanerciyes@aksaray.edu.tr

In 1967, C. H. Cook and H. R. Fisher introduced the category of uniform convergence spaces (and uniformly continuous maps) as a generalization of the category Unif of uniform spaces (and uniformly continuous maps) in the sense of A. Weil in 1938. In 1974, O. Wyler defined ULim of unifom limit spaces as a modification of uniform spaces. In 1992, G. Preuss and in 1993 A. Behling extented category ULim to obtain the topological universes SULim and SUConv of respectively semiuniform limit convergence spaces and semiuniform convergence spaces. These are cartesian closed and hereditary topological categories. There are several ways to generalize the usual separation axioms of topology to topological categories. For example, in 1992, Baran introduced local separation properties in set-based topological categories.

In this paper, we characterize T_1 semiuniform limit convergence spaces and investigate the relationships between them.

Keywords: Topological category, Semiuniform limit convergence space, T_1 space, discrete object.

Yeni Bir Gri Modelleme Yöntemi ve Türkiye'deki Sağlık Harcamalarının Tahmini Üzerine Uygulaması

Halis BİLGİL

Aksaray Üniversitesi, Fen Edebiyat Fakültesi, Matematik Bölümü
halis@aksaray.edu.tr

Gri modelleme, sınırlı verilere ait sayı dizilerinin kullanılarak, dizinin sonraki terimlerin tahmininde kullanılan ve en küçük kareler yöntemine dayalı bir yöntemdir. Bu çalışmada yeni bir gri tahmin modellemesi verilerek, bir uygulama olarak Türkiye'deki sağlık harcamalarına ait veriler kullanıldı. Elde edilen sonuçlar, önerilen modelin güçlü, kolay ve kullanışlı olduğunu ortaya koydu.

Anahtar Kelimeler: Gri modelleme, Gri sistem, Veri tahmini, En küçük kareler yöntemi

Weakly-t-flat Modules

Yılmaz Durğun

Çukurova University
ydurgun@cu.edu.tr

In this paper, we introduce and study a torsion-theoretic generalization of the weakly-flat module by using the concept of t-closed submodule for an idempotent radical. We introduce new module class called weakly-t-flat. We study these modules, generalizing several results both on extending modules and flat modules. We also study generalizations and characterizations of IF, (finitely-)CS and C rings by weakly-t-flat modules.

Proposition. R_R is a t-torsionfree modul if and only if weakly-t-flat modules are exactly t-torsionfree modules.

Theorem. Assume that t be a stable torsion theory. An injective module E is weakly-t-flat if and only if t(E) is a projective module.

Theorem. Assume that t be a stable torsion theory. The following statements are equivalent..

1. Every injective module is weak-t-flat.
2. For every t-torsion module T, E(T) is projective.
3. Every t-torsion module embeds in a projective module.
4. Every injective module E can be represented as $E = P \oplus N$, where P is a projective t-torsion torsion module and N is a t-torsionfree module.

Theorem. Let R be a commutative noetherian ring. The following statements are equivalent..

1. Every finitely generated t-torsionfree module is projective.
2. $R \cong A \times B$, where A is Σ-t-CS ring and B hereditary and C_t ring.

Keywords: (t-)closed submodule, (weakly-)flat module, hereditary torsion Theory

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Subprojectivity Domain of Rd-projective Modules

Yılmaz Durğun

Çukurova University
ydurgun@cu.edu.tr

Recently, studies have been carried out to determine the projectivity of non-projective modules. In this study, we aimed to determine the projective measure of RD-projective modules. We used subprojective domains for this aim. Each Rd-projective module is subprojective to any torsionfree (flat and projective) module. According to some module classes, where Rd-projective modules are subprojective, we observed that projectivity of Rd-projective modules can be measured. We have worked on Rd-projective modules, which is subprojective to torsionfree, flat and projective modules classes respectively. First, the properties of the subprojective domains of Rd-projective modules over different rings were determined. To keep in line about this subject, an Rd-projective right R-module M will be an rdp-indigent(respectively srdp-indigent, p-indigent if it is subprojective only to torsionfree (respectively flat, projective) modules. Then, we examined the ring structures where each non-projective Rd-projective module was subprojective only the torsionfree (respectively flat, projective) modules. We have given some result below.

Theorem. R is a torsionfree ring if and only if the subprojectivity domain of every Rd-projective module is closed under submodules.

Teorem. Let R be a right-left noetherian and right SRDP ring. Assume that every non-projective simple right R-module is srdp-indigent. Then R≅ SxT, where S is a semisimple artinian ring and T is an indecomposable noetherian ring satisfying only one of the following conditions:

1. T is right matrix ring over local QF-ring; or,
2. T is prime hereditary ring; or,
3. T is Morita-equivalent to a lower triangular matrix ring over a division algebra.

Keywords: Burulmasız modül, rd-projektif, düz modül, alt-projektiflik bölgesi

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PHYSICS

Development and Physical Basis of New Crystal Systems in the class of Multiferroics

Moldir Abdraimova

Kazakh State Women's Teacher Training University, Almaty, Kazakhstan

The purpose of scientific work is to solve the fundamental problem of designing new composite, polycrystalline and nanoscale materials in the class of multiferroics and the development of physical foundations of phenomena that determine susceptibility to magnetic and electrical influences.

Synthesis and X-Ray Study of Chromite – Gadolini Ferrite Composition $Gd_{(1-X)}CaCr_{0.5}Fe_{0.5}O_3$, $Gd_{(1-X)}BaCr_{0.5}Fe_{0.5}O_3$, (where x=0,5-0,7)

M.Mataev, M.R.Abdraimova*, N.Abisheva, G.S.Onalbek

Kazakh State Women's Teacher Training University, Almaty, Kazakhstan
*abdraimova87@mail.ru

Samples of chromite – ferrite gadolinium were synthesized by Sol – gel method. The method of x-ray phase analysis investigated the phase composition and crystal characteristics, determined the type of symmetry, unit cell parameters, radiographic and pycnometric densities.

The correctness of the results of the x-ray diffraction of complex mixed ferrite is confirmed by a good agreement between the experimental and calculated values of the inverse values of the squares of the interplanar distances ($10^4/d^2$).

Satisfactory consistency of the values of X-ray and pycnometric densities proves the correctness of the experimental results.

The paper presents the results of synthesis and XRF studies of new complex oxide chromite – gadolinium ferrites doped with alkaline earth metals (Ca,Ba).

$Gd_{(1-X)}CaCr_{0.5}Fe_{0.5}O_3$ and $Gd_{(1-X)}BaCr_{0.5}Fe_{0.5}O_3$chromite - ferrite gadolinium samples were obtained by the sol - gel method of synthesis.X-ray diffraction analysis of the products of the chemical reaction was carried out using a Miniflex 600 X-ray diffractometer (Rigaku). The X-ray display data of the synthesized chromite - ferrite gadolinium show that theseferrites have an orthorhombic structure.

Keywords: ferrites, synthesis, structure, X-ray examination

This research work is carried out by the Committee of science MES, AR05130165 (№88.05.03.2018) on the basis of a scientific project.

Mechanical and Anisotropy Properties of Trigadolinium Heptanickel Tetradecaaluminide ($Gd_3Ni_7Al_{14}$) Compound

Hacı Özışık, Engin Deligöz, Havva Boğaz Özışık

Department of Physics, Arts and Science Faculty, Aksaray University, Aksaray, Turkey
hacioz@aksaray.edu.tr

$Gd_3Ni_7Al_{14}$ compound is in the hexagonal P-62m structure [1]. We have studied the structural, electronic, elastic and anisotropy properties. We have been used strass-strain method to predict the second order elastic constants (C_{ij}) of the titled compound within the density functional theory [2-5]. Our results showed that the compound is satisfy mechanical stability for the considered structure. The polycrystalline aggregate behavior estimated using the elastic constants. The bulk modulus, shear modulus, Young's modulus, Possion's ratio, Debye temperature, and anisotropy value of polycrystalline aggregates have been derived and relevant mechanical properties are discussed.

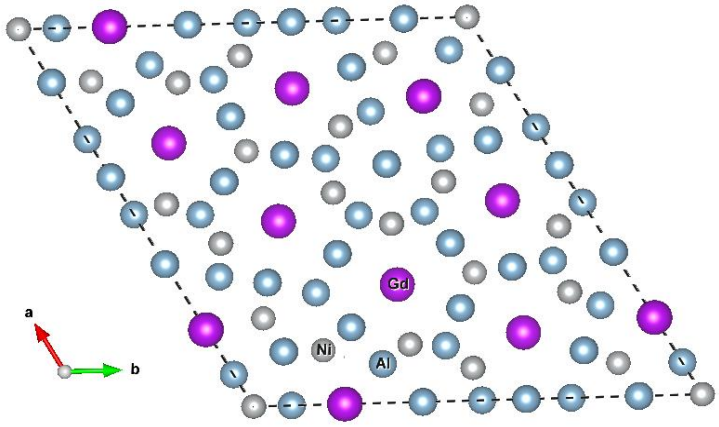

Figure 1. The crystal view of hexagonal $Gd_3Ni_7Al_{14}$ compound.

Keywords: $Gd_3Ni_7Al_{14}$, mechanical properties, anisotropy properties

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Investigation of the decay modes of superheavy nuclei with different theoretical models

Günel ALİYEVA*, Asım SOYLU

Niğde Ömer Halisdemir University
*aliyeva.gun.1997@gmail.com

More recently, the investigation of alpha decays of superheavy nuclei has become at the forefront of interesting topics as experimental. This alpha decay, the unstable nucleus or isotope, continues as a chain until it becomes a stable isotope. As the number of rings in this chain is evident in theories, they are seen as indirect evidence of the formation of some super-heavy elements. This interesting alpha decay process is not fully understood.

Another energetically possible decay for super-heavy nuclei is the spontaneous fission. Since the fission decay is more complex and there are many uncertainties in the fission process, it is very difficult to explain such a multi-dimensional system in a complete microscopic manner. There are various models in the literature used in order to calculate SF half-lives. However, there is no model that is fully compatible with experimental measurement.

There is no model that allows to know which decay modes dominates in the nucleus before the experimental studies. In this study, alpha and spontaneous fission decay of super-heavy nuclei with Z=125 proton number have been investigated with different models. These calculations have been performed with the Python program code whose name is the MES. The results have beencompared with the results in the literature and some new decay modes have been estimated for isotopes of Z = 125 superheavy nuclei.

Keywords: Alpha decay, superheavy nuclei, spontaneous fission, Python

Acknowledgment: This study has been supported by the TÜBİTAK 1001 project grant number with118R028.

Mechanical Properties of Sodium and Nano Sized Tin doped Bi-2212 Superconductors

Mehmet Ersin AYTEKİN[1], Berdan ÖZKURT[2]

[1]Mersin Üniversitesi İleri Teknoloji Eğitim Araştırma ve Uygulama Merkezi
[2]Tarsus Üniversitesi Enerji Sistemleri Mühendisliği
berdanozkurt@tarsus.edu.tr

Purpose and method: In this study, Superconducting samples in the $Bi_2Sr_{2-x}(SnO_2)_xCa_1Cu_{1.75}Na_{0.25}O_y$ (x = 0.0, 0.05, 0.1, 0.20) composition were produced using the conventional solid-state reaction method. The effect of sodium and nano-size tin doping on the mechanical properties of Bi-2212 superconductors has been analyzed using SEM (Scanning Electron Microscope), Vickers microhardness and Roughness measurements.

Results and conclusions: In the microstructure analysis of the samples, the formation of randomly oriented grains, which is the general behavior of the samples produced by the solids reaction method, was observed. As can be clearly seen from the SEM measurement results, the surface morphology of the samples consisted of plate-like grains indicating the presence of the Bi-2212 high temperature phase. The formation of less porous structure and grain boundaries was observed in x = 0.5 nano sized the tin sample. On the other hand, the mechanical properties of the samples were analyzed by Vickers Microhardness and roughness measurements. In the obtained microhardness test results, highest hardness value were detected in x = 0.1 tin doped samples. The surface roughness values of the samples have been increased with increasing nano sized tin contents. In the results obtained from the surface roughness measurement, highest roughness value among samples has been observed in sample including x =0.2 nano-sized tin.

Keywords: $Bi_2Sr_{2-x}(SnO_2)_xCa_1Cu_{1.75}Na_{0.25}O_y$, SEM, Microhardness, Roughness

Methodology Of Analysis For The Data Using NUMEXO2 Coupled With EXOGAM2 Detector

BOZKURT V* and ERTURK S

Nigde Ömer Halisdemir University, Physics Dept., Nigde, Turkey
*vakkas.bozkurt@gmail.com

In this study, we will introduce and show the performance of the final design digital electronic namely NUMEXO2 coupled with EXOGAM2 (EXOtic GAMma array) detector system at GANIL in France. This electronic has been developed due to the necessity of high rate signal transferring capacity when a radioactive ion beam is applied in order to produce exotic nuclei and to understand their nuclear structure.

In this presentation, methodology of analysis for the data taken during the test experiment at GANIL using NUMEXO2 coupled with EXOGAM2 detector will be explained. Furthermore details of NUMEXO2 digital electronic and characteristics of the EXOGAM2 detector system will be presented.

Acknowledgment: We acknowledge TUBİTAK (project Number : 114F473).

DFT Investigation of Large Macrocycles on Noble Metals: Metalated and Unmetalated Pyrphyrins on Ag(111) Surface

Yeliz Gürdal

Adana Alparslan Türkeş Bilim ve Teknoloji Üniversitesi
ygurdal@atu.edu.tr

Self-assembled monolayers (SAMs) on metal surfaces have inspired many interesting applications, such as chemical and biological sensors, molecular electronics, magnetism, and protective coatings. Thus, understanding the organic molecule and metal interface gains considerable importance. In this respect, we investigate a relatively unexplored porphyrin-related macrocycle, named as Pyrphyrin (Pyr), on Ag(111) surface by means of Density Functional Theory (DFT). To the best of our knowledge this is the first theoretical study characterizing the interface between Pyrphyrin and the Ag(111) surface. We have compared several adsorption configurations of both Pyr/Ag(111) and Cobalt incorporated Pyrphyrin, CoPyr/Ag(111) complexes and characterize energetically the most favorable configuration for each system. A detailed analysis of electronic structure together with investigation of molecular orbital distributions are also carried out. Our results show that main contribution to the adsorption energy is the dispersive contribution arising due to the interactions between the molecules and the surface. Optimal coordination of two cyano Ns and Co atoms (for CoPyr) to the surface Ag atoms determine preferred adsorption sites. Cobalt incorporation into the Pyr core, on the other hand, further increases the adsorption strength by contribution of the attractive interactions between Co and Ag atoms. Though, comparison with previous studies reveals that unmetalated and metalated Pyrphyrins adsorb on Ag(111) surface weaker than the adsorption observed on the Au(111) surface. Selected molecular orbital representations of the complexes reveal the extension of orbitals located on Co and/or on two cyano N towards surface Ag atoms, thus, hybridization between molecular and surface states upon adsorption are confirmed.

Keywords: Density Functional Theory, Ag(111), cobalt-pyrphyrin, adsorption, hybridization

Effect of growth velocity on microstructure of directionally solidified 7075 alloy

E. Nergiz[1*], E. Çadırlı[2], H. Kaya[3], U. Büyük[3], M. Şahin[4]

[1]Niğde Ömer Halisdemir University, Institute of Science, Department of Physics, Niğde, Turkey, *emelnergiz1@yahoo.com.tr
[2]Niğde Ömer Halisdemir University, Faculty of Arts and Sciences, Department of Physics, Niğde, Turkey
[3]Erciyes University, Education Faculty, Department of Science Education, Kayseri, Turkey
[4]Niğde Ömer Halisdemir University, Technical Vocational School of Sciences, Niğde, Turkey

7075 alloys were prepared using metals of 99.99% high purity in the vacuum atmosphere. These alloys were directionally solidified upwards under various growth velocities (8.3–166.0 μm/s) using a Bridgman-type directional solidification furnace. Dendritic spacings (λ_{1L}, λ_{1T}, λ_2) were measured from both longitudinal and transverse sections of the samples. The λ_{1L} decreased from 434.3 to 190.1 μm, the λ_{1T} decreased from 380.2 to 169.7 μm, and the λ_2 decreased from 41.1 to 12.2 μm with increasing growth velocity from 8.3 to 166.0 μm/s. Exponent values of the V for the λ_{1L}, λ_{1T} and λ_2 were calculated as 0.26, 0.27 and 0.41, respectively.

Keywords: 7075 alloy, Primary dendritic arm spacing, Secondary dendritic arm spacing

Savunma Sanayinde Nanoteknoloji

Oğuzhan KOSALI[1], Memduh KARA[2]

[1]Mersin Üniversitesi, Fen Bilimleri Enstitüsü, Nanoteknoloji ve İleri Malzemeler Anabilim Dalı
[2]Mersin Üniversitesi, Mühendislik Fakültesi, Makine Mühendisliği Anabilim Dalı
oguzhankosali@hotmail.com

Amaç ve yöntem: Nanoteknoloji, atomların tek tek kullanılarak; makro dünyada olmayan niteliklere sahip aygıtların üretilmesi ve kullanılması alanı olarak bilinmektedir. Türkçeye "moleküler üretim" diye çevrilebilecek olan nanoteknoloji disiplin dalı her geçen gün önemini artırmakta ve çok çeşitli alanlarda kullanılmaktadır. Nanoteknoloji, bilişim ve haberleşmeden, savunma sanayi, uzay ve uçak teknolojileri ve hatta moleküler biyoloji ve gen mühendisliğine kadar birçok konuda yenilikler getirmiştir. Yerli ve milli savunma sanayi ürünleri ihtiyacı her geçen gün artmaktadır. Ülkemizde nanoteknoloji uygulamalarının savunma sanayimizde kullanılmasıyla dışa bağımlılığımız azalacaktır. Nanoteknolojinin savunma sanayinde kullanılmasıyla çok daha hafif ve dayanıklı malzemelerin üretilmesi, eğitim için yapay sanal sistemler geliştirilmesi, insansız kara/deniz/hava araçları yapılması, minyatür sensörler, yüksek hızlı işlemci ve iletişim araçları kullanılması, beyin-makina arayüzünü sağlayan sistemlerin yaratılması sağlanacaktır. Çalışmamızda uluslararası ve ulusal düzeyde savunma sanayi alanındaki nanoteknoloji çalışmaları incelenmiştir.

Bulgular ve sonuçlar: Uluslararası alanda savunma sanayinde yapılan nanoteknoloji çalışmaları, robot bilimleri, akıllı üniformalar, hafif koruyucu elbiseler, beyin-makine etkileşimi, esnek görüntü sistemleri, akıllı tekstiller, biyoakışkan sensörler, yapay organ ve kan, hedefe ilaç dağıtımı, kablosuz sensörik aşılama, doku mühendisliği vb. alanlarda yoğunlaştığı görülmüştür. Ülkemizde yapılan nanoteknoloji çalışmaları ile de nanomalzemelerden üretilmiş hafif malzeme ve araçlar, nanokaplamalı zırhlar, mayın tarayıcı hassas nanosensörler, nanokaplamalar ile görünmezlik teknolojisi kabiliyeti, nanofiltrelere sahip gaz maskesi ve süzgeci, gömülü nanosensörler vb. sistemlere ulaşılması hedeflendiği gözlemlenmiştir.

Anahtar Kelimeler: Nanoteknoloji, Nanosensörler, Savunma Sanayi.

Altın Nanopartiküllerinin Sentezleme Yöntemi ve Kullanım Alanları

Oğuzhan KOSALI[1], Memduh KARA[2], Mehmet Ersin AYTEKİN[3], Berdan ÖZKURT[3]

[1]Mersin Üniversitesi, Fen Bilimleri Enstitüsü, Nanoteknoloji ve İleri Malzemeler Anabilim Dalı;
[2]Mersin Üniversitesi, Mühendislik Fakültesi, Makine Mühendisliği Anabilim Dalı;
[3]Tarsus Üniversitesi**,** Teknoloji Fakültesi, Enerji Sistemleri Anabilim Dalı,
oguzhankosali@hotmail.com

Amaç ve yöntem: Yunanca nanos kelimesinden gelen nano, metrenin milyarda biri (10^{-9}) anlamına gelmektedir. İyi bilindiği gibi Amerikan Test ve Malzeme Derneği nano boyutta bir parçacığı 1-100 nm aralığında tanımlamaktadır. Nano kuantum boyutları ve geniş yüzey alanı gibi özelliklerinden dolayı mikro boyutlara sahip malzemelere göre geliştirilebilir fiziksel ve kimyasal özelliklere sahiptir. Diğer bir taraftan nano boyutta partiküller arasında Altın nanopartikülleri soy metal nanopartiküllü olarak isimlendirilir. Asal metallerin nanoyapılı partikülleri, özellikle altın nanopartiküller (AuNP'ler), katalitik özelliklerinin yanı sıra, etkili elektronik, optik ve termal özelliklerine ve fizik, kimya, biyoloji, tıp ve malzeme bilimi alanları ile bunların farklı disiplinler arası alanlarındaki potansiyel uygulamalarına bağlı olarak büyük ilgi görmektedir. Bu partiküllerin çevresel değişiklikler üzerine hassasiyeti ve görünür bölgede optik rezonansı önemli fotonik özelliklerindendir. Sunulan çalışmada geçmişten günümüze literatürde bulunan Altın nano partiküllerinin sentezleme yöntemi ve kullanım alanları araştırılmıştır.

Bulgular ve sonuçlar: Literatürden iyi bilindiği gibi nano boyutta Altın partiküllerinin sentezlenmesi için birçok yöntem kullanılmaktadır. Genel olarak kullanılan işlemler "top-down (yukarıdan aşağıya)" yaklaşımı ve "bottom-up (aşağıdan yukarıya)" yaklaşımı olarak sınıflandırılabilir. Bu sınıflandırılmalar arasında AuNP'lerin sentezlenmesinde kullanılan en yaygın metot Turkevich ve Brust-Schiffrin metodu olarak bilinmektedir. Altın nanopartiküller düşük toksisitesi, biyouyumluluğu, boyutunu kontrol edilebilmesi ve yüzey modifikasyonları nedeniyle biyoteknoloji ve tıpta sıklıkla tercih edilmektedir. Özellikle kanser tedavisinde ilaç taşıyıcı olarak kullanımı yapılmakta ve geliştirilmektedir. Ayrıca dolaşımda uzun yarı ömre sahip olması nedeniyle biyosensör ve görüntüleme ajanları olarak kullanımı da yaygınlaşmaktadır.

Anahtar Kelimeler: Nanopartiküller, Altın Nanopartikülü, Turkevich Metodu, Brust-Schiffrin metodu.

Improved optical properties of density modulated ITO thin films for silicon based solar cell applications

Filiz KELEŞ*, Emre KARTAL, Ayşe SEYHAN

Fen Edebiyat Fak. Fizik Bölümü & Nanoteknoloji Uygulama ve Araştırma Merkezi
Niğde Ömer Halisdemir Üniversitesi
*fkeles@ohu.edu.tr

Indium tin oxide (ITO) is one of the most popular transparent conductive electrodes used in photovoltaic technology especially in silicon solar cells due to its high transparency and conductivity. It also behaves as an anti-reflective coating similar to nanostructures in order to capture the possible highest amount of incoming light. In this study, we investigated how the optical properties of ITO thin films are affected depend on their various thickness and material density values. For this purpose, we have deposited the density modulated ITO thin films by combining the high and low dense layers on different substrates. Additionally, we studied the homogeneity of the nanostructures synthesized by the wet chemical etching process on the low dense ITO coated textured silicon substrate. We operated the deposition at Ar gas pressure of 24 mTorr for high pressure sputter (HPS) and 3 mTorr for low pressure sputter (LPS) to obtain the low and high dense ITO thin film layers, respectively. The morphological and optical properties of the density modulated ITO thin films and nanostructures on HPS-ITO coated textured silicon were characterized. We observed that, as a result, the optical properties of the density modulated ITO thin films are improved by simply tuning the sputter working gas pressure. Moreover, it was found that the synthesized nanostructures on HPS-ITO are more homogenous which is desired for further enhanced absorption. In conclusion, HPS is a simple and effective method might be quite useful on the fabrication of ITO top layers on silicon solar cells.

Keywords: indium tin oxide (ITO), density modulated thin film, sputter, optical properties

Ferromagnetic Resonance and Applications to Nanostructures

O. Yalçın[1,*]

[1]Department of Physics, Nigde Ömer Halisdemir University, 51240 Niğde, Turkey
[*]yalcin@ohu.edu.tr

Magnetic structures can be classified as paramagnetic, diamagnetic, ferrimagnetic, antiferromagnetic and ferromagnetic to their magnetic moment order. Ferromagnetic resonance (FMR) is a very sensitive method for measuring the magnetic properties of materials depend on saturation magnetization, magnetic anisotropy, magnetostatic interaction investigation, linewidth, Landé g-factor and shape of the specimen [1-3]. FMR is widely used for investigation and characterization of different magnetic materials such as nanoparticles, thin films, nanowires, superparamagnetic magnets, exchange-spring and multilayer structures. Origin of the magnetism is the presence of a spontaneous order which is produced by a parallel alignment of spins. In the other words, the magnetization of the structures is derived by electrons moving around the nucleus of an atom. The teoretical and experimental results of the magnetic nano-structures such as nanowires, superparmagnetic structures, nanoparticles, thin films, multilayers and spring magnets are presented in detail in this work.

Keywords: Ferromagnetic resonance, nanowires, thin films, multilayer

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[3] https://www.springer.com/la/book/9783319052984

Investigation of Capacitive Properties of Cationic Dye Loaded Hydrogels

R. Coşkun[1], M. Okutan[2], M. Öztürk[3,*] O. Yalçın[4]

[1]*Department of Chemistry, Yozgat Bozok University, 66500 Yozgat, Turkey*
[2]*Department of Physics, Yıldız Technical University, 34210, Istanbul, Turkey*
[3]Zübeyde Hanım Health Services Vocational High School/*Department of* Opticianry Program*, Niğde Ömer Halisdemir University, 51240 Niğde, Turkey*
[4]*Department of Physics, Niğde Ömer Halisdemir University, 51240 Niğde, Turkey*
[*]*muhittin.ozturk@ohu.edu.tr*

Different cationic dyes (Methylene-Blue, Rhodamine-B and Methylene-Blue/Rhodamine-B) loaded hydrogels were prepared for capacitive measurements by using the radical polymerization technique. Frequency evolution of the capacitance and the surface resistivity for all samples have been performed by impedance spectroscopy (IS) at room temperature in the frequency range of 100 Hz to 40 MHz. The complex dielectric constant-based Cole-Cole plots (ε″-ε′) and their adopted to the synthetic equivalent electric circuits were analyzed. Electrode polarization effects were dominant on the capacitance and surface resistivity values for all samples at the low frequency region. At the high frequency zone, it is determined that decrease in the capacitance values were caused from the interaction between cationic dye ions and hydrogels band, and the cationic dyes ion-migration in the hydrogels channels. Results from this study were showed that Methylene-Blue, Rhodamine-B and Methylene-Blue/Rhodamine-B dyes loaded hydrogels can be an inspiring material for capacitance applications [1-4].

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Radiative and Non-radiative Decay of a Magnetic Dipole Near a Metallic Nanoellipsoid

Nurgül AKINCI

Zonguldak Bulent Ecevit University, Physics Department
nurozdede@hotmail.com

It is studied the spontaneous emission of a magnetic dipole near a triaxial ellipsoid-shaped metallic nanoparticle, with the aim to clarify the distance dependence of the radiative and non-radiative decay rates. The numerical results show that the dipole's position changes quitely the emission properties and an ellipsoid structure can be used for an efficient control of the decay rate of a magnetic dipole. The distance dependence of the radiative decay rate is subtle and the different behavior from the non-radiative decay rates implies that the apparent quantum yield always vanishes at short distance.

Keywords: Magnetic dipole, nanoellipsoid, radiative decay rate, quantum yield

Investigation of Structural Properties of $Cu(In,Ga)(Se_{1-y}Te_y)_2$ Thin Films Deposited on Flexible Substrate

Yavuz Atasoy[1,2*], Mehmet Ali Olğar[2], Bülent M. Başol[3], Murat Tomakin[4], Ali Çiriş[2], Emin Bacaksız[5]

[1]Department of Opticianry, Nigde Omer Halisdemir University, Nigde, Turkey
[2]Nanotechnology Application and Research Center, Nigde Omer Halisdemir University, Nigde, Turkey
[3]Active Layer Parametrics, 5500 Butler Lane, Scotts Valley, CA 95066, ABD
[4]Department of Physics, Recep Tayyip Erdogan University, Trabzon, Turkey
[5]Department of Physics, Karadeniz Technical University, Trabzon, Turkey
[*]yavuzatasoy@ohu.edu.tr

$Cu(In,Ga)Se_2$ (CIGS) based solar cells have occurred as promising material for a renewable energy technology due to their potential advantages (high absorption coefficient, convenient band gap). However, due to the Ga ratio in the structure determines the energy band gap and a homogeneous Ga distribution, is required for high conversion efficiency in CIGS solar cells. Therefore, in our study, it is aimed to investigate the effect of Te content on the structural properties of CIGS thin film. $Cu(In,Ga)(Se_{1-y}Te_y)$ (CIGST) thin films with different chalcogen atomic ratios (y = 0, 0.5 and 1) were grown on molybdenum coated flexible substrate via electro-deposition and e-beam evaporation methods. Then, these thin films annealed in Ar(%95)+H_2(%5) atmosphere at 600°C for 60 minutes. Structural characterizations were performed by X-ray diffraction (XRD), energy dispersive spectroscopy (EDS) and scanning electron microscope (SEM). The diffraction peaks from (112), (220/204) and (312/116) planes were observed clearly in XRD patterns for all of the samples. The 2θ values for the (112) peaks shift toward the small angles can be explained by the replacement of Se with Te in the lattice. By using XRD data, full-width half maximum, crystal grain size and lattice parameter of the samples were calculated and the effect of Te content on the variation of the parameters were discussed in detail. EDX measurements revealed chemical characterization of the samples and surface morphology of the thin films were determined by SEM images.

Keywords: $Cu(In,Ga)(Se_{1-y}Te_y)_2$ thin film, flexible substrate, two-stage process

Dynamic susceptibility for a spin-1 Ising model using the path probability method

Songül Özüm[1], Rıza Erdem[2]

[1]Alaca Avni Celik Vocational School, Hitit University, 19600, Çorum, Turkey ,
[2]Akdeniz University, 07058, Antalya, Turkey
songulozum@hitit.edu.tr

The nonlinear rate equations based on the path probability method is used to derive the dynamic (or complex) susceptibility (χ) for a spin-1 Ising model with bilinear and biquadratic interactions when the external magnetic field exists. Firstly, the rate equations are linearized. Then, these are solved in the presence of an oscillating external magnetic field. From the real and imaginary parts of χ, the magnetic dispersion and absorption factors are found. Temperature dependence of these quantities in the ferromagnetic and paramagnetic phase regions (as well as their critical properties) are presented. Finally, the theoretical results are compared with those obtained using irreversible thermodynamics.

Keywords: Spin-1 Ising model, Dynamic susceptibility, Path probability method.

Dünya ve Türkiye'de Bazı Nanoteknoloji Çalışmaları

F. Ceyhan[1], S. Özüm[2]

[1]Niğde Ömer Halisdemir Üniveristesi Eğitim Bilimleri Enstitüsü, 51240 Niğde
[2]Hitit Üniversitesi, Alaca Avni Çelik MYO, Elektronik ve Otomasyon Bölümü, 19600, Çorum
ceyhanfatih@outlook.com.tr

Atom, maddenin tüm özelliklerine sahip**,** hücre ise canlının tüm özelliklerini gösteren en küçük yapılardır. Büyüklük olarak karşılaştıracak olursak, hücre yaklaşık olarak atomdan 100.000 defa daha büyüktür. "Nano" sözcük olarak, metrenin milyarda birine karşılık gelir. İnsan saç telinin çapının yaklaşık 100.000 nanometre olduğu düşünülürse ne kadar küçük bir ölçekten bahsedildiği daha kolay anlaşılabilir. 100 nanometre ve daha küçük ölçeklerde aktif özellik sergileyen atom ve moleküller topluluğundan oluşan nanoteknoloji ise bu özelliklerinden dolayı disiplinler arası bir çalışma alanı sunmaktadır. Nano boyutlardaki malzemelerin bulk malzemelere göre ısı, sıcaklık ve boyut gibi çok sayıda farklı/yeni özelliklerinden dolayı yeni nesil teknoloji devrimi olan nanoteknolojinin önemli ayaklarından birisini oluşturmaktadır. Bu çalışmada, nanomalzemeler, nanofabrikasyon, nanokarekterizasyon, nano ölçekte kuantum bilgi işleme, nanofotonik, nanoelektronik, nanobiyoteknoloji ve nanomanyetizma gibi alanlarda ülkemiz ve Dünyada yapılan bazı çalışmaların karşılaştırması yapılacak olup, bazı nanoteknoloji araştırma merkezleri, bu merkezlerde yapılan bazı çalışmalar, nanoteknoloji alanında yapılan yayınların karşılaştırılması ve özel sektörlerdeki nanoteknoloji çalışmaları verilecektir. Nanoteknoloji alanında Türkiye ve Dünyada yapılan makale ve patent sayılarının karşılaştırılması yapılacak olup ayrıca sektörlere göre nanoteknoloji patent başvurularının ülkelere göre dağılım oranları verilecektir. Bunlara ek olarak nanoteknoloji alanındaki ülkelerin yatırımları, eksiklik ve motivasyonları üzerinde durulacaktır.

