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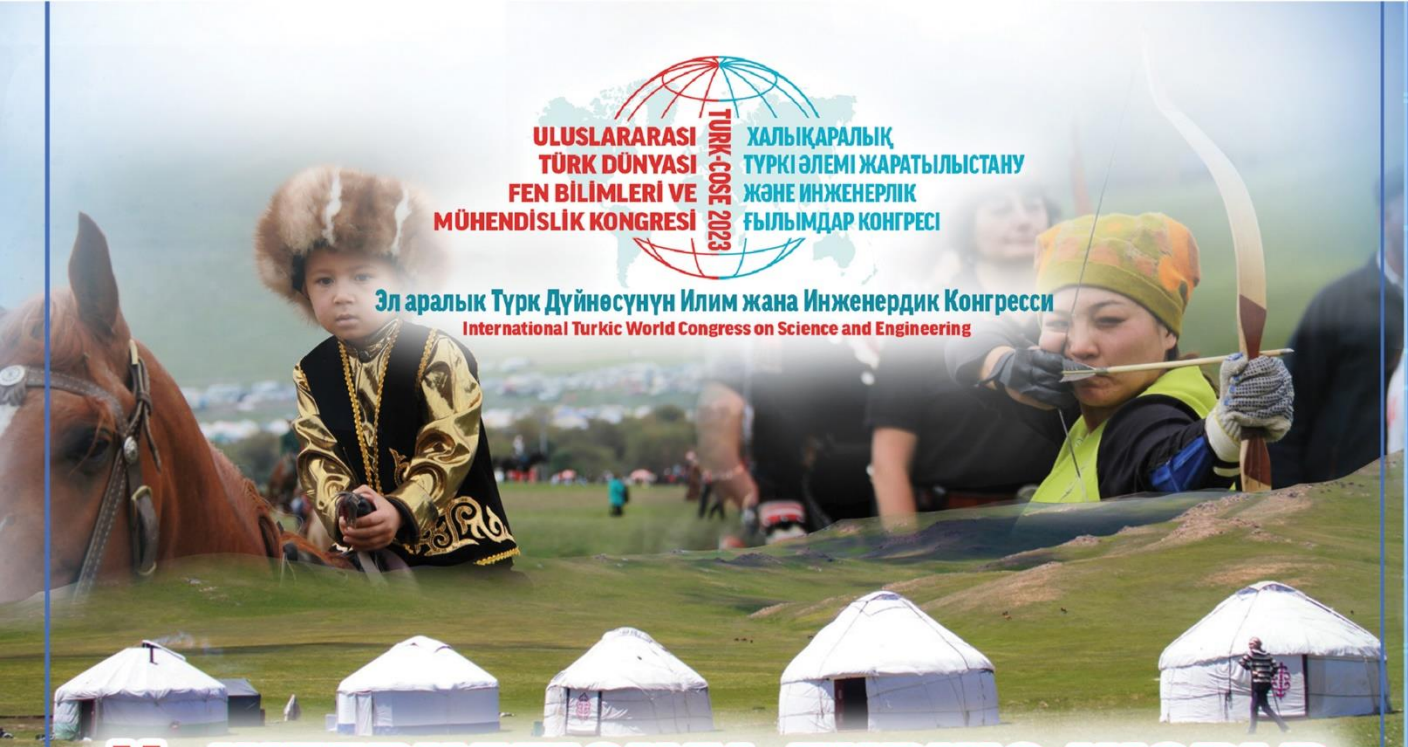

V. INTERNATIONAL TURKIC WORLD CONGRESS on SCIENCE and ENGINEERING

BOOK OF ABSTRACTS

15-16-17 September 2023

Kyrgyzstan-Türkiye Manas University,

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ELECTRICAL, ELECTRONICS AND COMPUTER ENGINEERING

Reconstruction of objects buried under tough surfaces using Supbspace Optimization Method

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Abstract: This study provides a solution to the problem of reconstructing cylindrical objects buried beneath rough surfaces. This problem, which involves an inverse electromagnetic scattering scenario, has been addressed using the Subspace Optimization Method (SOM). The roughness of the surface is incorporated into the solution through the Buried Object Approach (BOA), which models the rough interface as buried objects. The SOM technique divides the induced current space into a signal subspace and a noise subspace. The part associated with the signal subspace is extracted through spectral analysis, while the portion associated with the noise subspace is obtained through optimization techniques. Consequently, the inverse algorithm becomes more robust against noise. To demonstrate the effectiveness of the method in recontruction of the objects buried under rough surfaces, various numerical simulations are presented.

Keywords: Electromagnetic scattering, rough surface, buried object, inverse scattering, subspace optimazation.

Fotovoltaik panel beslemeli yükselten çeviricinin açık çevrim denetimi

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Özet: Fotovoltaik paneller ve yükselten çeviriciler sürdürülebilir enerjide sıklıkla kullanılmaktadır. Bu çalışmada yükselten çeviricinin giriş gerilimi için fotovoltaik panel kullanılmıştır. Yükselten çeviricinin devre yapısı analiz edilerek açık çevrim denetim gerçekleştirilmiştir. Açık çevrim denetim fotovoltaik panel beslemeli yükselten çeviricinin tasarım doğruluğunu test etmek için yapılmıştır. Benzetim çalışmaları Matlab/Simulink ortamında gerçekleştirilmiştir. Benzetim çalışmasından elde edilen sonuçlar açık çevrim denetim ile yapılan tasarımın doğruluğunu kanıtlamıştır.

Anahtar Kelimeler: Fotovoltaik Panel, Yükselten Çevirici, Açık Çevrim Denetim

Land cover generation using random forest algorithm on google earth engine platform

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Abstract: With the increase in population, changes occur in both urban and countryside. Climate conditions related to this adversely affect the ecosystem, creating differences in land cover and land use. Information about the Earth's surface can be acquired as a result of the rising amount of satellite images and the accessibility of free content. Land cover and land use maps are prepared using these remote sensing data. These maps are important in various fields as they serve as base maps. In this study, the feasibility of producing land use maps is tested using a machine learning algorithm through the Google Earth Engine web-based cloud platform. For this purpose, Sentinel-2 satellite images from 01/01/2023 to 31/01/2023 were used. Five classes (Wetland, Green Area, Building, Roads, and Barren Area) were established using a random forest technique.Firstly, training and test data were created using only Sentinel-2 satellite images. Then, validation data were generated, and the results were evaluated. The initial error matrix indicates an overall accuracy of 0.98379 and a kappa value of 0.971953 for the map. In the validation-generated error matrix, the overall accuracy is calculated as 0.92871, and the kappa value is 0.877396.

Keywords: Google Earth Engine (GEE), Land Use Land Cover, Machine Learning, Random Forest (RF)

IMU odometry using deep learning

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Abstract: IMU is a measurement unit that usually consists of sensors such as accelerometers, gyroscopes and magnetometers. Odometry is the estimation of incremental or absolute position and orientation of the device by processing sensor data over time. This paper focuses on how deep learning, a subtopic of artificial intelligence, can be used for IMU odometry. IMU odometry is solely the use of data from IMU sensors for position and orientation estimation. IMU sensor measurements are subject to many errors and noise, and therefore the measurements obtained may not reflect the true values. Our study filters these measurements with deep learning algorithms to provide a more consistent estimate. Our study uses recurrent neural networks such as LSTM, GRU and a hybrid CNN-LSTM network to estimate the position of a micro aerial vehicle using IMU data and compares the results with the ground-truth data by means of defined metrics. EuRoC MAV dataset is used for this purpose. Our study also aims to predict orientation change in terms of rotation angle using only IMU data utilizing a deep learning model. While GRU model performed the best on position estimation by an R^2 value of 0,996, orientation estimation reached an R^2 value of 0,56. The promising results enable the use of the proposed method as an intermediary position estimation on high level SLAM algorithms as a future work.

Keywords: IMU Odometry, Deep Learning, LSTM, GRU, CNN-LSTM.

Performance analysis between CPU and FPU for control algorithms

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Abstract: Nowadays, microcontrollers play a crucial role in control systems. Moreover, in the sector of the embedded systems, the choice of the right microcontroller designs with the right structures has great importance. Because the control systems can be complex, and they can be very demanding in terms of the resources. For instance, model-based design programs that are actively used among the most important manufacturing industries (automotive, aerospace, etc.) automatically generate codes. These source codes of the generated control algorithms may contain complex arithmetic operations and variables. In this sense, Float Point Unit (FPU) is a new key element when considering the microcontroller designs. Although the FPU increases the cost in the design, it has a significant impact on the execution time of the control algorithms. Therefore, a more efficient design is possible if the complexities are reduced by the FPU activation. In this paper, the effect of activating a FPU besides a Central Processing Unit (CPU) in control algorithms on execution time is investigated. The usage of floating variables in the FPU generates a superior performance over the CPU. As a result of activating the FPU in the microcontroller design, the execution of time of the mathematical operations is decreased robustly by around 90 percent with a good success.

Keywords: CPU, FPU, Embedded Systems, Automotive, Microcontroller.

Sanal atalet moment kontrolü içeren mikro şebeke sistemlerinin zaman gecikmesine bağlı gürbüz kararlılık analizi

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Özet: Bu makale, sanal atalet ve sönümleme (virtual inertia and damping, VID) kontrolü içeren zaman gecikmeli mikro şebeke (MG) sistemlerinin gürbüz kararlılık gecikme payı üzerindeki etkisini incelemektedir. Yenilenebilir enerji üretim sistemlerinin mevcut güç üretimi içerisinde hızlı artışı, senkron jeneratör tabanlı klasik güç üretim santrallerinin yük frekans kontrolü (YFK) sistemlerinde etkinliğini azaltarak, güç sisteminin çalışmasını ve nominal frekans kararlılığını bozacak bazı önemli problemlere neden olmaktadır. Özellikle haberleşme zaman gecikmesi içeren MG merkezli bir kontrolörde, denetleyici performansı ve sistem frekansı, haberleşme kanalındaki zaman gecikmelerinden ve parametrik belirsizliklerden olumsuz etkilenir. Dolayısıyla, bu makalede, gürbüz kararlılık gecikme payları, oransal-integral (PI) denetleyicinin farklı kazanç değerleri için Kharitonov Teoremi ve MATLAB/Simulink programı kullanılarak benzetim çalışmaları ile elde edilmiştir.

Anahtar Kelimeler: Yük frekans kontrol, Sanal atalet ve sönümleme, Gürbüz zaman gecikmesi, Kharitonov Teoremi

Optimizing solar photovoltaic performance under partial ahading: A novel approach to maximum power point tracking

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Abstract: In a world increasingly demanding green energy, solar energy systems play a critical role in combating climate change and enhancing energy independence. Nevertheless, the effectiveness of these systems, particularly when dealing with shaded situations, continues to be a significant issue of immediate importance. In this study a novel Maximum Power Point Tracking method is proposed to enhance photovoltaic system performance under partial shading. The method utilizes the open circuit voltage to locate multiple maximum power points, enabling the system to maximize energy yield and performance. This method detects the maximum power point of the solar panel system under the shade, then transfers this point to other known methods for a certain period of time, thus providing a hybrid operation among Maximum Power Point Tracking methods. It offers a practical solution for optimizing power output under dynamic environmental conditions, possible advancement in the utilization of solar energy.

Keywords: maximum power point (MPP), maximum power point tracking (MPPT), partial shading conditions (PSC), photovoltaic systems (PV), PV Converter

Мобилдик телекоммуникация технологиялары жана нерселердин интернети

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Абстракт: Дүйнөдөгү санариптештирүү процесси алдыңкы темалардын бири. Санарип формадагы маалыматтар интернет аркылуу ташылат, ошондуктан интернеттин ылдамдыгы инфраструктуралык түзүмү катары кайсы мобилдик телекоммуникация технологиясын колдонулгандыгынан көз каранды. Ошондуктан жалпы Орто Азия чөлкөмүндөгү жана Түркие мамлекетинде кайсы мобилдик технологиялар колдонулуп келе жатат деген суроолор каралган. Андан тышкары учурдагы 5G технологиясын колдонсок нерселердин интернети багытында кандай артыкчылыктарды берет деген суроолор каралган. Нерселердин интернети Кыргыз Республикасындагы абалы кандай экендиги боюнча маалымат берилет.

Ачкыч сөздөр: Мобилдик тармак технологиялары, нерселердин интернети

LoraWAN технологиясы жана чоң берилиштер

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Абстракт: Техника жана технологиянын өнүүгү процессинин жыйынтыгы катары сезгич жабдыктардын жардамы менен айлана-чөйрөнү көзөмөлдөө, ден соолук сыяктуу ар кандай багытта колдонулуп келе жатат. Бул сезгич маалыматтардан кантип берилиш топтолот кандай технология ыңгайлуу деген суроого жооп берүү үчүн LoraWan технологиясы боюнча маалымат берилген. Бул жабыктардан топтолгон берилиштердин үстүнөн иштөөдө кандай кадамдар аткарылыш керек деген суроого бул жерде маалымат берилет.

Ачкыч сөздөр: зымсыз сезгич тармагы, чоң берилиштер,

Nesnelerin interneti kullanılarak çiftlik hayvanları ekosisteminde konum ve hareket bilgilerinin toplanması

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Abstract: Çiftlik hayvanlarının hareket ve davranışlarını takip etmek zor görevlerden biridir. Hayvanlar alışkanlıklarına göre hareket ettiğinden, bu hareketleri izleme, verileri kaydetme ve çiftlik hayvanlarının durumunu çiftçilere iletme işlemlerini insan yoluyla yapmak zordur. Nesnelerin interneti (Internet of Things-IoT) ise bu işlemleri kolaylaştırmak için kullanışlı bir teknoloji haline gelmiştir. Hayvanların ahır içerisindeki konumlarını ve davranışlarını izlemek ve kayıt altına almak, kızgınlık dönemlerini doğru belirlemek etmek için bir yöntem olarak görülmektedir. Büyük boyutlu veri belleği gerektiren durumlarda IoT, ekonomik olarak daha avantajlı olmaktadır. Bu çalışmada, çiftlik hayvanlarının konum ve davranış bilgilerini özerk olarak yakalayan bir veri toplayıcısı ile açık kaynaklı bir çerçeve sunulmaktadır. Bu taşınabilir donanımda, kablosuz konum algılama sistemi, vücut ısısı tanımlama yoluyla çiftlik hayvanlarının davranışları ve anormal durumları, ahır içindeki birlikte vakit geçirme zamanlarını çıkarmak suretiyle bütünleşmiş bir sistem geliştirilmiştir. Kablosuz iletişim aracılığıyla, IoT destekli mikrodenetleyici, yüksek hızlı iletim, standart protokol ve düşük güç tüketimi ile sistem geliştirilmiştir. Veriler, gerçek zamanlı bir şekilde internet üzerinden sunucuya aktarılarak daha fazla analiz yeteneği sağlanır. Açık arazi uygulamaları için uygun olan hızlı izleme, yüksek hassasiyet ve güçlü bir sinyal sağlayıcı seçilmiştir. Yönlü hareketi ve titreşimi tahmin etmek için bazı hesaplamalar ivmeölçere dâhil edilmiştir. Düşük bant genişliğine, yüksek güvenilirliğe ve çift yönlü olan ve çoğu işletim sistemi için uygun olan protokoller, veri kaybını önlemek için sisteme yerleştirilmiştir. İklim değişiklikleri altında, önerilen çerçeve yalnızca çiftçilik tekniklerinin iyileştirilmesini desteklemekle kalmaz, aynı zamanda düşük maliyeti ve her tür için uygun bir politika yürütme kabiliyeti nedeniyle yoksul kırsal alanlar için yüksek kaliteli bir alternatif sunar.

Keywords: Internet of Things (IoT), konumlama, sıcaklık, takip, TCP/IP.