Anahtar Kelimeler: Nanoteknoloji, Nanoboyut, Nanoteknoloji Çalışmaları

Adjustment of Growth of Cu_2ZnSnS_4 (CZTS) Absorber Layer at Low Temperature for Thin Film Solar Cells

M.A. Olgar [1,2*], Y. Atasoy [2,3], A. Seyhan [1,2], and, R. Zan [1,2]

[1]Department of Physics, Nigde Ömer Halisdemir University, Merkez, 51240, Nigde, Turkey
[2]Nanotechnology Application and Research Center, Nigde Omer Halisdemir University, Nigde, Turkey
[3]Department of Opticianry, Nigde Omer Halisdemir University, Nigde, Turkey
*mehmetaliolgar@ohu.tr

$Cu(In,Ga)(S,Se)_2$ (CIGS)-based thin film solar cells have high device efficiency (>20%) [1], however scarcity and high cost of materials used in these devices limit manufacturing volume of this type of solar cells. Kesterite-structured $Cu_2ZnSnS(e)_4$ (CZTS(e)) materials are considered to be an alternative to CIGS, and they have drawn much attention due to their abundant constituent elements and superior optical properties. CZTS(e) has a suitable optical band gap energy ranging 0.9-1.6 eV and high optical absorption coefficients (≥ 10^4 cm^{-1}) in the visible part of the solar spectrum [2,3]. Although the theoretical conversion efficiency for CZTS(e)-based solar cell is estimated to be over 30% [4], the current record efficiency is only 12.6% [5]. Therefore, further optimization should be performed to increase conversion efficiency CZTS-based solar cells. In this study CZTS thin films were fabricated by a two-stage process includes sputter deposition of metallic Cu, Zn, and Sn on Mo coated glass substrates and sulfurization process at 500 °C for various dwell times using Rapid Thermal Processing (RTP) approach. The X-ray diffraction (XRD), Raman spectroscopy, Scanning Electron Microscopy (SEM), Energy Dispersive X-ray Spectroscopy (EDX), and photoluminescence were employed to characterize the CZTS thin films. These characterizations help to determine the most promising growth parameters for fabrication of CZTS thin films at low reaction temperature.

Keywords: Cu_2ZnSnS_4 (CZTS), sputtering, reaction temperature, sulfurization.

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n-tipi Grafen Sentezi ve Karakterizasyonu

Recep Zan, Ali Altuntepe

Nanotechnology Application and Research Center, Niğde Ömer Halisdemir University, Niğde, 51240, Turkey
recep.zan@ohu.edu.tr

Grafenin yüksek dayanımı, yüksek elektrik iletkenliği, yüksek optik geçirgenliği gibi üstün özellikleri bir atom kalınlığına sahip bu malzemeyi ilgi çekici hale getirmektedir. Bu özellikler grafeni güneş hücreleri, transistörler, sensörler, yakıt pilleri gibi birçok uygulama için önemli bir malzeme haline getirmektedir. Tüm üstün özelliklerinin yanı sıra grafen temel anlamda sınırlayıcı özelliklere de sahiptir; sıfır bant aralığı ve yüksek tabaka direnci (sheet resistance) gibi eksiklikleri bulunmaktadır. Bu sorunlar grafenin elektronik uygulamalarını sınırlamakta ve hatta bazı uygulamalarda kullanılamamasına sebep olmaktadır. Grafenin eksik yönleri olarak kabul edilen bu özellikleri çok katmanlı grafen sentezi ya da kimyasal katkılama gibi yöntemlerle giderilebilmektedir. Grafenin yüksek tabaka direncinin azaltmak ve farklı kullanım alanlarda uygulanabilirliğini arttırmaya amacıyla grafene kimyasal katkılama (doping) işlemi uygulanmıştır.

Grafen sentezi için ise öncelikle karbon kaynağı olarak metan (CH_4) ve ayrıştırıcı gaz olarak ise hidrojen (H_2) kullanılmıştır. Kimyasal katkılama işlemi ise üretim sırasında amonyak (NH_3) gazı kullanılarak gerçekleştirilmiştir. Katkılama için 5 sccm' den 15 sccm' e kadar NH_3 ile birlikte CH_4 gönderilmiştir. Elde edilen numuneler Raman spektroskopisi, SEM-EDS ve XPS kullanılarak karakterize edilmişlerdir. Bu kapsamda amonyak ve metan gaz akış oranlarının katkılamaya etkisi, katkılamanın başarısı ve grafen kalitesine olan etkisi incelenmiştir. Raman spektroskopisi sonuçlarından NH_3 miktarının artışı ile grafen yapısının tek katmadan çok katmanlı yapıya doğru geçtiği gözlenmiştir. Bunun yanı sıra 5 sccm NH_3 için %1.5' luk katkılama oranının gerçekleştiği diğer karakterizasyon yöntemleri (EDS ve XPS) ölçümleri ile tespit edilmiştir.

Bu çalışma TÜBİTAK tarafından 117M401 nolu proje ile desteklenmiştir.

Anahtar Kelimeler: grafen, doping, CVD, direnç

Optoelectronic Properties of Graphene vs. ITO

Ali Altuntepe, Ayşe Seyhan and Recep Zan

Nanotechnology Application and Research Center, Niğde Ömer Halisdemir University, Niğde, 51240, Turkey
recep.zan@ohu.edu.tr

Graphene has become one of the most attractive materials in recent years as it has remarkable properties such as a high optical transparency, conductivity, flexibility and durability. Graphene layers can be obtained via various techniques; however, growing graphene through chemical vapor deposition (CVD) technique provides large-scale single layer graphene with high homogeneity. Besides many good properties, graphene has few drawbacks like high sheet resistance and missing energy band gap. The sheet resistance of the graphene is higher than its rival that is indium tin oxide (ITO). In order to employ graphene as transparent conductive electrode in many optoelectronic applications, the sheet resistance somehow should be lowered to be competitive with the ITO.

In this research, a systematical study has been conducted regarding graphene and ITO fabrication and sheet resistance comparison. Graphene films were grown with different recipes on different types of copper substrates in the CVD furnace to find out the effect of growth process on the sheet resistance. Additionally, ITO thin films with different thicknesses were obtained on glass substrates via physical vapor deposition (PVD) technique. Finally, the obtained films sheet resistance and optical transparency values were compared. So, the sheet resistance of the single layer graphene films have been found to range from ~300 to ~900 Ω/sq with approximately 98% optical transmission. However, ITO sheet resistance values were between 30 and 300 Ω/sq for different ITO thickness. While the sheet resistance increased with the decreasing thickness of the ITO film, the optical transmission improved.

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Keywords: graphene, ITO, sheet resistance, transparent conductive electrode

A method to Recycle c-Si HIT Solar Cells

Elif Damgacı[1,2], Tolga Altan[2] and Ayse Seyhan[1,3]*

[1]Nanotechnology Application and Research Center, Nigde Omer Halisdemir University, Nigde 51240, Turkey
[2]Mechanical Engineering Department, Nigde Omer Halisdemir University, Nigde 51240, Turkey
[3]Physics Department, Nigde Omer Halisdemir University, Nigde 51240, Turkey
aseyhan@ohu.edu.tr, elifdamgaci@gmail.com

The increasing impacts of climate change and the serious economic and political consequences of the reduction of fossil fuel reserves have recently created an urgency to shift our energy resources towards renewable energy sources which led to significant growth of PV market. However, the growth of the photovoltaic market has brought new environmental problems such as many solar panels which reached their end of life. While this situation creates a big problem for the environment, the solutions and technologies to be developed in this area have the potential to create a new big market. The recycled Si can be used as Si wafer, Si ingot, and Si powder in the photovoltaic field. In this study, the development of the Si-based heterojunction (c-Si HIT) solar cell recycling process has been studied. The removal of front and rear side of metallization (Ag) and the ITO layer, which is used as the transparent conductive oxide layer, has been successfully carried out. To dissolve silver (Ag) from the c-Si HIT cells, HNO_3 was used at different concentrations and durations. The reagents HF (48%) + HNO_3 (70%) + H_2SO_4 (97%) + CH_3COOH (99%) were used for the removal of ITO layer. It was confirmed that the metallization and ITO layers were completely removed by using Scanning Electron Microscope (SEM) equipped with Energy-Dispersive X-ray Spectrometer (EDX). The removal studies on doped and undoped a-Si:H layers has been continued. For next studies, we will focus on c-Si HIT solar cell fabrication and characterization on the recycled wafers.

Keywords: Recycle, Renewable Energy, Solar Cell, Heterojunction

Vibrational stability of $RNiAl_3$ (R=Sc, Y) Compounds

Mehtap Altay[1,2], Hacı Ozisik[2], Engin Deligoz[2], HavvaBogaz Ozisik[2]

[1]Ministry of National Education, Yenikent Anatolian High School, TR-68210, Aksaray, Turkey
[2]Department of Physics, Faculty of Arts and Sciences, Aksaray University, TR-68100 Aksaray, Turkey
mehtap_altay_@hotmail.com

A large number of ternary compounds have been reported in the R–Ni–Al systems, where R is a rare earth element. The structures of these aluminides belong to seventeen different structure types [1-2]. We have used to ab-initio methods for determining the structural and vibrational properties for the $ScNiAl_3$ and $YNiAl_3$ compounds in orthorhombic Pnma structure (Spg No:62) [1]. All calculations have been carried by using the VASP code [4-5] based on the density functional theory (DFT). The electron–ion interaction was considered in the form of the projector-augmented-wave (PAW) method with plane wave up to an energy of 500 eV [7], an adequate value for studying the physical properties. Perdew–Burke–Ernzerhof (PBE) type functional [3] within the generalized gradient approximation (GGA) has been used for the exchange and correlation terms in the electron–electron interaction. 6x11x4 Monkhorstand Pack [6] grid of k-points has been used.The present phonon frequencies of $ScNiAl_3$ and $YNiAl_3$ compounds are calculated using the Phonopy code [8] and DFPT methods. The phonon dispersion curves have been calculated in high symmetry directions using 2x1x2 supercell. Also, the temperature dependent free energy, entropy and heat capacity quantities were calculated and discussed.

Keywords: $YNiAl_3$, $ScNiAl_3$, DFPT, Phonon

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Structural, Electronic and Nonlinear Opotical Properties of (E)-4-((3,5-dichloro-2-hydroxybenzylidene)amino)-N-(5-methylisoxazol-3-yl) benzenesulfonamide

Hamit ALYAR[1] and Saliha ALYAR[2]

[1]Department of Physics, Faculty of Sciences, Çankırı Karatekin University,Çankırı,Turkey
[2]Department of Chemistry, Faculty of Sciences, Çankırı Karatekin University, Çankırı,Turkey
halyar@karatekin.edu.tr

Sulfamethoxazole is an antibiotic which is derivatives of sulfonamide. It was used for bacterial infections such as urinary tract infections, bronchitis, and prostatitis and is effective against both gram negative and positive bacteria such as Listeria monocytogenes and E. coli.

In this study, structure of the derivative of sulfamethoxazole ((E)-4-((3,5-dichloro-2-hydroxybenzylidene)amino)-N-(5-methylisoxazol-3-yl) benzenesulfonamide) were optimized using Density Functional Theory (DFT) method and B3LYP/6-311++G(d,p) theory level. Minimum energy and molecular dipole moment of studied compound evaluated as -2440.17 a.u. and 6.36 D. Linear and Nonlinear optical properties(NLO), HOMO, LUMO molecular orbital energies, chemical reactivity descriptors (such as; molecular hardness, molecular softness, electrophilic index,… etc.), Mulliken atomic charges and molecular energy surfaces of the studied compound calculated with the same method and basis set. It found that, the first static hyperpolarizability of studied compound is 1868.56 times larger than that of urea (0.3728x 10^{-30} esu). Energy band gap of studied compound were found as 1.32 eV.

Keywords: Sulfamethoxazole; HOMO, LUMO; DFT, NLO.

Spectroscopic, Electronic and Nonlinear Opotical properties of 2-thiophene carboxaldehyde-sulfametrole

Hamit ALYAR[1] and Saliha ALYAR[2]

[1]Department of Physics, Faculty of Sciences, Çankırı Karatekin University,Çankırı,Turkey
[2]Department of Chemistry, Faculty of Sciences, Çankırı Karatekin University, Çankırı,Turkey
halyar@karatekin.edu.tr

Sulfonamides were the first drugs found to act selectively and could be used systematically as preventive and therapeutic agents against various diseases. Sulfur ligands are widespread among coordination compounds and are important components of biological transition metal complexes.

In this study, structure of 2-thiophene carboxaldehyde-sulfametrole were optimized using Density Functional Theory (DFT) method and B3LYP/6-311++G(d,p) theory level. Minimum energy and molecular dipole moment of studied compound evaluated as -2180.74 a.u. and 7.02148 D. Vibrational assignments, HOMO, LUMO molecular orbital energies, chemical reactivity descriptors (such as; molecular hardness, molecular softness, electrophilic index,… etc.), Nonlinear optical properties(NLO), Mulliken atomic charges and molecular energy surfaces of the studied compound calculated with the same method and basis set. Energy band gap of studied compound were calculated as 1.98 eV.

Keywords: Sulfonamides; HOMO, LUMO; DFT, NLO.

Katkılı Biyoaktif Camların Etkin Atom Numaralarının Karşılaştırılması

Özge Kılıçoğlu

Üsküdar Üniversitesi, Sağlık Hizmetleri Meslek Yüksek Okulu
ozge.kilicoglu@uskudar.edu.tr

Bu çalışmada 0.02 MeV ve 20 MeV foton enerji aralığında katkılı biyoaktif camların zırhlama özellikleri incelenmiştir. Kütle azaltma katsayısı (μ/ρ) ve etkin atom numarası (Z_{eff}), ortalama serbest yol (MFP) ve yarı değer kalınlığı (HVL) gibi parametreler zırhlama özelliğinin belirlenmesinde oldukça önemlidir. Bu parametrelerin teorik, pratik ve deneysel olarak farklı materyaller üzerinde test edilmeleri ve çalışılmaları zırhlama özelliklerinin tespiti için gereklidir. Bu bağlamda uygulama amaçlı farklı maddelerle katkılanmış biyoaktif camların bu parametreler bağlamında çalışılması gerekmektedir. Biyoaktif camlar özellikle medikal ve ortopedik uygulamalarda sıklıkla kullanılan ve son dönemde kullanım alanı hızla genişlemiş malzemelerdir. Biyoaktif camların zırhlama özellikleri ise literatürde fazla ele alınmamıştır. Bu çerçevede literatürde bulunan bu boşluktan hareket eden ve bilimsel anlamda önemli katkı sağlayan bu makalede biyoaktif camların teorik zırhlama özellikleri kütle azaltma katsayısı (μ/ρ), etkin atom numarası (Z_{eff}), ortalama serbest yol (MFP) ve yarı değer kalınlığı (HVL) gibi parametreler kullanılarak hesaplanmaktadır.

Anahtar Kelimeler: Zırhlama özellikleri, Yarı değer kalınlığı, Kütle azaltma katsayısı, Ortalama serbest yol, Etkin atom numarası

AUTOMOTIVE ENGINEERING

Numerical Investigation of 3-D Flow Structure Around A SUV Vehicle Model

Cihan BAYINDIRLI, Mehmet ÇELİK

Niğde Ömer Halisdemir Üniversitesi Teknik Bilimler Meslek Yüksekokulu
cbayindirli@ohu.edu.tr, mehmetcelik@ohu.edu.tr

One of the main subject of the automotive industry is to examine the flow structure around the vehicle by using numerical and experimental methods, and to develop vehicle design and aerodynamics accordingly. The aerodynamic structures of the vehicles have an effect on many parameters such as performance, fuel consumption, acceleration, road holding characteristics, emission values, cooling system, ventilation system, brake system, amount of noise from air flow around the vehicle. In this study, the drag force effecting a 1/50 scale SUV vehicle model which designed in SolidWorks© program and the 3D flow structure around the vehicle were investigated by computational fluid dynamics (CFD) method. Flow analyzes were performed at the free stream velocities of 20 m / s, 25 m / s, 30 m / s and 35 m / s using the k-ε turbulence model in Ansys Fluent CFD software. Flow analyzes were performed in the range of 3.2×105-5.7×105 Reynolds number where dynamic similarity was achieved. In study, the blockage rate was 6.22% and this value was lower than the blockage rate which accepted in the literature. The aerodynamic drag coefficient of the model vehicle was determined as 0.39. It was determined that 86.69% of the total drag force was pressure-induced and 13.31% was friction-induced. Flow separations on the model car body, pressure distributions and areas where high pressure based drag were determined by 3D flow imaging.

Keywords: CD coefficient, SUV model car, Ansys-Fluent, CFD, Drag force

Design and Analysis of a Drag Link Used in Heavy Commercial Vehicles

Mehmet Ziya OKUR[1,2*], Sami Gökberk BİÇER[1], Durmuş Ali BİRCAN[2], Abdulkadir EKŞİ[2]

[1]DİTAŞ Doğan Yedek Parça İmalat ve Teknik A.Ş, R&D Center, Niğde
[2]University of Cukurova, Faculty of Engineering and Architecture, Department of Mechanical Engineering, Adana
mehmetokur@ditas.com.tr

All vehicles must have the steering system for a safe driving. Drag link, an important component of the steering system in heavy commercial vehicles, is critical for the vehicle, because it allows the vehicle to travel safely by transmitting the rotational movement from the pitman arm linearly to the axle of the wheel. The drag links are mainly subjected to compressive loads, which causes buckling failure of drag link tubes. Furthermore, drag links are required to perform the expected function in narrow spaces in the vehicle package data and to be designed in different bends and geometries depending on the regulation requirements. These different bends and geometries affect to strength of the drag link. In this study, different tube raw materials were defined and calculated the buckling strength. Also, drag link tubes were analyzed in different compressive loads. Effects of these different compressive loads on tubes of the drag link were shown. Values obtained from the Finite Element Analysis (FEA) results were compared with each other.

Keywords: Design, Analysis, Drag Link, Steering System, Buckling Loads.

CIVIL ENGINEERING

A Framework for Signal Control to Support Efficiency, Sustainability and Human Health

Ghassan Abu-Lebdeh

Department of Civil Engineering, American University of Sharjah, PO Box 26666, Sharjah, UAE
gabulebdeh@aus.edu

This paper presents a conceptual framework for signal control where sustainability, human health, and aptness of control for autonomous vehicles (AV) are explicitly considered as objectives and guiding pimples. The key enabler of the dynamic speed-based control is the ability to strategically and dynamically alter speed both spatially and temporally. While the principle of using speed as a mean is not new, the notion of altering speed spatially and temporally-- made possible by communication, sensing, and computation technologies now ubiquitous to traffic control-- is novel. The core proposition here is that of using speed as a *control* variable as opposed to a constraint as traditionally is the case. Speed is to be optimized dynamically and used in controlling the signalized network. Such speed is an *operating* speed, not a speed limit. The paper demonstrates conceptually how control with dynamic operating speed can be used to realize not only typical traditional control objectives as improved traffic flow and safety, but also contemporary aims as sustainability and less driver stressful thus healthier conditions. The preliminary analysis shows that using dynamic speed (DS) control in signalized networks can increase throughput, decrease delay and number of stops, reduce speed noise and variation thus lowering the likelihood of crashes. The implications are obvious: DS control, when used synchronously with intelligent (dynamic) traffic signals, enables more sustainable traffic operations in signalized urban networks: higher traffic throughput, safer, fuel-conservative, reduced-emissions and reduced driver stress.

Keywords: Dynamic speed control, Intelligent signals, Sustainability, Health, Air pollution

Resource and energy efficiency in the preparation of concrete aggregates

Chal Otarbayev

L.N. Gumilyov Eurasian National University, 2 Satpayev str., Nur-Sultan, Kazakhstan
chal.otarbayev@gmail.com

One of the main trends in the change of modern production processes is to increase the efficiency of using energy-saving technologies, which affects the cost of production. Lean manufacturing should become a management concept based on the steady striving to eliminate all types of losses, which is associated with the modernization of existing production and management based on the use of the best world experience in energy saving as an ISO 50001 standard «Energy Management Systems — Requirements With Guidance for Use».

The enterprises of Kazakhstan are carrying out a restructuring of the energy supply, aimed at replacing the energy carrier of the main technological operations, optimization the storage of aggregates to reduce transportation costs and reduce the difference between the temperature of the incoming aggregate and the heating temperature, changes in heating methods, the introduction of specific standards and regulations of energy consumption per unit of production and ensuring compliance with these regulations. The article presents the comparative parameters of energy intensity of the processes of preparation of concrete aggregates.

Keywords: energy efficiency, concrete aggregates

Performance Analysis of Nano-Silica Modified Bitumen and Boron Oxide Filler Added Asphalt Coatings

Şebnem Karahançer, Mustafa Yasin Akbaş, Akten Cengizhan

Civil Engineering, Isparta University of Applied Sciences, 32260, Isparta
sebnemsargin@gmail.com , akbasmustafayasin@gmail.com,
cengizhanakten@gmail.com

The aim of the study was to evaluate the performance of Hot Mix Asphalt with Boron Oxide fillers and nano-silica modified bitumen in accordance with the SuperpaveTM volumetric mixing design procedure. Superpave mixture design is used to evaluate thermal cracks that will occur at low temperatures as a result of direct distortions, permanent deformations and material selection. In this study, the bitumen was modified with 0.3% nano-silica and the mixtures were replaced with 50% boron oxide (B2O3) to prepare the mixtures. Mechanical properties of modified bitumens with reference bitumen and nano silica additives were investigated. The optimum binding content for each ratio was determined. Based on the optimum binding ratios obtained from this bitumen mixture, the strength tests were performed considering the principles of Superpave mixture design. Then, the strength of the modified bitumen was investigated according to the indirect tensile strength test.

Keywords: Boron oxide, Bitumen, Nano Silica

Optimum Elastik Yaylar Üzerine Oturan Tımoshenko Konsol Kirişleri

Ersin AYDIN[1] ve Hüseyin ÇETİN[2]

[1]Niğde Ömer Halisdemir Üniversitesi Mühendislik Fakültesi
[2]Niğde Ömer Halisdemir Üniversitesi, Mühendislik Fakültesi, İnşaat Mühendisliği Anabilimdalı
eaydin@ohu.edu.tr

Bu çalışmada, elastik yaylar üzerine oturan Timoshenko tipi konsol kirişlerde, mesnetteki eğilme momentini minimize edecek optimum yay dağılımı incelenmiştir. Zaman tanım alanında yazılan hareket denklemlerine Fourier dönüşümü uygulanarak, frekans tanım alanında yönetici denklemler tanımlanmış ve transfer fonksiyonları türetilmiştir. Transfer fonksiyonlarına bağlı olarak tanımlanan mesnetteki eğilme momentinin genliği amaç fonksiyonu olarak düşünülmüş ve kirişin oturduğu yayların yay sabitleri tasarım değişkenleri olarak alınmıştır. Tasarım değişkenleri olarak alınan yay katsayılarının toplamı bir aktif kısıtlama ve her biri için de üst ve alt sınırlar pasif kısıtlamalar olarak alınmıştır. Optimallik kriterleri Lagrange Çarpanları yöntemi kullanılarak türetilmiştir. Optimizasyon problemini çözmek için gereken, duyarlılık analizlerinde kullanılacak olan denklemler analitik olarak türetilmiştir. Optimizasyonda gradyan temelli bir yöntem kullanılmıştır. Kirişin farklı modları için optimum tasarımlar bulunmuş ve bulunan optimum tasarımlar harmonik yükler altında zaman tanım alanında hesaplar ile test edilmiştir. Önerilen yöntem ve konsolun Timoshenko kirişine uygulanmasının sayısal sonuçları, hedeflenen yöntemin tüm modlar için optimum yay sertliği katsayıları bulmakta oldukça etkili olduğunu göstermektedir. Önerilen yöntem tasarımcılara konsol kirişlerini farklı harmonik titreşimler altında nasıl destekleyebilecekleri hakkında bir fikir verebilir.

Anahtar Kelimeler: Timoshenko konsol kirişi, transfer fonksiyonları, optimum yay tasarımı, Kiriş titreşimleri

Comparison of TSC-2018 and TSC-2007 Codes in terms of Equivalent Seismic Load Method

Mustafa Tolga COGURCU[1], Mehmet UZUN[2]

[1]Konya Technical University, Engineering and Natural Science Faculty, Civil Engineering Department, KONYA, TURKEY
[2]Karamanoğlu Mehmet Bey University, Engineering Faculty, Civil Engineering Department, KARAMAN, TURKEY
mehmetuzun@kmu.edu.tr

There are different methods used to calculate the effect of earthquake on structures. The most easily applied method is the equivalent seismic load method. In the equivalent seismic load method, each parameters affecting the earthquake behavior of the structure are expressed by one coefficient factor. Therefore, it is easy to apply.

The Seismic Code published in 2007 in our country was a very superficial code in terms of the parameters used to calculate equivalent seismic load. The fact that the parameters were not elaborated led to the deviation of the results obtained in the calculations. The deviation of the parameters from the actual earthquake behavior constitutes a risk for the earthquake safety of the structures. It causes insufficient performance of the structure during the earthquake. In the new code published in 2018, a more realistic structure behavior was demonstrated due to detailed parameters.

In this study, equivalent seismic load methods in TSC-2007 and TSC-2018 codes are examined. The parameters to be used in the calculations are discussed in detail. In addition, the base shear force was calculated on a sample structure and the results were compared.

Keywords: TSC-2007, TSC-2018, Equivalent Seismic Load Method

Approaches of Different Codes for Wind Load Calculation

Mustafa Tolga COGURCU[1], Mehmet UZUN[2]

[1]Konya Technical University, Engineering and Natural Science Faculty, Civil Engineering Department, KONYA, TURKEY
[2]Karamanoğlu Mehmet Bey University, Engineering Faculty, Civil Engineering Department, KARAMAN, TURKEY
[2]mehmetuzun@kmu.edu.tr

As a result of the earthquake in Turkey and the world in recent years many people died and lots of property have either damaged or collapsed. This situation led to an increase in the tendency towards studies on earthquake behavior. In the way with the studies, a lot of progress has been made in the design of earthquake resistant structures. The wind, which is a natural phenomenon like an earthquake, is ignored in Turkey. The reason lies behind this is that , earthquake causes more destructive effect on structures than wind. However, it is known that some of the damaged buildings in our country are damaged only by the effect of wind and it has very serious destructive effects especially during the construction phase. Therefore, wind load is also an issue that needs to be carefully examined during the design phase of structures.

TS-498 code is used in the calculation of the wind effect in our country. The principles of calculation in this code are provided without much detail. In this study, wind load calculation principles of different country codes and wind load calculation principles in our country are compared. In addition, an example of a damaged building due to wind during construction phase is presented.

Keywords: Wind Load, Dynamic Analysis, Wind Load Parameters

A Wise Choice for Construction; Structural Optimization

Serdar Çarbaş

Karamanoğlu Mehmetbey Üniversitesi, İnşaat Mühendisliği Bölümü
scarbas@kmu.edu.tr

The rapid increase in the world population leads structural engineers to design economic structures by using the materials most efficiently. For this purpose, structural engineers perform minimum weighted design of the structures to select the optimum one among the applicable designs with respect to strength, economy, and aesthetic. Generally, structural engineers intuitively assign dimensions to the sections of the structural members to design the structures under external loads. Yet, these structural sections are often uneconomical. A structural engineer assigns profiles to the structural members until finding the most economically suitable sections by trial and error. The growing desire for constructing structures with lower costs by remaining within acceptable limits has propelled the engineers to seek out some strict techniques of deciding, such as optimization methods, to design and produce structural systems not only economically and efficiently but also without compromising load carrying capacity. The main objective of structural optimization is to achieve the most appropriate design, minimum cost, minimum weight and/or the most profitable investment. Achieving the best feasible solution is a very challenging and time-consuming task that requires iterative analysis and evaluation phase under a certain number of constraints. By observing and inspiring nature, the structural optimization methods mimic the natural phenomenon and they are so-called metaheuristics. Metaheuristics make evaluation and solution operations within the algorithm and optimizing the structural design problem in terms of strength, rigidity, profitability and cost. In this study, the some recent metaheuristics simulating the natural processes which are used as tools to reach the optimum structural design in construction engineering are discussed.

Keywords: Structural Optimization, Optimum Design, Metaheuristics

The Steel Building Construction Using Cold-Formed Profiles in Sight of Sustainability

Serdar Çarbaş

Karamanoğlu Mehmetbey Üniversitesi, İnşaat Mühendisliği Bölümü
scarbas@kmu.edu.tr

Mankind has in need of shelter and protection since the starting of settled life. As the developments rapidly increased in response to these requirements, human beings began to damage the nature savagely. The more the consumption of natural resources deepen, the less the environmental quality. Thus, global warming and environmental deteriorations have been giving signs of danger. Nowadays, rapid population growth, depletion of natural resources, emerging climate abnormalities and critical carbon dioxide emissions compel the construction designers and engineers to use resources wisely. This is merely through the introduction of sustainable construction systems and designing environmentally friendly green buildings. Due to increase in demand for shelter and protection, many materials and construction techniques have been implemented. Among these materials, steel providing the most practical and reliable solutions has foremost popularity. Apart from the most known hot-rolled profiles, the less familiar but of growing importance sections are cold-formed from steel sheet, strip, plates, or flat bars in roll-forming machines or by press brake or bending brake operations. After 1999 earthquake in Turkey, some researches shows that aside from the reinforced concrete, masonry and wooden skeleton structures, the lightweight cold-formed steel skeleton structures should be considered as the load bearing system in a construction. In Turkey, the requirement of the lightweight steel building construction using cold-formed profiles as well as the determination of the suitability of lightweight steel skeleton systems made out of cold-formed profiles as a sustainable building material are emphasized in this study.

Keywords: Steel Structures, Cold-Formed Profiles, Sustainability, Green Buildings.

İri ve İnce Kumların Sıvılaşma Potansiyelinin Dinamik Basit Kesme Testi ile Araştırılması

Yetiş Bülent SÖNMEZER[1]

[1]Kırıkkale Üniversitesi, İnşaat Mühendisliği Bölümü, Kırıkkale /Türkiye
bsonmezer@kku.edu.tr

Soil liquefaction causes loss of life and property due to permanent damage to structures during an earthquake. Loose sands, which are saturated to water, lose their strength due to the increase in excess pore water pressure during repeated loads such as earthquakes. This phenomenon, called soil liquefaction, is an important issue in geotechnical earthquake engineering and an important subject to be examined. The aim of this study is to determine the liquefaction potential of coarse and fine sandy soils with different grain diameter. For this purpose, the relative density (30,50,70%), effective stress (50,100, 150 kPa) and average grain diameter (0.1, 0.25, 0.4, 0.8 mm) parameters, which affect the liquefaction potential, were investigated by means of cyclic simple shear deformation-controlled tests on the water-saturated samples. Experiments have shown that soil liquefaction is strongly dependent on effective stress, relative density and grain size distribution. The cyclic stress ratio (CSR) increases with increasing relative density and effective stress. In other words, the increase in relative density and effective stress decreases the liquefaction potential of the soil. In addition, when the coarse and fine sands are compared based on their ratio of shear modulus, which is an important indicator of stiffness degradation, the ratio of shear modulus of fine sands decreases rapidly with increasing number of cycles, whereas the respective value of coarse sands decreases much slower with increasing cycle number. Furthermore, the number of cycles, needed for the initiation of liquefaction, is greater in coarse-grained sands than fine-grained sands. This shows that the liquefaction potential of coarse-grained sands is less than that of fine-grained sands.

Keywords: Liquefaction, Sand, Average grain diameter

Yakın ve Uzak Alan Depremler Altında Düşey Düzensizlikler İçeren Betonarme Yapılardaki Deprem Davranışının İncelenmesi

Kenan ÖZYÜREK[1] ve Kemal BEYEN[2]

[1]İnşaat Mühendisliği Ana Bilim Dalı, Fen Bilimleri Enstitüsü, Kocaeli Üniversitesi, Kocaeli
[2]İnşaat Mühendisliği Bölümü, Mühendislik Fakültesi, Kocaeli Üniversitesi, Kocaeli
k.ozyurekk@gmail.com

Examining the dynamic behavior of the buildings is one of the priority subjects in civil engineering as a result of the disasters experienced in earthquakes. The earthquake effect is simulated by giving the acceleration-time records as input power in the time domain analysis. As the acceleration records move away from the epicenter of the earthquake, its content and effect change. The near-fault earthquake extending from the source center of the earthquake to 30-40 km distances and the impact extending to 150-200 km can be evaluated in the related studies as a far-fault earthquake. In this study, the behavior of vertical irregularities, which are very common in our country, in near-fault and far-fault area earthquakes. Firstly, earthquake records were scaled according to the current earthquake regulation and adapted to the design spectrum. Within the scope of the study, near-fault and far-fault earthquakes were applied to the structures containing resistance irregularity (weak storey), stiffness irregularity (soft storey) and vertical element discontinuity between the adjacent storey. According to the results obtained, it was observed that near fault earthquakes caused a greater amount of horizontal displacement, velocity and acceleration in the structures with vertical irregularity. It has been observed that earthquakes in the near fault cause more shear forces on critical storey than far fault earthquakes in the structure with weak storey irregularity. In addition, it was observed that near fault earthquakes caused a larger amount of horizontal displacement in the structure with soft storey irregularity. Another finding is that near-fault earthquakes lead to faster plasticisation in carrier structures in structures. Structures showed more ductile behavior in far-faults. All these results indicate that far-faults and near-fault earthquakes have important impact parameters to be considered in structural analysis.

Keywords: Weak Storey, Soft Storey, Near-Fault Earthquake, Far-Fault Earthquake

Test Methods for the Production of Glass Fiber Reinforced Concrete

Sadık Alper Yıldızel, Gökhan Çalış

Karamanoğlu Mehmetbey Üniversitesi, Mühendislik Fakültesi, İnşaat Mühendisliği Bölümü
sayildizel@kmu.edu.tr

Glass Fiber Reinforced Concrete (GRC) is one of the most complex composites widely used in today's construction applications. In this composite type, both matrix and reinforcement can be evaluated as composite alone. GRC differs from other cement based composites and the major difference is the stress transfer and fracture mechanisms, depending on the type of reinforcement. Test methods applied in most of the publications conducted in the last decade are generally based on other cement based composites test methods instead of the test methods belonging to GRC composites. In this study, all test methods for determination of fresh and hardened properties of GRC composites are examined in detail and it is aimed to introduce these methods for better understanding of its nature.

Keywords: Glass fiber, glass fiber reinforced concrete, test methods, concrete.