Least mean Kurtosis algorithm-based MRAS estimator for speed-sensorless model predictive control of induction motor

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Abstract: In this paper, a speed-sensorless model predictive controlled induction motor (IM) drive system is proposed and tested through simulation studies. To perform high-performance IM control, predictive current control (PCC) strategy is chosen since it eliminates weighting factor adjustment. Also, a stator current-based model reference adaptive system (MRAS) is chosen to estimate the speed and flux information due to its simple structure, low computational complexity, and sufficient estimation performance. Different from the current literature, this MRAS estimator uses a least mean Kurtosis (LMK) algorithm optimized by a genetic algorithm (GA) to further improve the speed and flux estimations. The proposed IM drive is tested by the simulation studies under a challenging scenario that includes wide speed range operation of the IM with linear- and step-type load torque variations. The simulation results verify the robustness of the proposed speed-sensorless PCC-based IM drive. Moreover, from the simulation studies, it is clearly seen that the proposed IM drive is reliable for both industrial and electrical vehicle applications.

Keywords: Model reference adaptive system, Genetic algorithm, Induction motor drive, Least mean Kurtosis, Predictive current control

Kompleks-değerli veriler kullanılarak derin öğrenme yöntemleri ile rüzgar hızı ve yönü tahmini

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Özet: Rüzgar hızı ve yönü tahmini, yenilenebilir enerji kaynaklarının yönetimi, hava trafik kontrolü ve hava tahmini gibi çeşitli uygulamalar için çok önemlidir. Bu çalışmada, kompleks-değerli sinyaller kullanarak rüzgar hızının ve yönünün tahmini görevi için üç farklı derin öğrenme yöntemini karşılaştırıyoruz. Bu yöntemler çok katmanlı algılayıcı (MLP), bir boyutlu evrişimsel sinir ağları (1DCNN) ve uzun-kısa süreli belleklerdir (LSTM). Bu modellerin başarımı, kapsamlı bir rüzgar veri kümesi üzerinde doğruluk, hesaplama verimliliği açısından değerlendirilerek analiz edilmektedir. Elde edilen sonuçlar, kompleks-değerli sinyaller kullanarak rüzgar hızı ve yönü tahmininde derin öğrenme yöntemlerinin potansiyelini ortaya çıkarmaktadır ve gelecekteki tahmin uygulamalarında önemli bir rol oynayabileceğini göstermektedir.

Anahtar Kelimeler: Rüzgar Sinyali, Yenilenebilir Enerji, Derin Öğrenme, MLP, CNN, LSTM.

Prediction of wind speed and direction with deep learning methods using complex-valued data

Abstract: Prediction of the wind speed and direction is essential for numerous applications, including managing renewable energy resources, air traffic control, and weather forecasting. In this paper, we compare three deep learning methods, namely multilayer perceptron (MLP), one-dimensional convolutional neural networks (1DCNN), and long-short-term memories (LSTM) networks, predicting wind speed and direction using complex-value signals. The evaluation of these models is conducted based on their accuracy and computational efficiency using a comprehensive wind dataset. The results demonstrate the potential of deep learning methods in predicting wind speed and direction using complex-valued signals and demonstrate their importance in future forecasting applications.

Keywords: Wind Signal, Renewable Energy, Deep Learning, MLP, CNN, LSTM.

Kompakt yüksek performanslı ultra-geniş bantlı 2×2 MIMO anten tasarımı

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Özet: Bu çalışma, ultra geniş bant (UWB) uygulamaları için 2×2 çok girişli çok çıkışlı (MIMO) bir anten tasarımı sunmaktadır. Tasarım başlangıçta, dikdörtgen bir yamayı temel alan tek bir MIMO elemanının teorik hesaplaması ve boyutsal optimizasyonu ile başlar. UWB frekans aralığı için bozulmuş bir toprak düzlemi kullanılmıştır. Tasarımdaki geliştirmeler, dikdörtgen yamanın etrafına dört adet T-şekilli saplamanın ve toprak düzleminde F-şekilli bir saplamanın eklenmesini içerir. Bu modifikasyonlar, antenin alt frekans sınırını sola ve üst frekans sınırını sağa kaydırarak anten bant genişliğini etkili bir şekilde artırır. Sonuç olarak 2.15-2.348 GHz ve 3.04-15.911 GHz frekans aralıklarında çalışan çift modlu bir anten elemanı elde edilmiştir. Ardından, aralarında yüksek izolasyon elde etmek için dikey olarak konumlandırılan anten elemanları ile MIMO anten tasarımına geçiş gerçekleşir. Önerilen MIMO anteni, 39 mm x 39 mm'lik kompakt bir form faktörünü korur. Antenin fiziksel bir prototipi üretilmiş ve ölçülmüştür. Ölçüm sonuçlarında, çalışma frekansı bant genişliğinin 2,508-15,69 GHz olduğu gözlemlenmiştir. Ayrıca, geri dönüş kaybının -15 dB'nin altında kaldığı bant genişliği 3.385 GHz ile 15.69 GHz arasında değişmektedir. Anten ayrıca 0.045'ten daha iyi bir düşük zarf korelasyon katsayısı (ECC) gösterir ve uygun çeşitlilik kazancı sağlar.

Anahtar Kelimeler: Ultra geniş bant, MIMO anten.

A design of compact high-performance ultra-wideband 2×2 MIMO antenna

Abstract: This study presents a design of a 2×2 multiple-input multiple-output (MIMO) antenna for ultra-wideband (UWB) applications. The design initially starts with the theoretical calculation and dimensional optimization of a single MIMO element, based on a rectangular patch. For the UWB frequency range, a defected ground plane is utilized. Enhancements to the design involve the addition of four T-shaped stubs around the rectangular patch and an F-shaped stub on the ground plane. These modifications shift the lower frequency limit of the antenna to the left and the upper frequency limit to the right, effectively increasing the antenna bandwidth. As a result, a dual-mode antenna element operating in the frequency ranges of 2.15-2.348 GHz and 3.04-15.911 GHz is obtained. Subsequently, the transition to the MIMO antenna design takes place, with antenna elements positioned vertically to achieve high isolation between them. The proposed MIMO antenna maintains a compact form factor of 39mm x 39mm. A physical prototype of the antenna is manufactured and measured. In the measurement results, the operational frequency bandwidth is observed to be 2.508-15.69 GHz. Furthermore, the bandwidth where the return loss remains below -15 dB

spans from 3.385 GHz to 15.69 GHz. The antenna also demonstrates a low envelope correlation coefficient (ECC) better than 0.045 and yields favorable diversity gain.

Keywords: Ultra wide band, MIMO antenna.

Kompleks-değerli büyük veri akışları için çevrim içi sansürleme tabanlı adaptif konveks kombinasyon

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Özet: Bu çalışma, dairesel ve dairesel olmayan kompleks-değerli verileri etkili bir şekilde işleyen CLMK ve ACLMK algoritmalarının bireysel avantajlarını bir araya getiren klasik adaptif konveks kombinasyon (adaptive convex combination, ACC) yapısının çevrim içi sansürleme stratejisi (online cencoring, OC) tabanlı versiyonunu sunmaktadır. Önerilen OC-ACC yapısının başarımı, OC-CLMK, OC-ACLMK ve klasik ACC algoritmaları ile ortalama kare hata (mean square error, SS-MSE), kararlı durum (steady-state MSE, SS-MSE) (dB) ve çalışma süresi açısından sistem tanımlama problemi üzerinde karşılaştırılmıştır. Karşılaştırma yapılırken algoritmalar, hem SL hem de WL olan bilinmeyen sistemler üzerinde test edilmiştir. Yapılan çalışmanın sonucunda, önerilen OC-ACC algoritması büyük-ölçekli kompleks-değerli büyük veriler üzerinde bilgilendirici olmayan veriyi sansürleme oranına göre sansürleyip, çok daha az veri ile OC-CLMK, OC-ACLMK ve ACC algoritmalarıyla benzer bir yaklaşım sergilemiştir.

Anahtar Kelimeler: Büyük veri akışı, çevrim içi sansürleme, kompleks-değerli en küçük ortalama kurtosis, adaptif konveks kombinasyon

Channel estimation for IRS-Aided millimeter wave communication systems using compressive sensing

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Abstract: An Intelligent Reflecting Surface (IRS) is a planar array consisting of independently controllable passive Reflecting Elements (RE) that can alter the phase and the amplitude of the reflected signals with the aim of improving the communication efficiency between a Base Station (BS) and a user. In IRS-aided communication systems, the optimum IRS reflection pattern is calculated by the BS, which needs to know the Channel State Information (CSI) of all the channels between the BS-IRS and IRS-user. Traditional channel estimation methods require long training periods and alternative methods of channel estimation are needed. In IRS-aided communication systems operating at millimeter wavelength (mmWave) frequency bands, the number of multipath or scattering paths between the IRS and the BS/user is limited, hence the channels can be modeled as having strong sparsity in the spatial and angular domains. The communication system adopted in this study is formulated as having a relatively small number of Angles of Arrival (AoA) and Angles of Departure (AoD), hence the channel estimation becomes a sparse signal recovery problem that can be solved with compressive sensing algorithms. Therefore, the objective of this study is to investigate the effectiveness of channel estimation based on compressive sensing algorithms in IRS-aided communication systems with sparsity in the angular domain. The study implements Orthogonal Matching Pursuit (OMP) based compressive sensing. Simulation results show that OMP-based compressive sensing can successfully estimate channel parameters in a shorter training period compared to traditional methods.

Keywords: Intelligent Reflecting Surface (IRS), Channel State Information (CSI), Channel Sparsity, Compressive Sensing, Orthogonal Matching Pursuit (OMP)

FPAA-based implementation of a memristor element defined by the Hanning window function

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Abstract: Emulator circuits serve the purpose of experimentally testing elements in electronic circuits that are difficult or impossible to test directly. Since the commercial production of the memristor element has not been made yet, the design of emulator circuits that will meet the characteristics of the memristor is an important research area. However, due to the complex structure of a memristor element defined by the Hanning window function, the implementation of this function with discrete elements is quite difficult. Thus, the Hanning window function based memristor element is constructed on the FPAA platform, which stands out with its analog nature. In this context, a numerical simulation of a memristor element defined by the Hanning window function are made. In these simulations, the hysteresis curve, which is the characteristic dynamic of the memristor element, is observed. Finally, after the presentation of the design stages of a memristor element defined by the Hanning window function on FPAA and the obtained realization results are presented.

Keywords: Field Programmable Analog Array (FPAA), Emulator circuit, Memristor, Reprogrammable circuit application.

Comparison of clustering algorithms on social media data

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Abstract: Access to social media platforms has become easier and the amount of data to be obtained from these platforms has increased with the advancement of technology. Clustering is the grouping of data showing similar characteristics in a dataset. In this study, social media data obtained from Twitter platform were clustered using DBSCAN, K-means, Farthest First, and Expectation Maximization algorithms. In the literature, the use of social media datasets is limited in the comparison studies of clustering algorithms. The performances of the clustering algorithms were evaluated with the Silhouette Index. In the study, DBSCAN algorithm found higher Silhouette index value than K-means, Farthest First and Expectation Maximization algorithms.

Keywords: Clustering, Social media, DBSCAN, K-means, Farthest First, Expectation Maximization

Comparison of list based high average utility itemsets mining algorithms

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Abstract: High average utility itemset mining is an important task in data mining field. Various algorithms using different types of data structures, such as list-based and tree-based, have been proposed to solve the problem, efficiently. In this study, EHAUPM and HAUI-Miner algorithms, which are list-based algorithms, are compared in terms of execution time, memory usage, and number of generated candidate itemsets. Comparison analysis is conducted on four real-world datasets with different properties. According the experimental results, EHAUPM algorithm is faster, consumes less memory and produces fewer candidates than HAU-Miner algorithm.

Anahtar Kelimeler: High average utility itemset mining, List based data structure, EHAUPM, HAU-Miner

PHYSICS AND EDUCATION

Diffusion Coefficients in Weakly Coupled Plasmas Tagged with Electric Field using Molecular Dynamics Simulations

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Absract: The effects of external electric field (E^*) on the diffusion coefficients of dust particles in weakly coupled complex dusty plasmas (WCCDPs) have been computed through equilibrium molecular dynamics (EMD) simulations. Velocity auto correlation function technique has been used to compute the diffusion coefficient of dust particles. Diffusion coefficient (D^*) is measured for fixed number of particles (N = 500) at different values of plasma parameters Γ and κ in canonical ensemble. Computed results showed that value of D^* decreases by increasing Γ and increases by increasing E^* and κ. Structural analysis of WCCDPs have also been analyzed using two diagnostic methods, one is lattice correlation function ψ (τ) and second is radial distribution function (RDF) $g(r)$ under the influence of E^*. Computational outcomes of (RDF) $g(r)$ at varying plasma parameters (Γ, κ) have been accounted for E^* = 0.05. Simulation results also exposed that present algorithm provides precise data as previous and this work has also some advancement due to E^*

Keywords: external electric field, diffusion coefficients, equilibrium molecular dynamics, dusty plasmas, lattice correlation.

Brilliance spectra of super conducting undulators at TURKAY

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Abstract: Synchrotron radiation sources are important research instruments for scientific and technical purposes. In Turkish Synchrotron Radiation Source Project named TURKAY, the properties of radiation were investigated based on normal conducting undulators with designed machine parameters. In this study, we present the radiation properties based on super conducting undulators using same machine parameters. Two different type, super conducting and helical super conducting undulators are chosen as an example. From the simulation results, it is shown that 5 times higher brilliance value can be obtained by using super conducting undulators.

Keywords: Undulator, Synchrotron radiation, Brilliance.

The nanostructured layered chalcogenide-based thermoelectric materials: a brief review on the nanostructuring methods

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Abstract: In this brief review, we summarize the nanostructuring techniques for fabricating functional layered chalcogenide materials with enhanced thermoelectric figure-of-merit. Here we discuss the known top-down and bottom-up fabrication methods such as ball-milling, sonochemical, and microwave synthesis applied to synthesize binary bismuth and antimony sesqui-chalcogenides classified also as Topological Insulator quantum materials. Further, here we highlight the perspectives of hydrothermal synthesis in the fabrication of chalcogenide materials with tailored properties. An application of nanostructuring in semiconductor materials opens up new paths to reach high thermoelectric figure-of-merit ZT which is a fundamental criterion for efficient thermoelectric energy conversion of waste heat.

Keywords: Nanostructuring, chalcogenides, thermoelectric materials, top-down approach, bottom-up synthesis

Mikaelian Photonic Crystal lens for subwavelength focusing and efficient light coupling

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Abstract: In this manuscript, we introduce the utilization of an all-dielectric graded index (GRIN) medium to achieve subwavelength focusing and efficient light coupling into a nano-waveguide. We approximate a continuous GRIN profile with a hyperbolic secant refractive index distribution (aka Mikaelian lens distribution) by employing two-dimensional photonic crystals (PCs). The phenomenon of light focusing is subject to thorough systematic and quantitative analysis across various operating frequencies, with the results being presented through numerical data. Specifically, we have achieved a full-width at half-maximum value of 0.24λ at the frequency corresponding to a/λ=0.10 within the structure of the all-dielectric GRIN PC. The potential applications of subwavelength light focusing span nanolithography, optical sensing, imaging, microscopy, precision optical measurements, and data storage.

Keywords: Photonic Crystals, Light Focusing, Graded Index medium, Electromagnetic Waves, In-plane light Coupling

Организация и разработка лабораторных занятий с использованием электронного учебно-методического пособия по физике

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краткое содержание: Активное развитие информационных технологий в эпоху четвертой промышленной революции делают вызовы и перед системой образования, обусловленные процессами цифровизации производства и услуг, изменениями в квалификациях и моделях занятости, а также изменениями технологических процессов образования. Как видно безмерное преобразование системы образования, принятых в стратегических направлениях и нормативных документах в Кыргызстане, придается важное значение внедрения информационных технологий в образовательных учреждениях и в нем главное место отведено электронным образовательным ресурсам . При определении места электронного образовательного ресурса в учебном процессе следует исходить из самой структуры учебного процесса. Несмотря на сложность новых научных концепций, современная наука не должна преподноситься молодым людям в сухой и неинтересной форме, т.е. в виде одних формул. Поэтому при изложении современных вопросов физики необходимо, во-первых, использовать качественные методы обучения, а во-вторых, преподавание физики, в силу особенностей самого предмета представляет собой благоприятную сферу для применения информационно-коммуникационных технологий.