Evaluation of Self-Repairing Concrete Chemicals

Sadık Alper Yıldızel, Gökhan Çalış

Karamanoğlu Mehmetbey Üniversitesi, Mühendislik Fakültesi, İnşaat Mühendisliği Bölümü
sayildizel@kmu.edu.tr

Concrete is widely preferred in concrete construction sector with its technical superiorities such as low cost and applicability. The weakest properties of concrete is its low strength under tensile stresses. Cracks caused by tensile stresses reduce the projected service life and durability of concrete, as well. Chemicals that progress through cracks can also cause reinforcement corrosion. n order to repair these cracks, the self-repairing concrete design has undergone a great improvement in recent years. In this study, different repair chemicals and performances were evaluated.

Keywords: Concrete, self-repairing concrete, concrete chemicals, self-repairing, self-repairing concrete chemicals.

Fiber Addicted Light Weight Concrete

Gökhan Çalış, Sadık Alper Yıldızel

Karamanoğlu Mehmetbey Üniversitesi, Mühendislik Fakültesi, İnşaat Mühendisliği Bölümü
gokhancalis@kmu.edu.tr

Concrete is known as one of the fundamental materials in construction with its high amount of use. Due to its high consumption, the normal weight aggregates (NWAs), such as granite and gravel, in construction concrete, natural stone deposits decreased dramatically. Such amount of usage caused damages to the natural environment. Consequently, the need for sustainable materials has become obvious. in the recent years.

Lightweight concrete (LWC) can be helpful material in reducing environmental effect of concrete by decreasing self-weight and dimensions of the structure. In order to reduce self-weight of concrete artificial aggregates are used, and it also contributes to develop a sustainable material.

Strength of LWC is vital criteria for utilization of LWC in various construction projects and needs to be higher than certain values. In order to improve light weight concrete properties, fibers are commonly used. Influence of fibers on mechanical properties of LWC has been investigated by the researchers . These fibers can be mainly divided in to 3 main types; metallic, synthetic and natural. Carbon, glass, steel, rubber, waste cable steel and glass are commonly used fibers for their various advantages.

The main objective of this study to understand influence of various fibers and especially steel and glass fibers on LWC. Due to lack of enough data about utilization of SF and GF in LWC, this study aims to explore impact of SF and GF on LWC, and provide numeric data from literature review.

Keywords: Lightweight concrete, Fiber addition

Comparison of Primavera P6 and MS Project Planning Softwares with Multiple Calendars

Gökhan Çalış, Sadık Alper Yıldızel

Karamanoğlu Mehmetbey Üniversitesi, Mühendislik Fakültesi, İnşaat Mühendisliği Bölümü
gokhancalis@kmu.edu.tr

Construction projects are complicated and difficult to be managed in terms of having high number of activities and types of resources. In order to complete these projects on the planned end date, and without exceeding the budget project management and project planning software such as; Primavera P6, MS Project, TILOS etc. are widely utilised. These software work based on critical path method and determine start/finish dates of the activities by considering relationships between the activities, durations and the calendars used in the schedule.

Depending upon scope of the project, having multiple calendars in the schedule can be necessary. For instance; if a company is performing a project outside of the its own country, the headquarter office and the construction team will have to follow two different calendars at the same time. Similarly, when the company imports equipment, material or service, the dates must be determined based the second calendar. Since this affects the end dates of activities and project finish date, it deserves sensitive approach.

In this study, two different project planning software with multiple calendars are reviewed. The subject of How start/finish dates of the activities are affected according to calendars, start and finish dates of predecessor/successor activities has been investigated by reviewing examples.

Keywords: Project Planning, MS Project, Primavera

Plak Döşemeli Betonarme Yapılarda Taşıyıcı Sistem Seçiminin Etkileri

Hakan ERDEM, Mustafa KAHRAMANER

Niğde Ömer Halisdemir Üniversitesi
herdem@ohu.edu.tr

Bu çalışmada, plak döşemeli betonarme yapıların taşıyıcı sistem seçiminde yapılan hatalar sonucu ortaya çıkabilecek durumların yapının davranışına etkileri bazı parametrelerin karşılaştırılması ile incelenecektir. Bu karşılaştırmalarda aynı yapı için altı farklı eksantrisite ve rijitlik için oluşturulan taşıyıcı sistemler kullanılmıştır. Analizlerde standartlara ve yönetmeliklere göre hazırlanan paket program kullanılarak yapının her iki doğrultuda birinci periyotları, maksimum yerdeğiştirmeleri, yapısal düzensizlikleri, betonarme elemanlarda oluşan kuvvetlerde değişim ve yapı maliyeti gibi parametreler incelenmiştir. İncelemeler sonucunda depreme dayanıklı taşıyıcı sistem seçiminin yapı davranışını olumlu etkilediği gözlenmiştir.

Anahtar Kelimeler: eksantrisite, rijitlik, düzensizlik, taşıyıcı system

The Effects of Natural Wollastonite on Early Age Strengths of Standard Mortars

Hatice Öznur Öz[1], Hasan Erhan Yücel[1], Çağlar Duymaz[1], Muhammet Güneş[1]

[1]Department of Civil Engineering, Nigde Ömer Halisdemir University, Turkey
oznuroz@ohu.edu.tr

Wollastonite which consisted mainly of CaO and SiO_2, is an inert additive material used in mortar/concrete. In this study, Natural Wollastonite (NW) was obtained from Balıkesir Region and the usage of NW in the mortar was determined indirectly based on pozzolanic activity test. Pozzolanic activity index of NW was identified as 76.7% and 76.6% at 7 and 28 days, respectively. Although, the NW is an inert material, it has been found to provide 75% as a limit value in ASTM C608. Therefore, NW was used in ratios of 0%, 3%, 6%, 9% and 12% instead of cement in standard mortar (SM). Compressive strength, flexural strength and ultrasonic pulse velocity (UPV) of SMs incorporating NW were determined at 3 and 7 days. The test results indicated that the mechanical performance of the SMs increased up to 3% NW.

Keywords: Early age strengths, Pozzolanic activity index, Standard mortars, Wollastonite.

The Effect of Bridge Pier Shapes on the Amount of Backwater

Kutsi Savaş ERDURAN[1], Uğur ÜNAL[1]

[1]Niğde Ömer Halisdemir University, Engineering Faculty, Department of Civil Engineering, Niğde, Turkey
kserduran@ohu.edu.tr

Bridge piers obstruct the flow and cause an increase in water levels upstream of the bridge. The increase is called the backwater, which is one of the most important causes of failure of the bridges worldwide. The backwater often results in flooding upstream of the bridges or can also disturb the traffic flow over roadway or railway bridges. Therefore, the accurate assessment of the amount of the backwater that depends on the channel contraction ratio, pier geometry and orientation as well as the flow condition is crucial for the essential hydraulic design of all the bridge structures, for flood protection structures upstream of the bridges and traffic control for the roadway and railway bridges. In this study, the effect of pier shapes on the amount of the backwater has been experimentally and numerically studied. A series of experiments using different pier shapes has been conducted in a flume in the Civil Engineering Department Hydraulic Laboratory at Niğde Ömer Halisdemir University. The numerical flow computations have been carried out using a well-known and widely used hydraulic software called HEC-RAS. Based on the obtained results, a comparison has been made between the measured and computed water surface profiles and the effect of the pier shapes on the amount of backwater has been shown.

Keywords: Bridge pier shapes, Backwater, Water surface profiles, HEC-RAS.

Steel Structure Systems and Design

Mahmut Çağlar[1], Ahmet Atasoy[2]

[1]Planning Manager, SETAP Yapı Müh. İnş. San. ve Tic. Ltd. Ştl. İstanbul,
[2]Department of Metallurgical and Materials Engineering, Faculty of Technology,
Sakarya University Of Applied Sciences, Sakarya
mahmut.caglar@ogr.sakarya.edu.tr

In these days, intense work put in place to make building safe especially in any natural disasters. Prefabricated steel roof construction systems being used Instead of conventional wook roof constructions. Steel construction performs better as opposed to traditional concrete construction during earthquake. Steel roof construction systems, along with modern developing technology, pushes traditional architecture changes where it is evolving and increasing the applications day by day. In steel roof construction systems, every knit tied with sticks where it approaches from 3 different directions.

In this work, mechanical and statical features researched. SAP200 software being employed for Beam and post where the weights are being carried on steel construction.

Keywords: Stell Structures, Construction, Parts of Component, SAP 2000

Investigation of Mechanical And Static Properties of Welded Joints In Steel Structures

Mahmut Çağlar[1], Ahmet Atasoy[2]

[1]Planning Manager, SETAP Yapı Müh. İnş. San. ve Tic. Ltd. Ştl. İstanbul,
[2]Department of Metallurgical and Materials Engineering, Faculty of Technology,
Sakarya University Of Applied Sciences, Sakarya
mahmut.caglar@ogr.sakarya.edu.tr

Steel construction is increasing day by day. Welded components is important as part of fabrication steel roof construction.

In this study, it has been researched mechanical and statical features of the project that S 275 JR and S 235-JR being used. For corner welded components, pull-fall, push tested applied. Micro and stiffness values researched for the welded place.

Keywords: Stell Structures, Welding Component, Beam,

Comparison of Types of Raw Mills in Cement Production

Bekir Sami TEZEKİCİ, Osman Ozan YAĞIZ

Niğde Ömer Halisdemir Üniversitesi Mühendislik Fakültesi Elektrik-Elektronik Mühendisliği Bölümü
o.ozanyagiz@gmail.com

Cement is a hydraulic binder that hardens in its reaction with water and has the property of sticking the materials around it and is insoluble in water after hardening. Today, with the development of the construction sector, cement production is also widespread. Every year, in Turkey, number of cement factories and the amount of cement production increase. According to data of TÇMB (Turkey Cement Producers Association) 80.5 million tons of cement were produced in 2017. In 2017, the cement sector broke the production record. Considering that the total cement capacity of 3 non-member producers is 6 million tons / year, a total of 84 million tons of production is projected in 2017. It is mixed with limestone and clay, iron ore, bauxite or other auxiliary additives which are used as raw material in cement production. Quality of the ceiling is one of the most important inputs determining the quality of cement. In addition, the production of headlight is about 30-40% in terms of the power spent in the cement production process. This makes it important to ensure the optimum production and cost of the headlight for the process. The importance of which type of raw mill is to be used in new installations is therefore quite significant. In this study, it is aimed to explain the raw mills that can be used in the cement sector and to help the factories select the most suitable farina mill for their own processes.

Anahtar Kelimeler: Çimento Sektörü, Farin, Farin Değirmeni, Dik Değirmen, Yatay Değirmen

Kumların Sıvılaşma Direncine Fiberin Etkisinin Araştırılması

Abdussamed AKYÜZ[1], Yetiş Bülent SÖNMEZER[1], Kamil KAYABALI[2]

[1]Kırıkkale Üniversitesi, İnşaat Mühendisliği Bölümü, Kırıkkale /Türkiye
[2]Ankara Üniversitesi, Jeoloji Mühendisliği Bölümü, Ankara/Türkiye
bsonmezer@kku.edu.tr

The water-saturated loose and medium dense sand deposits are tend to densify due to the particle rearrangement and the redistribution of voids on the soil when subjected to strong and repeated ground motions such as earthquakes. In such a case, excess pore water pressure increases rapidly and loses soil strength. This phenomenon, called soil liquefaction, caused the loss of life and property in many earthquakes. Many studies are carried out to strengthen the soil against liquefaction. For this purpose, the fiber reinforcement of the soil has become a prominent issue in geotechnical earthquake engineering in recent years. In this study, the liquefaction potential of the fiber reinforced sandy soil was investigated by a series of strain-controlled cyclic simple shear tests. In the experiments, fiber properties such a fiber content, fiber length as well as the effect of relative density of the sandy soil to were investigation in terms of liquefaction susceptibility. The experiments were performed at 50 kPa effective stress, 0.25%, 0.5% and 1% fiber content, 12mm and 19mm fiber lengths and 30% and 50% relative density. The results showed that the addition of fiber compared to the unreinforcement sample increased the number of cycles required for liquefaction of the sand and increased cyclic stress ratio (CSR). The highest liquefaction resistance occurs in the sample with 50% relative density and 1% fiber with a fiber length of 19 mm. This indicates that the addition of fiber increases the resistance of the soil against liquefaction.

Keywords: Fiber, Liquefaction, Sand,

COMPUTER AND SOFTWARE ENGINEERING

Algorithm for Solving Some Optimization Problems and its Application to Object Matching Problem

Raiymbek Sultanov, Rita Ismailova

Department of Computer Engineering, Kyrgyz-Turkish Manas University
rita.ismailova@manas.edu.kg

The problem of recognizing objects is one of the frequently encountered tasks in image analysis. One of the main methods for solving this problem is to simplify the contours of the object and match them in specified as a polygonal chain form. Thus, the solution of the problem is reduced to the problem of approximation optimization. In this paper, we propose an algorithm for finding approximation points on an object contour based on methods for solving optimization problems. The basic idea of the algorithm is that the comparison of the distance between the points on the vector space gives a one-to-one correspondence between the contour and the point in the vector space. This algorithm has a wide range of applications, such as numerical integration and calculating derivatives with specified number of grid nodes. A comparison of solutions on specific examples is presented.

Keywords: Contour simplification, Line approximation, Numerical methods, Numerical integration.

Ways to Improve Landscape Genre Using New Computer Technologies

Kavira Begimbai

L.N. Gumilyov Eurasian National University, 2 Satpayev str., Nur-Sultan, Kazakhstan
begimbai@hotmail.com

At present, we are experiencing the mass development of information technologies and their integration into various spheres of human life. This is the purpose of any manipulation of the design industry to see how the traditional art of contemporary technology, which glorifies the entire world, is to control the transformation process by using different computer techniques and to learn more quickly and to develop it further.

Particularly in the field of graphic design, which is one of the types of visual art, is mastering popular jazz and art methods today. Therefore, it is legitimate that higher education institutions are interested in this issue, which is interested in the professional training of future professionals.

We consider it one of our primary goals for teachers who work in this field to design a highly professional and up-to-date computer technology and who will be competitive in the future as a designer in the labor market, and can quickly adapt their knowledge and skills to new technologies.

Keywords: modern types of painting, jigital art, computer technologies, graphic editors, design.

Performance Evaluation of Data Mining Algorithms on Different Datasets

Alper Ecemiş[1], Ahmet Şakir Dokuz[2], Mete Çelik[3]

[1,2]Niğde Ömer Halisdemir Üniversitesi, Mühendislik Fakültesi Bilgisayar Mühendisliği Bölümü, 51240 Niğde, Türkiye
[3]Erciyes Üniversitesi, Mühendislik Fakültesi, Bilgisayar Mühendisliği Bölümü, 38039 Kayseri, Türkiye
ecemisalper@gmail.com

Data mining is the job of processing large-scale data and revealing meaningful information. Machine learning is the method by which the machine is able to model data and the machine discovers patterns on the data. Machine learning algorithms show different performances in different data sets. In this case data size, type and variety become important factors.

In this study, accepted data sets obtained from health, tourism, meteorology, education, automotive industry and world areas were used. Data sets were analyzed by using machine learning algorithms. The results were then compared and discussed in terms of data type, size and variety. Comparisons were performed as accuracy and process performance experiments.

As a result, data sets have been successfully tested with machine learning algorithms according to the size, variety and type of data sets. The results obtained were discussed and recommendations are given to those who will use data mining, which type of machine learning algorithm will be more successful in which variety, type and size of data sets.

Keywords: Data Mining, Machine Learning, Data Analysis

Makine öğrenmesi ve yapay zeka yöntemleri ile web sayfalarındaki zararlı yazılımın tesbiti ve sınıflandırılması

Muhammet Şahin, Şerif Bahtiyar

İstanbul Teknik Üniversitesi
muhammetsahin@itu.edu.tr

Makine öğrenmesi ve yapay zeka yöntemleri günümüz teknolojisinde akıllı sistemlerin kullanıldığı hemen her yerde kullanılmaktadır ve bu alanda çok önemli bir rol üstlenmektedir. Bu alanların başında zararlı yazılım tesbiti, doğal dil işleme, otonom araçlar, robotik sistemler ve siber saldırıların önlenmesi gelmektedir. Zararlı yazılımlar ve siber saldırılar maalesef bilgi güvenliği uzmanları için bir kabus haline dönüşmüş durumdadır. Hemen her sektörde yapılan siber saldırıların amacı finansal kazanımın yanında ünlenme isteğidir. Örneğin bir bankanın web sayfasına ya da veri tabanına yapılan saldırının amacı finansal olabilirken içişleri bakanlığının sayfasına yapılan saldırı ünlenme amacıyla yapılabilmektedir. Hatta son dönemde su, doğalgaz yada elektrik şebekelerine yapılan saldırıların amacı savaş bile olabilmektedir. Bu yüzden birçok ülke kara, hava, deniz komutanlıklarının yanında siber savaş komutanlığı kurmaktadır. Bu açıdan bakıldığında siber saldırıların tesbitinin önceden tesbiti ve önlenmesi hayati önem taşımaktadır. Makine öğrenmesi ve yapay zeka yöntemleri, bilgi güvenliği uzmanlarının silahı durumuna gelmesinin en temel sebebi elde edilmiş önceki verilerden olası bir saldırının tahmin edilmesini sağlamasıdır. Bizim çalışmamızda Web sayfalarının text özelliklerini inceleyerek makine öğrenmesi yöntemi olan yapay sinir ağlarını kullanarak zararlı web sitelerini %94 gibi yüksek bir başarım ile tesbit ettik. Elde ettiğimiz bu doğruluk oranı bu alanda karar destek makineleri ve karar ağaçları ile yapılan önceki başarımlardan daha yüksektir.

Anahtar Kelimeler: Makine öğrenmesi, Derin öğrenme, zararlı yazılım tesbiti, zararlı yazılım sınıflandırması

Wind Turbine Selection with Machine Learning Algorithms for Particular Load Demands

Alper Ecemiş[1], Halil Demolli[2], Ahmet Şakir Dokuz[3], Murat Gökçek[4]

[1,3]Niğde Ömer Halisdemir Üniversitesi, Mühendislik Fakültesi
Bilgisayar Mühendisliği Bölümü
51240 Niğde, Turkey
[2]Prishtina Üniversitesi, Makine Mühendisliği Fakültesi,
Bregu i Diellit p.n., 10 000, Prishtina, Kosovo
[4]Niğde Ömer Halisdemir Üniversitesi, Mühendislik Fakültesi
Makine Mühendisliği Bölümü
51240 Niğde, Turkey
mgokcek@nigde.edu.tr

Nowadays, due to global warming, environmental pollution and the reduction in fossil fuel reserves, interest in renewable energy sources is increasing. Wind energy is one of the most used renewable energy types. However, there are some difficulties in the estimation of wind energy potential and the establishment of wind power plants. These; the wind speed is variable due to the nature of the wind and the difficulty of forecasting wind power, determining the new wind turbine location and size and calculating the initial investment cost.

In this study, different wind turbines have been configured according to the user requirements. 2013-2017 Niğde wind speed data used for data set. Machine learning algorithms are used for regression. Between 2013 and 2016 use for the training data set and last year data set use for test dataset. Then forecasting wind power and turbine optimization according to energy needs. In the study, KNN, Support Vector Machine, Lasso, Random Forest and XgBoost algorithms were used for machine learning algorithms.

As a result, wind power estimation and wind turbine optimization has been carried out successfully according to user request.

Keywords: Machine Learning, Wind Power Forecasting, Wind Turbine Optimization

Solar energy forecasting using machine learning algorithms: Nigde City Case

Halil Demolli[1], Alper Ecemiş[2], Ahmet Şakir Dokuz[3], Murat Gökçek[4]

[1]Prishtina Üniversitesi, Makine Mühendisliği Fakültesi,
Bregu i Diellit p.n., 10 000, Prishtina, Kosovo
[2,3]Niğde Ömer Halisdemir Üniversitesi, Mühendislik Fakültesi
Bilgisayar Mühendisliği Bölümü
51240 Niğde, Turkey
[4]Niğde Ömer Halisdemir Üniversitesi, Mühendislik Fakültesi
Makine Mühendisliği Bölümü
51240 Niğde, Turkey
mgokcek@nigde.edu.tr

Renewable energy is the source of clean energy taken from unlimited natural cycles. Solar energy is also an important source of renewable energy. On forecasting solar energy power sunshine intensity and temperature are effective factor. These factors vary according to the weather conditions. For these reasons, it is difficult to forecast the energy potential of future solar panels.

In this study, solar energy power forecasting by using sunshine intensity and temperature values. 2013-2017 Niğde sunshine intensity and temperature data used for data set. Between 2013 and 2016 used for the training data set and last year data set used for test dataset. KNN, Support Vector Machine and Lasso algorithms were used for machine learning algorithms.

As a result, the solar energy power forecasting of the next year has been successfully forecast by using sunshine intensity and temperature data. The best performance was shown by the support vector machine with 0.997 R2 score.

Keywords: Solar Energy Forecasting, Machine Learning, Renewable Energy

Öznitelik Çıkartma ve Sınıflandırma Tekniklerini Kıyaslayarak Çevresel Ses Tanıma

Yaseminhan ARPACI[1], Hüseyin CANBOLAT[2]

[1]Aviyonik Yazılım Mühendisi Enginsoft-ASELSAN
[2]Ankara Yıldırım Beyazıt Üniversitesi
arpacyasemin@gmail.com, hcanbolat@ybu.edu.tr

Çevresel ses tanıma çalışması, son yıllarda popüler bir konu haline gelmiştir. Çevresel ses tanıma, akıllı bilgisayar sistemleri ve robotlar için önemli bir role sahip olduğu için geçtiğimiz on yılda, çevresel ses tanıma alanı ile ilgili araştırmalarda bu doğrultuda hızlandı. Bu makalede, çevresel seslerden oluşan verilere öznitelik çıkarımı ve sınıflandırma tekniklerinin kombinasyonları uygulanarak, bunlardan elde edilen sonuçlar üzerinden de karşılaştırmalar yapılarak en etkin biçimde çevresel ses tanıma yapılması amaçlandı. Sistemimizin ilk aşaması olarak ses verilerine (python dilinde) zaman-frekans ölçütlü öznitelik çıkarım teknikleri olan mel frequency cepstral coefficients (MFCC), continuous wavelet transform (CWT), chroma, zero crossing rate, spectral centroid teknikler uygulandı. Öznitelik çıkarımı karmaşık olan veri boyutunu azaltmak amacıyla bir sisteme giren girişlerin bütün bir bilgi olarak değil de bu bilgiyi oluşturan özelliklerden bazılarının çıkarılması ve sistemin bu özellikler üzerine kurulması durumudur. Sistemin ikinci aşaması olarak seslerden elde edilen öznitelik verilerine KNN, SVM, DecisionTreeClassifier, RidgeClassifierCV gibi sınıflandırma teknikleri uygulandı. Sınıflandırma algoritmaları, verilen eğitim kümesinden bu dağılım şeklini öğrenirler ve daha sonra sınıfının belirli olmadığı test verileri geldiğinde doğru şekilde sınıflandırmaya çalışırlar. Test verilerinden elde edilen sonuçlar: MFCC-SVM %97, MFCC-DecisionTreeClassifier %75, MFCC-RidgeClassifierCV %97, MFCC-KNN %75, CWT-SVM %95, CWT-KNN %50, CWT-DecisionTreeClassifier %95, CWT-RidgeClassifierCV %70, Chroma-SVM %30, Chroma-KNN %50, ZeroCrossingRate-SVM %75, ZeroCrossingRate-KNN %50, SpectralCentroid-SVM %65, SpectralCentroid-KNN %75. Elde edilen sonuçlara göre çevresel ses tanımada MFCC-SVM ve CWT-SVM'in en iyi kombinasyonlar olduğunu görüldü.

Anahtar Kelimeler: çevresel ses tanıma, öznitelik çıkarımı teknikleri, sınıflandırma teknikleri

ELECTRICAL AND ELECTRONIC ENGINEERING

Gesture Analysis and Recognition Based on Mems Sensors

Sevda AYDOĞAN[1], Yavuz ŞENOL[1]

[1]Dokuz Eylül University
sevdaydogan112@hotmail.com

This study covers the use of Micro-Electro-mechanical system (MEMS) sensors and communication with Bluetooth to transmit sensor data in order to understand the shape drawn into the air. It is important for people, especially children with speech disabilities, to be understood by the characters such as commands, shapes, letters or numbers that are given by their hand or arm movements. For this purpose, the MPU6050 was used as a MEMS sensor to capture dynamic hand movement. This device is preferred because it is a small integrated structure that transfers data from the gyroscope and accelerometer sensors inside to the computer via Bluetooth. They can be placed easily on the hand and arm.

The data transferred to the computer environment is expressed in Matlab using the dynamic time warping (DTW) algorithm. The reason for using the DTW algorithm is that even when the same person draws the same shape at different times, signals of different length may be generated. In this case, the similarity between the signals is found by the DTW method. As a result, using the DTW algorithm and MEMS sensor, simple basic shapes such as square or circle are understood and determined.

Keywords: MATLAB**,** MPU6050, Bluetooth, DTW, Gesture Analysis

Digital Repeater Design for Single Chip Radio Transceiver

Berkay EMİN, Suad BAŞBUĞ

Nevşehir Hacı Bektaş Veli Üniversitesi
berkayeminn@gmail.com

A proper radio frequency (RF) communication may not be sustained if there are physical obstacles between the transmitter and receiver. Line of sight propagation is especially important for the higher frequencies since the attenuations are more common for them. Placing a signal repeater between two stations to maintain the RF communication is one of the most robust solutions. In this paper, we propose a digital repeater for the application of single chip radio transceiver at 2.4 GHz, namely Nordic NRF24L01. The repeater basically consists of two transceivers, two antennas and one microcontroller. It resends the digital information that has received from the transmitter unit to the receiver. The repetition can be done simultaneously since the receiving and transmitting modules use different frequency channels. If it is necessary, the repeater can add information to the received data before retransmitting it or filter out unnecessary data from it. We tested the proposed repeater indoor and outdoor environment. It is compared with a one antenna and one transceiver system as well as no repetition equipment case. The results show that the digital repeater successfully increases the coverage area of the communication. Additionally, it is concluded that the proposed repeater is faster than the other single antenna-transceiver alternative.

Keywords: Line-of-sight propagation, Digital Repeater, Transceiver, Antenna.

Low Cost Measurement System Design for Antenna Radiation Patterns with Logarithmic RF Detector

Berkay EMİN, Suad BAŞBUĞ

Nevşehir Hacı Bektaş Veli Üniversitesi
berkayeminn@gmail.com

The radiation pattern is one of the most important parameters of an antenna. The far field radiation pattern can be measured by means of a combination of transmitting and receiving systems. The radiation measurements in transmit and receive modes are same thanks to the reciprocity property of the antenna. In this work, a low-cost radiation pattern measurement method with logarithmic RF detector is introduced. The transmitting part of the system contains an adjustable single board signal generator managed by a microcontroller. The signal generator is connected to a directional transmitting antenna. This antenna should be selected properly according to determined frequency. The receiving part comprises the antenna under test, logarithmic RF sensor, microcontroller, stepper motor, position sensor and bluetooth module. The measurement system can be started remotely with the help of bluetooth. Stepper motor turns the table that holds the antenna under test until it comes the same position. During this movement, transmitter sends the electromagnetic waves and the receiver measures the power level of the incoming waves. 360 sampled values are stored into microcontroller and sends to the computer via bluetooth just after measurement. The proposed system uses Analog Devices AD8318 chip as a logarithmic RF sensor. For the examples in this study, we have used a 2.4 GHz horn antenna for the transmitting module. We have manufactured a microstrip patch antenna as a test antenna. Same patch antenna is simulated with COMSOL multiphysics software. The results show that the simulation and measurement results are very similar after the normalization process.

Keywords: Radiation pattern, measurement, reciprocity, antenna, RF detector.

The Design of Direct Vector Control System Optimized with Lightning Search Algorithm

Emrah Zerdali

Niğde Ömer Halisdemir University, Faculty of Engineering, Electrical and Electronics Engineering Department
ezerdali@ohu.edu.tr

In this study, direct vector control system which is one of the high performance control methods of induction motor is optimized by lightning search algorithm. In the vector control method, traditional proportional-integral (PI) controllers are used in order to perform field, moment and speed controls. In the literature, these controller parameters are generally determined by time-consuming trial-and-error method. In addition, the failure to find the most suitable values by trial-error method leads to a deteriorate in the performance of the control system. In this study, all controller parameters are optimized with the recently proposed lightning search algorithm and then the optimized DVC system is tested under different operating conditions in simulations. Considering the simulation studies, it is observed that high control performance is provided.

Keywords: Induction Motor, Direct vector control, Optimization, Lightning search algorithm.

A Novel Hybrid Approach Based on the Artificial Neural Network and Adaptive Censoring Technique for Wind Speed Prediction

Ali Ogün SARP[1], Engin Cemal MENGÜÇ[1]

[1]Niğde Ömer Halisdemir Üniversitesi, Elektrik-Elektronik Mühendisliği Bölümü
ecmenguc@ohu.edu.tr

In this study, a new hybrid approach based on artificial neural network (ANN) and adaptive censorship technique has been proposed to predict the wind speed. In the proposed approach, adaptive censorship technique has been used as a pre-processing. Thanks to this technique, the number of data required to be used in the training process of the ANN has been severely reduced and the training of ANN has been carried out with an informative set of training which will be used only in the training process. As a result, the computational complexity is reduced with less data and the prediction performance of the wind signals is largely preserved. The mentioned results have been confirmed by simulations.

Keywords: Artificial neural networks, adaptive censorship, wind speed, prediction.

Modelling of Resting Tremor for Parkinson's Patients with Adaptive Fourier Linear Combiners

Neamatallah REZAYI[1], Engin Cemal MENGÜÇ[1]

[1]Niğde Ömer Halisdemir Üniversitesi, Elektrik-Elektronik Mühendisliği Bölümü
ecmenguc@ohu.edu.tr

In this study, adaptive Fourier linear combiners (FLC) are used to model the resting tremor in Parkinson's patients. The weight vectors of the FLC structures used in modeling, that is the Fourier series coefficients, are updated with the least mean square algorithm. The performances of these FLCs are tested in detail on the well-known real-world resting tremor datasets in terms of mean square error, convergence rate, and computational complexity. The simulation results show that adaptive FLC methods can be used effectively in the modeling of resting tremor observed in Parkinson's patients.

Keywords: Resting tremor, Fourier linear combiner, least mean square, modelling.

Prediction of The Load Moment of The DC Shunt Motor With Adaptive Neuro-Fuzzy Inference System

Şahin YILDIRIM[1], Mehmet Safa BİNGÖL[2], Hakan ÇELİK[3]

[1]Erciyes Üniversitesi Mühendislik Fakültesi Mekatronik Mühendisliği
[2]Erciyes Üniversitesi Mühendislik Fakültesi Mekatronik Mühendisliği
[3]Fırat Üniversitesi Mühendislik Fakültesi Mekatronik Mühendisliği
sahiny@erciyes.edu.tr

DC motors have a wide range of applications such as factories, textile industry, machine tools and robotic systems due to their superior features such as being able to be operated at different speeds, cheapness and ease of control. In this study, firstly DC shunt motor is modeled in MATLAB Simulink environment. The data is obtained by operating the DC shunt motor, the different voltage (Va) and the load torque (Ty). The obtained data is divided into 2 as traning set and test set. Then the Adaptive Neuro-Fuzzy Inference System (ANFIS) was designed to estimate the load torque. Designed ANFIS has been trained and tested with the dataset. The results are tabulated using different membership functions for the training process.

Keywords: DC motor, ANFIS, load torque.

Capacity Analysis of α-κ-μ Fading Channels for Different Adaptive Transmission Schemes

Mehmet Bilim[1]

[1]Nuh Naci Yazgan Üniversitesi
mbilim@nny.edu.tr

This study presents capacity analysis for different adaptive transmission techniques such as optimal rate adaptation with constant transmit power (ORA), optimal simultaneous power and rate adaptation (OPRA), channel inversion with fixed rate (CIFR) and truncated channel inversion with fixed rate (TCIFR) over α-κ-μ fading channels. The capacity expressions are derived separately for the different adaptive transmission schemes and the accuracy of these expressions is compared with the simulations. According to the demonstrated results, the results obtained by using the derived expressions are highly compatible with the simulations.

Keywords: different adaptive transmission techniques; α-κ-μ fading channels; adaptive transmission conditions.

Innovation-Based Extended Kalman Filter Design for the Rotor Resistance Estimation of Induction Motors

Remzi İNAN[1]

[1]Niğde Ömer Halisdemir Üniversitesi Mühendislik Fakültesi Elektrik-Elektronik Mühendisliği Bölümü
rinan@ohu.edu.tr

In this study, an innovation-based adaptive extended Kalman filter (IBEKF) is designed for the estimations of changes of rotor resistance with the stator stationary components of stator current and rotor flux in order to provide the direct vector control (DVC) of induction motors (IMs) with-speed sensor in field wekanening region which occurs over the rated speed. Conversely to the conventional GKF methods, where the system and measurement noise matrices are determined by trial-and-error or heuristical methods, the system noise matrix is determined by an adaptive structure according to the operation conditions of IM in IBEKF. It is preferred to determine only the system noise matrix by an adaptive mechanism in order to avoid the divergence problem which occurs when the determination of the system and measurement noise matirces together. In addition, changes in the magnetization inductance due to flux weakening are also determined by an external online magnetization inductance estimator. Thus, a hybrid estimator method is obtained by using two different estimation methods. With the proposed hybrid estimation mehtod, the stator stationary axis components of stator current and rotor flux and rotor time constant which changes especially in field weakening region are estimated. The tracking performance of the proposed hybrid estimation method is tested in simulation on the DVC of the IM with speed-sensor. The simulation results represent that the proposed drive system has satisfactory control and estimation performances.

Keywords: induction motor, innovation-based extended Kalman filter, field weakening region, rotor time constant

State and Parameter Estimation for Speed-sensored Direct Vector Controlled Induction Motor Drives

Rıdvan DEMİR[1]

[1]Niğde Ömer Halisdemir Üniversitesi Mekatronik Mühendisliği Bölümü Niğde/Türkiye

ridvandemir@ohu.edu.tr

In this study, the design of the speed-sensored extended Kalman filter (EKF) based estimation algorithm for direct vector controlled (DVC) induction motor (IM) drive has been performed. By the designed EKF algorithm, the rotor mechanical speed, load torque, and the stator stationary axis components of the rotor fluxes are estimated. The proposed EKF-based estimation algorithm is estimated the states and parameters of induction motor, using the equation of motion, unlike previous studies using stationary axis components of stator currents in the measurement equation. The performance of the proposed drive system has been tested with simulations in a wide speed range including zero speed, under different load torques. The results obtained by the simulation studies demonstrate that the proposed EKF based estimator has high performance.

Keywords: Induction motors, extended Kalman filter, state and parameter estimation, direct vector control.

The comparison of the position-sensorless two extended Kalman filter based speed estimators

Murat Barut[1], Zekeriye Emrullah Gök[1]

[1]Niğde Ömer Halisdemir University, Department of Electrical and Electronics Eng.
mbarut@ohu.edu.tr, emrullah_gk@yahoo.com

Permanent magnet synchronous motors (PMSMs) are still good alternative due to their reduced weight and volume resulting in higher power density and higher energy efficiency in the all of operating speed ranges, in spite of the aggressive competition between different types of electrical machines in the literature. Thus, in order to save energy and space they are commonly used in the electrical drive applications of hybrid electric vehicles (HEV), electrical vehicles (EVs), industrial machines, renewable power generation, and home appliances.

On the other hand, the electrical drive designed for the control of PMSMs requires rotor shaft position and angular velocity. For this aim, resolvers, optical encoders and hall-effect sensors can be used, but they increase the cost, size, weight and hardware wiring complexity of the electrical drive and reduce the drive reliability and mechanical robustness. Thus, position-sensorless control of PMSMs becomes crutial.

In this study, it is the first time to compare Extended Kalman filter (EKF) based two position-sensorless algorithms in the literature: By using measured stator currents and voltages, one of the EKF utilizes equation of motion including estimated load torque for the estimation of the rotor angular velocity while the other estimates the rotor angular as a constant state.

The Computer based simulation results show that the EKF based angular velocity estimator with the equation of motion has advantage over the EKF based angular velocity estimator with constant state in the transient states, but it needs more computational times than the EKF based angular velocity estimator with the constant state.

Keywords: PMSM, sensorless control, extended Kalman filter, speed estimation, equation of motion.

Unscented Kalman Filter Based Speed and Stator Resistance Estimation Speed-sensorless Vector Control of Induction Motors

Recep YILDIZ[1], Murat BARUT[1], Rıdvan DEMİR[2]

[1]Niğde Ömer Halisdemir Üniversitesi Elektrik-Elektronik Mühendisliği Bölümü Niğde/Türkiye
[2]Niğde Ömer Halisdemir Üniversitesi Mekatronik Mühendisliği Bölümü Niğde/Türkiye
ridvandemir@ohu.edu.tr

In this study, an unscented Kalman filter (UKF) algorithm concurrently estimating the stationary axes component of stator current and rotor flux, rotor mechanical speed and stator resistance has been developed for the speed-sensorless direct vector control (DVC) of induction motors (IMs). The proposed UKF algorithm has been tested in simulation under challenging scenarios including step and ramp changes at both load torque and stator resistance in a wide speed range involving zero and reversed operation. The obtained simulation results demonstrate the superior performance of the presented UKF algorithm.

Keywords: Induction motors, unscented Kalman filter, state and parameter estimation, direct vector control.

Stability Analysis of a Single-Area Load Frequency Control System Including Electric Vehicles and Communcation Time Delays

Ausnain NAVEED[1], Şahin SÖNMEZ[1], Saffet AYASUN[1]

[1]Elektrik-Elektronik Mühendisliği Bölümü, Niğde Ömer Halisdemir Üniversitesi, Niğde, Türkiye
sayasun@ohu.edu.tr

This paper investigates the impact of time delays on the stability of a single-area load frequency control (LFC) system that includes plug-in multiple electric vehicles (EVs) to regulate the system frequency. Time delays are caused by an open communication network used to send and receive control signals. These delays degrade the performance of the controller, lead to undesired oscillations in the system frequency and may even cause instability if they exceed an upper bound known as stability delay margin. Therefore, it is essential to compute stability delay margins of the single-area LFC system with EVs in terms of a stable operation. By implementing a simulation approach, this paper determines stability delay margins for a wide range of the proportional-integral (PI) controller gains of the single-area LFC system with plug-in EVs. Results indicate that stability delay margins decrease as the integral controller gain increases. The knowledge of stability delay margins make it possible to appropriately tune the PI controller gains that ensure a stable operation of the LFC system even in the presence of inevitable time delays.

Keywords: Communication time delay, Electric vehicles, Load frequency control, Stability delay margin

Jeotermal ve Denizaltı Petrol Kuyularında Kullanılan Üç Faz Asenkron Motor ve 120 derece Sürücü İçeren Sistemler için Rezonans Frekansı Tespiti

Sema Nur İpek[1], Eyüp Akpınar[1]

[1]Elektrik-Elektronik Mühendisliği Bölümü, Dokuz Eylül Üniversitesi, 35000, İzmir
semanuripek@outlook.com

Bir AC elektriksel güç kaynağından alınan sabit frekansta gerilimler doğrultucular aracılığı ile DC gerilime çevrilip sıfır frekansta gerilimler elde edilir. İkinci kademede, DC gerilimler tekrar istenen frekansta gerilime evirgeç (inverter) aracılığı ile dönüştürülür. Bunu sağlayan yarıiletken elemanların kullanıldığı doğrultucular ve çevirgeçler harmonikli akım ve gerilimler üretir. Doğrultucunun şebekeden çektiği akım harmonikleri enerji sistemi tarafında güç kalitesi ve rezonans sorunlarına yol açarken, evirgeç çıkışındaki gerilim ve akım harmonikleri yük tarafında rezonans, motorlarda tork salınımlarına ve rotor hızlarında salınımlara yol açmaktadır. Yüksek güçte (MW seviyesinde) motorların bağlı olduğu çevirgeçlerde ölü zaman denetimini daha kolay sağlayabilmek için 120 derece motor sürücüleri PWM tabanlı sürücülere tercih edilebilmektedir. Bu durumun en yaygın kullanım alanı da jeotermal ve denizaltı petrol kuyularıdır. Seçilen motorlar genellikle asenkron motor tipinde olup, çevirgeçlere uzun yeraltı kablolarıyla bağlanmaktadır. Doğrultucuların şebekeye bağlantısı da 12-pulse çıkış elde edebilmek için tek primer ve çift sekonder bulunduran trafolarla yapılmaktadır. Ayrıca çevirgeç ile motor arasında üçgen/yıldız trafo kullanımı etkili bir gerilim şekillendirilmesi olarak tercih edilmektedir. Dolayısıyla tüm sistem rezistans, endüktans ve kapasitör elemanlarıyla harmonik kaynaklı çevirgeç yapıları bulundurmaktadır. Böyle bir sistemde rezonansa bağlı arızalar çok yaygın ortaya çıkmaktadır. Rezonansın etkisiyle oluşabilecek aşırı gerilimler ve akımlar, sistem içerisindeki elemanlarının zarar görmesine neden olabilmektedir. Madenler, denizaltı pompa sistemleri, jeotermal enerji santralleri, petrokimya tesisleri gibi, yeraltı ve sualtında çalışan elektrik makineleri ve sürücüleri barındırabilen, büyük yüzölçümlü olduğu için uzun kablo kullanımını gerektiren sahalarda, motorların bakımı zor olacağından, yıkıcı etkileri görülmeden önce rezonans frekansının belirlenmesi ve herhangi bir harmonik frekansına denk gelmesinin engellenmesi önemli olmaktadır. Bu makalede, böyle bir sistemin simülasyonu ve rezonans analizi yapılacaktır. Elde edilen simülasyon sonuçları makalede verilerek, rezonans frekansının tespiti ve çözümü tartışılacaktır.

Anahtar Kelimeler: Jeotermal kuyularda motor ve sürücüleri, denizaltı petrol kuyularında motor kontrol, maden ocaklarında motor kontrol, rezonans frekansı, asenkron motor

Performance Analyses of Physical Downlink Shared Channels for 5G New Radio

Yasin KABALCI[1], Muhammad ALİ[2,3]

[1]Niğde Ömer Halisdemir Üniversitesi, Mühendislik Fakültesi, Elektrik-Elektronik Mühendisliği Bölümü, Niğde.
[2]Niğde Ömer Halisdemir Üniversitesi, Fen Bilimleri Enstitüsü, Elektrik-Elektronik Mühendisliği Anabilim Dalı, Niğde.
[3]University of Azad Jammu and Kashmir, Muzaffarabad, Pakistan.
yasinkabalci@ohu.edu.tr

Fifth Generation (5G) new radio (NR) is the latest radio air interface that is developed for next-generation wireless communication systems to meet the growing demands of connected devices. It is designed such that it can support different versatile scenarios like enhanced mobile broadband (eMBB), ultra-reliable low-latency communications (URLLC) and machine type communications (mMTC). The first scenario is develop to provide seamless and outstanding services to the users in upcoming wireless networks as compared with existing systems, whereas the URLLC is designed to overcome the challenging issues like reliability, availability and unwanted delays in modern applications, such as smart grids, remote monitoring and control, vehicle-to-everything (V2X) and so on. The last scenario (i.e., mMTC) allows the manifold connected devices with limited power consumption. This paper focuses on 5G NR physical channel for transmission of downlink user data namely as physical downlink shared channel (PDSCH). The NR utilizes different modulation and access technologies for meeting high data rate requirements. In this study, different modulation schemes are employed to compare the performance of PDSCH in terms of throughput versus signal-to-noise ratio (SNR) via computer simulation studies. Multiple antennas are deployed at both the transmitter and receiver to achieve maximum throughput. In addition, the effect of using different subcarrier spacing is also analyzed in this study. Lastly, the behavior of PDSCH in terms of throughput for different propagation channel models are analyzed with the aid of simulations.

Keywords: Fifth generation (5G) communication systems, physical downlink shared channel, throughput, SNR, clustered delay line channel, tapped delay line channel

Performance Analyses of LDPC codes for 5G New Radio

Yasin KABALCI[1], Ural MUTLU[2]

[1]Niğde Ömer Halisdemir Üniversitesi, Mühendislik Fakültesi, Elektrik-Elektronik Mühendisliği Bölümü, Niğde.
[2]Niğde Ömer Halisdemir Üniversitesi, Bor Meslek Yüksekokulu, Elektrik ve Enerji Bölümü, Niğde.
yasinkabalci@ohu.edu.tr

Following on the success of Fourth Generation (4G) and Long-Term Evolution (LTE), the upcoming Fifth Generation (5G) New Radio (NR) aims to improve data transmission performance by providing higher data rates with less delay. To achieve these aims, the 3rd Generation Partnership Project (3GPP) has defined new specifications for the 5G NR. One of the changes from 4G/LTE is the channel coding schemes. The expectation according to the 3GPP specifications is that Low-Density Parity-Check (LDPC) codes will be used for user data channels, while Polar codes will be utilized for broadcast and control channels. The implementation of these coding schemes is expected to improve error correction performance, thus increasing the overall data rates. The objective of this study is to investigate the throughput performance of LDPC codes in Physical Downlink Shared Channels (PDSCH) for Tapped Delay Line (TDL) channel model. The implementation of the simulations is carried out in three steps. In the first step, the transmitter parameters are set so that the user data (transport block) is channel encoded and modulated to generate a complex-valued signal which is then used to build Orthogonal Frequency-Division Multiplexing (OFDM) frame. In the second step, the OFDM frames are sent over Additive White Gaussian Noise (AWGN) and TDL channel. The third step is the reverse of the first step, where the received OFDM frames are decoded to extract user data. The simulation results are evaluated both Signal-to-Noise Ratio (SNR) versus Throughput Percentage and SNR versus Throughput Data Rate.

Keywords: Fifth generation (5G) communication systems, low-density parity-check (LDPC) codes, physical downlink shared channel (PDSCH).

Seyrek Kodla Çoklu Erişim (SCMA) İletişim Sistemlerinin Weibull Sönümlü Kanaldaki Bit Hata Oranı Başarım Analizleri

Yasin KABALCI[1], M. Aybüke TEZEKİCİ[2]

[1]Niğde Ömer Halisdemir Üniversitesi, Mühendislik Fakültesi, Elektrik-Elektronik Mühendisliği Bölümü, Niğde.
[2]Niğde Ömer Halisdemir Üniversitesi, Fen Bilimleri Enstitüsü, Elektrik-Elektronik Mühendisliği Anabilim Dalı, Niğde.
yasinkabalci@ohu.edu.tr

In recent years, the demand for multi-user communication has become one of the indispensable necessities of today. The fifth generation (5G) wireless communication standard aims to meet the need for higher spectral efficiency, greater connectivity and low latency. Non-Orthogonal Multiple Access (NOMA) is the system that provides a possible solution to increase the number of users within a given time-frequency source. Sparse code multiple access (SCMA) is a promising NOMA technique beyond 5G and wireless networks. Unlike the current studies available in the literature, in this study, the bit-error ratio (BER) performance analyzes of the SCMA communication systems in Weibull fading channel were performed. The Weibull fading channel model is an appropriate channel model to characterize multipath fading channels for both indoor and outdoor environments. In addition, detailed performance analyzes were conducted by using six different code books while performing simulation studies.

Keywords: Fifth generation (5G) communication systems, Sparse code multiple access (SCMA), Weibull fading channel.

Evrensel Filtrelenmiş Çoklu Taşıyıcılı (UFMC) İletişim Sistemleri İçin Farklı Pencerelerin Başarımlarının Karşılaştırılması

Yasin KABALCI[1], Gözde ERGİN[2]

[1]Niğde Ömer Halisdemir Üniversitesi, Mühendislik Fakültesi, Elektrik-Elektronik Mühendisliği Bölümü, Niğde.
[2]Niğde Ömer Halisdemir Üniversitesi, Fen Bilimleri Enstitüsü, Elektrik-Elektronik Mühendisliği Anabilim Dalı, Niğde.
yasinkabalci@ohu.edu.tr

With the development of technology, the demand for fast and reliable wireless network systems has increased significantly. Fifth generation (5G) communication systems aim to meet the requirements for higher capacity and data rate, lower latency and energy consumption, as well as more reliable communication systems. It is well known that Orthogonal Frequency Division Multiplexing (OFDM) technique is not capable of meeting the high requirements of 5G communication systems mentioned above. On the other hand, a promising technology proposed for 5G communication systems is Universal Filtered Multi Carrier System (UFMC). The UFMC is a Non-Orthogonal Multiple Access (NOMA) technology. In this study, the performances of different windowing methods that can be used in UFMC communication systems have been investigated. The windowing function is a special transaction aiming to improve performance in certain respects. In addition, performance analyzes of UFMC communication systems using different windowing methods are also presented in terms of Bit-Error Rate (BER).

Keywords: Fifth generation (5G) communication systems, Universal filter multiple carrier system (UFMC), Windowing techniques.

ENERGY ENGINEERING

Performance evaluation of a residential type micro-cogeneration system: First ever application in Turkey

Mehmet Kaplan[1], Mahmut Sami Büker[2]

[1]Elektrik Grubu, Seha Yapı, İttifak Holding
[2]Necmettin Erbakan Üniversitesi, Enerji ve Yarı-iletkenler Araştırma Grubu
msbuker@erbakan.edu.tr

In this study, the performance evaluation of a micro cogeneration system for residential sector in Konya city has been conducted. The internal combustion engine based and gas fired system has the capacity of 71 kWe. Besides electrical power, the system can provide heating during winter and domestic hot water production in summer and therefore provides energy efficiency for the whole year. The micro-cogeneration system was implemented in a 137-apartment housing project completed in Konya. The energy analysis of the applied micro-cogeneration system showed that the total efficiency of electricity and thermal was around 87%. The corresponding findings from the system operation show that 18.480 kWh of electricity was generated per month against 6.998 m³/month of natural gas consumption. Moreover, the electricity withdrawn from the network decreased 51% with the introduction of micro-cogeneration system. The findings show that micro-cogeneration provides a promising option for energy efficiency in households and therefore, more detailed studies are needed to focus on the housing stock in our country.

Anahtar Kelimeler: Konut, mikro-kojenerasyon, enerji verimliliği, Konya

Energy Survey of Karaman Public Hospital

Mehmet ATEŞ[1,2], Selmin ENER RUŞEN[1,2]

[1]Department of Energy Systems Engineering, Karamanoğlu Mehmetbey University, Karaman, 70100, Turkey.
[2]Engineering Academic Energy Research Group (AKEN), Karamanoğlu Mehmetbey University, Karaman, 70100, Turkey.
esmmehmetates@gmail.com

Today, the importance given to the control, management and efficient use of energy consumption gradually increases due to the rapid depletion of fossil energy resources and environmental problems caused by fossil fuels. In addition, the efficient use of energy will importantly contribute to the national economy. In our country, considering the distribution of energy consumption by sectors, the energy consumed in public institutions is extremely high. Especially in health facilities have much more energy consumption than traditional commercial buildings. They are the most energy consuming buildings (600 kWh / m^2 year) after the shopping centers in the buildings category in the reference indicators of the Ministry of Energy. Hospitals are huge energy consumers because they consist of large buildings where the care and treatment of patients are injured throughout the year (on 24-hour basis). Therefore, in this study, the preliminary energy audit of the Karaman State Hospital was carried out and the possible energy saving potential was revealed. Applicable efficiency methods were determined and their investment costs and payback periods were calculated. It has been proposed to make necessary system improvements to ensure efficient use of energy and to minimize the energy consumed here. In these efficiency studies, it was found that energy costs could be reduced without changing the comfort of health facilities. Thus, it could contribute to the national economy with the efficient use of energy.

Keywords: Energy Efficiency, Energy Audit, Hospital, Karaman.

The Effect of Periodic Measurement on Combustion Efficiency in Waelz Furnace

Mehmet ATEŞ[1,3], Selmin ENER RUŞEN[1,3] ve Aydın RUŞEN[2,3]

[1]Department of Energy Systems Engineering, Karamanoğlu Mehmetbey University, Karaman, 70100, Turkey
[2]Department of Metallurgical and Materials, Karamanoğlu Mehmetbey University, Karaman, 70100, Turkey
[3]Engineering Academic Energy Research Group (AKEN), Karamanoğlu Mehmetbey University, Karaman, 70100, Turkey
esmmehmetates@gmail.com

Nowadays, most of the countries are developing their energy policies on the research of new energy sources and the efficient use of their energy. Efforts to use energy more efficiently have been accelerated especially in energy-intensive sectors such as mining and metallurgy. In energy efficiency studies, it is very important to follow the energy usage in the system by periodic measurements especially in energy consumption points after energy efficiency applications.
In this study, in order to increase the burning efficiency of the system by optimizing the fuel-air mixture in the combustion system of the waelz furnace in an iron-steel plant, the furnace exhaust gas was periodically monitored by the flue gas analyzer. During the periodic measurements, the burner is adjusted to ensure optimum combustion conditions by monitoring the amounts of flue gas components (especially O_2). Thus, the annual fuel consumption of the waelz furnace has been significantly decreased by providing a high financial gain in terms of energy efficiency. The result of this study shows that periodic measurements of flue gas components may result in significant energy savings in waelz furnace systems.

Keywords: Energy Efficiency, Waelz Furnace, Burning Optimization

The Comparison of Weibull and Rayleigh Distribution Functions with Moment Method for Osmaniye Region of Turkey

Yusuf Alper KAPLAN[1]

[1]Department of Energy Engineering, Osmaniye Korkut Ata University, Osmaniye, Turkey
alperkaplan@osmaniye.edu.tr

In this study, wind energy potential of Osmaniye region is assessed statistically by using the Turkish State Meteorological Service's hourly wind speed data between 2009 and 2013. This study introduced the evaluation of Weibull Distribution Function and Rayleigh Distribution Function for Osmaniye Region. Moment Method is used to calculate the Weibull and Rayleigh parameters. The Relative Percentage Error (RPE) statistical test is used to compare the efficiency of these distribution functions. The calculated power density of all used distribution function is a major key issue for suitability use of wind energy. The evaluation of parameters and wind power distribution play a crucial role in producing electricity from wind power. The calculated power densities of all used distribution functions were compared with wind power density derived from measured wind data.

Keywords: Wind Energy, Weibull Distribution, Rayleigh Distribution, Moment Method.

ENVIRONMENT ENGINEERING

Treatment of poultry slaughterhouse wastewater using combined system

Kulyash Meiramkulova[1], Yerbolat Tashenov[1], Michail Zhumagulov[1], Maral Mussimkhan[2], Meruyert Pazylova[1]

[1]L.N. Gumilyov Eurasian National University, Kazhymukan Str., 13, Nur-Sultan, Kazakhstan
[2]Asfendiyarov Kazakh National Medical University, Tole Bi Str., 94, Almaty, Kazakhstan
kuleke@gmail.com

Poultry meat production of the Republic of Kazakhstan has increased by 24% or 29.6 thousand tons since 2014 and totaled 152700 tons in 2018. Poultry processing plant on average use about 18.9 to 37.8 liters/bird. Since slaughterhouses produces large amount of waste because of supply and demand, it is required to treat its effluents to a point that it can to released safely and sustainably to the environment.

The main purpose of this work is to evaluate the effectiveness of wastewater treatment using a combined system for obtaining a reusable water source. A sample of wastewater from the cooling and defeathering sections of the poultry slaughterhouse industry from a local company was used to proceed with the analysis.

Method: a lab based combined system was used which comprised of electrocoagulation, ultra-filtration, photo-chemical and oxidation processes for the treatment. This model can be used in other industries as well such as the agricultural sector.

The results are impressive as removal efficiencies of components such as COD, turbidity, suspended solids, and microorganism colonies were all above 90%, proving this system effective for treatment. In terms of nitrogen containing products, concentration of nitrates decreased substantially by about 96%, but ammonium nitrogen removal efficiency was only about 20%.

Conclusion: despite, some low removal efficiency or increase in some components, all the indicators after treatment were in accordance to the industrial standard. Now, the idea is to further enhance this technology to make it more efficient and more adaptable for other industrial applications.

Keywords: wastewater treatment, poultry slaughterhouse, combined system, removal efficiency.

Effect of electrode material on electrocoagulation treatment of wastewater

Kulyash Meiramkulova, Mikhail Zhumagulov, Duman Orynbekov, Yerbolat Tashenov

L.N. Gumilyov Eurasian National University, Kazhymukan Str, 13, Nur-Sultan, Kazakhstan
kuleke@gmail.com

The article is devoted to the study of the influence of electrode materials on the electrolytic processes in wastewater treatment.

The diverse parameters of the electrochemical process varied in a controlled manner, which served as the basis for selecting the electrode material with the required efficiency of wastewater disinfection. Wastewater from the technological cycle of the slaughterhouse of the poultry enterprise "Izhevskoye" (village Izhevsk, Kazakhstan) was taken as the object of research. Various materials, such as iron-aluminum, iron-graphite, aluminum-graphite, graphite-stainless steel, were selected and compared as electrodes. As a result, aluminum and graphite electrodes were chosen because of their stable operation and high efficiency. The effect of direct current with a range of 1–5 A with a voltage of 6–24 V for various times from 10 to 30 min was studied.

The following conclusions were obtained:

1. Depending on the choice of electrode material, various regularities were determined. The use of aluminum electrodes leads to the accumulation of aluminum hydroxide coagulant in the cathode space, oxidation of the surface of the aluminum anode and deposition of aluminum on the surface of the cathode.

2. Theoretical analysis and experiments have shown that the pH of the water does not affect on the electrolysis voltage. Graphic voltage dependencies were obtained, which is applicable to non-passivated aluminum electrodes. Using the obtained results, it is possible to determine the total required voltage of the electrolysis process.

3. It has been established that the optimal time for electrocoagulation is 20 minutes; with a longer process, the electrodes are passivated, which reduces the efficiency and power consumption of the electrolysis.

Keywords: electrolysis, electrodes, wastewater, voltage, electrocoagulation.

The Effects of Different Land Uses on Some Properties of Soils in Ovaçiftliği-Senirköy (Kayseri) Province

Selma YAŞAR KORKANÇ[1*], Mustafa KORKANÇ[2], Abdurrahman GEÇİLİ[1], İlker KARACA[1]

[1]Niğde Ömer Halisdemir University, Engineering Faculty, Department of Environmental Engineering, 51240, Niğde, Turkey
[2]Niğde Ömer Halisdemir University, Engineering Faculty, Department of Geological Engineering, 51240, Niğde, Turkey
[*]sykorkanc@ohu.edu.tr

People's use of land is a necessity to meet various needs. The land, which is an important natural resource, is used in various ways depending on human needs. Differences in land use can affect soil characteristics.The aim of this study is to determine the effects of land use differencies on some properties of soils in Ovaçiftliği-Senirköy (Develi-Kayseri). Soil samples were collected from 3 different land use types (12 of samples from grassland, 12 of from shurbland and 12 of from farmland). In each type of land use, 4 sampling areas were specified (20x30 m), and topsoil samples (0-20 cm depth) that are disturbed were collected from 3 spots of each area. pH, electrical conductivity, particle density soil organic carbon, particle size distribution, aggregate stability and dispersion ratio properties of the soils were determined. Data were evaluated by using one way analysis of variance (ANOVA).The study results showed that land use differencies significantly effect pH, electrical conductivity, particle density, soil organic carbon, clay, sand content and dispersion ratio. Soil samples taken from all land use types prone to erosion. Salinity problem has been found in the shrubland and grassland.

Keywords: Land use, soil properties, salinity, soil organic carbon

The Effect of Conductive Materials on Microbial Dynamics in Anaerobic Systems

Sevgi Demirel[1], Ö. Begüm Gökçek[1], Hamdi Muratçobanoğlu[1], Recep Zan[2]

[1]Department of Environmental Engineering, Nigde Ömer Halisdemir University, Turkey
[2]Nanotechnology Application and Research Center, Nigde Ömer Halisdemir University, Turkey
hamdimuratcobanoglu@gmail.com

Energy demand, the depletion of fossil fuels and concerns about sustainability increase the interest in the production of renewable energy sources. Biogas; it is a clean, environmentally friendly and highly efficient renewable energy source obtained by the digestion of organic waste. Biogas production is carried out under anaerobic conditions via complex microbial reactions to decompose organic matter into final products such as CH_4, CO_2, H_2S, and NH_3. The biogas content of the anaerobic decomposition (AD) process contains about 50-70% of methane and this methane is used for heat or electricity generation. The use of conductive materials in the AD process is a practical solution to the disadvantages such as the long lag phase, slow methane production and the lack of resistance to adverse conditions (low pH, ammonia effect, etc.). In recent years, conductive materials have been used to increase the amount of biogas and/or biomethane and to find solutions for operational problems. Electron transfer between microorganisms is a key process in AD reactions. The conductive materials can promote interspecies electron transfer between bacteria and methanogens. This review focuses on the effects of conductive materials such as activated carbon, biochar, carbon nanotubes, magnetite, graphene, graphite on the microbial community and the strategies used to promote electron transfer in engineered systems for biogas production.

Keywords: Anaerobic digestion, conductive materials, new generation sequencing, scanning electron microscopy (SEM), microbial community

Novel Treatment Technologies For Tannery Wastewater

Ece Ümmü DEVECİ[1] , Çağdaş GÖNEN[2]

Niğde Ömer Halisdemir Üniversitesi Çevre Mühendisliği Bölümü
ecedeveci@gmail.com

It is known that excessive amounts of water are consumed in industrial production. One of these industries is the food and textile industry. The tannery industry in the industry, development of open and Turkey is very common in the industry. The tannery industry has very complex wastewater, both due to the excessive water consumption and chemical structure which the raw leather and the synthetic chemicals it uses during production.

As a result the salt, high electrical conductivity, heavy metal (chromium, nickel, etc.) in the wastewater from the tannery processing industry, high amount of dissolved xenobiotic organics are mixed into the receiving water without adequate treatment. This situation destroys both soil and water resources and consequently its ecosystem is irreversible.

On the one hand, the tannery processing industry continues to develop innovative production technologies while the leather industry wastewater treatment and wastewater recovery technologies continue to be developed through scientific research. In this study, innovative technologies (membrane and advanced treatment technology) applied for the treatment of water treatment wastewater and water recovery will be considered.

Keywords: Tannery Wastewater, Innovative Technology, Membrane, Advanced Treatment Technology

Investigation of Pre-Service Teachers' Awareness on Climate Change in Terms of Demographic Characteristics

Meryem Nur Aydede[1], Çağdaş Gönen[2], Ece Ümmü Deveci[2]

[1]Department of Science Edycation, Nigde Ömer Halisdemir University, Turkey
[2]Department of Environmental Engineering, Nigde Ömer Halisdemir University, Turkey
mnaydede@hotmail.com

Climate change, mitigation and adaptation problems have been waiting to solve permanently for all countries. Turkey has a significant place among the countries who are causing the global warming. To mitigate the climate change, effective awareness must be created on public and on the teachers' candidates who are important role to educate public. The general purpose of this study is to investigate the pre-service teachers' awareness on climate change in terms of their demographic characteristics. Survey method was used as a research method in the study. The research group of the study constituted 250 teacher candidates who were studying at different departments of the Faculty of Education at Niğde Omer Halisdemir University. In order to collect data, *"awareness scale towards to climate change"* developed by researchers and applied to teacher candidates. The data obtained from the measurement tools were recorded with SPSS 15.0 statistical software. The results of the analysis are based on the mean scores of pre-service teachers about their awareness on climate change.

There is a significant difference between pre-service teachers' awareness of climate change awareness and gender ($t(248)=3.1$ $p<0.05$). In the study, a significant difference was found in favor of female teacher candidates' awareness of climate change. When the awareness levels of pre-service teachers on environmental activities are examined according to their participation in environmental activities, in the previous period, the candidates who participated in any activity in the environment (=30.82) and the candidates who did not participate in any environmental activity (=30.40) in favor of the candidates who participated in environmental activities ($t(248))=3.2, p>0.05$).

Keywords: Climate change, Climate change awareness, Global warming, Awareness scale, teacher candidates

Investigation of Climate Change Impact on Turkey via Climate Change Scenarios of IPCC

Çağdaş GÖNEN[1], Ece Ümmü DEVECİ[1]

[1]Department of Environmental Engineering, Nigde Omer Halisdemir University, Turkey
cagdas.gonen@ohu.edu.tr

Nowadays, increasing the greenhouse gas emission at the atmosphere have cause dramatically chance the climate of the word. As a result of accumulating greenhouse gasses at the atmosphere create temperature rising at the surface layer of the planet. Temperature rising especially begin after the 19. century and accelerate after the 1980's. Currently the temperature rising reach dangerous level of 1,5 °C. Scenarios of the Intergovernmental Panel on Climate Change (IPCC); to prepare a comprehensive review of the level of knowledge on climate change science and to provide recommendations, to identify the social and economic impacts of climate change and to inform the intervention strategies.

In this study, global warming effect occurring due to the increase of greenhouse gases in Word and Turkey were examined according to IPCC scenarios such as FAR, SAR, TAR, AR4, AR5. In addition, the climate of the word has been examined by means of the climate scenarios where measures are taken and the intervention strategies and the measures that may be taken to endanger the life of the globe. As a result of this study, expected climate change effects in Turkey indicate that 10% decline in average rainfall. Temperatures will increase by 2-3 °C in summer, 2°C in winter. Turkish territorial waters will rise of 12 - 18 cm, and extreme floods will occur in coastal cities.

Keywords: Climate change, Climate change mitigation, Climate scenarios, Global warming

Pretreatment of Dairy Industry Whey by Membrane Processes

Tuğba Çelik[1], Niğmet Uzal[2], Fehiman Çiner[1]

[1]Nigde Omer Halisdemir University, Engineering Faculty, Department of Environmental Engineering
[2]Abdullah Gul University, Engineering Faculty, Department of Civil Engineering
fciner@ohu.edu.tr

The aim of this study is to evaluate the pretreatment of the whey production process water from a milk and dairy production plant in Niğde. Before starting the experimental studies, COD, conductivity, pH and AKM parameter values of the raw whey coming from the dairy industry were determined. Vacuum filtration and dead end filtration systems were used for the pretreatment experiments. In pretreatment tests, dead end SEPA CF system was used and UF 50.000Da and 20.000Da, 10.000Da membranes were used. The pressure was applied between 2-3 bar. In UF experiments, samples filtered from 0.45 µm membrane and 1.2 µm filter were used. The flux was followed in each membrane and the first step was followed by pure water, followed by pretreatment with whey and the last pure water.

According to the results of the study, when 0.45µm membrane was used with 50.000Da UF membrane in pretreatment for whey; COD removal was 26% and for 0.45 µm membrane +10.000Da UF COD was 53%. Removed. When 1.2 µm filter was used in pretreatment with 50.000Da UF; COD removal was 44% and for 1.2 µm filter was used with 20.000Da UF membrane COD removal was achieved at 48%.

Keywords: pretreatment, whey, dairy industry, ultrafiltration

Evaluation of Some Spring Waters in Malatya Province by Water Quality Index (WQI) Method

Murat ÇELİKER[1]

[1]DSİ 9. Bölge Müdürlüğü, Elazığ/Türkiye
mceliker23@gmail.com

Water Quality Index (WQI) is a mathematical description used to transform large number of water quality data into a single parameter. So that, the water quality is expressed more simple and easy. The purpose of this study was to assess the quality of some spring waters in Malatya province based on water quality index (WQI). For this, 19 parameter analysis including in-situ measurements [color, turbidity, electrical conductivity (EC) pH] and chemical analyzes [total dissolved solids (TDS), total hardness (TH), alkalinity, calcium (Ca^{2+}), magnesium (Mg^{2+}), sodium (Na^{+}), potassium (K^{+}), bicarbonate (HCO_3^{-}), chloride (Cl^{-}), sulphate (SO_4^{2-}), ammonium (NH_4^{+}), nitrite (NO_2^{-}), nitrate (NO_3^{-}), phosphate (PO_4^{3-}), fluoride (F^{-})] in seven spring water were carried out in September 2015 period. The WQI value for spring water samples ranges from 13.29 to 19.30. The computed WQI shows that all of spring water samples fall in the ‘excellent’ water category.