В свою очередь электронные образовательные процессы, определяется как средства обучения физике, как отдельный компонент технологии обучения. На сегодняшний день выявлена закономерность: при комбинировании воздействия (зрительного и слухового) запоминание материала повышается в два раза, а если человек вовлекается в активные действия в процессе изучения, то процент усвоения материала повышается до 75% и выше. Соответственно, мультимедийное воздействие повышает эффективность усвоения материала у обучающегося. Разработка электронного учебного пособия по изучению той или иной дисциплины позволяют повысить процент усвоения материала, создать хорошую базу для самостоятельной подготовки студентов .

Ключевые слова: физика, самостоятельная работа, электронный учебник, информационные технологии.

Биолог мамандарды даярлауда цифрлық платформалар арқылы интеграцияланған тапсырмаларды қолдану мәселелері

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Аңдатпа: Қазіргі кезде білім сапасын арттыруда цифрлық технологияларды қолданудың маңыздылығы жоғары. «Цифрлық білім беру», «Цифрлық білім беру технологиялары» ұғымдарының мәні мен мазмұнын түсіндіреді. Цифрлық технологияны қолдану және одан нәтиже шығару әрбір оқытушының кәсіби білімі, білігі мен дағдысына байланысты. Қазіргі таңда оларды пайдалану тиімділігі ақпараттық білім беру ортасына қызығушылықты тудыруымен қатар ақпаратқа қолжетімділік дәрежесін қамтамасыз ету және білім сапасын арттыру. Заманауи әлемдегі цифрлық дағдылар қажетті және қазіргі қашықтықтан оқыту жағдайында тиімді өзара әрекеттесу қабілетті ретінде тұлғааралық қарым-қатынас дағдыларымен толықтырылуы тиіс.
Цифрлық білім беру ресурстарын пайдалану арқылы білім алушылардың өз бетімен зияткерлік әлеуетін дамытады. Цифрлы білім беру ресурстары дидактикалық мақсатқа жетуге немесе белгілі бір оқу міндеттерін шешуге бағытталған дайын интерактивті мультемедиялық өнім болып табылады.

Кілттік сөз: цифрлы оқыту, пәнаралық интеграция, цифрлы дағды, инновация

Problems of using integrated tasks through digital platforms in the training of biology specialists

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Abstract: Currently, the use of digital technologies of great importance in improving the quality of education. Explains the meaning and content of the concepts of "Digital Education", "Digital Education Technologies". Using of digital technology and its results depend on the professional knowledge, skills and abilities of each teacher. Currently, the effectiveness of their use is to create interest in the information education environment, as well as to ensure the degree of access to information and increase the quality of education. Digital skills are necessary in today's world and must be complemented by interpersonal skills to interact effectively in today's distance learning environment.
Through the use of digital educational resources, students develop their own intellectual potential. Digital educational resources are ready-made interactive multimedia products aimed at achieving a didactic goal or solving specific educational tasks.

Keyword: digital learning, interdisciplinary integration, digital skills, innovation

ОНЛАЙН САБАҚ БАРЫСЫНДА ДЕНЕНІ СЕРГІТУ ЖАТТЫҒУЛАРЫН ЖАСАУДЫҢ ФИЗИОЛОГИЯЛЫҚ ЖАҒЫМДЫ ӘСЕРЛЕРІ

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Аңдатпа: Қазіргі таңдағы мектеп оқушылары бойындағы байқалатын үнемі шаршаңқылық, көпшілік білім алушылардың көзілдірік тағуы мен сүйектерінің нашар дамуы өзекті мәселелердің біріне айналып отыр.Осы мәселелерді шешу бойынша жылдар бойы көпетеген ғалымдар зерттеу жұмыстарын жүргізіп келді. Соған сай тиісінше методикаларды да қалыптастырып келді десек те болады. Бірақ бұл мәселе түбегейлі өзінің шешімін тапқан жоқ, тіптен артып келеді десек те болады. Оның ең маңызды себептерінің біріне қазіргі таңдағы экологиялық жағдай, дұрыс тамақтанбау, онлайн білім алу кезіндегі электрондық құрылғылармен ұзақ уақыттық байланыс жасаудың, монитордың алдында ұзақ отырудың салдары, үй жағдайында білім алу кезіндегі ыңғайсыз үстелдер, сабақ барысындағы сергіту жаттығуларының орындалмауы, міне осылардың барлығы қолайсыз факторлар тізім қатарын толықтырады. Қазіргі таңдағы дене тәрбиесі пәндерінде орта мектептерде жаңашылдықтың болмауы спортқа деген жасөсірімдердің қызығушылығын төмендетіп, соған сәйкес физиологиялық жағдайының дұрыс қалыпта болмауы, дені сау ұрпақтың қалыптасуына кедергі келтіреді десек те болады. Сондықтан да осы мақалада сынып сағаттарындағы физиологиялық жаттығулар мен психологиялық ойындардың тиімділігі мен дәстүрлі және онлайн форматтағы сабақтар барысында осындай сынып сағаттарын жүргізудің өзектілігі мен маңызын қозғап өттім. Дене тәрбиесі пәнінде жасалынатын жаттығулар мен ойын түрлерінің жасалуында еш жаңашылдықтың жоқтығы, сабақ кестесіне қолайсыз келуі, сабақтан тыс арнаулы сынып сағаттарының жоқтығы, дене тәрбиесі пәнінің жүргізілу барысында оқушылардың жасерекшеліктерінің ескерілмеуі, әр оқушының қызығушылық бағыттарына қарай аздаған оқушы санын қамтитын топтардың болмауы, осы жекелей топтармен жұмыс жүргізетін арнаулы мамандардың болмауыда мәселелер қатарын толықтырады. Дегенмен әр педагог маман тек білім берумен ғана шектеліп қана қоймай оқу процесіне, оқу процесінің қаншалықты игерілетіндігіне, оқушылардың сабақ барысындағы көңіл-күйіне мән беретін болса, себебі эмоционалды түрде шаршаңқы оқушының материалды игерудегі мүмкіншіліктер қабілеті төмендеп кетеді. Өз сабақ өту процесінде балаларға керемет көңіл-күйде материалды игеріп, сабақ барысында сергіту жаттығулары жасалынып, эмоционалды жағдайына мән берсе, балалардың тек материалды игеруі артып қана қоймай, сонымен қатар, физиологиялық, яғни көру жүйесі, омыртқа жүйесі, бұлшықет систематикасындағы және психоэмоционалдық ақаулықтардың алдын алған болар еді.

Түйін сөздер: Психоэмоция; Мінез-құлық; Физиология; Психофизиология; Сколиоз; Эмоциялық жағдай; Физикалық дене ауыртпалықтары; Дене шынықтыру.

Physiological positive effects of body toning exercises during online classes

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Abstract: One of the most pressing problems is the constant fatigue of modern schoolchildren, the wearing of glasses and poor bone development of most students.Over the years, many scientists have been conducting research on solving these problems. In this regard, we can say that we have developed methods accordingly. But this problem has not yet been solved, and it is growing. One of the most important reasons for this is the current environmental situation, malnutrition, the consequences of long-term communication with electronic devices during online education, sitting in front of a monitor for a long time, uncomfortable tables during home education, failure to perform toning exercises during classes, and all these unfavorable factors add to the list.

The lack of innovation in modern subjects of physical education in secondary schools reduces the interest of young people in sports, and accordingly, the lack of proper posture of the physiological state interferes with the formation of a healthy generation. The lack of innovation in the creation of exercises and games in the discipline of physical education, unfavorable attendance of classes, lack of special class hours outside of classes, neglect of the age characteristics of students in the course of physical education, the lack of groups containing a small number of students depending on the areas of interest of each student, the lack of special specialists working with these individual groups add to the number of problems. Since my scientific work has a connection with physical culture, I had to touch on issues related to this discipline of physical education.

However, each teacher not only limits himself to education, but also pays attention to the learning process, how much the learning process is mastered, and the state of mind of students during the lesson, because the emotionally exhausted student's ability to assimilate the material decreases. During the course of their classes, children were able to master the material in a great mood, during the lesson they performed toning exercises and paid attention to their emotional state, not only increased the assimilation of the material, but also prevented physiological, that is, problems with the visual system, Spinal System, muscle Systematics and psychoemotional.

Keywords: Psychoemotion; behavior; Physiology; Psychophysiology; scoliosis; emotional state; physical physical burdens; physical fitness.

ӨЛКЕТАНУ МАТЕРИАЛДАРЫН ПАЙДАЛАНЫП СЫНЫПТАН ТЫС ЖҰМЫСТАРДЫ ҰЙЫМДАСТЫРУ

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Түйіндеме: Өлкетану – белгілі бір жердің, қаланың, елді мекеннің бір бөлігін оқып білу. Жергілікті жер оқушылар мен мамандар үшін (тарихшылар, биологтар, геологтар, архитекторлар, этнографтар, экологтар) туған өлке болып саналады. Өз өлкесінің мәліметтерін пайдаланып оқушыларға экологиялық білім мен тәрбие беру оқушының адамгершілік, интеллектуалдық, эстетикалық, еңбексүйгіштік, тұлғалық дамуының маңызды факторы болып табылады. Туған өлкенің өткенімен, қазіргі кезімен және жорамалды болашағымен, табиғи, экономикалық, тарихи, мәдени және басқа да ерекшеліктерімен танысу оқушының дүниетанымын қалыптастыруға жағдай жасайды. Өлкетану материалдарын пайдалану экологиялық білім беру мен тәрбиелеуді өмірмен байланыстыратын маңызды құрал болып табылады. Өлкетану материалдарын пайдалану арқылы экологиялық білім мен тәрбие беру мақсатты, жүйелі түрде ұйымдастырылса оқушылар үшін білімдік, танымдық, дамытушылық, тәрбиелік маңызы ерекше болады. Сабақ үрдісіндегі жергілікті жерге байланысты деректерді тиімді пайдалану оқушылардың тарихи құбылыс заңдылықтарын толық түсініп, адамзаттың материалдық және рухани байлықты жасаушы ретіндегі рөлін ғылыми жолмен түсіне білуіне мүмкіндік береді. Өлке материалдарын пайдаланып оқытудың күнделікті өтілетін сабақтардан өзгешелігі бар. Өзіне жақын да таныс жерлер мен адамдар туралы айтылатын оқиғалар мен деректер әр нәрсеге қызыққыш, эмоционалды болып келетін балалардың жан - қуаттарының оянуына түрткі болып, мұндай сабақтарға қызығушылықпен, белсенділікпен қатысады. Өлкетану материалдарын пайдалану оқушылардың ой - өрісін дамытады, еліміздің тыныс - тіршілігімен, шаруашылық өмірімен таныса отырып, қоғамға қажетті білімге құштарлық, байқағыштық, тапқырлық, ізденімпаздық қасиетке өз бетімен шығармашылық іске ұмтылуына, болашақ мамандық таңдауына да игі әсер етері сөзсіз.
Кілт сөздер: Өлкетану, оқушы, сыныптан тыс жұмыстар, туған өлке, экология.

Organization of extracurricular activities using local history materials

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Abstract: Local history is the study of a part of a particular place, city, settlement. The local area is considered a native land for schoolchildren and specialists (historians, biologists, chemists, geogrphs, geologists, architects, ethnographers, ecologists). Environmental education and upbringing of pupils using the data of their region is an important factor in the moral, intellectual, aesthetic, hardworking, personal development of a pupil. Familiarization with the past, present and hypothetical future, natural, economic, historical, cultural and other features of the native land creates conditions for the formation of the pupils worldview. The use of local history materials is an important tool that connects environmental education and education with life. With

the use of local history materials, environmental education and upbringing are organized in a targeted, systematic manner, which has a special educational, cognitive, developmental and educational significance for. The effective use of local data in the lesson process allows pupils to fully derstanding the laws of historical phenomena and scientifically understand the role of humanity as the creator of material and spiritual wealth. Training using local materials differs from daily classes. Events and data that are told about places and people close to them and familiar to them stimulate the awakening of the souls of children, who are curious and emotional in everything, participate in such classes with interest and activity. The use of local history materials develops students ' thinking, familiarity with the life of the country, economic life, the desire for knowledge necessary for society, observation, ingenuity, inquisitiveness, will undoubtedly have a positive impact on the desire for independent creative work, the choice of a future profession.

Keywords: Local History, Pupil, Extracurricular Activities, Native Land, Ecology.

БИОФИЗИКА ПӘНІН ОҚЫТУДЫҢ ЕРЕКШЕЛІКТЕРІ

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Түйіндеме: Биофизиканың пәні-тірі организмдердің, тіндердің, жасушалардың өмірлік процестерінің негізінде жатқан организмдерге физикалық, физика-химиялық құбылыстар мен абиотикалық факторлардың әсерін зерттейтін биология ғылымы. Биофизиканың пәні физика, химия, экология, математика, информатика, физиология, молекулалық биология, цитология, генетика, химия және т.б. қазіргі эндогендік және экзогендік факторлардың әсерінен биологиялық жүйелер молекулалық және физика-химиялық қасиеттерін зерттейді. Биологиялық физика тірі организмде болатын физикалық, физика-химиялық процестерді, тірі заттың құрылымы бар биологиялық жүйелерді, молекулалардың ультрақұрылымы мен қасиеттерін, оларда болып жатқан процестер мен энергияны, ағза бақылайтын ішкі байланыстар жүйесін зерттейді.

Кілт сөздер: Биофизика, Болонья, Пән, Молекулалық Биофизика, Биомолекулалық.

Features of teaching the discipline of biophysics

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Abstract: The subject of biophysics is the biological science that studies the influence of physical, physicochemical phenomena and abiotic factors on organisms, which are the basis of the life processes of living organisms, tissues, cells. The subject of biophysics is physics, chemistry, ecology, mathematics, computer science, physiology, molecular biology, cytology, genetics, chemistry, etc. Biological systems influenced by modern endogenous and exogenous factors study molecular, physico-chemical properties. Biological physics studies the physical, physico-chemical processes occurring in a living organism, biological systems with the construction of living matter, the ultrastructure and properties of molecules, the processes and energy occurring in them, the system of internal connections controlled by the body.

Keywords: *biophysics, bologna, discipline, molecular biophysics, biomolecular.*

ТРАНСШЕКАРАЛЫҚ СЫРДАРИЯ ӨЗЕНІНІҢ ЭКОЛОГИЯЛЫҚ-ГЕОГРАФИЯЛЫҚ МӘСЕЛЕЛЕРІ

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Түйіндеме: Жаһандану жағдайында трансшекаралық аумақтарды тұрақты дамыту мәселелері өзекті болып отыр. Осындай трансшекаралық құрылымдардың бірі-біртұтас табиғи жүйелер болып табылатын екі немесе бірнеше мемлекеттің аумақтарын қамтитын трансшекаралық өзен бассейндері. Трансшекаралық өзен бассейндерінің теңгерімді әлеуметтік-экономикалық дамуын қамтамасыз ету табиғатты пайдалану саласындағы келісілген экономикалық, әлеуметтік және құқықтық саясатты талап етеді. Сонымен бірге трансшекаралық өзеннің су жинау алаңында болып жатқан өзгерістер су нысандары мен халықтың тіршілік әрекетінің сапалық және сандық сипаттамаларына сөзсіз әсер етеді. Әлемде екі немесе одан да көп елдер арасындағы саяси шекараларды кесіп өтетін 263 халықаралық бассейн бар. Әлем халқының шамамен 40% пайызы тұратын бұл бассейндер жер бетінің жартысына жуығын қамтиды. Олар жердегі тұщы судың шамамен 60% пайызын құрайды. Халықаралық бассейндер 145 елдің аумағын ішінара басып алады, ал 21 мемлекеттің аумағы толығымен халықаралық бассейндерге кіреді. Халықтың тез өсуіне және даму процесін ұтымсыз басқаруға байланысты тұщы судың сарқылуы мен деградациясы көптеген елдерде негізгі су пайдаланушылар — шаруалар, өнеркәсіп және қала тұтынушылары арасында үлкен мәселе тудырады. Мемлекеттік шекараларды кесіп өтетін су ағындары трансшекаралық өзендер барған сайын маңызды стратегиялық маңызға ие болуда.

Кілт сөздер: Қазақстан, Трансшекаралық өзен, Жайық өзені, Сырдария өзені,Экология.

Ecological and geographical problems of the transboundary syr darya river

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Abstract: In the context of globalization, the issues of sustainable development of cross-border territories are becoming relevant. One of these transboundary structures is transboundary river basins, which cover the territories of two or more states, which are single natural systems. Ensuring the balanced socio-economic development of transboundary river basins requires a coordinated economic, social and legal policy in the field of nature management. At the same time, the changes taking place in the catchment area of the transboundary river inevitably affect the qualitative and

quantitative characteristics of water bodies and the vital activity of the population. There are 263 international basins in the world that cross political borders between two or more countries. These basins, which contain about 40% of the world's population, cover almost half of the Earth's surface. They make up about 60% of the Earth's fresh water. International basins partially occupy the territory of 145 countries, and the territory of 21 states is completely included in international basins. The depletion and degradation of fresh water due to rapid population growth and irrational management of the development process poses a serious problem in many countries among the main water users — peasants, industry and urban consumers. Water flows that cross state borders cross-border rivers are becoming increasingly important strategic importance.

Keywords: Kazakhstan, Transboundary river, Syrdarya river, Ecology.

Ortaöğretim öğrencilerinin matematik dersine karşı tutumları üzerine bir araştırma

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Özet: Bu araştırma Ortaöğretim öğrencilerinin matematik dersine karşı tutumlarını, cinsiyet, okul türü ve sınıf düzeyine göre incelemek amacıyla yapılmıştır. Araştırmanın örneklemini Ankara ili Mamak ilçesinde bulunan bir Anadolu Lisesi ve bir Mesleki ve Teknik Anadolu Lisesinden 112 kız, 162 erkek toplam 273 Ortaöğretim öğrencisi oluşturmaktadır. Bu araştırmanın temel amacı Ortaöğretim öğrencilerinin Matematik dersine yönelik tutumlarını belirleyerek bu tutumların okul türü, cinsiyet ve sınıf bazında anlamlı bir farklılık yaratıp yaratmadığını incelemektir. Bu amaçla öğrencilere Matematiğe karşı tutum anketi uygulanmış ve elde edilen veriler SPSS20 ile analiz edilerek yorumlanmıştır.

Araştırmanın sonucunda ortaöğretim öğrencilerinin matematik dersine yönelik tutumlarında bazı değişkenlere göre anlamlı bir farklılık olduğu görülmüştür. Araştırmanın sonucuna göre Ortaöğretim öğrencilerinin genel olarak Matematik dersine karşı olumlu tutumları vardır. Cinsiyet açısından matematiğe karşı tutumlarında anlamlı bir farklılık olmadığı görülmüştür. Ayrıca bu araştırmada okul türleri ile matematiğe karşı olumlu tutum açısından anlamlı bir farklılık bulunamamıştır. Bunun yanında okul türü ile olumsuz tutumlar açısından farklılıklar görülmüştür. Buna göre Mesleki Teknik Anadolu Lisesi Öğrencilerinin Anadolu Lisesi Öğrencilerine göre olumsuz tutumlarının daha fazla olduğu bulunmuştur. Elde edilen bulgularda sınıf düzeyleri ile olumlu ve olumsuz tutumlar açısında anlamlı farklılıklar bulunmuştur.

Anahtar Kelimeler: tutum, matematik, sınıf düzeyi, cinsiyet

A research on secondary students attitudes to mathematics course

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Absract: This research was conducted to examine secondary school students' attitudes towards mathematics according to gender, school type and grade level. The sample of the research consists of 273 secondary education students, 112 girls and 162 boys, from an Anatolian High School and a Vocational and Technical Anatolian High School located in the Mamak district of Ankara. The main purpose of this research is to determine the attitudes of secondary school students towards the Mathematics lesson and to examine whether these attitudes create a significant difference on the

basis of school type, gender and class. For this purpose, an attitude survey towards mathematics was applied to the students and the obtained data were analyzed and interpreted with SPSS.

As a result of the research, it was seen that there was a significant difference in the attitudes of secondary school students towards the mathematics lesson according to some variables. According to the results of the research, secondary school students generally have positive attitudes towards Mathematics. It was observed that there was no significant difference in their attitudes towards mathematics in terms of gender. In addition, in this study, no significant difference was found in terms of school types and positive attitudes towards mathematics. In addition, there were differences in terms of school type and negative attitudes. Accordingly, it was found that Vocational Technical Anatolian High School Students had more negative attitudes than Anatolian High School Students. In the findings obtained, significant differences were found in terms of grade levels and positive and negative attitudes.

Keywords: attitude, mathematics, grade level, gender

The role of applied Sciences in teaching foreign languages

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Abstract: Speaking is “the process of building and sharing meaning through the use of verbal and non-verbal symbols, in a variety of contexts” (Chaney and Burk, 1998:13). Speaking is important aspect because it is related with producing language or communicating in teaching and learning process. Speaking is also one of types of classroom activity. According to Sardiman (2016:100), activity is related both physically/body and mentally/spiritual. It means that speaking activity is a situation where people communicate each other physically and psychology.

Keywords: Speaking, Around, Activity, Involve

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AGRICULTURAL SCIENCES AND TECHNOLOGIES

Comparative genomics of genes involved in cuticular wax biosynthesis in sunflower

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Abstract: Sunflower is an important oil seed crop worldwide. In Pakistan, it is mainly cultivated in spring season and is badly affected by drought due to scarcity of irrigation water. Epicuticular wax acts as the first line of defense to protect plants from biotic and abiotic stresses. It can seal the arial parts of land plants to prevent them from non-stomatal water loss. Various genes have been characterized for wax biosynthesis under drought stress in Arabidopsis thaliana and other plants. However, very scanty information is available for involvement of MYBs in drought stress and wax biosynthesis in sunflower. In this study, we compared the already reported A. thaliana cuticular wax and drought responsive genes with sunflower genome and identified putative genes like, MYB transcription factors, LACS and CER in sunflower. Phylogenetic associations in Arabidopsis and sunflower indicated strong conservation of these genes. From gene structure analysis, it was observed that intron and exon organization was family specific. They were unevenly distributed on sunflower chromosomes. Evolutionary analysis indicated the segmental duplication of these genes in Sunflower. Quantitative Real Time PCR revealed upregulation fo three MYB, two each for LACS and CER genes under drought stress. The expression was found many folds higher in drought subjected plants as compared to control. Present study provides the first insight about the characterization of wax biosynthesis genes in sunflower under stress conditions.

Keywords: Sunflower, MYB Transcription Factors, Drought, LACS, CER, Wax Biosynthesis

RNAi mediated knockdown of vital genes involved in metamorphosis of colorado potato beetle (*Leptinotarsa decemlineata* Say)

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Abstract: RNA interference (RNAi), an innovative gene regulation technology, has revolutionized the field of insect research, offering a promising alternative to synthetic insecticides for precise and targeted pest control. This study aims to reveal the mechanism and effectiveness of RNAi-mediated gene knockdown in Colorado potato beetle (CPB). We employed double-stranded RNAs (dsRNAs) to target the ultraspiracle protein and ecdysone receptor genes in CPB, involved in the regulation of development and metamorphosis. The dsRNAs were synthesized using the *L4440* vector and *E. coli HT115* strain and were delivered to the insects by topical application onto potato leaflets. The application of dsRNAs targeting the ultraspiracle protein and ecdysone receptor genes resulted in significant effects on several key parameters in CPB larvae compared to the control groups treated with an empty vector and green fluorescent protein. Larval survival rate and weight gain was notably reduced in the experimental group treated with ultraspiracle and ecdysone receptor dsRNAs. The leaf consumption by CPB larvae was also substantially decreased in the 3rd and 4th instars larvae. In conjunction with the phenotypic observations, we performed quantitative real-time PCR (qRT-PCR) to assess the mRNA levels of the targeted ultraspiracle and ecdysone receptor genes in CPB larvae. Our qRT-PCR analysis revealed a significant downregulation of both ultraspiracle and ecdysone receptor gene expression in larvae treated with the dsRNAs. Our study contributes essential insights into the mechanisms of RNAi-mediated gene knockdown in insects and paves the way for future advancements in sustainable and eco-friendly approaches to tackle agricultural pests.

Keywords: RNA Interference, Synthetic İnsecticides, Mortality, mRNA Level, Target Pest Control

RNAi yöntemiyle *Leptinotarsa decemlineata* say (patates böceği) metamorfozunda rol oynayan genlerin susturulması

RNA interferansı (RNAi), yenilikçi bir gen düzenleme teknolojisi olarak, böcek araştırmalarında yeni bir perspektif sunmuş, konvonsiyonel insektisitlere alternatif olarak, hassas ve hedefe yönelik zararlı kontrolü için umut veren bir seçenek sunmaktadır. Bu çalışma, patates böceği (PB)'nde RNAi aracılı gen susturmanın mekanizmasını ve etkinliğini ortaya çıkarmayı amaçlamaktadır. Bu çalışmada, PB'de gelişim ve metamorfozun düzenlenmesine rol oyanayan ultraspiracle protein ve ecdysone reseptör genlerine yönelik çift-sarmallı RNA'lar (dsRNA'lar) kullanıldı. *L4440* vektörü ve *E. coli HT115* suşu kullanılarak sentezlenen dsRNA'lar, patates yaprakçıklarına topikal uygulanmış ve PB bu yapraklar ile beslenmiştir. Ultraspiracle protein ve ecdysone reseptör genlerine yönelik dsRNA'ların uygulanması, boş vektör

ve yeşil floresan protein (*GFP*) ile muamele edilen kontrol gruplarına göre CPB larvalarında birkaç temel parametre üzerinde önemli etkilere neden olmuştur. Ultraspiracle ve ecdysone reseptör dsRNA'ları ile muamele edilen deneysel grupta larvaların canlı kalna oranları ve ağırlık kazanımları önemli ölçüde azalmıştır. PB larvalarının 3. ve 4. instar larvalarında yaprak tüketimi de önemli ölçüde azalmıştır. Fenotipik gözlemlerle birlikte, CPB larvalarında hedeflenen ultraspiracle ve ecdysone reseptör genlerinin mRNA seviyelerini değerlendirmek için kantitatif gerçek zamanlı PCR (qRT-PCR) yapılmıştır. qRT-PCR analizimiz, dsRNA'lar ile muamele edilen larvalarda hem ultraspiracle hem de ecdysone reseptör gen ekspresyonunda önemli bir düşüş olduğunu gözlenmiştir. Çalışmamız, RNAi aracılı gen susturmanın böceklerdeki mekanizmalarına ilişkin temel bilgiler sunmakta olup, tarım zararlılarıyla mücadelede sürdürülebilir ve çevre dostu yaklaşımların gelecekteki gelişimine öncülük etmektedir.

Anahtar Kelimeler: RNA Interferansı, Sentetik Insektisitler, Mortalite, mRna Seviyesi, Hedefe Yönelik Zararlı Kontrolü

Определение генотоксичности почвы методом Allium-test

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Аннотация: одной из самых глобальных проблем на сегодняшний день является экологическая деградация окружающей среды. Во всем мире, так же как и в крупном агломерате Бишкек антропогенный прессинг изменяет практически все компоненты природной среды: атмосферу, растения, почву, рельеф, подземные воды и даже микроклимат городской среды, что сопровождается рядом специфических экологических проблем. Население города Бишкек, являющегося центром промышленности, строительства, энергетики и автопарка, является источником антропогенного загрязнения атмосферного воздуха, поверхностных и подземных вод, почвы. В данной работе было проведено исследование генотоксичности почвы города Бишкек. При изучении кариологических особенностей растения *Allium cepa*, используемого в качестве тест-объекта, наблюдались следующие виды митотических аномалий: хромосомные фрагменты, анафазные мостики, неправильно ориентированные хромосомы, мультиполярные клетки, хромосомы, расположенные вне метафазной пластинки, полиплоидные клетки. В результате исследования установлено, что почва города Бишкек является генетически токсичной и существует высокий риск воздействия мутагенных факторов на растения, произрастающие в почве.

Ключевые слова: генотоксичность, Allium-test, митотические аномалии, *Allium cepa*

Phytobiotics: a viable alternative to antibiotics for advancing poultry nutrition and promoting productivity and sustainability

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Abstract: Phytobiotics, plant-based feed additives derived from herbs, spices, and medicinal plants, have emerged as a promising alternative to antibiotics in poultry nutrition. With growing concerns over antibiotic resistance and consumer demands for antibiotic-free poultry products, researchers have turned their attention to these natural compounds to enhance productivity and sustainability in the poultry industry. Phytobiotics' impact on gut health and microbiome management has been a focal point of investigation. These additives have shown the ability to modulate the composition of gut microbiota, promoting the growth of beneficial bacteria while inhibiting harmful pathogens. This shift in gut microbial balance improves nutrient absorption, strengthens immune responses, and reduces gastrointestinal diseases, leading to overall healthier poultry flocks. Beyond their role in gut health, phytobiotics have demonstrated potent antimicrobial properties, making them effective in controlling bacterial infections in poultry. By incorporating phytobiotics into poultry diets, not only are flock health and welfare improved, but the risk of zoonotic diseases in humans is also minimized. By reducing the reliance on antibiotics, phytobiotics contribute to lowering antibiotic residues in poultry products, providing a more environmentally friendly approach to poultry nutrition. In conclusion, phytobiotics hold significant promise as an alternative to antibiotics in advancing poultry nutrition, fostering improved productivity and sustainability. Their multifaceted benefits, including enhanced gut health, and support for the immune system, pave the way for a healthier, and antibiotic-free future for poultry production. Further research will continue to unveil their full potential, driving the poultry industry towards a more sustainable and consumer-friendly direction.

Keywords: Phytobiotics, Poultry Nutrition, Gut Health, Sustainability, Immune System

Implementation of Peganum harmala and Trigonella foenum graceum in animal production

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Abstract: Innovative and advanced research on Peganum harmala and Trigonella foenum graceum (Fenugreek) in recent years has divulged several health benefits and medicinal advantages in animal and human health perspectives. These plants have beneficiary bioactive compounds profile which medicinal properties such as carminative, gastric stimulant, antidiabetic, antibacterial, antifungal, antiviral, antileishmanial, insecticidal, galactagogue effects, hypocholesterolemic, anticarcinogenic, anti-lipidemia, antioxidant, anti-inflammatory, antiulcer, anti-lithogenic, anticarcinogenic, hepatoprotective and other miscellaneous pharmacological properties. Aqueous extraction of these plants has good effects on the weight gain, feed conversion ratio, carcass traits, feed cost, and gross profit of broiler production. Fenugreek has a satisfactory impact on the weight of the visceral organs of broiler birds. Trigonella foenum graceum seeds and their extracts have useful effects on the partitioning of nutrients from roughages and concentrate-based feed to methane in vitro. There is no comprehensive in vivo and in vitro study present on ruminant digestibility and total gas production of these plants. The inclusive evaluation of the total polyphenolic compounds of these plants is also scarce. This study will provide inclusive analyzed information on the botanical, chemical, and pharmacological aspects of the above-mentioned plants in livestock production.