Keywords: WQI, Malatya, spring water, water quality

The Effect Of Electrode Types To Color And Cod Removal From Textile Wastewater With Electrochemical Treatment Method

Önder Kahraman[1], İsmail Şimşek[2]

[1]Çevre Mühendisliği Bölümü, Aksaray Üniversitesi, Türkiye
[2]Çevre Mühendisliği Bölümü, Aksaray Üniversitesi, Türkiye
okahraman1878@gmail.com

Wastewater from industrial activities should be treated according to regulations limits before discharge to the receiving environment. The common characteristics of the textile industry wastewater are high COD and color content. This wastewater, which is discharged without any treatment to the receiving environment, absorbs sunlight, prevents photosynthesis in the receiving environment and causes a decrease in dissolved oxygen value. These problems cause the extinction of aerobic organisms living in the receiving environment, changing species.

Electrochemical treatment mainly consists of three different processes such as electrocoagulation, electroflotation, and electrooxidation. These processes can be operated individually or in some cases at the same time. Electrochemical methods can be used effectively in the treatment of many pollutants such as color and COD removal from wastewater.

In this study, chemical oxygen demand (COD) and color removal were investigated which are the important pollutant parameters of denim production plant wastewater by using electrochemical methods.

In the scope of electrochemical treatment, 16 different combinations of iron, aluminum, stainless steel, and graphite electrodes were used in anode and cathode.
Color and COD parameters as well as pH, conductivity, turbidity, and operating costs were investigated in the experiments.

The highest removal efficiency of COD which was initial value 714,75 mg/L was determined as 61,76% with iron (anode) and stainless steel (cathode) electrodes. The highest removal efficiency of color which was initial value 1172,75 Pt-Co was determined as 96,77% with stainless steel (anode) and aluminum (cathode) electrodes.

Keywords: Electrochemical treatment, Textile wastewater, COD removal, Decolorisation, Electrode types

Life Cycle Analysis of High Performance Mortar

Sevgi Demirel[1], H. Öznur Öz[2], Muhammet Güneş[2]

[1]Environmental Engineering Department, Niğde Ömer Halisdemir University, Türkiye
[2]Civil Engineering Department, Nigde Ömer Halisdemir University, Türkiye
sevgidemirel@ohu.edu.tr

Nowadays, the sustainable environmental approach is increasingly attracted by the global warming and solidified environmental policies. The environmental concerns of the cement production process, such as the limited CO_2 emissions and depletion of natural resources, have led to research for the alternative materials in the construction sector. More sustainable building materials can be obtained by the usage of industrial wastes such as fly ash, blast furnace slag, silica fume with pozzolanic properties in concrete and cement production. Life Cycle Analysis (LCA) is designed to examine the environmental impacts of a product from the supplying of raw material to the final disposal depending on the material usage and type of energy. In this study, the life cycle analysis of the high-performance mortar (HPM) mixture containing fly ash and waste glass powder was carried out with the SimaPRO 8.5.0.0 software and the environmental impacts that could be occurred at all stages from the supplying of raw material to the transportation of construction site were proved via an approach with "from cradle to gate". At the end of the study for LCA, it was concluded that the 20% substitution of cement with fly ash and waste glass powder has reduced the environmental burden of YPH produced under normal conditions.

Keywords: High performance mortar, fly ash, waste glass, life cycle assessment, SimaPRO

FOOD ENGINEERING

Kefirlerin Konjüge Linoleik Asit İçeriği ve Ayçiçek Yağı İlavesinin Etkisi

Özlem ERİNÇ[1], Ayşe ÖZBEY[1]

[1]Niğde Ömer Halisdemir Üniversitesi Gıda Mühendisliği Bölümü, Niğde
ayse.ozbey@gmail.com

Conjugated linoleic acid (CLA) is a group of positional and geometric isomers of linoleic acid. CLA isomers, which are natural and functional components, predominantly present in meat and milk of ruminants and their products. Hovewer, dietary CLA intake is relatively low to promote the desired physiological effects (antioxidant, anti-carcinogenic, anti-obesity, immunomodulation). Many scientific studies have proved that the health benefit of CLA isomers can be produced from linoleic acid by using bacteria of kefir grains. For this reason, the amounts of CLA and the changes during storage of kefir produced by using kefir grain from different milks (cow, goat, and sheep) were determined during storage at +4°C. Furthermore, the effect of the addition of sunflower oil into cow milk on the amount of CLA was investigated during storage. For this purpose, 0.5%, 1%, 1.5%, and 2% sunflower oil was added into cow milk, and then kefir was produced. CLA contents of final product were analysed on days 0, 2, 7, 14, and 21. The results of this study showed that the amounts of CLA increased after fermentation and during storage. Also, addition of sunflower oil resulted in proportional increase in the CLA contents of kefir. Adding of sunflower oil into milk for kefir production increased CLA content from 0.806 (mg/g) to 0.909 (mg/g). This study revealed that addition of sunflower oil into milk may help the production of kefir samples with remarkably high CLA content.

Keywords: Conjugated linoleic acid, kefir, sunflower oil, sheep's milk, goat's milk

Escherichia coli O157:H7'nin Sütte Gelişimi Üzerine Eco-Fajlarının Etkisi

Bilger TAŞ, Tuba Sakin, Zeliha YILDIRIM

Niğde Ömer Halisdemir Üniversitesi

Bakteriyofajlar, bakterileri enfekte eden viral ajanlardır. Bu çalışmanın amacı 5 farklı Eco-fajlarının Escherichia coli O157:H7'ye karşı tek tek ve kombine olarak virülant etkilerini UHT sütte saptamaktır. E. coli O157:H7 ile 103 ve 106 kob/ml düzeyinde kontamine edilen UHT süt örnekleri 109 pob/ml düzeyinde Eco-fajları ile muamele edildikten sonra buzdolabı ve oda sıcaklığında depolama işlemine tabi tutulmuşlardır.

Araştırma sonucunda Eco-fajları E. coli O157:H7'yi 103 kob/ml düzeyinde içeren süt örneklerine 109 pob/ml seviyesinde uygulandığında, buzdolabı ve oda sıcaklığında konakçı bakteri sayısını belirlenemeyecek seviyenin altına düşürdükleri belirlenmiştir. E. coli O157:H7'yi 106 kob/ml içeren süt örneklerinde ise Eco-fajlarının buzdolabı sıcaklığında tutulan örneklerde E. coli O157:H7 sayısında depolamanın birinci gününde 5,14-6,56 log'luk; oda sıcaklığında muhafaza edilen süt örneklerinde ise 5,11-6,53 log'luk azalmaya neden olduğu belirlenmiştir. Depolama süresinin uzamasıyla birlikte oda sıcaklığında muhafaza edilen örneklerde E. coli sayısının biraz arttığı, ancak bu artışın kontrol örneği ile kıyaslandığında düşük düzeyde olduğu gözlenmiştir. Eco-fajlarının depolama süresince hem buzdolabı hem de oda sıcaklığında stabilitelerini korudukları ve enfektif etkilerinin 4°C'ye göre 25°C'de daha yüksek olduğu da tespit edilmiştir. Bakteriyofaj içermeyen kontrol örneklerinde ise E. coli O157:H7 sayısının depolama süresince arttığı ve bu artışın oda sıcaklığında muhafaza edilen örnekte daha yüksek olduğu gözlenmiştir.

Çalışma sonucunda Eco-fajlarının UHT sütte konak hücreleri olan E. coli O157:H7'e karşı biyokoruyucu ajan olarak kullanılma potansiyeline sahip oldukları saptanmıştır.

Anahtar Kelimeler: Bakteriyofaj, Escherichia coli O157:H7, süt, biyokoruyucu

GEOLOGY ENGINEERING

Geological and Gemological Investigation of The Agates Around The Kuruseki, Serince, Görümlü (Almus-Tokat) Region

Erhan TURHAL[1], Fetullah ARIK[2]

[1]Konya Technical University, Graduate Education Institute, Geological Engineering Department, Selçuklu, Konya
[2]Konya Technical University, Faculty of Engineering and Natural Sciences, Geological Engineering Department, 42031, Selçuklu, Konya
fetullaharik@gmail.com

In this study, we aimed to determine the geological, mineralogical and petrographical characteristics of the agate nodule formations and wall rocks in the northern part of the Almus Dam Lake and the gemological characteristics of the agates.

In the study area, metamorphic, magmatic and sedimentary units formed from Paleozoic to the present day are exposed. The Paleozoic aged Tokat Massif, which is represented by low-grade metamorphic rocks such as metabasites, marble, phyllite, serpentinite, mica-schist, amphibolite and a small amount of blueschist, forms the basement of the study area. Mainly consisting of gabbro, serpentinite and dolerite dykes, the Bakımlıdağ complex with ophiolitic character lies with tectonic contact on the Paleozoic units. Middle Late Eocene volcano sedimentary Almus Formation represented by conglomerate, sandstone, mudstone, and shale intercalations with andesitic-basaltic lava, tuff, agglomerate, volcanic breccia, is unconformably over the other units. The youngest units in the region are Quaternary alluvium.

The agate nodule formations in the region are concentrated around the fault zones of the volcanic breccia and volcanoclastic sandstones belonging to Almus Formation, in the direction of WNW-ESE and dip towards north. The size of the agate nodules is quite variable and ranges from a few mm to 30 cm. The size of the nodules and the number of minerals found in the control of the small nodules are more homogeneous while large nodules with different colors and patterns of agate bands, coarse crystalline quartz amorphous SiO_2 and calcite fill. The nodules are generally filled with red bands and yellowish green lace patterns in a thin agate sheath from the outside and quartz and chalcedony in the remaining spaces.

As a result of petrographical, XRD and gemological analysis, agate, calcite and quartz minerals were determined. Chalcedonies are usually purple, transparent and translucent. Reddish orange hematite droplets and yellow hematite inclusions were observed in the tubers.

Keywords: Agate, Almus, Gemstone, Gemology, Tokat

Geological and Gemological Properties of The Döllük And Gümenek (Tokat) Chalcedonies

Abdurrahman RUŞEN[1], Fetullah ARIK[2]

[1]Konya Technical University, Graduate Education Institute, Geological Engineering Department, Selçuklu, Konya
[2]Konya Technical University, Faculty of Engineering and Natural Sciences, Geological Engineering Department, 42031, Selçuklu, Konya
fetullaharik@gmail.com

In this study, it was aimed to investigate the relations of chalcedony formations with the rocks located in around of the Gümenek and Döllük villages of Tokat City center and their petrographical and geolomogical features.

In the region, consisting of Paleozoic to today, it is observed magmatic and sedimentary units. The Tokat Massif, which forms the basement of the study area, is low grade metamorphosed in the greenschist facies and is represented by metabasalt, metagraywacke, micaschist, crystallized limestone, marble, amphibolite and less amount blueschists. In the west of the area, Middle Eocene volcano-sedimentary Haydaroğlu formation consisting of conglomerate, mudstone, sandstone and shale intercalations with andesitic-basaltic lava, tuff, agglomerate, volcanic breccia, unconformably covers the Tokat Massif.

Blue chalcedony formations are observed along a fault zone close to the E-W trending line passing through the metamorphic units of the Tokat Massif. The chalcedonies were formed mostly in the cracks, fractures and cavities of the recrystallized limestones, which had a more fractured and brecciated structure due to faults along a line approximately 25 m perpendicular to this fault zone. The color of the chalcedonies is mostly light blue and close to white, dark blue and greyish blue. Usually asymmetrical and symmetric vessel filling, gap filling, geoid, banded and lacy structures are observed. Parallel to each other, several mm thick banded structures are common from the outside of the void and some cavities are filled with coarse crystalline quartz.

As a result of mineralogical, petrographical, XRD and gemological investigations of the samples selected among the chalcedonies calcites and chalcedonies were observed in some light white bands.

Keywords: Chalcedony, Tokat, Gümenek, Gemology, Semi-Precious Rock

Geologıcal and Gemologıcal Propertıes of The Gümüşyurt Chrysoprase (Artova-Tokat)

Arif DELİKAN[1], Fetullah ARIK[1], Yeşim ÖZEN[1]

[1]Konya Technical University, Faculty of Engineering and Natural Sciences, Geological Engineering Department, 42031, Selçuklu, Konya
adelikan@ktun.edu.tr

It is aimed that to investigate of the geological, mineralogical, petrographic and gemological characteristics of the chrysoprase that exposed in a large area in the west of the Gümüşyurt village, approximately 20 km from Artova (Tokat), in this study.

The oldest unit in the area is the Late Triassic age Devecidağ Complex, which is represented by volcanic units, greywackes, and Permian aged limestone blocks. The Çekerek Formation, which consists of Eocene continental-marine sediments and volcano-sedimentary units, including chrysoprase, covers this unit with angular unconformity.

The non-cracked parts of the chrysoprase are hard and massive. Chrysoprasses are generally dark green and appear in light green tones. In the mineralogical, petrographic and XRD studies made of rocks, quartz was found in the content of the rocks.

According to the gemological investigations made from chrysoprase, the rocks were determined as chalcedony (chrysoprase). It was determined that chrysoprases from the region could be used as a gemstone in terms of the basic gemstone properties (hardness, strength, color diversity, polishing and light reflectance).

Keywords: Chrysoprase, Gemstone, Gümüşyurt, Tokat

Stratigraphic and Sedımentologıc Propertıes of The Jurassıc-Lover Cretaceuos Deposits İn Hasanoglan (NE Ankara-Turkey) Region

Arif DELİKAN[1],Tülin HATİPOĞLU[2]

[1]Konya Technical University, Faculty of Engineering and Natural Sciences, Geological Engineering Department, 42031, Selçuklu, Konya
[2]Selçuk Universty, Graduate School of Natural Scıences, 42031, Selçuklu, Konya
adelikan@ktun.edu.tr

Jurassic-Early Cretaceous rocks are observed in Hasanoglan region in east of Ankara. In this study, stratigraphic and sedimentological features of Jurassic Cretaceous sediments are investigated and they contribute to regional geology.The Jurassic-Lower Cretaceous sequence in the study area lies on the Late Triassic weakly metamorphosed rocks (Karakaya Complex) with angular unconformity. It begins with interbedded deltaic conglomerate and sandstone (Çoraklıktepe member). There are abudant granite pebbles in the conglomerates. It is red in color and highly fossiliferous. Crinoidal limestone and ammonite bearing marl rest on the sandy limestone Thick non fossiliferous mudstone was deposited over the ammonite bearing rocks. That means that the area was shallowed during Early Pliensbachian. During Late Pliensbachian-Early Toarcian detritic rocks progressively passes into variegated- red limestone. This typical ammonitico-rosso facies wedges laterally into green mudstone (Beytepe member). Due to block faulting formed after Callovian in the area, the base topography of the basin was changed. For that reason, at the northern part of the study area, the pelagic carbonate platform sediments (Çakırlardere formation) having abundant ammonite and pelagic oolite were deposited directly on the basement rocks. This points that shallow areas were formed off shore as a result of synsedimentary faulting. The pelagic ooid bearing limestone grades laterally and vertically into cherty limestone. During Oxfordian -Early Cretaceous , the area was deepened rapidly and the limestone with Radiolaria (Soğukçam formation) was deposited

Keywords: Hasanoğlan, Ammonite, Granitic conglomerate, Jurassic, Ankara

Sulfur Isotope Investigation of Pınarbaşı Cu-Mo Mineralization (Gediz-Kütahya) In Western Turkey

Yeşim ÖZEN[1], Fetullah ARIK[1]

[1]Konya Technical University, Faculty of Engineering and Natural Sciences, Geological Engineering Department, 42031, Selçuklu, Konya, Turkey
yesimbozkir@gmail.com

The Pınarbaşı porphyry Cu-Mo mineralization is located at the western part of Anatolia and in southern part of the İzmir-Ankara suture zone. The Pınarbaşı porphyry Cu-Mo mineralization hosted in the Early Miocene Pınarbaşı granitoidic intrusion consisting of granite, granodiorite, quartz monzonite and granite porphyry, composes of molybdenite, chalcopyrite, galena, sphalerite, pyrite as mainly ore minerals and they are accompanied by chalcocite, covellite, bornite, malachite, orpiment, realgar, Fe-oxides, gangue quartz, and calcite. The Pınarbaşı Cu-Mo mineralization contains substantial quantities of Mo, Cu, Pb, Zn, Au, Ag and As. The $\delta^{34}S_{H2S}$ values (0.6 to 4.5‰) of sulfides (molybdenite, chalcopyrite, pyrite and galena) suggest a magmatic origin for the ore-forming fluids.

Keywords: porphyry Cu-Mo, sulfur isotope, Pınarbaşı, Kütahya, western Turkey

Glacier Tracks in Niğde

Mehmet Şener[1]*, Murat Türkmehmet[2], Mehmet Furkan Şener[1]

[1*]Niğde Ömer Halisdemir Üniversitesi, Mühendislik Fakültesi, Jeoloji Mühendisliği Bölümü, Niğde, Türkiye 51240
[2]Maden Tetkik ve Arama Genel Müdürlüğü, Enerji Hammadde Etüt ve Arama Dairesi, Ankara, Türkiye 06800
[1]Niğde Ömer Halisdemir Üniversitesi, Fen Edebiyat Fakültesi, Coğrafya Bölümü, Niğde, Türkiye 51240
*msener@ohu.edu.tr

The Gökbez Formation, which was observed in an area of approximately 25 km2 in the south of Niğde, was deposited in a lake environment, which was relatively deepened from north to south. The unit is composed of micritic in the northern parts, sparitic in the southern parts and oomicritic limestones in the western parts. Due to this lithological differentiation in limestones; a large number of lapya, dolin and grike-clint have developed various karstic structures. Due to the dense karstification observed in the southern parts of the formation, its thickness was reduced to 50 cm and it was determined that it would disappear over time due to the drainage networks. In the SE section of the Gökbez formation, in the grike-clint structures commonly observed in the Obruk Tepe, Cinali Tepe, İşbaşı Tepe, Kestel Tepe and Dikmen Tepe, the grics are approximately NS oriented and offer a depth of 15-45 cm. Clints can reach 20-200 cm2 dimensions. Such karstic structures are usually formed in the glacial environment. There is no literature information about Gökbez formation sedimentation environment and glacial formation of the nearby region. However, in the south of the study area, especially in the Aladağlar Yedigöller Plateau and Hacer Valley, using the cosmogenic ^{36}Cl isotope, the height of some of the glaciers that developed between 10,2 ± 0,2 and 8,6 ± 0,3 byo was 200 m. 7 units of moren cedar were found. In the light of this information, traces of the Würm glacial period which developed approximately 110.000-10.000 years ago in the near of Niğde region are projected as glacial traces.

Keywords: Niğde, Grike-clint, Glacier, Karstification

Building Stones Used In Andaval Church (Niğde) And Ancient Stone Researchs

Mustafa KORKANÇ[1,2*]

[1]Niğde Ömer Halisdemir University, Engineering Faculty, Department of Geological Engineering, 51240, Niğde, Turkey
[2]Niğde Ömer Halisdemir University, Industrial Raw Materials and Building Materials Application and Research Center, Niğde, Turkey
[*]mkorkanc@ohu.edu.tr

There are various cultural assets in Niğde and its region which have been built by different civilizations depending on the strategic importance of the city. Some of them are quite large and important structures and their artistic, cultural and aesthetic features are also very interesting. Due to the lack of good maintenance and preservation of historical buildings, it has been deteriorating day by day; it loses its architectural, historical and aesthetic features. As a result of the negative effects of climatic conditions, important degradation occurs in these structures due to neglect and disregard. The fact that the building blocks that need to be changed as a result of deterioration and various damage are original stones is an important requirement for restoration work. Andaval Church, which was built in the 6th century on the name of Helena, the mother of Roman Emperor Constantine, who was on the holy pilgrimage road in time was studied. In the building, the ignimbrite rock was used as a block cut stone and the wall paintings which were made in the 11th and 12th centuries can be seen today. It is known that the building, which was used as a middle part church until the early 1900s, was used as an apple storage after 1923. In 1977, the church was demolished by an unknown reason. The excavation and restoration works that started in 1996 and landscaping were opened to visitors in April 2019 by making walkways for visitors. In the case of the repair of the structure, which is mostly ruined, in the future, the ancient stone quarry areas where the stones used in the building were taken were determined. In this study, it is tried to create an important basis for restoration works by putting forth the engineering properties of stones similar to the original stone properties.

Keywords: Andaval Church, deterioration, building stone, Niğde.

MECHANICAL ENGINEERING

Questions of calculation of working equipment of power-shovel

B.T. Sazambayeva[1], B.B. Togizbayeva[2]

[1,2]L.N. Gumilev Eurasian National University, Astana, Kazakhstan
[1]a.sazambaeva_t@mail.ru, [2]baglan099@mail.ru

This article discusses the method of calculating the design of a hydraulic excavator with an additional working body in the form of a milling cutter for cutting hard rock, spent asphalt, frozen soils. The review, collection and analysis of patents, copyright certificates on the designs of technical solutions for multifunctional structures of the working body of a hydraulic excavator were made. The general provisions of digging are considered, cutting forces are determined with simultaneous use of the bucket and cutting discs. A patent has been filed for a working equipment of a single-bucket excavator that includes, as an additional organ, a disk milling cutter that allows simultaneous destruction and excavation of asphalt concrete during the stripping works. Computer simulation of multifunctional working equipment of single-bucket hydraulic excavator was carried out. It was determined that the modernization of the working body through the introduction of cutting disks will improve the performance and quality of excavation work performed by the excavator.

Keywords: Working equipment, excavator,millingcutter, arm, hydraulic, handle, single-bucket.

Power efficient vortex burner device

Baubek A.A.[1], Zhumagulov M.G.[1]

[1]Thermal power engineering department, LN Gumiliyev Eurasian National University, Astana city 010008, Republic of Kazakhstan, Satpayev Str. 2
zhmg_9@mail.ru

This article dwells on the scientific study of the vortical device for the efficient combustion of fossil fuels. The innovative burner device under investigation is based on principal of vortical motion of fuel air mixture. There is a precombustion chamber, where inflammation and partial combustion of the swirling flow takes place. The article describes experiment on defining the geometric dimensioning of the burner discharge nozzle in relation to a combustion chamber. During the experiment, the exhaust nozzle was moved into the chamber. The recommended degree of deepening is 47-50% of the total length of the precombustion chamber. Mathematical model has been developed and discussed in the article too, which enables to calculate the distribution of the tangential speed of the swirling flow, the distribution of the angular velocity, static pressure drop, and air resistance loss in the space of the vortical burner chamber (precombustion).

Keywords: fossil fuels; burner; vortical burning; combustion; hydraulic friction; flow velocity

General Considerations Affecting the Pull-Out Performance of Pedicle Screw Fixation

Durmuş Ali BİRCAN[1], Ammar KAYALI[1]

[1]Çukurova University, Mechanical Engineering Depth
abircan@cu.edu.tr, ammarkayali1980@gmail.com

Fracture and deformity of the human spine caused by tumours, trauma and abnormal spinal curvature, requires accurate stabilization of the spine. To accomplish spinal stability, various rods, plates or cages are fixed to the vertebrae using bone screws. The pull-out strength used to measure loss of reduction of pedicle screw is one of the most important parameter that effect durability of fixation. There are many factors influence on the pull-out strength directly/indirectly such as: bone density, screw design, type and volume of cement augmentation, range of insertion angle. Since a reduction in bone quality leads to non-union, screw pull-out, and, adequate fixation with in the bone-screw interface for patients with osteoporosis represents a continuous challenge. Osteoporosis at vertebral bodies causes weakening of bones which reduces the strength of screw- bone interface resulting in loosening or failure of fusion construct. There are many screws designs enhancing the pullout strength: monoaxial, polyaxial, cannulated, expandable screws, the use of longer screws with a wider diameter; the use of screws with cementation. Numerous studies addressed cement augmentation with polymethylmethacrylate (PMMA), calcium phosphate, and cyanoacrylate, which can dramatically change the purchase of screws in the vertebral.

There is minor evidence about the optimal volume of bone cement and the stability of pedicle screws in the postoperative operations, and there is no adequate study about the effecting of all these parameters together on the pedicel screw fixation. The aim of this study is to make review on the factors affecting on the pullout strength of spinal fixation screws.

Keywords: Pedicle screws; Pull-out strength; Bone density; Osteoporosis; Fixation

Design and Construction of The Grinding Machine to Evaluate Steal Bread: A Study for Waste Economy

Bekir Cirak[1], Mehmet Onur Ogulata[1], Sezgin Eser[1], Abdullah Ozdal[2], Ersoy Topal[2]

[1]Karamanoglu Mehmetbey University, Engineering Faculty, Mechanical Engineering Department, Yunus Emre Campuses, Karaman/TURKEY
[2]Karamanoglu Mehmetbey University, Graduate School of Natural and Applied Sciences, Mechanical Engineering Master Science, Yunus Emre Campus Karaman/TURKEY
bcirak@kmu.edu.tr

In this study, a grinding machine incorporated with safety hollow for housing hard foreign materials besides machineed steal breads was designed, constructed and its performance evaluated. Grinding machine have been one of the stale of food and industrial processing for centuries. Like other industrial machines, steal bread grinding machine have a number of unique design requirements. The performance evaluation was carried out to determine the efficiency of the machine by comparing its actual grinding time with its expected grinding time. During operation, the machine was effective in separating hard foreign materials. The test results revealed actual Grinding times of 3.5, 3.5 and 3.5 min for the three runs analyzed in comparison with the expected grinding time of 3.5 min for 25 kg of steal bread feed to obtain an efficiency of 78.5 %. In all, the grinding machine is portable, easy to operate, economically efficient and environmental friendly with less hygiene and electrical hazard and has been designed for the conversion of steal bread into a nutritive supplement in live stock feed.

Anahtar Kelimeler: Steal Bread, Grinding, Waste

Numerical Analysis of Vertical Ground Heat Exchangers for Variable Wall Temperature

Havva Demirpolat[1]

[1]Department of İnterior Design University of Selçuk, Konya, Turkey
hdemirpolat@selcuk.edu.tr

Ground heat exchanger has been widely used in heating, cooling and ventilating systems both residential and commercial purposes. Heating and cooling periods follow each other at different surface and fluid temperatures in ground heat exchanger. For this reason the temperature around the heat exchanger is not constant. The main objective of this paper is to numerical analyze in the event of vertical ground exchanger pipes wall temperature change with time periodically and determining design criteria by introducing pipe interactions. A numerical finite-difference approach is used to solve the energy equation. It is assumed that ground temperature and thermo-physical properties are constant for accepted depth and longitudinal conduction of pipe wall is neglected.To simplify problem formulation thermal resistance is neglected between soil and pipe. Mainly, heat is transferred between pipe wall and ground by conduction, convection and radiation parts are negligible. It is observed that the average values of surface and surrounds temperatures has not change with heating and cooling cycles in long term periods but ground temperature around the buried pipe is highly affected from periodical wall temperature changing in short-term period. Periodic changing ground temperature of surround the vertical ground heat exchanger may effect on system efficiency over time. Distance of ground heat exchanger pipes is critical parameter for vertical ground heat exchanger. For different pipe and ground applications periodic temperature values changes with time. For different pipe and ground applications periodic temperature values changes with time. Thermal properties of ground for buried depth are important for energy efficiency. It can be said that dimensionless periodic wall temperature amplitude and values are constant for different ground heat conduction value. This value based on mainly fluid temperature in pipe. Distance of ground heat exchanger pipes is critical parameters for vertical ground heat exchanger. As it seen, at $r' = 500$, there is no effect periodic temperature changing on ground. This is critical value for vertical ground heat exchanger distance. In this study,it is accepted that the ratio of heat conduction value is generally used in engineering application. In different pipe and ground applications periodic temperature values changes with time. Results may provide references for predicting the ground temperature surround the vertical ground heat exchanger.

Keywords: vertical ground heat exchanger, periodic wall temperature, ground temperature

METALLURGICAL AND MATERIALS ENGINEERING

4-Nath-3-Thiosemicarbazide as Corrosion Inhibitor for Copper in Sea Water (3.5% Soduim Chloride)

Mothana Ghazi Kadhim ALFALAH[1], Mohammed Abdulrazzaq[2], Fatma Kandemirli[3]

[1]Metallurgy and Materials Engineering, Faculty of Engineering and Architecture, Kastamonu University, 37150, Kastamonu, Turkey.
[1]Materials of Engineering Department, College of Engineering, University of Al-Qadissyah, Iraq
[2]Materials of Engineering Department, College of Engineering, University of Al-Qadissyah, Iraq
[3]Department of Biomedical Engineering, Faculty of Engineering and Architecture, Kastamonu University, 37150, Kastamonu, Turkey.
muthanakadhem@yahoo.com

The effects of 4-NaTh-3-Thıosemıcarbazide on the corrosion of Copper immersed in sea water has been evaluated. The inhibitor efficiency was determined by using a three electrochemical techniques, Potential dynamic polarsation (PDP), Impedance spectroscopy (EIS), and Linear polarization resistance (LPR) by using Potentiostat Instrument type compact stat (IVIUM) after immersion in sea water contain 3.5% Sodium chloride with presence and without corrosion inhibitor.In addition, optical microscopic was used to evaluate the surface layer before and after immersion in sea water. A good inhibition efficiency is noticed which increases with an increase in corrosion inhibitor concentration. It was obtained that the inhibitor efficiency reached around 97% at 0,01 M from corrosion inhibitor. Both the cathodic and anodic curves are changed markedly in the presence of 4-NaTh-3-Thıosemıcarbazide. The mechanism of inhibition was proposed along the basis of the adsorption of the inhibitor molecules on the copper surface.

Keywords: 4-NaTh-3-Thiosemicarbazide, Copper, Impedance spectroscopy, LPR

Investigation of Traces of (1-Amino-5 (4-Methyl Benzyl)) -4- (4-Methyl Phenyl) Pyrimidine-2 (1H) -Thion) on The Behavior of Mild Steel Corrosion in Hydrochloric Solution

Khaled Saad Mıled Ferıgıta[1], Fatma Kandemirli [2]

[1]Department of Materials Science and Engineering, Faculty of Engineering and Architecture, Kastamonu University, Kastamonu, Turkey.
[2]Department of Biomedical Engineering, Faculty of Engineering and Architecture, Kastamonu University, Kastamonu, Turkey
ksmf74@yahoo.com

In This Study, The Effect Of 1-Amino-5 (4-Methyl Benzoyl) -4- (4-Methyl Phenyl) Pyrimidine-2 (1h) –Hion.

As an inhibitor for mild steel softening through Tafel measurement, and current capacity at 273 K. It was found that 1-Amino-5 (4-methyl benzoyl) -4- (4-methyl phenyl) pyrimidin-2 (1H).

A good corrosion inhibitor works for solid corrosion in a hydrochloric solution (HCL). Increased inhibition efficiency with increased concentrations of 1-amino-5 (4-methyl benzyl) -4- (4-methyl phenyl) pyrimidine-2 (1H) -hion).

Indicates that inhibition measures due to adsorption on the surface of steel followed by isothermal adsorption according to experimental data concluded that 1-amino-5 (4-methyl benzoyl) -4- (4-methyl phenyl) pyrimidine-2 (1H) -hion Use to control corrosion of steel.

Keywords: Corrosion, Mild Steel, Carbothioamide, Acidic medium

Design and implementation of a bi-copter driven by dual electric ducted fans using genetic algorithm optimization technic

M. Kürşat Yalçın[1], İlyas Kacar[1], Halil Bahadır Akyıldız[1]

[1]Niğde Ömer Halisdemir University Engineering Faculty, Department of Mechatronics Engineering, Niğde, Turkey
mkyalcin@gmail.com, ikacar@gmail.com, h.bhdr01@gmail.com

In this study, the design and analysis of a bi-copter-type mini unmanned aerial vehicle that has double EDF (electric ducted fan) as main thrusters is provided. A genetic algorithm-based optimization method is used during design. Finite element simulations of static, modal and forced vibration analyzes of bi-copter have been performed and optimum values have been determined. A prototype has been implemented using optimum values.

This study covers just design and optimisation. For subsequent study, it is aimed to applly different control technics on flight stability and equilibrium for that bi-copter-type aerial vehicle.

Keywords: Bi-copter, Tandem Rotor, UAV Design, Genetic Algorithm, Optimization.

Investigation of Aging Parameters For Al 6082 Alloy

İlyas Kacar [1], Özkan Tunç [2,3]

[1]Niğde Ömer Halisdemir University Engineering Faculty, Department of MechatronicsEngineering, Niğde, Turkey,
[2] Ditaş, Kayseri Yolu 3.Km, 51100 Niğde, Turkey
[3]Niğde Ömer Halisdemir University, Graduate School of Natural and Applied Sciences, Department of Mechanical Engineering, Niğde, Turkey
ikacar@gmail.com, makmuhozkan@gmail.com

Aging is a heat threatment process applied on Al, Mg alloys in order to change the microstructure to obtain better mechanical properties. The aim of this study is to determine the most suitable artificial aging sequences to obtain higher tensile strength values for 6082 aluminum alloy. Different dissolution temperatures, durations, cooling mediums, aging temperatures, and aging durations are applied. Subsequently, tensile tests are performed on aged samples.

Keywords: 6082 aluminum alloy; artificial aging; microstructure, mechanical property.

Investigation of The Effects of BenzHC on The Behaviour of Steel Corrosion in Acidic Solution

Mahmud Ibrahim Elusta[1], Emel Bayol[2], Fatma Kandemirli[3]

[1]Metallurgy and Materials Engineering, Faculty of Engineering and Architecture, Kastamonu University, 37150, Kastamonu, Turkey.
[2]Niğde Ömer Haslidemir University, Faculty of Science and Art, Department of Chemistry, 51240, Niğde, Turkey.
[3]Department of Biomedical Engineering, Faculty of Engineering and Architecture, Kastamonu University, 37150, Kastamonu, Turkey.

In this study, the effect of N-benzylhydrazine-1,2-bis(carbothioamide) (BenzHC) as corrosion inhibitors for mild steel was assessed by measuring AC Impedance, and current-potential at 293 K. It was found that the HMTA acts a good corrosion inhibitor for steel corrosion in acids solution. Increase in inhibition efficiencies with the increase of concentrations of HMTA shows that inhibition actions are due to adsorption on the steel surface and adsorption follows the Langmuir isotherms. According to the experimental data, it is concluded that Benz C can be used in the control of the corrosion of steel. The quantum chemical parameters of the BenzHC molecule were calculated with the DFT method at the B3LYP/6-31++G (2d, 2p) and B3LYP/6-31G (d, p) levels.