Keywords: Peganum Harmala Extract, Trigonella Foenum Graceum Extract, Digestibility, Broiler Performance, Ruminant Production

Modern molecular tools for crop protection with case study of double stranded Rna-based control of dusky cotton bug

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Abstract: The crop plants are constantly exposed to insect pests and disease threats from their emergence from soil to harvesting. The literature suggests that 37% overall losses are incurred to crop yield because of insect pests and diseases. Crop protection measures need special attention to address the yield concerns. The use of chemicals (insecticides, herbicides, and fungicides etc) has been used widely to control the losses from insect pests and diseases. The researchers are exploiting new crop protection technologies (like RNA interference and genome editing) for crop improvement against pests and diseases. The use of RNA interference and CRISPR (Clustered regularly interspaced short palindromic repeat)-Cas9 (Crispr associated nuclease 9) associated with bacterial immune system against viral attacks has been utilized recently in silencing and editing genes in association with the RNA-guided nucleases. In present case study, dsRNAs from the the internal fragments of four crucial and vital dusky cotton bug genes Actin, Serine Carboxypeptidase (SCP), Ecdysone Receptor (ECR) and Chitin Binding Peritrophin (CBP) were synthesized. The lab biotoxicity assays were performed using these dsRNAs against DCB. Besides that, chemical insecticide, clothianidin, was used in combination with dsRNAs to see the synergistic effect of both treatment on survival of insect pest. The mortality was recorded as 20 % to 30 % for Actin, 55 % for SCP, 33 % for CPB and upto 50 % for EcR. While the rate of mortality was higher (60 % to 80 %) in insects fed with the mixture of dsRNA and clothianidin. The results showed that the dsRNA targeting Actin, SCP, CPB and EcR genes would be useful tool in management of DCB population. The use of RNAi may therefore be accepted as a viable alternative to DCB control.

Keywords: RNA İnterference, Genome Editing, Cotton Dusky Bug, Plant Protection

In vitro digestibility of cabbage and kohlrabi leaves

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Abstract: Plant wastes are aggravating pollution due to a lack of disposal options, which exerts pressure on the agro-industrial industry for their recycling. However, if managed judiciously, they might be used as feedstuffs and could improve feed producers' profits and environmental quality. This study was carried out to determine the in vitro true digestibility of cabbage and kohlrabi leaves and their silages to identify the potential use of non-conventional feed sources for ruminants. Fresh cabbage and kohlrabi leaves were obtained from the nearby village as a harvest leftover. Two types of silage were prepared from the leaves; cabbage leaves silage (CLS) and cabbage + kohlrabi leaves silage (CKLS). In CKLS, 50% cabbage and 50% kohlrabi leaves were mixed. In vitro rumen digestibilities of feed components (fresh cabbage and kohlrabi leaves and their silages) were examined by DaisyII Incubator (Ankom Technology, USA). The in vitro true digestibility (IVTD), NDF, and OM digestibilities were similar ($P>0.05$) among all the feedstuffs. The IVTD was highest in fresh cabbage leaves followed by CKLS, CLS, and fresh kohlrabi leaves respectively. Cabbage and kohlrabi leaves and their silages exhibited adequate nutritive values with a high amount of CP and low fibrous content. In conclusion, silages of cabbage and kohlrabi leaves have adequate nutritional characteristics made them appropriate feedstuffs, which may offer excellent potential as non-conventional feed sources for ruminants, and are an eco-friendly way of waste disposal.

Keywords: Cabbage, Kohlrabi, Silage, In Vitro Digestibility

The glutamic acid spraying exposes significant effect on yield and agronomic characteristics of sunflower (*Helianthus annuus* L.)

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Abstract: The present study was conducted to determine the effects of glutamic acid treatments at different doses on yield and growth parameters of some sunflower varieties under Anbar-Iraq conditions in 2021. Glutamic acid treatments were practiced as foliar sprays at four different concentrations (0, 100, 200 and 300 mg l^{-1}) to three different sunflower varieties (Sakha, Amar and Ishaqi-1). Field experiments were conducted in randomized blocks split-plots experimental design with three replications. The highest average stem height was measured as 194.25 cm, leaf area as 10188.70 cm^2, number of leaves per plant as 23.93 leaf $plant^{-1}$, plant dry weight as 181.22 g, seed weight as 49.17 g $plant^{-1}$, seed yield as 4.87 t ha^{-1} and biological yield as 17.98 t ha^{-1}. The 100 mg l^{-1} glutamic acid treatments of the variety Aqmar yielded the highest head diameter (17.525 cm). The 100 mg l^{-1} glutamic acid treatments of the variety Ishaqi-1 were superior in number of seeds per head (850 seed $plant^{-1}$). The 100 mg l^{-1} glutamic acid treatments of the variety Sakha were superior in 1000-seed weight (66.50 g) and harvest index (33.58 t ha^{-1}). As a result, the highest seed yield (5.49 t ha^{-1}) was obtained with 300 mg l^{-1} glutamic acid treatments in Ishaqi-1 sunflower variety.

Keywords: Sunflower, Glutamic Acid, Growth, Yield

Niğde ili kentsel alanında hanelerin süt ve süt ürünleri tüketim alışkanlıklarının belirlenmesi

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Özet: Bu çalışma, Niğde ili ve ilçelerinde, hanelerin süt ve süt ürünleri tüketim alışkanlıklarını incelemek amacıyla yapılmıştır. Araştırmanın verileri, 2020-2021 yılında Niğde ili ve ilçelerinde 382 hane ile yüz yüze anket çalışması yapılarak toplanmıştır. Hane halklarının %36'sı süt pastörize-UHT, %35'i doğrudan süt üreticisinden, %9'u sokak sütçüsünden ve %20'side kendi üretimi vb. diğer kaynaklardan süt satın alarak tükettikleri belirlenmiştir. Tüketicilerin sokak sütü tercih nedenlerinden en önemlisi sütün taze olması (%45), Pastörize- UHT sterilize süt tercihinde güvenilir olması (%29), sütü doğrudan tüketiciden satın alma nedenleri arasında doğal olması (%64) en önemli faktörler olarak saptanmıştır. Çalışma alanında hane halklarının haftalık açık süt ve paket süt tüketimleri sırasıyla 0.94 ve 0.51 litre olurken yoğurt 0.91 kg, peynir 0.25 kg, kaşar peyniri 0.23 kg ve tereyağı 0.25 kg'dır. Tüketicilerin %55'i inek, %26'sı koyun, %15'i keçi ve %4'ü de manda sütünü tercih ettiklerini bildirmiş ve %94'ününde organik süt üretimini talep etmişlerdir. Niğde ilinde hane halkları marka denildiğinde %19 bilinirlik, %48 kalite, %29 güven ve %4 diğer nedenler olarak sırlanmıştır. Marka tercihinden %32'si fiyat, %26'sı çok çeşit, %19'u tat/koku/aroma, %10'u sağlıklı ürün, %9'u güvenilir, %9'u da kalitenin önemli olduğu saptanmıştır. Tüketicilerin süt ve süt ürünleri satın alırken kararlarını etkileyen ürün tanıtımı, güven ve görünürlük gibi faktörlerin önemli olduğu sonucuna varılmıştır.

Anahtar Kelimeler: Niğde, Eğitim, Meslek, Süt, Tüketici, Marka, Güven

Determination of milk and dairy products consumption habits of households in the urban area of Niğde province

Absract: This study was conducted to examine the milk and dairy product consumption habits of households in Niğde province and its districts. The data of the study were collected by face-to-face survey with 382 households in Niğde province and its districts in 2020-2021. It was determined that 36% of the households consumed pasteurised-UHT milk, 35% purchased milk directly from milk producers, 9% from Street sellers and 20% from other sources such as own production. The most important reasons for consumers' preference for fresh milk were that the milk was fresh (45%), pasteurized- UHT sterilized milk was reliable (29%), and natural milk (64%) was the most important factor for buying milk directly from the consumer. In the study area, weekly open milk and packaged milk consumption of the households were 0.94 and 0.51 liters, respectively, while yoghurt 0.91 kg, cheese 0.25 kg, cheddar cheese 0.23 kg and butter 0.25 kg. Consumers reported that 55% of them prefer cow milk, 26% sheep milk, 15% goat milk and 4% buffalo milk and 94% of them demanded organic milk production. In Niğde province, 19% of the households ranked brand as awareness, 48% quality, 29% trust and 4% other reasons. It was determined that 32%

price, 26% variety, 19% taste/smell/flavour, 10% healthy product, 9% reliable, 9% quality were important for brand preference. It was concluded that factors such as product presentation, trust and visibility are important factors affecting consumers' decisions when purchasing milk and dairy products.

Keywords: Niğde, Education, Occupation, Dairy, Consumer, Brand, Trust

Japon bıldırcını yemlerine farklı düzeylerde portakal kabuğu tozu ilavesinin farklı depolama koşullarındaki yumurtanın iç ve dış kalitesi üzerine etkisi

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Özet: Bu çalışma, Japon Bıldırcını (Coturnix coturnix Japonica) yemlerine kontrol grubu (%0), %1, %2 ve %3 seviyelerinde portakal kabuğu tozu ilavesinin farklı depolama koşullarında yumurtanın raf ömrü ve iç ve dış kalitesi üzerine etkilerini araştırmak için yapılmıştır. Araştırmada, muamele grupları 4 muamele×5 tekkerrür olarak ve her muamele grubunda toplam 40 yumurta olacak şekilde düzenlenmiştir. Çalışmada; 0.gün ve15.gün ile 30.gün oda sıcaklığı ve +4 ^{o}C olarak farklı depolama koşullarında depolanan yumurtalarda iç ve dış kalite özellikleri incelenmiştir. İç kalite özellikleri olarak; sarı indeksi (%), ak indeksi (%), sarı ağırlığı (g), yumurta sarısının rengi (L,A ve B değerleri) ve Haugh Birimi (%) belirlenmiştir. Dış kalite özelliklerinden olarak; yumurta ağırlığı (g), yumurta ağırlık kaybı (g), şekil indeksi (%), ortalama yumurta kabuk kalınlığı (µm), kabuk kırılma direnci (g/kg) ve kabuk ağırlığı (g) ölçülmüştür. Japon bıldırcını yemlerine farklı dozlarda ilave edilen portakal kabuğu tozunun yumurta dış kalite özelliklerinde, 0.gün de kabuk ağırlığı ($P<0.013$), şekil indeksi ($P<0.004$), ortalama kabuk kalınlığı ($P<0.008$); 15.günde oda sıcaklığında kabuk ağırlığı ($P<0.001$) ile +4^{o}C'de yumurta ağırlığı (Lineer $P<0.021$) ve yumurta kabuk kırılma direnci (Kübik $P<0.032$); 30.günde oda sıcaklığında kabuk ağırlığı (Kuadratik $P<0.046$) bakımından gruplar arasında önemli farklılıklar bulunmuştur. Farklı sürelerde depolanan yumurtaların iç kalite özellikleri bakımından; 0.günde ak indeksi (Lineer $P<0.018$); 15.günde oda sıcaklığında sarı ağırlığı ($P<0.014$, kuadratik $P<0.04$) ile +4^{o}C'de sarı indeksi ($P<0.029$, Lineer $P<0.017$); 30.günde oda sıcaklığında sarı indeksi ($P<0.002$, Lineer<0.013; Kuadratik $P<0.002$),yumurta sarısı renginde B değeri (Kubik $P<0.040$) ile +4^{o}C'de sarı indeksi ($P<0.012$, Kuadratik $P<0.003$) bakımından gruplar arasında önemli düzeyde farklılıklar olduğu bulunmuştur.

Anahtar Kelimeler: Japon Bıldırcını, Portakal Kabuğu Tozu, Depolama Süresi, Depolama Sıcaklığı, Yumurta İç ve Dış Kalite Özellikleri

The effect of adding various levels of orange peel powder to Japanese quail feeds on the internal and external quality of eggs under different storage conditions.

Abstract: This study was carried out to investigate the internal and external quality of eggs stored in different conditions and obtained from Japanese Quail (Coturnix coturnix Japonica) fed with feeds added various levels of orange peel (control group (0%), 1%, 2%, and 3%). The treatment groups were arranged as four treatments to 5 repetitions, and 40 eggs were in each. The eggs were stored at room temperature and +4 ^{o}C on day 0, day 15, and day 30. As internal quality features, yolk index (%), white

index (%), yolk weight (g), egg yolk color (L, A, and B values), and Haugh Unit (%) were determined. As external quality features, egg weight (g), egg weight loss (g), shape index (%), mean eggshell thickness (µm), shell breaking strength (g/kg), and shell weight (g) were measured. Significant differences were found among the groups in different storage conditions. On day 0, the eggshell weight ($P<0.013$), shape index ($P<0.004$), and mean shell thickness ($P<0.008$) were significantly different in the groups. On day 15, the shell weight at room temperature ($P<0.001$), egg weight at $+4^oC$ (Linear $P<0.021$), and eggshell breakage resistance (Cubic $P<0.032$) were different in the groups. On day 30, at room temperature, shell thickness (Quadratic $P<0.046$) was significantly different between the groups. Significant differences were found in terms of the internal quality characteristics of eggs stored under different conditions. On day 0, the white index (Linear $P<0.018$); On the 15th day, yolk weight at room temperature ($P<0.014$, quadratic $P<0.04$), and yellow index at $+4^oC$ ($P<0.029$, Linear $P<0.017$) were significantly different in the groups. Furthermore, there were significant differences in the yellow index at room temperature ($P<0.002$, Linear<0.013; Quadratic $P<0.002$), egg yolk B value (Cubic $P<0.040$), and at $+4^oC$ in the yellow index ($P<0.012$, Quadratic $P<0.003$) on day 30.

Keywords: Japanese Quail, Orange Peel Dust, Storage time, Storage Temperature, Internal and External egg Quality Features

Application of encapsulation techniques in livestock and poultry feeds

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Abstract: Encapsulation technology has emerged as a transformative strategy in the livestock industry, employing various methods to encapsulate active substances within protective matrices. This paper highlights the methods of encapsulation, such as spray-drying, coacervation, and extrusion, and elucidates their benefits in enhancing livestock products and farming practices. Encapsulated nutrients promote efficient absorption, leading to improved growth rates and enhanced productivity. Encapsulated probiotics ensure the survival of beneficial microorganisms within the gut, bolstering immune responses and minimizing disease incidence. Additionally, encapsulation mitigates volatile compound losses in animal feed, contributing to economic savings and reduced environmental impact. While challenges in material selection, process optimization, and long-term effects persist, collaborative efforts between stakeholders hold the potential to overcome these barriers. Ultimately, encapsulation technology offers targeted delivery, advancing feed efficiency, animal health, and sustainable livestock farming practices.

Keywords: Encapsulation technology, Livestock products, Spray-drying, Coacervation**,** Extrusion

Lavanta (*Lavandula angustifolia* Mill.)'da fosfor gübrelemesinin bitki gelişimi ve uçucu yağ verimi üzerine etkisi

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Özet: Lavanta (*Lavandula angustifolia* Mill.), Lavandula cinsine aittir ve dünyada en çok yetiştirilen ve ticarileştirilen türdür. Lavandula angustifolia parfümeri endüstrisinde kullanılır, ancak aynı zamanda tedavi edici özellikleri de mevcuttur. Bu çalışma, Niğde bölgesinde Lavantada fosfor (P) gübrelemesinin bitki gelişimi ile uçucu yağ verimi üzerine etkilerini belirlemek amacıyla 2022 yılında Niğde Ömer Halisdemir Üniversitesi Tarım Bilimleri ve Teknolojileri Fakültesi Tıbbi Bitkiler Uygulama Bahçesinde Tesadüf Blokları Deneme Desenine göre üç tekrarlamalı olarak kurulup yürütülmüştür. Çalışmada Sevtapolis lavanta çeşidi kullanılmıştır. Deneme beş farklı uygulamadan (P0: 0 kg P2O5/da, P6: 6 kg P2O5/da, P12: 12 kg P2O5/da, P18: 18 kg P2O5/da, P24: 24 kg P2O5/da) oluşmuştur. Fosfor gübresi, önerilen miktarda dikim öncesinde uygulanmıştır. Yetişme süresince bakım işlemleri tekniğine uygun olarak yapılmıştır. Çalışmada, her bir uygulamaya bağlı olarak bitki boyu (cm), çiçek başağı sayısı (adet/bitki), başak uzunluğu (cm), yaş çiçek verimi (kg/da), drog çiçek verimi (kg/da) ve uçucu yağ verimi (l/da) gibi özellikler tespit edilmiştir. Çalışma sonucunda, en yüksek yaş çiçek verimi (90.9 kg/da) ve drog çiçek verimi (71.3 kg/da) kontrol uygulamasından elde edilmiştir. Lavantada uçucu yağ verimi önemli bir parametredir. Çalışmamızda fosfor uygulamaları uçucu yağ verimi üzerine önemli etkiye sahip olmuştur. En yüksek uçucu yağ verimi (1.79 lt/da) kontrol uygulamasından elde edilmiştir.

Anahtar Kelimeler: *Lavandula angustifolia*, Fosfor Gübrelemesi, Uçucu Yağ Verimi, Niğde

Phosphorus fertilization affects on plant growth and essential oil yield of lavander (*Lavandula angustifolia* Mill.)

Abstract: Lavender (*Lavandula angustifolia* Mill.) belongs to the genus Lavandula and is the most cultivated and commercialized species in the world. Lavandula angustifolia is used in perfumery industry, but also presents medicinal properties. This study will be conducted to determine the effect of phosphorus (P) fertilization on plant growth and essential oil yield of Sevtapolis lavender cultivar (Lavandula angustifolia Mill.) at the Medicinal Plants Application Garden of Faculty of Agricultural Sciences and Technologies, Nigde Omer Halisdemir University in 2022 year. The experiment has been designed according to Randomize Complete Block with 3 replications along with the application of five different phosphorus doses (P0: 0 kg P2O5/da-1, P6: 6 kg P2O5/da-1, P12: 12 kg P2O5/da-1, P18: 18 kg P2O5/da-1, P24: 24 kg P2O5/da-1). Phosphorus fertilizer will use in soil in proper amount for each sub-plot before planting. In the study, plant height (cm), number of flower spikes per plant (number/plant), flower spike length (cm), fresh flower yield (kg/da), drug flower yield (kg/da), essential oil yield (l/da), parameters were examined. As a result of the study, the highest fresh flower yield (90.9 kg/da) and drug flower yield (71.3 kg/da) were obtained from the control

application. Essential oil yield are important parameter in lavender. The effect of phosphorus applications on essential oil yield was significant in our study. The highest essential oil yield (1.79 lt/da) was obtained from the control application.

Keywords: Lavandula angustifolia, Phosphorus Fertilization, Essential Oil Yield, Niğde

Kalsiyum nitrat ve kalsiyum klorürün patateste (*Solanum tuberosum* L.) verim ve yumru kalitesi üzerine etkisi

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Özet: Bu çalışma, patatesin yoğun olarak yetiştiriciliğinin yapıldığı Niğde bölgesinde farklı kalsiyum kaynakları ve dozlarının verim ve kuru madde, özgül ağırlık ve nişasta gibi kalite kriterleri üzerine etkilerini belirlemek amacıyla, 2020 yılında Niğde ili Misli ovasında bölünmüş parseller deneme desenine göre üç tekrarlamalı olarak kurulup yürütülmüştür. Çalışmada, iki farklı kalsiyum kaynağı (kalsiyum nitrat ve kalsiyum klorür) ve altı farklı kalsiyum dozu (Ca0: 0 kg/ha, Ca30: 30 kg/ha, Ca60: 60 kg/ha, Ca90: 90 kg/ha, Ca120: 120 kg/ha, Ca150: 150 kg/ha) uygulanmıştır. Çalışmada farklı kalsiyum kaynakları verim ve kalite parametreleri üzerine etkili olmazken kalsiyum dozları verim ve kalite parametrelerini etkilemiştir. Uygulanan kalsiyum dozu arttıkça verim, kuru madde, özgül ağırlık ve nişasta artmıştır. 150 kg/ ha dozu, 0 kg/ha kalsiyum uygulamasına göre verimi %13.5, kuru maddeyi %8.1, nişastayı %10.8 oranında artırmış özgül ağırlığı 1.074 g/cm^3 ten 1.082 g/cm$^{3'}$ e çıkarmıştır. Sonuç olarak, uygulanan farklı kalsiyum kaynakları etkili olmazken kalsiyum dozları arttıkça incelenen özellikler artmış olup uygun kalsiyum dozunun 150 kg/ha olduğu belirlenmiştir.

Anahtar Kelimeler: *Solanum tuberosum*, Kalsiyum, Verim, Kalite

The effect of calcium nitrate and calcium chloride on yield and tuber quality in potato (*Solanum tuberosum* L.)

Abstract: This study was established in Niğde province Misli plain in 2020 in order to determine the effects of different calcium sources and doses on yield and quality criteria such as dry matter, specific gravity and starch in the Niğde region, where potato is grown intensively. This study was carried out as three replications according to the split plot design. In this study, two different calcium sources (calcium nitrate and calcium chloride) and six different calcium doses (Ca0: 0 kg/ha, Ca30: 30 kg/ha, Ca60: 60 kg/ha, Ca90: 90 kg/ha, Ca120: 120 kg/ha, Ca150: 150 kg/ha) were used. While different calcium sources were not effective on yield and quality parameters in this study, calcium doses affected yield and quality parameters. As the applied calcium dose increased, yield, dry matter, specific gravity and starch increased. 150 kg/ha dose increased the yield 13.5%, dry matter 8.1%, starch 10.8% compared to 0 kg/ha calcium application, and increased the specific gravity from 1.074 g/cm^3 to 1.082 g/cm^3. As a result, while the different calcium sources applied were not effective, the properties examined increased as the calcium doses increased and the appropriate calcium dose was determined to be 150 kg/ha.

Keywords: *Solanum tuberosum*, Calcium, Yield, Quality

Effect of chitosan coating supplemented with peppermint essential oil on the oxidative quality of fish meatballs

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Abstract: This abstract is taken from my PhD thesis research portion which is entitled as “Determination of the antioxidant and antimicrobial effects of chitosan coatings prepared with herbal essential oil emulsions in fish meatballs” and I want to publish this in international conference book. The objective of my research is preservation of fishery products by using Packaging technology to extend shelf life of fishery products. Fish is a major source of protein, polyunsaturated fatty acids and many other minerals and vitamins, but due to high perishability of fish meat many synthetic materials were used for quality maintenance of fishery products. Due to increasing awareness of consumers about negative effects of plastic packages, edible packaging and coatings have become one of the most interested topic. These edible coatings can be prepared by using chitosan, gelatin, and antioxidants from plants and herbs. In my research I prepared Mackerel fish meatballs, divided them into three groups, one group without any coating (C), second group with only chitosan coating (CF) and third group was coated with chitosan and peppermint essential oil emulsion (PMO) which have high antioxidant activity to prevent fish meat balls from oxidative spoilage. After coating, fish meatballs were stored at refrigerated temperature 4±1^{o}C for 18 days and changes in oxidative quality during storage were monitored periodically. Results of oxidation analysis in this study revealed that fish meat balls which were coated with chitosan and peppermint essential oil emulsion (PMO) have the lowest oxidative value as compared to only chitosan coating group (CF) and control group (C). It was concluded from this study that usage of peppermint essential oil emulsion in the chitosan coating is an effective method to stop oxidative spoilage in the fish meatballs during the refrigerated storage.

Keywords: Peppermint essential oil, Oxidative spoilage, Emulsion, chitosan, Packaging.

Determination of phenolic compounds of the Arnebia euchroma plant growing in Kyrgyzstan by HPLC

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Abstract: The determination of phenolic compounds in Arnebia euchroma, a plant indigenous to Kyrgyzstan, holds significant botanical and pharmacological relevance. In this study, a High-Performance Liquid Chromatography (HPLC) method was employed to analyze the phenolic composition of Arnebia euchroma extracts. Plant samples were collected, dried, and powdered, followed by extraction using a suitable solvent. The resulting extracts were then subjected to HPLC analysis using a calibrated system equipped with a UV-Vis detector. A C18 column was employed to separate the phenolic compounds, and a mobile phase gradient was applied to achieve optimal separation. Calibration standards of known phenolic compound concentrations were used to quantify the phenolic compounds present in the extracts. The retention times, UV-Vis spectra, and peak areas of the sample compounds were compared to those of the standards for identification and quantification.
The HPLC analysis revealed the presence of diverse phenolic compounds within Arnebia euchroma extracts, including flavonoids, phenolic acids, and other polyphenols. The concentrations of individual phenolic compounds were determined and summed to estimate the total phenolic content in the plant samples.
This study provides valuable insights into the phenolic profile of Arnebia euchroma, contributing to the understanding of its potential medicinal properties and establishing a foundation for further botanical and pharmacological investigations. The developed HPLC method offers a reliable approach for the qualitative and quantitative analysis of phenolic compounds in this Kyrgyzstan native plant, fostering opportunities for its potential utilization in various fields including natural medicine, cosmetics, and nutraceuticals.

Keywords: Arnebia euchroma, phenolic compounds, High-Performance Liquid Chromatography (HPLC)

Assessing the morphological diversity of *origanum majorana* accessions in the central anatolia region of turkey

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Abstract:*Origanum majorana,* also known as sweet marjoram, is an herbaceous perennial plant with plenty of culinary and medicinal uses. However, little is known about its morphological diversity in the Central Anatolia region of Turkey. This study aims to provide an in-depth morphological study of *Origanum majorana* to better understand its growth and morphological behaviour. The study was conducted at the Agricultural Sciences and Technologies Faculty medicinal crop research area in Nigde Omer Halisdemir University. Seeds of *Origanum marjorana* were nursed in the greenhouse and about 500 seedlings were transplanted to the field in 2020. Morphological parameters such as growth habit, plant height, internode length, the longest branch, leave size, number of nodes per plant, fresh leave colour, and drought leave colour of 54 randomly selected plants were assessed in August 2022. The accessions exhibited erect and semi-erect growth habit with the height, number of nodes per plant, internode length and longest branch length ranging from 43 .00 to 97.00cm, 8.00 to 30.33, 1.7 to 5.6cm and 4.33 to 37.00 cm respectively. In addition, the leaves characteristic showed sizes ranging from 2.00 to 7.53cm, fresh leaves colour ranging from -7.2 to 0.62, and dry leave colour of 7.3 to 20.6. Except growth habit, all other morphological traits were significantly diverse ($P< 0.05$), indicating their genetic disparities. This finding has raised questions on the genetic and biochemical characteristic of these accession of *Origanum majorana*. Further work is needed to dissect the biochemical and genetic characteristics of the plant accessions.

Keywords: *Origanum majorana*, morphological traits, Turkey, accessions

Assessing the morphological diversity of *origanum majorana* accessions in the central anatolia region of turkey

Özet: Tatlı mercanköşk olarak da bilinen Origanum majorana, bol miktarda mutfak ve tıbbi kullanıma sahip çok yıllık otsu bir bitkidir. Ancak Türkiye'nin İç Anadolu bölgesindeki morfolojik çeşitliliği hakkında çok az şey bilinmektedir. Bu çalışma, büyümesini ve morfolojik davranışını daha iyi anlamak için Origanum majorana'nın derinlemesine bir morfolojik çalışmasını sağlamayı amaçlamaktadır. Çalışma, Niğde Ömer Halisdemir Üniversitesi Ziraat Bilimleri ve Teknolojileri Fakültesi tıbbi bitkiler araştırma alanında yapılmıştır. Origanum marjorana tohumları serada büyütülmüş ve 2020 yılında yaklaşık 500 fidan tarlaya nakledilmiştir. Büyüme alışkanlığı, bitki boyu, boğum arası uzunluğu, en uzun dal, yaprak boyutu, bitkide boğum sayısı, taze yaprak rengi gibi morfolojik parametreler , ve kuraklık yaprak rengi rastgele seçilen 54 bitkinin Ağustos 2022'de değerlendirilmiştir. Salkımlar 43 .00 ile 97.00cm arasında değişen boy, bitkideki boğum sayısı, boğum arası uzunluk ve en uzun dal uzunluğu ile dik ve yarı dik büyüme alışkanlığı sergilemiştir. , sırasıyla 8,00 - 30,33, 1,7 - 5,6cm ve 4,33 -

37,00 cm. Ayrıca yaprak karakteristiği 2.00 ile 7.53 cm arasında değişen boyutlar, -7.2 ila 0.62 arasında değişen taze yaprak rengi ve 7.3 ila 20.6 arasında değişen kuru yaprak rengi göstermiştir. Büyüme alışkanlığı dışında, diğer tüm morfolojik özellikler önemli ölçüde farklıydı (P< 0.05), bu da onların genetik farklılıklarını gösteriyordu. Bu bulgu, Origanum majorana'nın bu katılımının genetik ve biyokimyasal özellikleri hakkında soruları gündeme getirdi. Bitki girişlerinin biyokimyasal ve genetik özelliklerini incelemek için daha fazla çalışmaya ihtiyaç vardır.

Anahtar Kelimeler: Origanum majorana, morfolojik özellikler, Türkiye, örnekler

Investigaton of potyvirus diseases on common bean (*Phaseolus vulgaris* L.) grown in Niğde province

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Abstract: In this study, potyvirus infection was evaluated in common bean (*Phaseolus vulgaris* L.) in Niğde province during 2021. A total of 228 bean virus symptomatic samples collected from 41 fields were subjected to ELISA test using potyvirus-specific antiserum and out of 132 samples have been found infected with potyvirus. According to the infection rates of collected common bean samples obtained monthly, higher infections have been acquired towards the end of August. The analyzed common bean leaves had an overall infection rate of 57.8%, whereas the overall infection rate of visited common bean fields had 78%. Sixty potyvirus-positive samples were selected to be tested by RT-PCR againt several potyvirus. Fifty-four of those samples were found to be infected with bean common mosaic virus (BCMV) and one was infected bean yellow mosaic virus (BYMV). Bean common mosaic necrosis virus (BCMNV), cowpea aphid-borne mosaic virus (CABMV), soybean mosaic virus (SMV), peanut mottle virus (PeMoV) and clover yellow vein virus (CIYVV) did not detected among the examined samples by RT-PCR. It was concluded that the samples collected in August and September were almost all positive in terms of potyviruses.