Keywords: Corrosion, Mild Steel, Carbothioamide, Acidic medium, DFT, Mild steel

LabVIEW based temperature control system for neonatal incubator

Zaid H. Al-Sawaff[1,2], Yahya Zakariya Yahya[3], Fatma Kandemirli[4]

[1]Department of Materials Science and Engineering, Faculty of Engineering and Architecture, Kastamonu University, Kastamonu, Turkey.
[2]Biomedical Engineering Department, Technical Engineering College, Northern Technical University, Mosul, Iraq.
[3]Auckland Bioengineering institute, The University of Auckland, Auckland, New Zealand.
[4]Biomedical Engineering Department, Faculty of Engineering and Architecture, Kastamonu University, Kastamonu, Turkey.
Zaidh.sawaff@gmail.com, yyah724@aucklanduni.ac.nz, fkandemirli@yahoo.com

In the first 28 days of life for neonatal, which is the most critical time for a child's survival. new born children face the highest risk rates of dying in their first month of life at an average global rate of 19 deaths per 1,000 live births in 2018. relatively,
the probability of dying after the first month Due to negligence of the most important parameters for survival (heat, humidity, oxygen rate in blood) caused by the less number of medical staff, and the poor quality of medical equipment used especially in the developing countries.

Therefore, to reduce all these death rates, an extra monitoring and control system must be established. This system should have the properties of being cheap, easy to use, able to deal with many units as possible at the same time, and finally can be operated automatically or by one person. this system will give a temporary solution for a period of time till the responsible person would fix the main problem.

This system used to monitor and control the sudden change in temperature depending on two parts: first is the microcontroller which is a compact integrated circuit designed to run a specific operation in an embedded system, and LabVIEW which is an engineering software used for applications that require test, measurement, and control with rapid access to hardware and data insights. those two important parts along with other components (heaters, fans, data acquisition card) will be used to designed the desired system.

Keywords: Neonatal, incubator, LabVIEW, microcontroller, temperature. control system

Nanocellulose as an ingredient in food industry

S. Şebnem Severcan[1], Ayşe Korkut[2], Kevser Kahraman[3*]

[1]Dept. of Material Science and Mechanical Engineering, Abdullah Gül University, 38039, Kayseri, Turkey, sebnem.severcan@agu.edu.tr
[2]Dept. of Advanced Material and Nanotechnology Engineering, Abdullah Gül University, 38039, Kayseri, Turkey, ayse.korkut@agu.edu.tr
[3*]Corresponding Author, Dept. of Material Science and Nanotechnology Engineering, Abdullah Gül University, 38039, Kayseri, Turkey, kevser.kahraman@agu.edu.tr

In recent years, materials obtained from renewable sources have been quite remarkable for researchers. Cellulose with renewable, biodegradable and non-toxic properties is an example of these materials. Cellulose is structural component of lignocellulosic materials like wood, cotton and natural fibers. Also, because of its abundance in nature, cellulose has been widely used as a raw material by manufacturers in many different areas such as, paper industry, textile, food, cosmetics or pharmaceuticals for a long time. Furthermore thanks to advances in nanotechnology, cellulose particles with high surface area aspect ratio can be produced in nano scale. Nanocellulose is examined in three groups, including nano crystalline cellulose, nanofibril cellulose and bacterial nanocellulose. Although these three types of nanocellulose have similar chemical composition, they have different properties in morphology, particle size and crystallinity due to source and extraction methods. While, bacterial cellulose is fabricated applying bottom-up method on glucose molcule produced by Acetobacter Xylinum, nano crystalline and nanofibril cellulose originated from plants are fabricated top-down method with various enzymatic, chemical and mechanical processes. Due to good mechanical and optical properties, better rheological and water absorption, high crystallinity, and non-toxic and thermal stability properties, nanocellulose is a promising material for food applications in many fields such as, stabilizers, functional food material and food packaging material. Since this workspace is quite new, resources, methods, characterizations and applications are currently under development. Therefore, this review will address main nanocellulose sources, production and characterization methodologies of cellulose nanocrystals and application areas in food science.

Keywords: nanocellulose, food, emusifier, stabilizer

MINING ENGINEERING

The Use of Mineral Fillers in Different Polymer Types

Diler KATIRCIOĞLU BAYEL[1]

[1]Niğde Ömer Halisdemir Üniversitesi
dkatircioglu@ohu.edu.tr

From the earliest days, mineral fillers have played an important role in the development of uses for different polymers. Actually, the word filler is seen cost reduction, hence the name filler. However in these days it has become more widely accepted that mineral fillers modify all properties of the polymer. The mineral filler containing polymer compounds has a lot of advantages like chemical resistance, easy processability, low cost and recyclability. Polymers are a wide variety of natural and synthetic substances or man made found in every section of life. For example, cellulose, starch and cotton are organic, sand and clay are inorganic natural polymers. The kinds of synthetic polymers, in order of worldwide application, includes polyethylene, polypropylene, polystyrene, polyvinyl chloride, synthetic rubber, phenol formaldehyde resin (Bakalite), neoprene, nylon, PVB and silicone.

In this study, a brief summary of the principal characteristic of each polymer class is exhibited.

Keywords: Polymer, mineral filler, reinforcing, filler surface modifier

Recovery of Boron from Boron Slurry Wastes Containing Ulexite-Colemanite

Emine Yoğurtcuoğlu[1]

[1]Maden Mühendisliği Bölümü, Niğde Ömer Halisdemir Üniversitesi
eyogurtcuoglu@ohu.edu.tr

Compared to the world, our country has around 72% boron reserves. One of the most important areas where these reserves are located is Balıkesir Bigadiç area. The sample taken from the waste ponds of the area at issue consists of wastes containing colemanite ($2CaO.3B_2O_3.5H_2O$) and ulexite ($Na_2O.2CaO.5B_2O_3.16H_2O$) minerals.

In this study, tank leaching was performed at a temperature of 60-65 ° C for 1 hour using different dilute solutions prepared from 95% H_2SO_4 on the waste sample (about 81 µm and 11 % B_2O_3). The experiments in question were carried out to obtain the boron content of these waste ponds. As a result of the experiments carried out under the same conditions at different concentrations, recoveries of 80-95% were achieved. Consequently, the recovery of the boron reserve in the content of this waste will lead to the recovery of the boron content that is expected in the ponds/dam after the classification/grinding processes, and to open the way for the use of this content in different industrial areas with new evaluation policies with further studies.

Keywords: Sulfuric acid, tank leaching, waste pond/dam, boric acid, colemanite mineral, ulexite mineral

Niğde Calcite Mining Export Values Analysis in the Context of Turkey Logistics Performance Indicators

Mahmut Suat Delibalta[1]

[1]Niğde Ömer Halisdemir University
msdelibalta@ohu.edu.tr

Natural raw materials and mineral deposits are scarce resources that cannot be renewed and exhausted when produced. More than 10 billion tons of mine is produced in the world, worth $ 1.5 trillion a year. 75% of this production belongs to energy raw materials, 10% to metallic minerals and 15% to industrial raw materials. An indicator of the level of development of societies is the amount of industrial raw materials they use. Turkey calcite production in the 2000s 300-400 thousand tons/year from 2018 to the point when 1.5 ~ 2.0 million tons/year and an annual consumption rate is increasing rapidly approaching. Purest and whitest calcite formations in Turkey is situated in Niğde. According to the data of the Ministry of Industry and Technology Niğde Provincial Directorate of 2017, there are 33 different companies operating in the region which produce industrial raw materials and building materials in our region. A total of 1,501 people were employed by these firms, and micronized calcite exports worth $ 17,747,871.62 were realized.

The variability and irregularities in the distribution of natural resources in the world make the international trade of mining products a necessity. Therefore; today, with the impact of globalization and increasing competition, logistics and supply chain management must be implemented effectively and accurately in the preservation and development of an innovative, high value-added mining industry. It is known that various problems are experienced in our region both in domestic and international calcite shipments. Also; according to World Bank data, our country is ranked 47th in the Logistics Performance Index (LPI) of 2018, declining 13 places. Due to the increase in the costs of logistics and the production costs, it is noteworthy that the inflation in the domestic market is affected negatively and the weakening of the international competitiveness of the Turkish products on the other hand. In this research; Niğde calcite mining export figures of Turkey in the context of evaluating the performance of the logistics statistically, the industry forward for institutions and investor's useful projections are presented.

Keywords: Mining, Niğde, calcite, logistic, export.

ARCHITECTURE

The development of ecotourism in Ugam-Chatkal national park of Tashkent region

Lola Egamberdiyeva, Tatyana Kim

National University of Uzbekistan, Tashkent, Uzbekistan

This paper presents the Ugam-Chatkal National Park material as an object for the development of ecotourism in Uzbekistan. It sets out the physiographic, biological (flora and fauna) characteristics. State National Natural Park, tourist sites, as well as the territory of the park is also a place of historical and archaeological heritage.

Innovative Unusual Houses

Fatih SEMERCİ[1], Zehra Nur ÖNCEL[1]

Architecture Department of Eng. and Architecture Faculty, Necmettin Erbakan University, Konya, Turkey
fsemerci@gmail.com, ncelzehranur@gmail.com

Housing, which has been constantly changed according to human needs and lifestyles, has become an object of consumption as every object that emerges from production as a result of industrialization by developing technology and modernization process. By this change, the excessive interest in the housing remains short. Thus, it continues its production wheel by taking another residence. These houses, which are enough to provide permanence, try to make themselves different from material, structure, form, color, size and context With new techniques, materials, facilities and comfort offered to its users, it goes beyond the individual's monotonous life. Examples of housing in this study reflect the changing housing over the modern individual. The size of living spaces, the variety of needs programs and the flexibility of spaces show how housing adapts to the individual's life. Objective + method: four unconventional houses are determined by technological innovations, building materials and structures. For this purpose, readings were made. In addition to its physical properties, some conclusions have been made by briefly referring to the construction goals and users. The purpose of the study is to determine the reasons and the characteristics of each house in its context. Results: it has been observed that these houses containing innovative materials, construction techniques and concepts began to lose their old importance and extraordinary externality over time. It has been determined that the residences have a limited life span. Conclusion: cultural interaction and pervasive consumption culture leads the upper classes to new pursuits and architectural designs. However, these architectural designs are not permanent. Every architectural product has a life span and today it is quite short. Architecture discipline, which constantly renews itself, has no interest in permanence.

Keywords: Unusual Housing, Homes of Tomorrow, Xanadu Houses, Möbius House, Wing House

Re-Functioning Of Inactive Industrial Buildings As Educational Structure:Two Sample Buildings From Istanbul, Haliç

Fatih SEMERCİ[1], Ayşegül ÇELİK[2]

Architecture Department of Eng. and Architecture Faculty, Necmettin Erbakan University, Konya, Turkey
fsemerci@gmail.com, aysemgulcelik@gmail.com

Industrial structures are the places that are defined as an archaeological area due to the fact that industrial culture consists of historical, technological, social, architectural and scientific values. In this direction, They are our heritage that is very important of right protection. These structures have lost their original functions and turned into idle groups because they could not respond to the transforming conditions of the social structure they are in. The concept of re-functionalization of inactive industrial structures is important on behalf of maintain urban identity and the history of structure. **Aim:** This study has been carried out in order to understand how the re-functioning of inactive industrial structures resulted in the effect of the city on the zoning decisions and architectural interventions as well as read re-functioning of them as spatial. **Scope:** Within the scope of this, primarily, the concept of re-functionalization of industrial structures have been explained and then the interventions in Haliç region were discussed in order to understand the impact of the region. Examples of re-functionalized industrial structures in Haliç region have been given. Two of these structures have been examined in detail, which are the transformation of the Silahtarağa Electricity Power Plant to Bilgi University and the Cibali Tobacco Factory to Kadir Has University. **Method:** In the study, literature research, current situation evaluation and comparison have been made. The results have been compared each other in the tables. **Findings:** In the light of the researches and evaluations, the effects of the interventions on the city and the industrial heritage have been revealed. During the re-functioning of the structures,the decisions taken and the interaction of these structures with the city have been determined. In this context, it was decided to be an industrial zone for Haliç and then to be a cultural center in terms of necessary conditions. Thus, a transformation has started for industrial structures in Haliç. Cibali Tobacco Factory was transformed into Kadir Has University and Silahtarağa Electricity Power Plant was transformed into Bilgi University. **Conclusion:** As a result of all researches, evaluations and analyzes; It has been concluded that the transformation decisions of the Haliç had an effect on the transformation of both structures, and that a bridge was formed between the new function and the old function when the structures turned into educational structure. Thus, the integrity of the building was ensured and it was provided economic and cultural contribution for city.

Keywords: Re-Functioning,Inactive Industrial Structures,Transformation,Industrial Heritage in Haliç.

SEKA Paper Factory's Transformation - SEKA Paper Museum and Science Center

Özge Ceylin YILDIRIM, Mazlum KALAK

Niğde Ömer Halisdemir University
ozgeceylinyildirim@gmail.com

It is defined as a scientific discipline that focuses on the industrial heritage concept, the efficiency of producing goods and / or services in the broadest sense by means of mechanical means and devices and the architecture that is produced for this purpose.

SEKA Cellulose and Paper Factories, which started operations in 1936, are among the pioneering modernization movements established in Kocaeli in the Republican period. Not only has it been production-oriented, it also contributed to the city economically, socially and culturally in Kocaeli. SEKA Cellulose and Paper Factories, which were privatized in 1998 due to their economic policies, were terminated in 2005 due to lack of technology.

In this study, SEKA Paper Museum and Science Center, which has been re-functionalized within the scope of the Industrial Heritage, are used to evaluate the transformation and memory relationship of SEKA 1. Paper factory. The historical process of SEKA is considered from the architectural point of view, and the current state-of-the-art examinations are discussed through literature and project processes.

21. Yüzyıl Kafe İç Mekan Tasarımlarında Görülen Aynılaşmanın İncelenmesi

Tuğçe Öztürk[1], Yavuz Irmak[2]

[1]İstanbul Gelişim Üniversitesi
[2]İstanbul Ticaret Üniversitesi
tozturk@gelisim.edu.tr

Günümüzde kafe iç mekan tasarımlarının büyük bir bölümünde küreselleşme etkisi ile kullanıcı beklentileri de bu yönde olduğu için kullanılan mobilya, aydınlatma, teknik donatı, malzeme kullanımı, yapısal ve dekoratif öğeler bağlamında benzer eğilimler ve aynılaşma görülmektedir. Bu çalışmanın amacı; günümüz kafe iç mekan tasarımlarında görülen benzer eğilimi ve mekansal tasarımlarda tekrar eden unsurları tespit etmek, kullanıcıların mekan tercihlerini yaparken hangi unsurları göz önünde bulundurduğunu analiz ederek kullanıcı davranışlarını anlamak, kullanıcı beklentilerinin ve tercihlerinin kafe iç mekan tasarımı üzerindeki etkisini ölçmek ve günümüzde yaygın olarak kullanılan kamusal mekanlardan biri olan kafelerin iç mekan tasarımında geldiği noktayı tespit etmektir. Çalışmanın yöntemi; alan araştırması yöntemidir. Buna göre; Karaköy semti, Kemankeş Karamustafa Paşa Mahallesi örneklem olarak seçilmiştir. Bu bölgeden seçilen kafelerin iç mekanında kullanılan mekansal öğeler; mobilya, aydınlatma, teknik donatı, malzeme kullanımı, yapısal ve dekoratif öğeler bağlamında incelenerek ortaya çıkan veriler doğrultusunda kafe iç mekan tasarımları birbirleriyle karşılaştırılmış ve benzerlikleri saptanmıştır. Modernizmle başlayan ve günümüzde de devam eden küreselleşme, endüstrileşme, ticaret, turizm, ulaşım ve iletişim teknolojisindeki gelişmeler tüm Dünya'da toplumları etkileyerek mekansal özellikleri, işlevi, kimliği ve kültürü değişime uğratmış ve aynılaşmayı da (benzeşme, tek tipleşme, homojenleşme) beraberinde getirmiştir.

Anahtar Kelimeler: İç mimaride mekansal aynılaşma, kafe iç mekan tasarımı, Karaköy kafeleri, tasarım analizi, yeme-içme mekanları.

Planting Design in Urban Roads: The Case of Kilis

Murat Yücekaya[1], Ahmet Salih Günaydın[2]

[1]Nevşehir Hacı Bektaş Veli Üniversitesi, Mühendislik - Mimarlık Fakültesi, Peyzaj Mimarlığı Bölümü, Nevşehir, muratyucekaya@nevsehir.edu.tr
[2]Kilis 7 Aralık Üniversitesi, Teknik Bilimler Meslek Yüksekokulu, Peyzaj ve Süs Bitkileri Bölümü, Kilis

The rapid growth of the cities along with the population growth brought about the increase in the number of vehicles. The increase in the number of vehicles not only increases air pollution and noise pollution, but also increases the number of fatalities and injuries. In order to minimize these problems, all aspects of urban traffic design must be correctly constructed. Urban traffic design elements such as directions in the traffic, road widths designed on the basis of traffic density, underpasses, traffic light requirements and right planting at the crossroads, will ease traffic in the cities, people will spend more time in traffic, in addition to reduce pollution and reduce traffic accidents. In this study, general principles of planting in urban roads will be given. In this context, suggestions will be presented on planting focus on how urban traffic design should be. The study will be carried out in Kilis. Kilis ring road plantation, which extends parallel to the city along the Syrian border in the south of Kilis and which connects to the province of Gaziantep from the north to the province of Hatay and which is used intensively as the urban connection road, will be evaluated in terms of road planting techniques. In the next stage, a plan of a planting plan will be prepared and discussed in a certain part of the ring road.

Keywords: Urban Traffic Design, Planting at the Crossroads, Kilis

Eco Cities in The Context of Environmental Sustainability: The Case Of China Dongtan City

Ahmet Salih GÜNAYDIN[1], Murat YÜCEKAYA[2]

[1]Kilis 7 Aralık Üniversitesi, Teknik Bilimler Meslek Yüksekokulu, Peyzaj ve Süs Bitkileri Bölümü, Kilis, ahmetsalihgunaydin@gmail.com
[2]Nevşehir Hacı Bektaş Veli Üniversitesi, Mühendislik ve Mimarlık Fakültesi, Peyzaj Mimarlığı Bölümü, Nevşehir

The rapid growth of cities brings environmental problems and social problems. Cities need to be transformed into ecological cities that meet almost every need of themselves, to become environmentally friendly and to develop new policies that will partially solve this problem. For this purpose, the ecological structuring of buildings and urban open spaces is important in order to increase the quality of urban life in the construction regions. To preserve the rest of nature and to improve the quality of life, it is necessary to look for ways to establish green ecocity. The main purpose of the ecocities is to ensure the sustainability of the green areas and the built environment in the city, to prevent possible damage in the environment and to enable people to live in higher quality environments. In this study, information will be given about ecocity and the advantages of environment and people will be discussed. The place and importance of aesthetics in the design of ecological cities will be mentioned. In this context, Dongtan city in Chongming Island, which is one of the satellite cities to be connected to Shanghai by a tunnel and bridge, which is the first urban project designed entirely as an ecocity, will be evaluated by considering ecological and aesthetic aspects.

Keywords: Ecocity, Sustainability, Quality of Urban Life

Planting Design in School Gardens: The Case of Mugla

Hülya Akat[1]*, Gülbin Çetinkale Demirkan[2]

[1]Muğla Sıtkı Koçman Üniversitesi Ortaca Meslek Yüksekokulu, Park ve Bahçe Bitkileri Bölümü, Muğla-Türkiye
[2]Niğde Ömer Halisdemir Üniversitesi Mimarlık Fakültesi Peyzaj Mimarlığı Bölümü, Niğde-Türkiye
*hulya_akat@hotmail.com

Decreasing green areas and increasing traffic jam because of heavy structuring have caused loss of play grounds. School gardens are important places for school children to play outside. It's know that natural arrangements at school gardens have positive effects on child development. Besides using a school garden as a play and sports area, it also hepl game children to learn environment and natüre awareness. The materail of this study is Kargınkürü Primary School Garden in Dalaman in Muğla district as a concept of "My School Is First Project". Plant landscape architecture arrangement is done according to planning and design principles at school garden. Before and after situations are shown in the study. Enlargement of school gardens is not possible when it's thought the school gardens positions. Therefore, it's necessary to short a development system for school gardens both structural and botanical landscape arrangements. At first stage of Dalaman Kargınkürü Primary School Garden botanical landscape arrangements, safer, improving awareness of environment and natüre and child development playground as a school garden have been composed. Also, it's stated how the arrangements will be made according to botanical landscape architecture planning and design principles.

Keywords: Planting Design, Primary school garden, Muğla

The Current Situation and Evaluation of The Ornamental Plants Sector in Mugla Province

Hülya Akat

Muğla Sıtkı Koçman Üniversitesi Ortaca Meslek Yüksekokulu
hulya_akat@hotmail.com

The share of agricultural production of our country's ornamental plants sector is increasing day by day in terms of product variety and scope. Nowadays, ornamental plants which have high economic return compared to other agricultural products, contribute to the improvement of healthy generations as well as rehabilitating human psychology. In addition, especially in recent years, the positive change in environmental awareness and increasing the demand for ornamental plants usage in landscape designs in order to create recreation areas in the developed cities has allowed opportunities for the development of this sector. In this study, the current situation of the ornamental plants sector of Mugla province has been investigated. Its ecology, favorable geographical conditions and rich natural plant diversity have been made Mugla province advantageous for the ornamental plant sector. In the ornamental plant sector, the current situation should be evaluated in order to reach the place it deserves and contribute to our national economy. Considering the advantages of Mugla province; if the structural characteristics of all enterprises interested in ornamental plants are improved, the use of technology is expanded, the standards are complied with, the products culture which are suitable for the market demands can be preferred, ornamental plants production is increased by overcoming the problems of the transportation, we believe that it will have an important place in terms of the ornamental plants sector.

Keywords: Muğla, Sector analysis, Ornamental plants, Trade, Production

İmar Planları Açısından Niğde'nin Güncel Durumuna Yönelik Eleştirel Yaklaşımlar ve Ulaşım Planlaması Sorunları

Aziz Cumhur KOCALAR

Niğde Ömer Halisdemir Üniversitesi, Mimarlık Fakültesi, Şehir ve Bölge Planlama Bölümü, Niğde, Türkiye
azizcumhurkocalar@gmail.com

Çalışmada öncelikle Niğde'nin son yıllarda yaşadığı kentsel dönüşüm ve kentsel gelişim şeklinin şehir yaşamına etkileri farklı boyutlarıyla birlikte ele alınmaktadır. Bu amaçla araştırmada, 1980 sonrasından itibaren kentlerin uğradığı bütüncül planlardan yoksun, plansız ve parçacıl (plan tadilatları odaklı) değişimler, kapsamlı planlama bakış açısıyla incelenerek değerlendirilmektedir. Niğde'nin tarihteki konumunun aksine küçük bir il olarak algılandığı günümüzde halen, sürekli küçük ölçekli imar uygulamalarına maruz kalacak şekilde nazım imar plansız bırakıldığı ortada duran bir gerçekliktir. Bu hatalı durum sonrasında yaşadığı değişimler ise çalışmada dönemsel olarak ayrıntılarıyla birlikte incelenmektedir. Son yıllardaki süreçlerde yaşanan bu tür değişimlere zemin olan imar yaklaşımları ise yer yer gözden geçirilerek, kentin bütünlüğü açısından yeniden değerlendirilmiştir. Bu yaklaşımlara ait imar uygulama örnekleri ise, şehircilik bilimi açısından bütüncül bir bakış açısıyla irdelendikçe bazı ciddi sorunlar göze çarpmaktadır. Diğer yandan çevre kirliliği vb. biriken kentsel sorunlar ise acilen çözülmek zorundadır. Kentsel gelişmenin (Batı yönündeki) nitelikli bağ ve bahçeler ile tarımsal alanları yok edişine göz yumulabilmiştir. Özellikle ulaşım planlamasının eksikliği ve mevcut durumu da, gelişmeler ve beklentiler ışığında çalışmada yine ayrıca bu geniş kapsamla birlikte tartışmaya açılmıştır. Bu anlamda da tehditler ve fırsatlarla birlikte avantajlar ve dezavantajlar bir Swot analizi ile birlikte ele alınmıştır. Niğde'nin, geleceğin planlı şehirleri arasında yerini almakta geciktiği sürece, kalıcı atılımlardan mahrum ve çarpık gelişmelere açık durumda kalacağı açıktır.

Anahtar Kelimeler: Ulaşım Planlaması, İmar Planları ve Uygulamaları, Kentsel Dönüşüm ve Gelişim, Şehircilik, Şehir ve Bölge Planlama.

Kentsel Koruma ve Yenileme Sorunları Açısından Niğde

Aziz Cumhur KOCALAR

Niğde Ömer Halisdemir Üniversitesi, Mimarlık Fakültesi, Şehir ve Bölge Planlama Bölümü, Niğde, Türkiye
azizcumhurkocalar@gmail.com

Niğde'nin tarihteki konumundan günümüzdeki yerine doğru yapılan yedi yıllık şehircilik araştırmalarının koruma eksenli bir derlemesi bu çalışmanın ana kapsamını oluşturmaktadır. Özellikle kentsel koruma ve yenileme sorunları açısından Niğde'deki son 30 yıllık değişimler incelenmektedir. Geleceğe yönelik koruma ve yenileme önlemlerinin acilen alınması ise çalışmanın esas amacıdır. Bu amaçla neoliberal hükümetlerin 1980 sonrasında şehirlere olumsuz etkileri de araştırmanın genel çerçevesini oluşturmuştur. Son dönemlerdeki değişimler değerlendirildiğinde ise kentsel koruma ve yenileme ile kentsel kimlik açısından genellikle yıkıcı sonuçlar verebildiği görülmektedir. Niğde'nin tarihin farklı dönemlerindeki yeri ve konumunun aksine, yaşanan olumsuz yöndeki küçük ölçekli imar uygulamaları ile nazım imar plansız bırakılışı gibi değişimler de halen ciddi bir sorun kaynağı oluşturmaktadır. Çalışmada son yıllardaki koruma karşıtı değişimlere zemin olan imar yaklaşımları ve bu yaklaşımlara ait imar uygulama örnekleri ise kentin silueti ve kentsel yenileme ihtiyacı açısından eleştirel bir açıdan irdelenmektedir. Kale ve çevresinin koruma amaçlı imar planının revizyonunun ihmal edilişinin yanı sıra araştırmanın çıktıları içerisinde tabiatı korumaya yönelik sürünceme de bırakılmış sorunlara da yine temas edilmektedir. Diğer yandan seçilen kentsel gelişme (Batı) yönünün Niğde'nin kimliğinde önemli bir yeri olduğu bilinen bağ ve bahçeleri, çayır ve meraları yok ettiği de görülmektedir. Kayardı Vadisi gibi eşsiz tabiat güzelliklerinin tehdit altında olduğu da şüphesiz unutulmamalıdır. Şehrin kültür ve tabiat varlıklarına olan yakınlığının çekici bir unsur olmasına karşın, bu değerlerin yıllardır koruma amaçlı imar planlarına bağlı gelişmelerden oldukça uzak bırakılışı, doğa ve kültür turizmine dayanak olma noktasında, sit alanlarına değer verilemeyişi üzücü ve düşündürücüdür. Bu varlıkların sadece şehrin tanıtımlarında yer alacak şekilde imaj olarak yaşatılması ise oldukça manidardır. Araştırmada Niğde'nin tarihsel kimliğinin yeniden ortaya çıkarılmasının önemli olduğu sonucuna varılmıştır.

Anahtar Kelimeler: Kentsel Koruma ve Yenileme, Sit Alanlarını / Kültür ve Tabiat Varlıklarını Koruma, Şehircilik, Şehir ve Bölge Planlama.

AGRICULTURE

Implementation of Multiplex Amplicon Sequencing For Evaluation of Genetic Diversity in Wheat Germplasm

Mehraj Abbasov[1], Zeynal Akparov[1], Robert Brueggeman[2]

[1]Genetic Resources Institute of ANAS, Baku, Azerbaijan
[2]North Dakota State University, Plant Pathology department, Fargo, ND, USA

Multiplex amplicon sequencing is an alternative method for reducing genome complexity with the application of selective primers and is an indispensable tool for plant breeding and genomic research. In the current experiment, for the first time, a PCR-genotyping panel comprising 830 primers distributed over the hexaploid wheat genome (ABD) was developed and used to genotype 88 bread wheat accessions (Ion PGM platform). The analysis resulted in 830 polymorphic SNPs, of which 401 high-quality SNPs were used for further analysis. Among hexaploid wheat genome, B genome had the highest SNP density, whereas the D genome had the lowest. The number of SNPs mapped to the A and B genome was 1.6 and 1.7 times higher than that to the D genome. 1B and 3B chromosomes were characterized with highest and 3D and 4D with the lowest number of SNPs. The majority of nucleotide variations was transition type (84%), with a transition-transversion ratio of 5.3. The most observed transitions and transversions were C/T and G/T, respectively. Polymorphism information content (PIC) values were calculated for all markers. The PIC values ranged from 0.014 to 0.4, the mean across all genotypes was 0.246. The SNP based cluster analysis was able to differentiate all studied bread wheat genotypes. The mean Nei genetic distance index among accessions was 0.368. Three clusters were observed in the dendrogram, of which clusters I and III comprised gene bank accessions, while all local varieties fell into cluster II, indicating similar genetic background. The obtained results prove that the current PCR-genotyping panel can be used with confidence in genotyping studies and in future genotype-phenotype association analyzes.

Keywords: wheat, genomics, Next Generation Sequencing, amplicon sequencing, genetic diversity

Genome and chromosome analyses in caper, Capparis spinosa

Ainura Adylbek Kyzy[1], Ahmet L.Tek[2]

Department of Agricultural Genetic Engineering, Ayhan Şahenk Faculty of Agricultural Sciences and Technologies, Niğde Ömer Halisdemir University, 51240, Niğde, Turkey
[1]lightainur@gmail.com
[2]altek2@gmail.com

Caper, Capparis spinosa L., a member of the Capparidaceae family, is a taxonomically complex species with many different forms known for their medicinal and aromatic properties. Due to its physical and chemical properties, its potential in agriculture is quite large. The taxonomic diversity and genetic variation that the caper possesses suggest a potential that exists in the breeding efforts. However, the genetic and chromosomal characteristics of this genetic diversity are extremely limited. The aim of this study is to determine the caper genome and chromosome structure using flow cytometry, restriction enzyme digestion and chromosome analyses. Here we will present our preliminary results of genome size, major repetitive DNA fractions, karyotype features for a better understanding of caper genome and chromosome structure.

Keywords: Capparis spinosa, chromosome, genome, karyotype.

Atık Konumundaki Ceviz ve Fındık Zarının Antibakteriyel Özelliklerinin İncelenmesi

Hicran Alkan[1], Ahmet Hamdi Alkan[2], Ebru Sezen[2], Zeynep Aktaş[2], Muzaffer Alkan[3]

[1]Kafkas Üniversitesi Sosyal Bilimler Meslek Yüksekokulu-KARS
[2]Trabzon Ali Soylu Anadolu İmam Hatip Lisesi-TRABZON
[3]Kafkas Üniversitesi Eğitim Fakültesi-KARS
hicran61alkan@gmail.com

Yakın zamanlarda anti-bakteriyel etki incelemeleri çalışmalarına sıklıkla rastlanmaktadır. Özellikle bitki ve bitki türevlerine doğal içerikli kaynak olarak ilgi duyulduğu hem yazılı hem de görsel medyanın da önemli bir konusu olmuştur. “Acaba bu kaynaklar antibakteriyel etki gösteriyor mu?” düşüncesinden hareketle birçok bitki ile ilgili çalışmalar yapılmıştır. Bazı bitkilerde sonuçlar pozitif sonuç verirken, bazılarında da beklenen etkilere rastlanmamıştır. Bazı bitkilerde antioksidan özelliklere rastlanması ise çalışma alanını geliştiren teşebbüsler olmuştur. Bitkilerin tedavi edici etkisi donanımlı laboratuarların kurulmasından sonra akademik düzeyde incelenmekte ve bilimsel sonuçlar çeşitli makalelerle insanlara duyurulmaktadır. Özellikle antibiyotik direnç gelişimi neticesinde alternatif antibakteriyel madde arayışları önemini muhafaza etmiştir.

Bu çalışmada, ceviz ve fındık zarının antibakteriyel özelliklerinin incelenmesi amaçlanmaktadır. Atık olarak değerlendirilen bu kısımların *Bacillus subtilis, Bacillus cereus, Pseudomonas aeruginosa, Klebsiella pneumoniae, Staphylacoccus aureus* ve *Escherichia coli* bakteri suşlarına karşı etkinliği denenmiş ve elde edilen sonuçlar tablolar halinde sunulmuştur.

Sonuç olarak atık konumundaki ceviz ve fındık zarının antibakteriyel etkisi farklı zonlarda tespit edilmiştir. Özellikle cevizin yaygın enfeksiyon etkeni bakterilere karşı gösterdiği etki dikkat çekici düzeyde olmaktadır. Fındıkta ise bu değer daha az olmakla birlikte göz ardı edilmeyecek düzeydedir. Dünyada en fazla fındık üreten ülke olarak bu sonuç daha da önem kazanmaktadır. Hem gram (-) hem de gram (+) bakterilere karşı yaygın etkinin görülmesi şaşırtıcı olarak değerlendirmektedir. Bu atıkların kullanılabilir ürün haline dönüştürülmesi ayrı bir araştırma konusu olarak gündeme gelecektir.

Anahtar Kelimeler: Ceviz ve fındık zarı, antibakteriyel etki, gram (-) ve gram (+) bakteri

Sulphur alleviates iron deficiency responses under high pH conditions

Amir Maqbool[1], Muhammad Abrar[2], Emre Aksoy[1]

[1]Department of Agricultural Genetic Engineering, Faculty of Agricultural Sciences and Technologies, Nigde Omer Halisdemir University, Nigde Turkey.
[2]Department of Agronomy, Faculty of Agriculture, University of Agriculture Faisalabad, Pakistan.
amirmaqbool767@gmail.com

Nutrient deficiencies and toxicities have extensively been studied because of their negative impacts on crop growth and yield. However, limited studies are available about the effect of one nutrient on the uptake and translocation of other. Iron is an important essential micronutrient serve as a co-factor for many proteins involved in electron transport and other metabolic processes. Although iron constitutes about 5 percent of the earth crust but high pH soils (constitutes about 30 % of world's arable land) make it unavailable for plant. An imperative macro-nutrient, sulphur has pivotal role in plant growth and developmental due to its pivotal role in amino acid structures. The interaction between these essential nutrients can be of great importance because most of the iron present in plants is found in the form of Fe-S clusters. For this purpose, two soybean cultivars, namely Nova and Arisoy, were grown on Hogland's solution with different sulphur concentrations in the range of 1.5 - 5 mM at pH 9 under controlled growth conditions. Results showed that high sulphur concentrations increased chlorophyll index, photosynthesis rate, stomatal conductance and transpiration rate in soybean cultivars grown at high pH as compared to the plants grown under high pH conditions with 1.5 mM sulphur. In addition, an increase in biomass accumulation, plant length and root length was also observed with increase in sulphur concentration. It can be concluded that increase in sulphur concentrations alleviates iron deficiency responses in plants.

Keywords: Iron, Sulphur, Chlorophyll index, Biomass, Photosynthesis

Analyses of Physiological, Biochemical and Molecular Responses Of Different Soybean (*Glycine max*. L.) Cultivars Under Iron Deficiency

Amir Maqbool[1] , Emre Aksoy[1] and Sevgi Caliskan[2]

[1]Department of Agricultural Genetic Engineering, Faculty of Agricultural Sciences and Technologies, Nigde Omer Halisdemir University, Nigde Turkey.
[2]Department of Plant Production and Technologies, Faculty of Agricultural Sciences and Technologies, Nigde Omer Halisdemir University, Nigde Turkey.
amirmaqbool767@gmail.com

Iron (Fe) is one of the essential micronutrients for both plants and humans, and Fe deficiency is among the most widespread nutritional deficiencies. Fe deficiency leads to Fe deficiency chlorosis (IDC) due to decreased chlorophyll biosynthesis, which, in turn, directly causes yield losses in plants. Soybean (*Glycine max*. L.) belongs to the legume family and is the top second plant species with the highest Fe content. However, soybean yields are negatively affected by Fe deficiency during growth in the field. In this study, the physiological, biochemical and molecular responses of 4 different soybean cultivars (Nova, Atakisi, Arisoy and SA-88) were determined against Fe deficiency in two developmental stages. In this context, chlorophyll indexes and amounts, photosynthesis rates, root length and shoot fresh/dry weights; FRO enzyme activities and iron accumulation in leaves, roots and seeds were determined from the plants exposed to Fe deficiency. In addition, expression levels of GmIRT1-like, GmFRO2-like, GmFERRITIN and AtNRAMP-like [GmDMT1; 1] genes responsible for Fe uptake and distribution were determined from the roots of plants grown under control and stressed conditions. Two cultivars showed different sensitivities to Fe deficiency. Contrary, two other cultivars were determined as tolerant, and they activated different tolerance mechanisms against iron deficiency stress. Tolerant cultivars can serve as the potential candidates to grow at high pH soils.

Keywords: Iron, Photosynthesis, FRO, Soybean, IDC

Investigating miRNA Mediated Networking Against Drought Tolerance In Potato (*Solanum tuberosum* L.)

TAALAYBEK KIZI Begimay[1], Arslan Asim[1], Allah Bakhsh[1], Ufuk Demirel[1]

[1]Department of Agricultural Genetic Engineering, Faculty of Agricultural Sciences and Technologies, Niğde Ömer Halisdemir University, Turkey
arslanasim92@gmail.com

Potato is declared as one of the valuable crops because of its uniqueness to overcome poverty and malnutrition related concerns of farmer's worldwide due to its high capacity to grow well in adverse conditions. Unfortunately, potatoes have to go through many abiotic and biotic stress periods during the growing season. All of these stresses might cause adverse effect on normal growth and functions of the plant and ultimately resulting in reduction of potato yield. The plants evolved various defensive mechanisms at the molecular level against the stress factors. One of these defensive mechanisms is the alteration in gene expression. miRNAs bind to the target gene's mRNAs, either causing the mRNAs to break down by endonuclease enzymes or preventing attachment of the ribosomes onto the mRNA, thus stopping translation. During abiotic stress tolerance mechanism, miRNAs play a key role in the regulation of gene expression during transcription. In previous bioinformatic studies, it was reported that miRNA398 targets the Cu/Zn SOD gene, which plays a significant role in drought tolerance of potato and experimentally obtained preliminary findings in this direction. In this study, stu-miR398 was suppressed by the Short Tandem Target Mimicry (STTM) method, as a result, the expression of the Cu/Zn SOD gene was increased. Thus, this is important finding which confirms target genes (Cu/Zn SOD) of stu-miR398. However, it has been determined that stu-miR398 is functionally involved in the tolerance mechanism of potato crop. Therefore, the expectation is by using the pathway through miRNA, it might be possible to increase drought tolerance in potato.

Keywords: Short Tandem Target Mimicry, stu-miRNA398, down-regulation, drought tolerance

CRISPR/Cas9: Developments and Applications for Genome Editing in Plants

Bayram Ali Yerlikaya, Emre Aksoy

Niğde Ömer Halisdemir University, Faculty of Agricultural Sciences and Technologies, Agricultural Genetic Engineering, Main Campus, Niğde, 51240 Turkey
bayerlikaya@gmail.com

Due to the increasing burden of world's population, it requires the development of more improved and robust crops in agriculture. Thanks to the increasing amount of information in sequenced plant genomes, required technologies can be used to study the function of genes in detail, and to design improved crops at the molecular level. In order to achieve these goals, the newly developed Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR)/Cas9 system is a new generation of genome editing technology rapidly replacing zinc finger nucleases (ZFNs) and transcription activator-like effector nucleases (TALENs) systems. Due to its high efficiency and advantages of simplicity, the CRISPR/Cas9-based genome editing technology is getting a powerful tool in plant science research. The strengths and advantages of this technology compared with two well-structured genome editing platforms (ZFNs and TALENs) are specially highlighted. Here in this study, the technical features of the plant CRISPR/Cas9-based genome editing system, potential future developments and its applications in plant functional genomics studies and genetic improvements are clearly underlined.

Keywords: CRISPR/Cas9, Genome editing, Plant improvement, TALENs, ZFNs

Arabidopsis GATA12 Transcription Factor Can Regulate the Crosstalk between Gibberellic Acid Signalling and Iron Deficiency Responses

Bayram Ali Yerlikaya, Emre Aksoy

Niğde Ömer Halisdemir University, Faculty of Agricultural Sciences and Technologies, Agricultural Genetic Engineering, Main Campus, Niğde, 51240 Turkey
bayerlikaya@gmail.com

Iron is the fourth most abundant element, which constitutes about 5 percent of the earth crust. Additionally it is also the third most important nutrient directly limiting plant growth/development and yield through effect on hormone metabolism, photosynthesis, chlorophyll biosynthesis, proteins and enzymes, respiration, nutrient uptake mechanisms, DNA stability and repair, transport of oxygen. Recent studies have shown that plant hormones can be comprised in the regulation of mineral nutrient uptake/distribution. On the contrary, nutrients can affect hormone biosynthesis, including a relationship between nutrition and hormones homeostasis. Gibberellic acid which was exogenously performed have been studied to induce the expression of several iron-uptake-related genes, although the mechanism and the role of gibberellic acid in iron-deficiency responses remain largely unknown. GATA factors are a widely-distributed group of transcriptional regulators in eukaryotes and characterized by the presence of a conserved type- IV zinc- finger motif (C- X2- C- X17−20- C- X2- C) followed by a highly basic region. Regulatory region of many genes such as gibberellic acid- and/or iron deficiency-related genes. One of the family members of GATA genes, GATA12 transcription factor is significantly negatively regulated by gibberellic acid. Response of GATA12 under iron deficiency condition is still unknown. Thus, we performed bioinformatics analyses as the preliminary study of a large project, to understand the crosstalk of gibberellic acid and iron deficiency responses through GATA12. The analyses comprised expression analysis on Genevestigator, gene clustering, protein-protein interaction analysis in String and co-expression analysis on Atted II.

Keywords: Bioinformatics, GATA12, Gibberellic acid, Iron deficiency, Transcription factor

RNA Metabolizma Regülatörü CPL1'in Bitki Tuz Stresindeki Rolünün İncelenmesi

Emre Aksoy, Buasimuhan Abudureyimu

Niğde Ömer Halisdemir Üniversitesi, Tarım Bilimleri ve Teknolojileri Fakültesi,
Tarımsal Genetik Mühendisliği Bölümü
esma151190@gmail.com

Tuz stresine maruz kalan bitkilerde çeşitli gelişim süreçlerinin yanında morfolojik, hücresel, fizyolojik ve moleküler seviyede pek çok problemler gözlenmektedir. Bu durum, hücre genişlemesinin azalması ve sürgün gelişimin yavaşlamasına neden olarak ürün verimi ve kalitesini olumsuz yönden etkilemektedir. Tuz stresi toleransı ile ilgili moleküler kontrol mekanizmalarının aydınlatılması stres ile ilişkili çeşitli genlerin aktivasyonu, inaktivasyonu ve/veya birbirleriyle olan genetik etkileşime dayanmaktadır. Tuz stresi altında SOS (Salt Overly Sensitive) tolerans mekanizması bitkinin tuza toleransı açısından büyük önem taşımaktadır. Aynı anda bitki tuz tolerans mekanizmasında stres genlerinin transkripsiyonunu kontrol eden ko-transkripsiyon faktörleri bulunmakta ve bunlar hücre içinde belirli proteinlerin sentezlenmesini kontrol etmektedir. Bunlardan bir tanesi C uç bölgesi (CTD) Phosphatase-Like1 (CPL) olarak bilinen ve RNA Polymeraz II holoenziminin en büyük parçasının CTD bölgesinin defosfatlayarak transkripsiyon döngüsünün devamlılığını sağlayan fosfatazdır. Ancak RNA metabolizma regülatörü olan CPL1'in tuz stresi ile olan etkileşimi her ne kadar uzun yıllardır bilinse de, bu etkileşimin genetik karakterizasyonu ve tuz stres toleransındaki rolü henüz anlaşılamamıştır. CPL1'in SOS yolağı ile genetik etkileşime girerek tuz stres toleransındaki rolünün ortaya çıkartılması bu tolerans mekanizmasının kontrolünde RNA metabolizma regülatörlerinin görevlerinin anlaşılması açısından büyük önem arz etmektedir. Bu çalışmada model bitki olan glikofit Arabidopsis thaliana bitkisinde cpl1 mutantı ile tuz tolerans mekanizmasından sorumlu genlerin mutantlarının genetik olarak birbirleriyle olan etkileşimleri incelenecek ve dolaylı yoldan bütün mutantların tuz stresine karşı vermiş oldukları fizyolojik, biyokimyasal ve moleküler tepkilerin analiz edilerek, genlerin fonksiyonlarının ve tuz toleransındaki önemi ortaya çıkartılacaktır. Bu sayede, bitkilerin tuza tolerans mekanizmasının ve bu mekanizmadaki genler ile RNA metabolizma regülatörü CPL1 arasındaki genetik etkileşimin aydınlatılması sağlanacaktır.

Anahtar Kelimeler: CPL1, transkripsiyon, tuz stresi, SOS tolerans mekanizması, RNA metabolizma regülatörü

A field study on the basic economic activities of the Yoruks and their expectations for the future

Ayhan Ceyhan[1], Adnan Ünalan[2], Ethem Akyol[1]

[1]Department of Animal Production and Technologies, Faculty of Agricultural Sciences and Technologies, Nigde Omer Halisdemir University, Turkey
[2]Department of Biostatistics, Faculty of Medicine, Nigde Omer Halisdemir University, Turkey

This study was carried out in order to obtain the current information about the livestock activities, which constitute the main sources of income of the Yoruks, which still exist in the Mediterranean and Eastern Anatolia regions. During the period of the Ottoman Empire, the nomadic Turkmens in Western Anatolia were named as “Yoruk”. Yoruks are defined as moving groups that provide their livelihoods generally with livestock and pass their lives with regular departures between pastures, highlands and overwinterings. Yoruks are groups that have adopted nomadic life in accordance with their ancient traditions. For this reason, they need pastures, highlands and overwinterings where they can live and feed their animals in different seasons throughout the year. In this study, various data about Yoruk were collected through observation, questionnaire and interview. The answers to the open-ended questions were evaluated in the study. During the interviews, audio recordings were taken with permission. In addition, various visuals of the culture of the bearers were also photographed. When the data obtained from the study are evaluated, it is seen that today and still the verbal and practical knowledge they have learned from their ancestors in animal breeding and animal feeding subjects, which are the main economic activities of the participants. The most distinctive features of the judges are that they define themselves as people who can solve all kinds of problems. However, especially young people do not want to be nomadic in the future. As a reason for this situation, they show the problems they experienced in education, low income, high cost of animal feed, lack of state support for the participants, lack of communication problems such as telephone and internet in pasture, highland and overwintering areas.

Keywords: Yoruk, transhumance, culture, livestock, expectations

Farklı Mikoriza Ortamlarının Bazı Böğürtlen Fidelerinin Gelişme Performanslarına Etkisi

Gülbeyaz Derin Altay*, Mustafa Özden

Nigde Ömer Halisdemir University, Faculty of Ayhan Şahenk Agricultural Sciences and Technologies, Department of Plant Production and Technologies, 51240, Nigde, Turkey
*glbyz51kbr@hotmail.com

Bu araştırmada bazı böğürtlen çeşitlerinin fide gelişimi aşamasında farklı mikoriza içeren ortamlardaki bitki gelişimleri karşılaştırılmıştır. Bu amaçla arbüsküler mikorizal fungus inokulumlarının farklı böğürtlen fidelerinin gelişimine etkisi araştırılmıştır. Çalışmada böğürtlen üreticileri tarafından yaygın olarak tercih edilen Chester Thornless ve altı böğürtlene (Black Diamond, Black Pearl, Metolius, Newberry, Obsidian, Triple Crown) mikoriza uygulaması yapılmış kontrol grubu ve 3 farklı mikorizal ortamda (Endorootsoluble, G. Intraradices ve G. Mossea) gövde çapı (mm), bitki boyu (cm), kök yaş ve kuru ağırlığı (gr), yaprak klorofil içeriği ve renk tayini gibi toplam 13 parametre kullanılmıştır. Araştırma sonuçlarına göre mikoriza uygulamalarının böğürtlen bitkisinde yeşil aksam büyümesini, kök kuru ağırlığını, klorofil içeriğini arttırdığı belirlenmiştir.

Anahtar Kelimeler: Böğürtlen, gelişme performansı, mikoriza

Devastation Effects of Groundnut Pod Borer on Groundnut (*Arachis hypogea*) in the Bulsa-North District of Upper East Region of Ghana: Using Tedema as Study Site

Eric Kuopuobe NAAWE[1], Elijah Dakorah ANGYIEREYIRI[1]

[1]Department of Applied Biology, Faculty of Applied Sciences, University for Development Studies, Tamale; Ghana.
eric.naawe@gmail.com

Arachis hypogaea is an ancient oil seed crop cultivated worldwide for its beneficial uses. Groundnut is one of the main cultivated crops in Northern Ghana. Pests, especially *Elasmolomus sordidus* is the major biotic setback of groundnut production in the Upper East Region of Ghana, where it infests almost every farm in the region. This research was conducted to assess the devastating effects of the pod borer, its ecological behaviour and potential control measures. Field surveys were conducted and data on pest status, feeding habits, resting, and escape behaviours were collected. Standard insect identification keys were employed to identify pod borers, pod infestation and weight loss. All surveyed farms were infested with *Elasmolomus sordidus,* which suck the juice of groundnut kernel using proboscis-like mouth. *Elasmolomus sordidus* were found to rest under the thrust of the groundnut and try to escape when encountered by human. The pod infestation (%) and weight loss (%) ranged from 11.80% to 26.04% and 18.53% to 32.04%, respectively. Other pests incidence ranged from 2.0% to 52.7%. Affected kernels loss their economic value, tasted very bitter and were rejected by domestic animals. Farm sanitation and immediate harvesting after uprooting were control measures identified. Further research strategies are recommended on pests' effect on oil content and germination properties of the groundnut, and chemical analysis of the deposit pests that cause their rejection by animals.

Keywords: *Elasmolomus sordidus,* groundnut, Ghana, pod infestation, kernel

Bio-inoculants improve phosphorus nutrition and maize-wheat yields under alkaline soil

Fazli Wahid[1,2], Muhammad Sharif [2], Shah Fahad[1], Emre Aksoy[3], Imtiaz Ali Khan[1,2], Amjad Ali[4], Muhammad Adnan[1]

[1]Department of agriculture, The University of Swabi, Swabi 23561, Pakistan.
[2]The University of Agriculture Peshawar-25130, Pakistan.
[3]Ayhan Sahenk Faculty of Agricultural Sciences and Technologies, Department of Agricultural Genetic Engineering, Nigde Omer Halisdemir University, 51240, Nigde-Turkey
[4]College of Natural Resources and Environment, Northwest Agriculture and Forestry University, Yangling, Shaanxi, 712100, P. R. China
fazliwahid@uoswabi.edu.pk

Bio-inoculants like arbuscular mycorrhizal fungi (AMF) and phosphate solubilizing bacteria (PSB) promote plant productivity primarily through enhancing phosphorus (P) availability but their combined influence in releasing P from rock phosphate (RP) in alkaline calcareous soils have been little investigated. In this regard, two successive field experiments were conducted to assess the interactive inoculation potential of AMF and PSB strain Bacillus sp. PIS7 with RP on the yield and P uptake of maize and wheat crops in alkaline calcareous soil. The first field experiment was conducted in a complete randomized block design with 10 treatments (replicated 3 times) by inoculating maize seeds with AMF inoculum and Bacillus sp.PIS7 alone or/and in combination with RP and their performance was compared with single super phosphate (SSP). Afterwards, the residual effects of inoculated AMF and Bacillus sp.PIS7 were investigated on wheat as a subsequent crop. Maize and wheat yield parameters, P uptake, AMF root colonization and PSB population was measured.The results of both trials indicated that compared to control, the beneficial effects of AMF and Bacillus sp. PIS7 with RP in increasing the plants grain yield and P uptake was continued until the second season after inoculation. Likewise, maize and wheat roots colonization, PSB population density and post-harvest soil properties were also improved by the combined inoculation of AMF and Bacillus sp.PIS7 with RP. It is concluded that PSB solubilize the unavailable forms of P in combination with RP fertilizer in soil and AMF ultimately transfer it to plants for growth promotion. Moreover, the combined inoculation of AMF and PSB with ground RP has the potential to improve maize-wheat yields and P uptake comparable to those obtained by using expensive SSP fertilizer in P deficient soils of Pakistan.

Keywords: Mycorrhizae; phosphate solubilizing bacteria; rock phosphate; alkaline calcareous soils; plant nutrients; residual effect

Estimation of Gene Action and Combining Ability Effects Related to Yield Contributing Traits in Cotton (*Gossypium hirsutum* L.)

Muhammad Daniyal Junaid[1], Usman Khalid Chaudhry[2], Muhammad Farhan Yousaf[2]

[1]Department of Plant Breeding and Genetics, University of Agriculture Faisalabad, Pakistan
[2]Department of Agricultural Genetic Engineering, Faculty of Agricultural Sciences and Technologies, Niğde Ömer Halisdemir University, Niğde, Turkey
mdaniyaljunaid@gmail.com

Cotton (Gossypium hirsutum L.) is the most important fiber crop in the world including Pakistan. Considering its importance, it is essential to identify the parents with high yield traits to enhance the economic yield. Diallel mating system was used for this purpose because it is the best tool for evaluation of general combining ability (GCA) and specific combining ability (SCA). Yield contributing traits were analyzed in this study. To identify suitable parents, combining ability analysis was applied. Four parental genotypes were crossed by using complete diallel mating system to develop F1 hybrids. F1 hybrids along with parental lines were planted in field, following randomized complete block design (RCBD) with three replications. Data related to different yield traits i.e. plant height, bolls per plant, number of monopodial branches, number of sympodial branches, seeds per boll, cotton seed yield per plant, boll weight, seed index, fiber strength, fiber fineness, lint index and uniformity ratio were measured from the mature crop using standard procedures. Recorded data was subjected to analysis of variance (ANOVA). Traits that exhibited significant variability, further analyzed for combining ability effects and gene action related to yield contributing traits. Among all crosses, the best crosses were identified on the basis of combining ability. Study unveiled additive gene action as well as dominance gene action present in parental genotypes and hybrids. SCA variance for most of the genotypes was found to be better than GCA and reciprocal crossing ability (RCA) variance. All of the aforementioned traits were under the control of non-additive gene action which means inheritance of these traits would be helpful in heterosis breeding.

Keywords: Breeding, Cotton, Combining ability analysis, Diallel, Yield traits.

Domates Çeşitlerinin *Amaranthus retroflexus*'a Karşı Rekabetinin Belirlenmesi

Gönül Dursun[1], Khawar Jabran[2]

[1]Düzce Üniversitesi, Ziraat ve Doğa Bilimler Fakültesi, Düzce, Türkiye; [2]Niğde Ömer Halisdemir Üniversitesi, Tarım Bilimleri Fakültesi, Niğde, Türkiye
gnldrs@gmail.com

Ülkemizde birinci sırada yetiştiriciliği yapılan sebzeler içerisinde en çok meyvesi tüketilen domates taze ve işlenmiş olarak değerlendirilmektedir. Dünyada 177 milyon ton domates üretilmekte olup Türkiye; Çin, ABD ve Hindistan'dan sonra 12,75 milyon ton ile dördüncü sıradadır. Domates insan sağlığı açısından da önemlidir; kalp ve koroner hastalığı yanı sıra kanser riskini de düşürmektedir. Türkiye'de domates yetiştiriciliği bölgelere göre değişmekte olup genel olarak Nisan- Mayıs aylarında dikilip Haziran-Temmuz aylarında hasat edilmeye başlar. Gübreleme, sulama, ilaçlama ve budama domatesin verimliliği açısından önemlidir. Domates yetiştiriciliğinde üründe kalite ve verimde artış için; fungal, bakteriyel, viral hastalıklar ve yabancı ot mücadelesinin yapılması gerekmektedir. Yabancı ot mücadelesi yapılmazsa üründe %45-90 arasında verim kaybı yaşanır. Yabancı otlar ile mücadelede öncelikle kültürel; temiz tohum kullanmak, yabancı otlar ile rekabeti yüksek çeşitler kullanmak v.b. sonra fiziksel; solarizasyon ve malçlama v.b. daha sonra biyolojik; yararlı böcekler salınımı v.b. ve en son kimyasal mücadele; herbisit uygulaması istenir. Çalışmamızda farklı domates çeşitlerinin yabancı ota (Amaranthus retroflexus) karşı rekabet yeteneklerini arazi koşullarında değerlendirdik. Çalışma sonucunda domates tarlasında yabancı otlardan horoz kuyruğu (Amaranthus retroflexus) belirlenmiştir. Çeşitler arasında yabancı otlara karşı herhangi bir farka rastlanmamıştır. Domates, Dünya ve Türkiye'de yetiştiricilik, sofrada tüketim ve sağlığa faydaları açısından sebzeler arasında ilk sırada gelir. Domates yetiştiriciliğinde yabancı ot kontrolü verimde ve kalitede önem arz etmektedir.

Anahtar Kelimeler: Domates, Yabancı Ot, Mücadele, Verim.

A comparative method study to measure dry matter content of potato genotypes under different environmental conditions

Muhammad Naeem[1], Muhammad Farhan Yousaf[1], Caner Yavuz[1], Ayten Kubra Yagiz[1], Eric Kuopuobe Naawe[1], Ufuk Demirel[1], Sevgi Çalışkan[2], Mehmet Emin Çalışkan[1]

[1]Department of Agricultural Genetic Engineering, Faculty of Agricultural Sciences and Technologies, Nigde Omer Halisdemir University, Nigde, Turkey.
[2]Department of Plant Production and Technologies, Faculty of Agricultural Sciences and Technologies, Nigde Omer Halisdemir University, Nigde, Turkey.
naeemmuaf@gmail.com

Dry matter content is considered as the main determinant of processed potato tuber quality. Studies revealed that high dry matter content and low reducing sugars increases the crispy consistency of chips, decreases oil absorption while cooking, reduces bitter taste and dark color of processed tuber products. Thus, it is imperative to investigate rapid, accurate and reliable methods to measure tuber dry matter content. The current study was planned to compare three different methods (viz., Martin Lishmans's Digital Potato Hydrometer, sea sand and oven dry methods) for the determination of tuber dry matter content (TDM%) among 200 diverse potato genotypes grown under three different environmental conditions (Hatay “standard water application”, Konya “standard water application” and Konya “drought”) during the year 2018. Results showed significant strong correlation of r=0.890 and r=0.889 between sea sand and hydrometer methods in Konya standard water application and Konya drought conditions, respectively. Though, a correlation of 0.854 exist between oven dry and hydrometer methods in Hatay standard water application, but considerably lower “r” values of 0.663 and 0.582 were observed with same methods, in Konya standard water and drought conditions, respectively. Oven dry method also gave significantly lower “r” value of 0.556 in comparison to sea sand method for the determination of TDM%. The study concludes comparative efficacy of both sea sand and hydrometer methods over oven dry method for measurement of TDM%. The sea sand is an accurate, destructive method but offers some limitations in terms of laborious and time consuming. Alternatively, hydrometer is an automated, non-destructive, easy method to calculate TDM% of large number of tuber samples. Nevertheless, it requires approximately 2000g of clean raw tubers with minimum of 3-4 replications per sample. Therefore, oven method is not reliable according to the current study. A strong correlation between sea sand and hydrometer was observed.

Keywords: Dry matter content, Hydrometer, Potato, Oven dry method, Sea sand method.

Distribution of root diseases and plant parasitic nematodes, screening of some wheat genotypes on resistance to Cereal Cyst nematode (*Heterodera filipjevi* Madhizov) in Kazakhstan

Nurgul AMANGELDI[1], Alexei Agibaev[2], Abdulmamat Kochorov[2], Abdelfattah A. DABABAT[3]

[1]Kazakh National Agrarian University, Almaty, Kazakhstan; nnurka87@mail.ru
[2]Kazakh National Agrarian University, Almaty, Kazakhstan; agibaev52@mail.ru, kochorov@mail.ru
[3]CIMMYT Global Wheat Program Ankara-Turkey; g.erginbas@cgiar.org, a.dababat@cgiar.org

Root rot diseases and plant parasitic nematodes are major pest of wheat fields in Kazakhstan. Therefore, resistance of wheat varieties to these nematodes are very important. They are significant constraints to sustainable agriculture and can be difficult to control. Due to the fact that the structure of populations of pathogens in root diseases is constantly changing, it is important to new wheat genetic resources to control very dangerous diseases in semiarid regions like Kazakhstan, Turkey. Surveys were conduct in the major cereal crop growing areas of Northern Kazakhstan-Shortandy, A.I. Baraev research centre, Uralsk experimental station and Kaskelen research development stations were taken 270 soil samples. The results indicated that highest cyst number was found Astana-Kostanay as 418 cysts/100 g. 21 resistant genotypes of wheat (lutescens 30 69/97, ekada148, fiton 41, fiton 204, tselinnaya niva, asylsapa, akmola 2, tselinnaya 3s, astana, altaiskaya70, lutescens29-12, lutescens106-11, lutescens916, grecum1003, lutescens89-06, eritrospermum85-08, lutestsens220-03-45, grekum 650, lutescens 920, select, lyutestsens 208-08-4) were determined against to Cereal cyst nematode (Heterodera filipjevi). The results of this study will be very useful for researchers and breeders in future.

Keywords: cereal cyst nematode, wheat, resistance, screening.

Morphological and Physiological Response of Potato To High Temperature Under Tissue Culture Conditions

Seher ÖMEZLİ

Niğde Ömer Halisdemir University, Department of Agricultural Genetic Engineering, Faculty of Agricultural Sciences and Technologies, Nigde Omer Halisdemir University, Nigde, Turkey.
Seher_yss51@hotmail.com

Potato is a high-yielding crop and potato tubers have high nutritional value in terms of carbohydrate, protein, vitamin and mineral contents. For this reason, it is regarded as the main food in the fight against malnutrition. Most potato varieties have been developed in temperate climates. For this reason, it produces higher tuber yield in temperate climate regions. However, potato is sensitive to abiotic stress factors such as drought, heat and salinity. Sustainability of potato production under various environmental condition is very important for food safety and social sustainability. In order to ensure the future of potato cultivation, new potato varieties being tolerant to major abiotic stress factors are urgently needed for use in both developed and developing countries. This study is aimed for the determination of the morphological and physiological responses of the 15 potato genotypes, known field yield performance, to high temperature under tissue culture conditions. As a result, there was high correlation between tuber yield and traits of TTC, chlorophyll a, the ratio of chlorophyll a/b, total chlorophyll.

Keywords: Heat Stress, Potato, Abiotic Stress, Tissue Culture, Character Detection.

The Role Of Agricultural Non-Governmental Organization In Informing And Creating Awareness To Farmers: A Case Study Of Women Farmers Advancement Network (WOFAN) Kano State

Sani Ibrahim Ibrahim

Department of Agricultural Genetic Engineering, Faculty of Agricultural Sciences and Technologies, Nigde Omer Halisdemır University, Nigde, Turkey
sirneee@gmail.com

Role of agricultural non-governmental organizations (NGOs) informing and creating awareness to farmers was analysed through a study conducted in WOFAN(WOMEN FARMERS ADVANCEMENT NETWORK) Kano State Chapter. Major WOFAN programmes are agricultural programmes, health programmes, human resource development programmes, community development and industrial and trade programmes. Majority of the beneficiaries are from rural areas. The objectives of the study are firstly, to find out the roles of WOFAN in creating awareness to farmers, to find out the activities of WOFAN, to identify the challenges confronting WOFAN. The overall analysis of the article reveals that WOFAN are very prominent in effective implementation of charity programmes towards helping rural people through the third party activities in education, health, agriculture, community development, energy, environment, and waste, moral upbringing, youth empowerment and poverty alleviation.

Keywords: Communıty, Empowerment, Human Resource, NGO, WOFAN.

EFFECT of ANTIMICROBIAL EDIBLE COATING on QUALITY and SHELF-LIFE of SWEET CHERRY (*Prunus avium* L.)

K. Sinem TULUKOĞLU KUNT, Mustafa ÖZDEN

Department of Plant Production and Technologies, Faculty of Agricultural Science and Technologies, Niğde/ Turkey
ksinemtulukoglu@gmail.com

Sweet cherry (*Prunus avium* L.) is one of the globally appreciated fruit as well as its exporting value. The aim of this study is that study on effect of antimicrobial edible coating on shelf life and quality of sweet cherry. For this purpose, 1% chitosan (CT) and different concentrations of salicylic acid (1 mM, 2 mM) were applied on sweet cherry by dipping as an antimicrobial edible coating. Coated and uncoated samples were stored at 0 ± 2°C, with 90% ± 5 relative humidiy for 35 days in storage room. Weight lost (%), color (Chroma index), total soluble solids (TSS), pH, titrable acidity (TA), fruit skin strength (N) and bioactive compounds such as total phenolic content, total flavonoids, total anthocyanin were weekly analyzed by used spectrophotometric methods. Also, total antioxidant capacity (TAC) were analyzed followed by FRAP and DPPH methods for each intervals. There is no statistically significant effect of coating treatments on weight lost at end of the storage. However, results of TSS, TA, pH, Chroma index and fruit skin strength indicate that these quality parameters were retained in samples applied CT coating together with different SA concentrations. On the other hand, CT coating is found more promising treatments on phytochemical compounds and TAC rather than the others.

Keywords: Chitosan, salicylic acid, sweet cherry, cold storage

SiO_2 Nanopartiküllerinin Mısır Tohumu Çimlenmesi ve Bitki Gelişimi Üzerine Etkisi

Ayten Kübra YAĞIZ, Mehmet Emin ÇALIŞKAN

Niğde Ömer Halisdemir Üniversitesi Ayhan Şahenk Tarım Bilimleri ve Teknolojileri Fakültesi Tarımsal Genetik Mühendisliği Niğde, Türkiye
aytenkubraturkmen@gmail.com

Tarımsal üretimin en önemli girdilerinden biri de tohumdur. Tohum çimlenmesi sırasında görülen abiyotik stres faktörleri, uygun olmayan çevre koşulları ve düşük tohum kalitesi tohum çimlenmesinin senkronize bir şekilde gerçekleşmesini engellemekte ve tohum çimlenmesini geciktirmektedir. Ortaya çıkan bu sorunu çözmek için geliştirilen yöntemlerden biri de 'tohum priming'dir. Çok eski zamanlardan beri uygulanmakta olan priming yönteminde su, çeşitli kimyasallar ya da bitki büyüme faktörleri sıklıkla kullanılmaktadır. Fakat gelişen teknoloji priming yöntemine de yeni bir bakış açısı getirmiş ve farklı nanopartiküllerin priming işlemi için kullanılmasına imkan vermiştir. Yapılan çalışmada mısır tohumlarına silisyum dioksit (SiO_2) nanopartikülleri ile muamele edilerek tohum çimlenmesinin ve bitki gelişiminin iyileştirilmesi hedeflenmiştir. Bu amaçla ticari şekilde elde edilen mısır tohumlarına farklı konsantrasyonlarda (10, 20, 40, 60, 80 ve 100 mg/L) SiO_2 nanopartikülleri yardımıyla oda sıcaklığında 8 saat boyunca nanopriming uygulanmıştır. Daha sonra tohumlar MS0 ortamında 25°C'de uzun gün koşulları altında (16/8 saat) bir hafta inkübe edilmiştir. Uygulama sonrası çimlenme yüzdesi ve bitki gelişimi incelenmiştir. Nanopriming sonrası çimlenme oranlarına bakıldığında tüm konsantrasyonlarda çimlenme oranı kontrol grubundan daha yüksektir. Ayrıca sap gelişimi de yine en yüksek 20 mg/L konsantrasyonda görülürken; en iyi kök gelişimi 10 mg/L SiO_2 uygulaması ile sağlanmıştır.