Keywords: Common bean, potyvirus, BCMV, BYMV

Üzümlerdeki *(Vitis vinifera* L.) *tras*-resveratrolün ölçümünde farklı dedektörlerin (FLD, DAD) RF-HPLC ile kullanımı

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Özet: Resveratrol, antioksidan etkiye sahip *cis* ve *trans* özellik gösteren fitoaleksin, stilben grubunda yer alan organik bir bileşiktir**.** Bu çalışmanın amacı, FLD ve DAD dedektörleri kullanılarak üzümlerde bulunan *trans*-resveratrol miktarının tespiti ve dedektörlerin birbiri ile karşılaştırılmasıdır. Çalışmada, shimadzu marka LC-20AD pompa, SIL-20A HT otoörnekleyici, CTO-10AS VP kolon fırını, SPD-M20A DAD ve RF-20A floresan dedektörü kullanılmıştır. Hazırlanan numune metanol ile ekstraksiyona tabi tutulmuştur. Gradient akış 0.7 ml/dk, mobil faz olarak saf su (% 0.2 formik asit) A hattı ve asetonitril (% 0.2 formik asit) B hattı kullanılmıştır. Ters faz (RF), 5 μm-25 cmx4,6 mm çapa sahip standart C18 kolon kullanılmıştır. Ekstraktlar HPLC-FLD ve -DAD dedektörlerleri kullanılarak analiz edilmiştir. Analiz sonuçlarına göre floresan (FLD) dedektörüyle 2.094 ppm ve diode array (DAD) detektörüyle 2.880 ppm *trans*-resveratrol tespit edilmiştir. DAD dedektöründe, *trans*-resveratrol bileşiği saf standardında 10.611'inci ve üzüm örneklerinde ise 10.624'üncü dk. da tespit edilmiştir. *trans*-resveratrol DAD dedektöründe 306 nm'de maksimum spektrum vermiştir. Floresan dedektöründe excitation dalga boyu 300 nm ve emission dalga boyu 386 nm olarak ayarlanmıştır. *trans*-resveratrol floresan detektörüyle başarıyla tespit edilmiştir. Analiz sonuçlarına göre floresan detektörden elde edilen pikin DAD detektöre göre daha belirgin olduğu görülmüştür. Bu nedenle floresan dedektörün seçiciliği daha yüksek bulunmuştur. DAD dedektöründe yakın spektrum ve alıkonma zamanına sahip maddelerden dolayı 10.45'inci dk. da pik saflığı tespit edilmemiştir. DAD dedektöründe bulunan pik saflığı inceleme özelliği sayesinde iç içe pikleri tespit etmede avantaj oluşturmaktadır. Sonuç olarak üzümlerde *trans*-resveratrol FLD ve DAD detektörleriyle başarıyla tespit edilebilmektedir.

Anahtar Kelimeler: HPLC-DAD, Floresan, Fenolik Bileşikler, Resveratrol, Üzüm

Abstract: Resveratrol is a phytoalexin stilbene compound with cis and trans properties that has antioxidant properties. The aim of this study was to determine the amount of *trans*-resveratrol in grapes using FLD and DAD detectors and to compare the detectors with each other. Shimadzu LC-20AD pump, SIL-20A HT autosampler, CTO-10AS VP column oven, SPD-M20A DAD and RF-20A fluorescence detector were used in the study. Methanol was used to extract the prepared sample. Gradient flow 0.7 ml/min, pure water (0.2 % formic acid) line A and acetonitrile (0.2 % formic acid) line B were used as mobile phase. A standard reverse phase (RF) C18 column with a diameter of 5 μm-25 cmx4,6 mm was used. HPLC-FLD and -DAD detectors were used to analyze the extracts. According to the results of the analysis, 2.094 ppm of *trans*-resveratrol was detected with the FLD detector and 2.880 ppm with the DAD detector. *trans*-resveratrol compound was detected in the DAD detector at 10.611 min in pure standard and 10.624 min in grape samples. *trans*-resveratrol gave a maximum spectrum at 306 nm in the DAD detector. The fluorescence detector's excitation wavelength was set to 300 nm, and the emission wavelength was set to 386 nm. The *trans*-resveratrol was successfully detected with the fluorescence detector. According to the analysis results,

the peak obtained from the fluorescence detector was more clear than the peak obtained from the DAD detector. Therefore, the selectivity of the fluorescence detector was found to be higher. Peak impurity was detected in the DAD detector at 10.45 min due to substances with close spectrum and retention time. The DAD detector's peak purity inspection feature is useful for detecting nested peaks. As a result, *trans*-resveratrol in grapes can be successfully detected with FLD and DAD detectors.

Keywords: HPLC-DAD, Fluorescence, Phenolic Compounds, Resveratrol, Grape

Niğde ili lahana üretim alanlarındaki *Heterodera schachtii* (Schmidt, 1871) (Nematoda: Heteroderidae)'nin popülasyon takibi

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Özet: Niğde, Türkiye'nin lahana (*Brassica oleracea* L. var. capitata) üretiminde ilk sırada yer almaktadır. Aralık 2021-2022 yılları arasında lahana üretim alanlarından 100 toprak örneği alınarak, *Heterodera schachtii* (Schmidt, 1871) (Nematoda: Heteroderidae)'nin kist yoğunluğu belirlenmiştir. Alınan toprak örneklerinin ektraksiyonu yapılarak, araziler arasında yoğunluğu en fazla olan iki tarla seçilerek, düzenli olarak her ayın aynı gününde bir yıl boyunca iki tarladan popülasyon takibi yapılmıştır. Her ay alınan toprak örnekleri laboratuvara getirilerek, örneklerin ekstraksiyonu sonucu kistler ve larvalar elde edilerek ışık mikroskobu altında sayımı yapılmıştır. Kist popülasyonunun en yoğun olduğu ay Kasım ayı iken, larva yoğunluğunun en fazla olduğu ay ise Mart ayı olarak belirlenmiştir. Popülasyonun konukçunun bulunmadığı kış ve ilkbahar aylarında düştüğü gözlenmiştir. Popülasyon yoğunluğunun belirlenmiş olması mücadele zamanının belirlenmesinde yardımcı olacaktır. Bölgede kist nematodları ciddi ekonomik kayıplara sebep olmaktadır ve verimi düşürmektedir.

Anahtar Kelimeler: *Heterodera schachtii,* Kist, Lahana, Niğde, Popülasyon dinamiği,

Antibacterial effect of some plant extracts against potato common scab

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Abstract: Potato common scab is one of the most common diseases of potato, worldwide. There are some pesticides available but due to their side effects on human health and other living organisms, there is a need for more sustainable alternative ways. Using plant extract may offer an alternative way to harmful pesticides. In this study, we aimed to: determine to antibacterial activity of plant extract of *Magnolia liliiflora, Viola odorata, Muscari armeniacum* and *Taraxacum officinale* using the agar diffusion method against *Streptomyces scabiei, Streptomyces turgidiscabies, Streptomyces acidiscabies, Streptomyces stelliscabies and Streptomyces europaeiscabiei.* As a result of this study; *Viola odorata* (flower) methanol extract was shown 65.87-75.47 % antibacterial activity and was finally selected as the most effective in potato common scab growth inhibition *in vitro* test. In future prospects, *Viola odorata* (flower) extract may be proposed as a potential biochemical against potato common scab.

Keywords: Potato, *Streptomyces scabie*, Methanol extract, Antibacterial activity.

Research on cloning of newly detected viruses on grapevine and determination of genetic properties

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Abstract: Grapevine being a socio-economically important commodity is sensitive to diverse plant diseases, causing yield reduction. The effectiveness in managing these plant pathogens is achieved by foremost carrying out identification processes. In view of the prior research, four viral RNAs of the *Secoviridae* family were newly sequenced by the rise of Illumina in grapevine. This study aimed at mechanically transmitting, cloning the viruses, and analyzing genetic properties through bioinformatics tools. The amplicons of viral transcripts from RT-PCR and DNA elution were introduced in TA vectors (*pTZ57R/T*) cloned by transforming into *Top 10* bacterial cells. The RNA2 (whole genome) was cloned in TA vector and the outcomes revealed the presence and existence of the target sequence, signifying replicates of the viruses, however, the sequencing results after cloning were inconsistent (though, giving 44.43% and 41.62% match in different sequences). Also, analysis of the Illumina sequence data through bioinformatics portrayed the similarity level of the viral contig to both *Fabavirus* and *Comovirus* is not enough to categorize it under *Comovirus,* therefore, there is the need for the creation of a new genus. This research for further studies, is on the verge of fulfilling Koch`s postulates whenever the infective virus clones are produced.

Keywords: *Secovirus*, virus genome cloning, characterization

Exploring the potential antagonist yeasts from wild fruit species

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Abstract: Postharvest losses due to fungal diseases pose significant challenges to food security and economic sustainability. The search for effective and eco-friendly strategies has led to increased interest in utilizing biocontrol agents (BCAs) (e.g. yeasts, bacteria, fungi) for postharvest disease management. This study focused on the isolation and characterization of epiphytic antagonistic yeasts isolated from wild plants such as *Malus domestica* cv. “Niğde Elması”, *Pyrus elaeagrifolia*, *Rosa canina*, and *Crataegus monogyna*. A total of 375 isolates were screened against Alternaria alternata, causal agent of black rot of apple, by using in vitro dual culture assay. From the preliminary results, 34 yeast isolates that displayed ed a mycelial fungal inhibition by 40% and up were selected and classified as a potential BCA. Selected epiphytic yeasts showed an inhibition rate ranged from 44.37% to 46.76%. Isolates were subjected to molecular characterization by using universal primers ITS1 and ITS4 and a phylogenetic analysis was conducted. All yeast isolates were clustered with *Aureobasidium pullulans var. pullulans* references. Results showed that potential BCAs belonging to *A. pullulans* species can be found on wild fruit species. The isolated strains were characterized by a great potential to inhibit apple black rot. These findings showed how wild plants could represent a new source for new BCAs isolation. However, further studies are needed for revealing the mechanisms of action of the selected potential BCAs to apply during the postharvest phase.

Keywords: Biological control, postharvest, *Alternaria* spp., apple.

Climate change and agricultural production in Azerbayjan

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Abstract: Climate change refers to weather changes that occur over time, either naturally or as a result of human activity. Climate change is now a worldwide issue, and in this article, we highlight the impact of Climate Change on Agricultural Production in Azerbaijan. The results of this study showed that the highest annual maximum temperature was 29.6 °C in August, while the lowest maximum temperature was 7.4 °C in January. while the minimum temperature ranged from 3.7 °C in January to 23.9 °C in August. For average temperature, the highest degree was 26.9 °C in August, and the lowest was 5.6 °C in January and February. As for the precipitation, the highest total was 45 mm in November, while the lowest total was 6 mm in August. As for the rainy days, they ranged from 1 mm in June, July, and August to 7 mm in November. Maximum humidity was 79% in February, while minimum humidity was 64% in July. The highest number of daylight hours was recorded in June, when it was 13.1 hours, and the lowest hours, at 4.5 hours, were recorded in January. This article investigated the potential effects of various climate variables on agriculture production in Azerbaijan. Due to its heavy reliance on low-yield, low-productivity subsistence farming, high rates of soil degradation, and restricted land availability, Azerbaijan's agriculture industry is particularly vulnerable to climate change. Rising temperatures and greater water stress will make the low production and yields worse. Stakeholders in Azerbaijan, notably policymakers, are likely to find the study's findings useful for better anticipating how climate change would affect agriculture, understanding the many impact routes, and evaluating the viability of intervention choices. The findings of this research will be helpful for better predicting how climate change will impact agriculture, comprehending the many forms of effect, and determining the efficacy of certain intervention approaches that are feasible.

Keywords: Climate Change, Agricultural Production, Azerbayjan

Humic acid fertilizer applications on the forage yield and yield characteristics of silage corn (*Zea mays* L.). A review.

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Abstract: Corn Zea mays L. is an essential crop in the world after wheat, rice, and barley. The top three largest corn producer countries in the world are United States, China, and Brazil, their production approximately about 563 of the 717 million tons/year. Corn production in Turkey is about 9.5 million tons in 2017/2018 season. This crop is consumed in different forms such as foods and row materials for industrial products, like starch, oil, beverage, glue, industrial alcohol, and biofuels as ethanol, also corn has been used for livestock as forage crop or silage. Corn has been a main source used for feeding animals a silage crop by using good cultural practices, good silage management practice, and growing in optimum weather condition leading to obtain high-quality corn silage. This review will summarize on the management practices of production, and growing corn of silage. The aim of this review is to give main principles of growing corn for silage production. The main objective of this paper is to increase awareness of humic acid fertilization on the silage corn production.

Keywords: Corn, Corn Silage, Humic Acid, Corn Fertilization.

Global warming and food production in Uzbekistan

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Abstract: Global production of agricultural food is in danger due to extreme climatic changes which leads to rise in temperature, filuctuations in rainfall, precipitation and humidity. These all climatic variabilities effects the food crop productions on large scale and causes food insecurities especially in Central Asia. In this article we have focused on effects of climatic variabilities in Uzbekistan food crop production. We calculated climatic variabilities data by using statistical methods of regression analysis and standard deviation. Maximum and minimum values of temperature, Precipitation, Rainy days, Humidity and sunny days are given here. The minimum temperature ranges from -4.9 °C in January to 19.5 °C in July, while the highest maximum temperature was 34.6 °C in July, and the lowest maximum temperature was 6.2 °C in January. The maximum value of precipitation was recorded as 103mm in April, while the minimum value was recorded as 5mm in August. The values of rainy days were recorded as lowest 1mm in August to greater 9mm in March and April. Maximum value of humidity was recorded as 73 % in January, while the minimum value was recorded as 34 % in July. The values of sunny days were recorded as lowest 6.6 hours in December to greater 13.4 hours in June. Resultant values of standard deviation are 10.592, 8.955 and 10.229 for max. temperature, min. temperature and average temperature respectively which means max. temperature and average temperature has high variability in whole duration, while min. Temperature has less variability in whole duration. precipitation has highest value of standard deviation which is 33.195 means it has very high variability in whole duration, while rainy days is 2.778 which means it has very less variability in whole duration. Humidity also has high value of standard deviation which is 15.575 while sunnny days has 2.591 value which is least value as compared to all other variables and it means sunnny days has very less variability in whole duration.

Keywords: Global warming, Food production, Uzbekistan

The effects of global warming on food security in Kazakhstan

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Abstract: Climate change known as those type of weather changes which stays for years or centuries. These climate changes are happening due to global warming which can be naturally or due to human activities. Climatic changes effects the agricultural production globally due to change in temperature, humidity, precipitation and rainfall. World food supply rely on agriculture, so by effecting the agricultural production food supply is becoming scarce. In this article we discussed and calculted the climatic change factors in Kazakhstan that how much they are effecting the food production in Kazakhstan which is considered as breadbasket for Asia and Eastren europe. We have data of a year comprising Max temperature, Min temperature, Average temperature, humidity, precipitation, rain fall and sunny days. It shows Highest values were recorded as 14.6°C, 25.2°C, and 20.4°C in July, for Minimum temperature, Maximum temperature and Average temperature respectively while the lowest values were recorded as -18.1°C, -10.9°C and -14.2°C in january for minimum temperature, Maximum temperature and Average temperature respectively throughout the year. Highest value of Precipitation and Rainy days were recorded as 64.0mm and 9.0mm in July, while the lowest values of Precipitation and rainy days were recorded as 20.0mm in january and 4.0mm in september and february respectively throughout the year. Highest value of Humidity and sunny days were recorded as 82.0% in January, and 13 hours in june respectively, while the lowest value of Humidity and sunny days were recorded as 47.0% in May and 3 hours in december and january throughout the year. We applied statistical analysis like standard deviation and linear regression for data calculation. It was concluded that Humidity has highest value of standard deviation which is 14.390, while sunny days and Rainy days has lowest values which are 4.082 and 1.371 respectively, as compared to all other variables which means these variables has very less variability in all months of whole year whether Humidity varied so much as it has highest value of standard deviation. It confirmed that because of change in climate real values of climatic variables are varying extremely which are continuously effecting the agricultural food supply of Kazakhstan.