Anahtar Kelimeler: Mısır, Nanopriming, Priming, SiO_2, *Zea mays*

Prevalence of Fusarium equiseti for soybean root rots in Western Kazakhstan

Kuldybayev N.[1], Sultanova N.[2], Daugaliyeva S.[3], Islam R.[4] Dutbayev Y.[1]

[1]Kazakh National Agrarian University, Almaty, Kazakhstan
[2]Kazakh Scientific Research, Institute of Plant Protection and Quarantine, Almaty, Kazakhstan
[3]Institute of Microbiology and Virology, Almaty, Kazakhstan
[4]The Ohio State University, Piketon, USA

Soybean is an important oilseed crop in Kazakhstan, but its production is often affected by soil-borne diseases. A replicated field experiment was established at Aktobe agricultural experimental station in Western Kazakhstan to identify and evaluate the prevalence of soil-borne diseases in 12 Eurasian soybean cultivars. Composite random samples were collected and analyzed for disease prevalence. The genetical analysis of the isolates from culture media from soybean root cuts infected by root rot, showed that the main biotic agent responsible of soybean root rot disease was Fusarium equiseti. Further studies are needed to determine the impact of F. equiseti infection on physiological variables on soybean cultivars in the laboratory condition.

Molecular cloning of the CenH3 gene in soybean and wild species

Hümeyra Yıldız, Bilge Şevval Yıldırım, Ahmet L. Tek

Department of Agricultural Genetic Engineering, Ayhan Şahenk Faculty of Agricultural Sciences and Technologies, Niğde Ömer Halisdemir University, 51240, Niğde, Turkey
hmyildiz51@gmail.com, altek2@gmail.com

The centromere, which is conserved structurally and functionally in all eukaryotes, is important in the accurate distribution of the chromosome. The centromere-specific histone H3 (CENH3) protein in eukaryotic centromere is considered to be a landmark for providing functional property. It is described in detail in many different organisms and the species specificity and highly variable properties of the CenH3 gene has been well established. Considering the importance of the CENH3 protein on centromere, the molecular structure of the CenH3 gene needs to be studied on cultivated and wild forms representing all Glycine species. In this study, total RNA isolation, cDNA synthesis by reverse transcriptase, PCR amplification by gene specific primers, cloning and sequencing were performed in a representative number of Glycine species. Comparative analysis of CENH3 protein sequences with bioinformatics methods will be presented and the similarities and differences among them will be discussed for variable and conserved domains.

Keywords: Glycine, CENH3, centromere, PCR, cDNA

Image Processing Techniques and Applications in Plant Production

Mustafa AKKAMIŞ, Sevgi ÇALIŞKAN

Niğde Ömer Halisdemir University, Faculty of Ayhan Şahenk Agricultural Sciences and Technologies, Department of Plant Production and Technologies, 51240, Merkez, Niğde, Turkey
scaliskan@ohu.edu.tr

Image processing is tecnique of performing any operation on the image with the help of computer of images obtained analog or digital. Thus the obtained new images are used for the purpose. The applications made by taking and processing images in plant production are fast, easy and economical. Therefore image processing studies are increasing at a present time. Detection of diseases, pests and weeds by using different wavelengths of radiation reflected from plants can be determined by using image processing techniques. Image processing also used irrigation and fertilization applications. In particular, the use of chemical drugs and fertilizers made at the same rate in all agricultural land in the agricultural struggle made with them is reduced by image processing techniques and the negative effects caused by both the agricultural input cost and the use of drugs are reduced. The image processing is also used to classify fruits during the post-harvest period in plant production. The data obtained from agricultural lands can be evaluated by image processing methods and variable rate operations can be performed. The data obtained electronically in the image processing is first converted to numerical data, then algorithms are created to perform the desired application with these data. In this study, image processing techniques which are used in plant production are examined. As a result of the literature studies, it has been observed that the image processing techniques used for sustainability are the least economical and environmental damage.

Keywords: Camera, digital data, sustainability, color

POSTER PRESENTATIONS

Overview of cervical cancer in Batna, Algeria

Romyla Bourouba[1]*, Samia Boubechiche[2], Karima Yakoubi[2]

[1]University of Ferhat Abbas Sétif 1, Faculty of Nature and Life Sciences, Department of Biology and Animal Physiology, Sétif, Algeria.
[2]University of Batna, Faculty of Sciences, Department of Nature and Life Science, Batna, Algeria.
*brromyla@yahoo.fr

Cervical cancer is a major public health issue. Infection with human papillomavirus is the most common cause, in addition of other risk factors like lifestyle habits, obesity, and family history of cervical cancer. To evaluate the usefulness of early screening of cervical cancer, and the possible non-viral risk factors in Batna region of Algeria, our study group consisted of 100 randomly healthy women aged between 20 and 70 years old. In Addition, we evaluated the cytological changes in cervix by appropriate Pap smear tests at the Anatomy-Pathology Section of the Batna University Hospital.

Cervical screening results showed that the prevalence of cervical inflammatory lesion is not negligible (41%) especially in women between 20-30 years old. Moreover, abnormal cervical cells were present in all studied group, but the most affected group with cervical intra-epithelial Neoplasia grade 1 (CIN 1) was 31-40 years old (31%), while 17 % of CIN2 cases was observed in that of 61 -70 years old. Oral contraceptive use, menopause, and smoking were significantly related to cervical cancer risk, while multiparity, sexual intercourse before age 18, and abortion are not risk factors.

In conclusion, cervical cancer is a devastating cancer that may be preventable by early detection and treatment of precancerous tissue. It is not surprisingly that large proportions of the patients are diagnosed with advanced stage of the invasive cervical cancer. It is reasonable to promote organized population-based screening programs and awareness of women about the benefits of periodic screening Pap test and some cultural health beliefs barriers in our Country.

Keywords: Algeria, age, Batna, cervical cancer, Pap smears, risk factors.

Klebsiella Pneumoniae Suşlarının Bazı Antibiyotiklere Direnç Durumlarının Değerlendirilmesi

İhsan Obalı[1], Ahmet Uysal[2], Emine Arslan[3]

[1]Biyoloji Bölümü, Fen Fakültesi, Selçuk Üniversitesi, Konya, Türkiye,
[2]Sağlık Hizmetleri Meslek Yüksekokulu, Tıbbi Laboratuvar Bölümü, Selçuk Üniversitesi, Konya, Türkiye,
[3]Biyoloji Bölümü, Fen Fakültesi, Selçuk Üniversitesi, Konya, Türkiye,
obalihsan@gmail.com

Ülkemizde yaygın antibiyotik kullanımı hızla artmaktadır. Bunun sonucunda, antibiyotiklere karşı direnç genlerinin yanı sıra gereksiz kullanılan antibiyotiklere karşı kazanılan direnç genleri de yayılmaktadır. Bu ise gereksiz antibiyotik kullanımına sebep olmaktadır. Hastane kökenli *Klebsiella pneumoniae* suşları birçok antibiyotiğe karşıda dirençlidir. Bu çalışmada Konya'daki bazı hastanelerden izole edilen 192 *K. pneumoniae* suşunun antibiyogram direnç profilleri belirlenmiştir. Bu çalışma materyalini oluşturan *K. pneumoniae* suşları, Konya ilinde, Kamu hastaneleri ve bazı özel hastanelerin mikrobiyoloji laboratuvarlarından izole edilmiş ve Vitek2 identifikasyon kartları ile identifiye edilmiştir. Antibiyotik duyarlılık testleri, McFarland 0,5'e göre ayarlanan suşların Mueller hinton agarda belirli aralıklarla İmipenem (10mg), Tobramisin (10mg), Amikasin (30mg), Ciprofloksasin (5mg), Ofloksasin (20mg), Norfloksasin (10mg), Lemofloksasin (10mg), Ampisilin (10mg), Colistin (10mg), Meropenem (10mg), Ertapenem (10mg), antibiyotikleri yerleştirilmesi ile 37 ^{o}C'de 18 saat inkübe edildi. Antibiyotik disklerine ait inhibisyon zonları, Clinical and Laboratory Standards Institute (CLSI) önerileri doğrultusunda değerlendirildi. Bütün suşların antibiyotiklere karşı duyarlı veya dirençli oldukları belirlendi.

Elde ettiğimiz bulgulara göre; İmipenem (10mg) *%28,64* ve Tobramisin (10mg) *%45,31* oranında dirençli bulunmuştur. Aminoglikozid grubu antibiyotiklerden Amikasin (30mg) *%33,33* oranında dirençli oldukları tespit edilmiştir. Ciprofloksasin (5mg) *%47,39*, Ofloksasin (20mg), *%46,35,* Norfloksasin (10mg) *%47,39,* Lemofloksasin (10mg) *%47,91,* Ampisilin (10mg) *%97,91*, Colistin (10mg) *%11,45,* Meropenem (10mg) *%32,29*, Ertapenem (10mg) *%42,18* oranında dirençli bulunmuştur. Klinik örneklerden izole edilen *K. pneumoniae* suşlarının en yüksek direnç gösterdikleri antibiyotik Ampisilin (10mg) (%97,91) olurken en düşük dirençe sahip antibiyotik ise Colistin (10mg) (%11,45) olmuştur. Direnç profilinin saptanarak uygun antibiyotik politikalarının oluşturulması yeni dirençlerin gelişmesinin önlenmesinde önemlidir.

Anahtar Kelimeler: *Klebsiella pneumoniae*, antibiyotik dirençliliği, Ampisilin, hastane, Konya.

Karyological review of belonging to the some cyprinid genera (*Leucaspius*, *Leuciscus*, *Luciobarbus*, *Petroleuciscus*, *Pseudorasbora*, *Rhodeus*, *Rutilus* ve *Scardinius*) species in Turkey and other countries IV

Atilla ARSLAN[1], Ahmed Sadeq Jaber DOORİ[2], Zafer ALPASLAN[2]

[1]Department of Biology, Science Faculty, Selcuk University, Konya, Turkey
[2]Science Institute, Department of Biology, Selcuk University, Konya, Turkey
ahmedsdoori@gmail.com

Purpose and Method: In this study, karyological review of *Leucaspius*, *Leuciscus*, *Luciobarbus*, *Petroleuciscus*, *Pseudorasbora*, *Rhodeus*, *Rutilus* and *Scardinius* species belonging to Cyprinidae (cyprinids) family in Asia and Europe is maded.

Findings: In karyological studies on *Leuciscus* species in Europe (Germany, Czech Republic, Sweden and Poland), the diploid chromosome number (2n) 50 and 52 of *L.idus*; 50 of *L.leuciscus*; 34, 50, 52 of *L.aspius* expressed as. Number of diploid chromosomes (2n) of *L.pectoralis* while 100 in Turkey *L.pectoralis* is seen as 148. Number of diploid chromosomes (2n) 50 of *P.borysthenicus* and the NF value 94 is explained as. In studies in Turkey and Japan, diploid chromosome number (2n) of *P.parva* has been found as 50. In studies in different localities, respectively number of diploid chromosomes of *R.amarus*, *R.rutilus* and *S.erythrophthalmus*; 48, 50 and 52, 48 and 50 has been reported as.

Results: *Leucaspius*, *Petroleuciscus*, *Rhodeus* species the number of chromosomes is the same in different localities, while the number of chromosomes of species of belonging to other genera is concluded to be different.

Keywords: Asia, Cyprinidae, Europe, Karyotype

Karyological review of belonging to the some cyprinid genera (*Alburnoides*, *Acanthobrama*, *Blicca, Carasobarbus*, *Pseudophoxinus*, *Tinca* and *Vimba*) species in Turkey and other countries II

Atilla ARSLAN[1], Zafer ALPASLAN[2], Ahmed Sadeq Jaber DOORİ[2]

[1]Department of Biology, Science Faculty, Selcuk University, Konya, Turkey
[2]Science Institute, Department of Biology, Selcuk University, Konya, Turkey
zfralpaslan@gmail.com

Purpose and Method: In this study, located within the family Cyprinidae (cyprinids) and distribution showing in Turkey *Abramis*, *Acanthobrama*, *Alburnoides*, *Blicca*, *Carasobarbus*, *Pseudophoxinus*, *Tinca* and *Vimba* of species karyological studies literature is aimed to considering. Also karyological characteristics of species in different countries were discussed.

Findings: According to available literature data, the diploid chromosome number (2n) of the species of *Abramis*, *Acanthobrama*, *Alburnoides*, *Blicca*, *Pseudophoxinus* and *Vimba* is 50 and the diploid chromosome number (2n) of *Carasobarbus* species vary between is 148-150. The number of diploid chromosomes (2n) of *Tinca tinca* (Tench), the only species of the genus *Tinca*, is 48 in Turkey, while the number of diploid chromosomes (2n) of this species in Italy are stated to be 50. The molecular cytogenetic (FISH) specificities of species other than standard karyological methods were investigated by some researchers.

Results: Sex chromosomes of species could not be detected in studies conducted at different localities in Turkey and Europe. When karyological studies of the 12 different endemic species in the *Pseudophoxinus* genus to Turkey examined, while karyotype formulas of the species showed similarity, number of fundamental chromosome arms (NF) are 92 and 94.

Keywords: Asia, Europe, Cyprinidae, Karyotype, Chromosome

Structural and Physical Properties of Sodium and Nano Sized Tin doped Bi-2212 Superconductors

Mehmet Ersin AYTEKİN[1], Berdan ÖZKURT[2]

[1]Mersin Üniversitesi İleri Teknoloji Eğitim Araştırma ve Uygulama Merkezi
[2]Tarsus Üniversitesi Enerji Sistemleri Mühendisliği
berdanozkurt@tarsus.edu.tr

Purpose and method: In this study, ceramic superconducting samples with different addition rates in the initial composition of $Bi_2Sr_{2-x}(SnO_2)_xCa_1Cu_{1.75}Na_{0.25}O_y$ (x = 0.0, 0.05, 0.1, 0.20) have been produced using the conventional solid state reaction method. The effect of sodium and nano-sized tin doping on the physical and mechanical properties of Bi-2212 superconductors has been analyzed using X-ray Diffraction (XRD), SEM (Scanning Electron Microscope), Electrical Resistance (R-T) and Magnetization (M-T) measurements.

Results and conclusions: In the XRD measurement results, it has been observed that despite the formation of some impurity phases, phase structure in all samples mainly is the Bi-2212. In addition, the highest rate of formation of Bi-2212 superconductivity phase was observed in the samples including x = 0.05 nano-sized tin-doped. In the SEM microstructure analysis results, the formation of plate-like grains indicating the presence of the Bi-2212 high temperature phase in all samples was observed. In addition, the best surface morphology with the formation of larger plate-like grains and less porous structure belong to the sample including x = 0.05 nano-sized tin. The results of electrical resistivity measurement clearly show that all samples have superconductivity transition after their Tc onset values. Also, the highest superconductivity transition temperature was observed in x =0.05 nano sized tin doped sample. On the other hand, magnetization measurements were performed by magnetic hysteresis measurements. In the obtained hysteresis graphs, the characteristic behavior of Bi-2212 superconductors was observed in all samples.

Keywords. $Bi_2Sr_{2-x}(SnO_2)_xCa_1Cu_{1.75}Na_{0.25}O_y$, XRD, SEM, M-H

Salmonella Enteritidis'i Enfekte Eden Se-P5 Fajının Karakterizasyonu

Nida Nur URGANCI, Tuba SAKİN, Zeliha YILDIRIM

Niğde Ömer Halisdemir Üniversitesi

Salmonella, insan sağlığı için en büyük tehditlerden biri olup salmonellosiz ve tifonun da aralarında yer aldığı pek çok hastalığın etkenidir. Salmonella salgınlarından sorumlu en önemli serovar olan Salmonella Enteritidis, insanlar ve hayvanlar tarafından kontamine gıdalar vasıtasıyla alındığında gıda kaynaklı hastalıklardan salmonellozis'e neden olmaktadır. Salmonellozis bir tür akut bağırsak enfeksiyonu olup, Avrupa ülkelerinde gıda kaynaklı hastalıklar içerisinde ikinci sırada yer almaktadır.

Bu projenin amacı Salmonella Enteritidis'i enfekte eden litik bakteriyofaj izole etmek ve bakteriyofajı saflaştırıp konak hücre aralığı, biyokimyasal, fiziksel ve morfolojik özelliklerini belirlemektir. Araştırma sonucunda, atık sudan izole edilen ve saflaştırılan SE-P5 olarak adlandırılan fajın, konak hücre aralığının geniş ve litik aktivitesinin kuvvetli olduğu belirlenmiştir. SE-P5 fajının test edilen 10 farklı Salmonella Enteritidis suşundan 8 tanesine ve ayrıca Salmonella Typhimurium suşlarından 4 tanesine karşı enfektif olduğu saptanmıştır. SE-P5 fajın kuyruklu ve Siphoviridae familyasına ait olduğu, çoklu enfeksiyon ve mutant frekans değerlerinin ise sırasıyla 0.0001 ve 10-7 olduğu belirlenmiştir. 25 ve 37°C'de besiyerinde konak bakterisine karşı test edildiğinde Salmonella sayısını tespit edilemeyecek seviyeye düşürdüğü ve inkübasyonun ilk 5 dakikasında konak hücresine %96 oranında adsorbe olduğu gözlenmiştir. SE-P5 fajın latent periyodunun 5 dk, patlama sayısının 277 faj/hücre ve patlama süresinin 20 dk olduğu saptanmıştır. Geniş pH (2-13) aralıklarına ve yüksek sıcaklık (80-90°C) uygulamalarına karşı dirençli olduğu, -20, -80, 4, 25 ve 35°C'de 3 aylık depolama süresince stabilitesini koruduğu belirlenmiştir. Sonuç olarak, SE-P5 fajının Salmonella Enteritidis'e karşı gıda endüstrisinde biyokoruyucu olarak kullanılma, veteriner hekimlik ve tıpta antibiyotiklere alternatif olma potansiyeline sahiptir.

Anahtar Kelimeler: Salmonella Enteritidis, patojen, bakteriyofaj, biyokoruyucu

The Continuance of The "Engineer School" Established By The Ottoman State With The Name of "Professional Engineer School" In The Republic of Turkey

Derya GEÇİLİ[1]

[1]Niğde Ömer Halisdemir Üniversitesi, Atatürk İlkeleri ve İnkılap Tarihi Bölümü
dgecili@ohu.edu.tr

In 19th Century, probably one of the most important innovations in the Ottoman State was the establishment of Engineer Schools that were built with the intention of providing technical training. For the first time, the Engineer School was established in 1775 in *Tersane-i Âmire* with the name "*Hendeshane*" (i.e. the Engineering School); then, it was reorganized in 1793 by Selim III; and continued its existence as of 1806 as two separate engineer schools, one under the name of "*Mühendishane-i Berri Hümayun*" (the Engineer School for Land Forces), and the other one under the name of *Mühendishane-i Bahri Hümayun* (the Engineer School for Naval Affairs). With the establishment of the Republic of Turkey, the engineer school was named as "Professional Engineer School". At first, the Professional Engineer School used the Gümüşsuyu Headquarters, then, it grew with the possession of arsenals in Maçka And Taşkışla. In 1944, the Professional Engineer School became the Istanbul Technical University. These educational institutions, which had important roles in the realization of many important military and civil technological projects as the Professional Engineer School in the Republic of Turkey, have a separate importance because of their pioneering role in the creating of modern technical training system in the Republic of Turkey. The students, who were educated and trained in this school, and the curriculum of it constituted the first step in the opening of modern schools. The transition process of Engineering Education/Training History from the Ottoman State to the Republic of Turkey has been explained in the following sections.

Keywords: Professional Engineer, Technical, Education/Training.

Peynirlerden izole edilen Enterococcus spp. izolatlarının farklı pH değerlerindeki antimikrobiyal aktivitelerinin belirlenmesi

Zeynep NALVURAN[1], Nihat AKIN[2]

[1]Niğde Öner Halisdemir Üniversitesi
[2]Selçuk Üniversitesi
zeynepnalvuran@gmail.com

Günümüze kadar bakterilere karşı etkili çok sayıda antibiyotik ve kimyasal ajan geliştirilmiştir. Ancak son yıllarda bakterilerin kullanılan antibiyotiklere karşı hızla direnç kazanması, yeni antimikrobiyal bileşiklerin araştırılmasını ve geliştirilmesini hedefleyen çalışmaları ön plana çıkartmıştır. Çalışmamızda, gıdaların doğal florasında bulunmasının yanı sıra yardımcı kültür, starter kültür ve probiyotik olarak gıda sanayinde önemli bir yeri olan *Enterococcus* kültürlerinin antimikrobiyal etkilerinin belirlenmesi amaçlanmıştır.

Bu çalışmada çeşitli peynirlerden izole edilen *Enterococcus* spp. suşlarının farklı pH koşullarında indikatör olarak kullanılan ve insanlarda sıklıkla patojeniteye sebep olan *Bacillus cereus* ATCC 11778, *Staphylococcus aureus* ATCC 25923, *Pseudomonas fluorescens* ATCC 49642 bakterilerine karşı antimikrobiyal etkileri modifiye agar-sandviç yöntemi kullanılarak incelenmiştir. *Enterococcus sp.* İzolatlarının pH 5.5, 6.5 ve 7.5 değerlerinde *Bacillus cereus*'a karşı 4.9- 15.5 mm; *Staphylococcus aureus*'a karşı 4.6-5.7 mm ve *Pseudomonas flourescens*'e karşı ise 3.8-6.3 mm arasında değişen çaplarda zon oluşturdukları gözlenmiştir. Çalışma kapsamında ayrıca *Enterococcus spp* izolatlarından hiçbirisi pH 4.5'de antimikrobiyal etki sergilememiştir. Sonuç olarak, uygun pH değerlerinde *Enterococcus* kültürlerinin indikatör bakterilerin gelişimini inhibe edici etkileri olduğu, ayrıca gıdalarda bolca bulunan ve sağlığa zarar vermeyen antibakteriyel kültür kaynaklarının gelecekte gelişmesine katkıda bulunacağı saptanmıştır.

Anahtar Kelimeler: Antimikrobiyal aktivite, Enterococci, modifiye agar-sandviç yöntemi

Isotherm modelling for the adsorption of methyl orange on a polydopamine-coated sporopollenin adsorbent: A column study

Zeynep NALVURAN, Abdurrahman ACAR, Orhan GEZICI

Niğde Ömer Halisdemir University
zeynepnalvuran@gmail.com, ogezici@gmail.com

Azo dyes are among the primary compounds that frequently found in wastes of many industries, such as textile, leather, plastics, cosmetics, and food. Because of their undesired effects, the removal of this class of chemicals is deemed important. Adsorption is a method of choice to remove dyes from waste waters because of its simplicity, efficiency, and flexibility. A wide range of natural and synthetic materials/adsorbents are used for this purpose.

In the present study, a naturally-occurring biomacromolecule, sporopollenin (SP), was subjected to a surface modification process called *polydopamine (PDA) dip-coating*. The obtained adsorbent (SP-PDA) was used for dye adsorption for the first time. The adsorbent was characterized by FTIR spectroscopy and pH_{pzc} measurements. In the adsorption experiments, methyl orange (MO) was used as the probe dye, and the effect of (*i*) the feed concentration (5.0–20 mg / L) and (*ii*) the temperature (25–45 °C) on MO adsorption was studied in a column system. Adsorption capacities were calculated from the breakthrough curves recorded on-line and the data were modeled with respect to the Langmuir, and the Freundlich isotherm models. Of the two studied isotherm models, the Freundlich model showed the best fit to the experimental data. The isotherm parameter, $1/n$, was found to be lying in the range 0–1, indicating a beneficial process for the studied conditions. Both isotherm modeling and the results of temperature experiments revealed that adsorption of methyl orange on SP-PDA was a process which is mainly governed by physical interactions.

Keywords: Adsorption, Dye, Polydopamine, Sporopollenin

Transformation of a type of gene conferring insect resistance, *chitinase 2a*, from barley (*Hordeum vulgare*) into potato (*Solanum tuberosum*)

Caner Yavuz[1], Cehibe Tarim[1], Ali Onaran[1], Mehmet Yildirim[2], Mehmet Emin Çalışkan[1], Bushra Tabassum[3]

[1]Agricultural Genetic Engineering Department, Faculty of Agricultural Sciences and Technologies, Nigde Omer Halisdemir University, Nigde, TURKEY
[2]Plant Production and Technologies Department, Faculty of Agricultural Sciences and Technologies, Nigde Omer Halisdemir University, Nigde, TURKEY
[3]Center of Excellence in Molecular Biology, University of the Punjab, Lahore, PAKISTAN

Using chitinases as a mean of insect resistance method in crops is a common concept benefiting from hydrolytic activity of chitinase gene using transgenic approach. Chitinase targets chitin, found in exoskeleton, in insects, fungi, yeast and disrupting cuticle layer therefore avoids the damaging effects of insects and fungi on crops. To observe anti-fungal and insect resistance effects of chitinase gene on potato, in this study chitinase 2a gene from barley was processed using bioinformatic tools and transformed into potato to improve its ability to tolerate insects through Agrobacterium-mediated method. Chitinase 2a gene was isolated from barley and cloned into Thymine Adenine (TA) cloning vector and gene insertion was confirmed by PCR reaction, later transformation was carried out and TA-chitinase 2a construct was screened in colonies. Several positive colonies were detected and for future study, this construct is planned to be transformed to potato plant.

Keywords: chitinase, potato, barley, transformation

Development of a New HPLC Method For Measurement of Reducing Sugar Content in Potato by Using Aminopropyl Column

Caner Yavuz[1], Mehmet Emin Çalışkan[1]

[1]Agricultural Genetic Engineering Department, Faculty of Agricultural Sciences and Technologies, Nigde Omer Halisdemir University, Nigde, TURKEY

Storage at low temperature results in glucose and fructose (reducing sugars) accumulation as a result of starch breakdown in potato. Reducing sugar and asparagine/glutamine undergoes a reaction called Maillard reaction at which processed potatoes like French fry and chips become brown in color and become neurotoxic/cancerogenic for human consumption. High pressure liquid chromotagraphy offers a very sensitive method to measure glucose and fructose content of potato especially when more conventional methods such as polarimetric method, commercial assay kits and Fehling's solution are considered for their low sensitivity in small quantities of sugars during analysis. Of these methods, HPLC is the most efficient way to analyse almost 0.01% reducing sugar content. Here in this study, we have developed new extraction protocol and HPLC conditions by using aminopropyl column for reducing sugars extracted from potato by using refractive index detector (RID). Potato tubers stored at 80C were cut in strips and frozen strips were transferred to lyophilizator, later dried samples were smashed by blender. About 200 mg potato powder was taken with differing volumes of water and differing solvents of ethanol, methanol and acetonitrile. Therefore, a modified method for reducing sugar extraction was developed by using Inertsil NH2 column in reversed phase mode without demand on solid phase extraction. The optimum conditions for column were 400C at 1 ml/min flow rate and its mobile phase composition was 20%:80% (v/v) water: acetonitrile. This method can be automated for large number of samples.

Keywords: potato, reducing sugar, HPLC, Maillard reaction

Investigation of Safety Hardware Machines in Occupational Health and Safety and Evaluation of Risks

Ahmet Obalı[1], Cevat Aydın[2]

[1]Department of AgriculturalMachinery, Faculty of Agriculture, Selçuk University, Konya, Turkey
[2]Department of AgriculturalMachinery, Faculty of Agricultures, Selçuk University, Konya, Turkey
ahmetobali@gmail.com

Hazelnut Harvesting Machines, hazelnut in the garden, soil, grass, leaves and nuts without damaging the nuts and manpower relieves. The studies carried out to determine the risks related to hazelnut harvester in the field of occupational health and safety, to prevent hazards, to predict and to assess the risks, to eliminate these risks completely or to minimize their losses. Hazelnut Harvesting machines are mostly composed of fast moving or high turn-over parts, the clamping points are located in motion transmissions such as belt-pulley, chain-gear and gear wheels. It was determined that there were limb losses and injuries caused by moving parts. It has been determined that these accidents will be reduced by training them in their workers together with adequate and appropriate protective covers, switch systems and photocell installations.
In addition, a risk assessment study was performed with the L-type matrix method against the risks and hazards associated with the machines.

Keywords: OccupationalHealth, Hazelnut, Harvesting Machine, Risk Assessment

Research on the Potato Virus Y Infection in Potato Tubers Grown in Kyrgyzstan

Nurdinbek Temirbek Ulu, Çiğdem Ulubaş Serçe

Department of Plant Production and Technologies, Ayhan Şahenk Faculty of Agricultural Science and Technologies, Niğde Ömer Halisdemir University, Niğde/ Turkey
cigdemserce@gmail.com

Kyrgyzstan divided from Russia on 5th of December in1936, and was granted the status of the Kyrgyz Soviet Socialist Republic. It became an independent state on 31 August 1991 after the collapse of the Soviet Union. In the country, because of the small number of specialists in phytopathology and virology in particular, studies in this field are very limited. Therefore, the aim of this study is to investigate and determine the strains of PVY virus in seed potato tubers to be obtained from the areas where potato cultivation is the most common in Kyrgyzstan. PVY can be found on all parts of the plant and is transmitted in the field with vector aphids. Especially necrotic strains of the virus cause serious losses in the tuber or decrease in market value. DAS-ELISA tests were performed from 141 potato tuber shoots of Nevskiy, Jelly, Jelly and Pikaso potato varieties obtained from Issık Lake and Chui regions in Kyrgyzstan. Among them, 48.9% of tubers were found to be infected with PVY. Multiplex IC-RT-PCR was performed to determine the strain of the virus in PVY infected samples. As a result, it was determined that PVY strains in tubers were PVY-NW-A or B among necrotic recombinant races and PVY-NW: O mix strains were also found in a tuber. The fact that the virus is found in approximately half of the investigated seed tubers and that it contains the most harmful necrotic strains requires taking measures in the production of seed potatoes in the country. In this study, PVY virus and strains were the first records in Kyrgyzstan.

Keywords: PVY, potato, tuber, IC-RT-PCR, DAS-ELISA

CAMTA Transkripsiyon Faktör Ailesinin Bitkilerdeki Rolü

Dilan Ateş

Niğde Ömer Halisdemir Üniversitesi, Tarım Bilimleri ve Teknolojileri Fakültesi, Tarımsal Genetik Mühendisliği, Merkez Kampüs, Niğde, 51240 Türkiye
atessdilann9@gmail.com

Bitkiler doğaları gereği yaşam süreleri boyunca büyüme ve gelişmelerini olumsuz yönde etkileyecek stres faktörlerine maruz kalırlar. Bitkiler hayatta kalabilmek için, çevresel faktörlerin olumsuz etkilerini, stres olarak algılamakta ve metabolizmalarında uygun fizyolojik, biyokimyasal ve moleküler tepkiler oluşturmaktadır. Kuraklık, tuzluluk, yüksek sıcaklık, kimyasal toksisite ve oksidatif stres gibi abiyotik stresler bitkilerde fizyolojik ve biyokimyasal zararlara yol açarak, ürün nicelik ve niteliğini olumsuz yönde etkilerler. Dolayısıyla, tarımsal faaliyetlerin sekteye uğramasına ve çevrenin bozulmasına neden olan ciddi tehditlerdir. Dünya çapında bitkisel verim kaybının birincil nedeni olan abiyotik stresler en fazla ürün elde edilen kültür bitkilerindeki ortalama ürün verimini % 50'den fazla azaltmaktadır. Bitkiler bu olumsuz etkileri azaltmak veya engellemek amacıyla moleküler savunma mekanizmaları geliştirmişlerdir. Transkripsiyon faktörleri bitkinin maruz kaldığı stres sonucunda DNA'nın belli bölgelerine bağlanarak genin ekspresyon (ifade) seviyelerini kontrol ederler. Bu nedenle de abiyotik stres toleransında önemli görevler üstlenirler. Kalmodulin bağlama transkripsiyon aktivatörü (CAMTA) ailesinin üyesi transkripsiyon faktörleri, sensör mekanizmalarından büyüme ve gelişim sürecini düzenlemeye kadar bitki için önemli birçok yolağın kontrolünde rol almaktadırlar. Bu çalışmada model bitki Arabidopsis thaliana'daki CAMTA transkripsiyon faktörlerinin abiyotik stres toleransındaki görevlerinden bahsedilecek olup, genetik mühendisliği yöntemleriyle CAMTA'ların düzenlenmesi sonucunda bitkilerin stress koşullarına karşı adaptasyonu ve dirençliliğinin arttırılmasından bahsedilecektir.

Anahtar Kelimeler: CAMTA, Abiyotik Stres, Transkripsiyon Faktörü, Gen Ekspresyonu

Aspir (*Carthamus tinctorius* L.) Tarımının Ülkemizdeki Durumu

Ali ERPAY[1], Özden ÖZTÜRK[2]

[1]Tarım ve Orman Bakanlığı Balışeyh İlçe Müdürlüğü
[2]S.Ü. Ziraat Fakültesi Tarla Bitkileri Bölümü
ali.erpay@tarimorman.gov.tr

Türkiye, bitkisel yağ açısından büyük oranda dışa bağlı durumdadır. Bitkisel yağ bakımından dışa bağımlılığımızı azaltmak için ülkemiz koşullarında yetişebilen yağlı tohumlu bitkilerin üretimine önem verilmesi gerekmektedir. Aspir (Carthamus tinctorius L.) bu kapsamda ele alınması gereken bir üründür. Aspir ile ilgili ilk çalışmalar 1930 yılında Eskişehir'deki Sazova Tarım Islah istasyonunda başlamıştır. Şu anda ülkemizde son yıllarda yapılan araştırmaların artması ile birlikte, 15 adet çeşit tescil edilmiştir. Ayrıca, devlet destekleri sürekli arttırılmıştır. Sonuç olarak, ülkemizin tarım ürünleri ithalatında ilk sırada yer alan yağlı tohum ve türevlerinin payının azaltılması için aspir stratejik bir önem taşımakta olup, bu makalede aspir tarımı ve ülkemizdeki durumu hakkında bilgi verilecektir.

Anahtar Kelimeler: Aspir, Ekim Alanı, Üretim, Verim