Keywords: Global Warming, Food Security, Kazakhstan

ARCHITECTURE-CIVIL ENGINEERING

Kapadokya bölgesinde yer alan kayadan oyma depo yapılarının tasarım özelliklerinin incelenmesi

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Özet: Bu çalışmada Kapadokya bölgesinde yer alan kayadan oyma depo yapıları incelenerek seçilen depo örnekleri üzerinden tasarım esasları değerlendirilmiştir. Bölgeden üç farklı tipte depo örneği konu alınarak bu depoların kayaç özellikleri, taşıyıcı sistemleri, mekân boyutları ve biçimlenişleri karşılaştırılmış ve bölgede kayadan oyma depoların tasarım ve uygulamasında dikkat edilmesi gereken faktörler belirlenmiştir. Elde edilen sonuçlara göre kayadan oyma depo yapılarının dayanımını etkileyen yapısal faktörler; deponun açılacağı bölgedeki kayacın cinsi ve özellikleri, deponun giriş yönü, üst örtü kalınlığı, galeri, loca ve topuk boyutları, olarak belirlenmiştir. Depo üstündeki tabakanın eğim yönü, depo girişi, galeri, loca ve havalandırma bacalarının boyutları ve biçimlenişi, depo girişinde ve üst örtüdeki yapılaşmaların doğal çevreye uyumu ise kayadan oyma depo yapılarının tasarımında dikkate alınması gereken faktörler olarak değerlendirilmiştir. Ürünlerin uygun koşullarda muhafazası için ideal ortamlar sunan kayadan oyma depoların belirli esaslar uyarınca tasarlanması daha etkin kullanılmalarına ve böylelikle bölge ve ülke ekonomisine katkı sağlayacaktır. Kayadan oyma depoların yapımı ve kullanımı sırasında can ve mal güvenliğinin korunması için yürürlükteki mevzuat hükümlerine göre gerekli boyutlandırmalara ve yapım tekniklerine uyulması gereklidir. UNESCO Dünya Kültür Mirasları arasında yer alan ve büyük bir turizm potansiyeline sahip olan Kapadokya bölgesinin doğal dokusunu korumak amacıyla, kayadan oyma depo yapılarının tasarımında çevreye uyum faktörü oldukça önem taşımaktadır.

Anahtar Kelimeler: Kapadokya, Kayadan Oyma Depo, Tasarım, Galeri, Loca.

Examination of the design principles of rock-carved warehouse structures in the Cappadocia region

Abstract: In this study rock-carved warehouse structures in the Cappadocia region were examined and their design principles were evaluated through selected warehouse examples. By taking three different types of warehouse examples from the region, the rock properties, structural systems, space dimensions, and forms of these structures were compared and the factors that should be considered in the design and application of rock-carved warehouses in the region were determined. According to the results obtained structural factors affecting the strength of rock-carved warehouse structures are; the type and characteristics of the rock in the region where the warehouse will be opened, the entrance direction of the warehouse, the thickness of the upper cover, the dimensions of the gallery, lodge and heel are determined. The slope direction of the layer above the warehouse, the dimensions and formation of the warehouse entrance, gallery, lodge, and ventilation chimneys, and the compatibility of

the structures at the entrance and on the upper cover with the natural environment were evaluated as factors that should be taken into consideration in the design. Designing rock-carved warehouses, which offer ideal environments for storing products under suitable conditions, in accordance with certain principles will contribute to their more effective use and thus to the economy of the region and the country. In order to protect life and property safety during the construction and use of rock-carved warehouses it is necessary to comply with the dimensions and construction techniques in accordance with the provisions of the current legislation. In order to protect the natural appearance of the Cappadocia region, which is among the UNESCO World Cultural Heritage sites and has great tourism potential, the environmental compatibility factor is very important. in the design of rock-carved warehouse structures.

Keywords: Cappadocia, Rock-Carved Warehouse, Design, Gallery, Lodge.

Afete duyarlı peyzaj planlama ve tasarımlarda bitkisel tasarım senaryoları

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Özet: Türkiye yerleşim konumundan dolayı doğal felaketlere ve iklim değişimlerinden etkilenmeye yatkın bir ülkedir. Çeşitli iklim felaketleri, küresel ısınma, nüfus artışı, yoğun göçler kentlerde plansız alanlar hızla artmaktadır. Deprem, sel, kuraklık gibi doğal afetler ile petrokimya tesislerinde kazalar, buhar kazanlarının patlaması ve insan kaynaklı afetler şehirlerin gelişimini tehdit etmekte ve etkilemektedir. Bu nedenle bilim adamları, şehir plancıları, peyzaj mimarları dayanıklı kentler, dayanıklı peyzaj gibi konseptlere önem verilmesi gerektiğini bildirmektedirler. Bu çalışma dayanıklı kentler perspektifinden dayanıklı parklar konusu ya da kamu açık alanları (KAA) tartışılmaktadır. Deprem sırasında KAA güven için önemli olabilir. KAA normal zamanlarda günlük kullanımını arttırmanın yanı sıra deprem zamanında hizmet verebilecek şekilde tasarlanması önemlidir. Bu çalışma, KAA nın planlaması ve tasarımı sırasında depreme dayanıklılık kriterlerini inceleyerek ve keşfederek deprem sırasında etkili alanlar oluşturabilme ve geliştirmeyi hedeflemektedir. Depreme dayanıklı kriterinden erişilebilirlik, etkililik, güvenlik ve çok fonksiyonel ilkeleri incelenmiştir. Bu çalışma deprem felaketlerine dayanıklı şehirleri arttırmak için değerli bir kaynak olarak değerlendirilebilir.

Anahtar Kelimeler: Niğde, Peyzaj, Deprem, Açık Yeşil Alan, Deprem Toplanma Alanı

Plant design scenarios in disaster-sensitive landscape planning and designs

Abstract: Turkey is a country that is prone to natural disasters and to be affected by climate changes due to its settlement location. Various climate disasters, global warming, population growth, intense migrations, unplanned areas in cities are increasing rapidly. Natural disasters such as earthquakes, floods, droughts, accidents in petrochemical plants, explosions of steam boilers and man-made disasters threaten and affect the development of cities. For this reason, it is necessary to give importance to concepts such as scientists, city planners, landscape architects, durable cities and durable landscape. This study discusses the issue of resilient parks or public open spaces (POS) from the perspective of resilient cities. During an earthquake, POS can be important for confidence. In addition to increasing the daily use of the POS in normal times, it is important to design it in a way that can serve during earthquakes. This study aims to create and develop effective areas during earthquakes by examining and exploring earthquake resistance criteria during the planning and design of the POS. Accessibility, effectiveness, safety and multi-functional principles were examined from the earthquake resistance criterion. This study can be considered as a valuable resource to increase earthquake resistant cities.

Keywords: Niğde, Landscape, Earthquake, Public Open Spaces, Earthquake Assembly, Area.

NDVI verileriyle bitki örtüsünün zamansal değişiminin incelenmesi: Niğde örneği

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Özet: Uzaktan algılama (UA) ve coğrafi bilgi sistemleri (CBS), doğal kaynakların analizinde ve ilgili planlama çalışmalarında en yaygın kullanılan teknikler arasındadır. Mekânsal planlamada kullanılan UA ve CBS verileri, bilgi gerektiren çeşitli bilim dallarına cevap vermektedir. Ayrıca uzaktan algılama verileri, araziyi farklı aralıklarla ve farklı çözünürlüklerde görüntüleyerek gerekli bilgileri hızlı ve güvenilir bir şekilde sağlarlar. Özellikle uzaktan algılama verilerinin kaynağı olan uydu görüntüleri birçok doğal ve kültürel veri içermektedir. Bu veriler, farklı bantlardaki uydu alıcıları aracılığıyla elektromanyetik enerjilerin kaydedilmesi yoluyla toplanır. Her bandın hassas olduğu yansıma verisine sahiptir. Birden fazla bant birleşerek görüntü oluşturabileceği gibi, tek bir banttan oluşan görüntüler de vardır. İşlenmemiş uydu görüntülerinden veri elde etmek için istatistiksel analiz ve yorumlama teknikleri kullanılmaktadır. Sınıflandırma yöntemleri, bu verileri yararlı kılmak ve yeryüzü hakkında bilgi toplamak için en sık kullanılan yöntemlerdir. Bu yöntemler amaca ve veri tiplerine göre farklılık göstermektedir. Geleneksel yöntemlerle elde edilmesi imkânsız olan flora bilgilerine artık uzaktan algılama yöntemleriyle rahatlıkla ulaşılabilmektedir. Normalleştirilmiş Fark Bitki Örtüsü İndeksi (NDVI), bitki örtüsü indeksinin varlığını incelemek için yakın kızılötesi (NIR) ve görünür kırmızı (R) ışık kullanılarak formüle edilmektedir. NDVI hesaplamasında dijital sayı (DN) ve farklı bant değerleri kullanılır. Bu piksel bantlarından bir dijital sayı değeri oluşmaktadır. Bu çalışmanın amacı, Niğde İlinin 2003 – 2013 – 2023 yılları arasında bitki örtüsündeki değişimini uzaktan algılamada yoğun olarak tercih edilen NDVI yöntemi ile ortaya koymaktır. Niğde İlinin yeşil alan varlığında özellikle 2003 – 2013 yılları arasında büyük kayıp meydana geldiği, daha sonraki yıllarda yeşil alan varlığının kısmen artmış olsa bile bunun tarımsal uygulamalardan dolayı meydana geldiği, ormanlık alanlarının azaldığı tespit edilmiştir.

Anahtar Kelimeler: Uzaktan Algılama, Coğrafi Bilgi Sistemi, NDVI, Vejetasyon, Niğde.

Sürdürülebilir peyzaj uygulamaları kapsamında bazı parklardaki süs bitkilerinin kurakçıl peyzaj açısından irdelenmesi: "Muğla ili Ortaca ilçesi örneği"

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Özet: Her geçen gün miktarı azalarak değeri artan suyun tüm canlılar için önemi oldukça yüksektir. Nüfus yoğunluğu, sanayileşme, küresel ısınma gibi nedenlere bağlı olarak ihtiyaç duyulan ve kullanılan su miktarının artması, ciddi çevre sorunlarına neden olarak mevcut su kaynaklarının daha akılcı bir biçimde değerlendirilmesi zorunluluğunu ortaya çıkarmaktadır. Bu doğrultuda suyun etkin kullanılması için yeni çözümler aranmış ve çeşitli kavramlar ortaya atılmıştır. Bu kavramlardan biri 'Kurakçıl Peyzaj' ya da diğer bir ismiyle 'Xeriscape' yaklaşımıdır. Araştırma, 2020 yılında Muğla İli Ortaca İlçesinde daha yoğun kullanılan parklarda gerçekleştirilmiştir. Çalışmaya konu olan parkların büyüklükleri ile mevcut süs bitkileri tespit edilerek su istekleri açısından değerlendirmeler yapılıp kurakçıl peyzaj ilkeleri doğrultusunda irdelenmiştir.

Sonuç olarak araştırmada incelenen tüm parklarda su isteği az ve orta düzeydeki türler ile doğal bitkilere yer verilmiş olmasının kurakçıl peyzaj yaklaşımı açısından büyük bir avantaj oluşturduğu belirlenmiştir. İncelen tüm parklar klasik peyzaj tasarımı kapsamında gerçekleştirilmiş olmasına rağmen su isteği yüksek bitki türlerine yer verilmemesi kurakçıl peyzaj ilkeleri doğrultusunda hareket edildiğinin bir göstergesidir.

Anahtar Kelimeler: Kurakçıl Peyzaj, Süs Bitkileri, Suyun Etkin Kullanımı.

Gelenekselden geleceğe tasarım trendleri ve 21. yüzyıl mimarlığı

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Özet: Mimarlık çok boyutlu, çok farklı bileşenlere sahip bir tasarım pratiğidir. Mimarlık hakkında düşünmek, tartışmak, doğru ve etkin tasarım için araştırmak, tasarım felsefesi ortaya koymak ise mimarlık teorisini oluşturmaktadır. Antik dönemden bu yana tartışılan mimari tasarımın arka planı ve teorik tabanı 20. Yüzyıl'dan itibaren farklı bir konuma taşınmıştır. Teknolojideki gelişmelere bağlı olarak birçok kuramsal yaklaşım ve tasarım anlayışı değişmekte ve bu dönemde binalar hızla teknolojik, tematik ve akıllı binalara dönüşmektedir. Böylece geleneksel yaşam alanları, mekan organizasyonunda yeni gereksinimleri beraberinde getiren yüksek teknolojili binalara dönüşmektedir. Bu süreçte mimarlık da bireylerin ihtiyaçlarına göre değişmekte ve estetik yaklaşımlar da dönüşen teknolojilerle birlikte değişmektedir. Bu bağlamda, ısı, renk, aydınlatma, psikoloji, sürdürülebilir akıllı yapı malzemesi, akıllı güvenlik gibi kişisel tercihler için dijital ve elektronik sistemlerin kullanımı ile fütüristik uygulamalar mimari tasarımda ana belirleyiciler olmaktadır. Mimarlık, mekanik ve elektronik alanındaki gelişmelerden doğrudan etkilenmekte, güncel tasarım ve teknolojik trendler bireylere daha nitelikli, konforlu mekânlar sunabilmektedir. Kentsel çevrelerde gerçekleşen birçok kentsel aktivite, algoritmik, robotik ve nano teknolojilerin kullanımı ile iç mekanlara taşınmaktadır. Bunun yanı sıra geleneksel yapı malzemelerinin yeni yorumlar ile kullanımı yaygınlaşmakta; hem ulusal hem de küresel ölçekte farklı, özgün ve sıra dışı yapılar tasarlanabilmektedir.

Bu bildiride, mekân algısı ve tasarım kavramları açısından güncel gelişmeler ve küresel eğilimler kapsamında geleceğin mimarisi irdelenecektir. Her gün değişen ve dönüşen tasarım ve yapım teknolojileri yapay zekanın tasarım ve yapılanma sürecinde kullanımı ile evrilen mimarlık olgusu, akıllı binalar, kinetik yapılar, genetik mimarlık ve fütüristik mekanlar kapsamında değerlendirilmiştir. Yanı sıra geleceğin kentsel çevreleri ve mimarlık mekânsal, zamansal ve anlamsal olarak farklı boyutları ile tartışılmıştır.

Anahtar Kelimeler: Mimarlık, Güncel Tasarım Trendleri, Yapay Zeka, Genetik Mimarlık, Bina Teknolojileri

21st. Century architecture and desing trends from traditional to future

Abstract: Architecture is a multidimensional design practice having various components. On the other hand, thinking, discussing, researching for an effective design and setting the philosophy of design is the theorethical background of architecture which was discussed till the period of antiquity has reached to a different stage till 20th Century. Many theorethical approaches and design concepts are

changing due to the developments in technology and buildings were transformedrapidly to technological, thematic and smart buildings in this period. So, traditional living environments are turning into high tech buildings which brings new needs in space organisation. By this process, architecture is also changing by the needs of individualsand aesthetic approaches are also changing by the transforming technologies. In this context, futuristic applications became as the main determnants in architecturaldesign by the use of digital systems and electronicsfor personal preferences such as heat, color, lighting, psychology, sustainable smart building material, smart security and so on. Architecture is influenced directly from the developments in the period of mechanics, and electronics. So, architectural design has the chance of offering people more qualified, comfortable spaces as far ascurrent design and technological trends are concerned. Many urban activities that take place in urban environments are carried to the inner spaces by the use of algorithmic, robotic and nano Technologies. Besides the use of traditional building material with new interpretation is commonly used. Thus, different, unique and extraordinary buildings are created in this context both at ational and global scales.

In this decleratoin, the architecture of future was discussed due to the current developments and global trends as far as space perception and design concepts are concerned. Futuristic architecture which is evolving by new trends and artificial intelligence were evaluated in the frame of smart buildings, kinetic buildings, genetic architecture and futuristic spaces.On the other hand, living spaces of future, architecture and space phenomenon were evaluated as far as time, space and meaning are concerned.

Keywords: Architecture, Current Design Trends, Nano Architecture, Artificial Intelligence, Building Technologies.

Uçucu kül ve yüksek fırın cürufunun alkalilerle aktive edilmesi sonucu elde edilen bağlayıcı ile üretilen SIFCON'un darbe özelliklerinin belirlenmesi

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Özet: Bu çalışmada; çimento kullanılmadan, uçucu kül (UK) ve yüksek fırın cürufu (YFC) gibi endüstriyel atıkların, sodyum silikat (Na_2SiO_3) ve sodyum hidroksit (NaOH) gibi alkaliler ile aktive edilmesi sonucu üretilen bağlayıcı ile çimento matrisi enjekte edilmiş lif donatılı beton (SIFCON) matrisi üretilmiştir. Karışımlar %50 UK ve %50 YFC malzemesi kullanılarak hazırlanmıştır. Üretilen SIFCON matrisine farklı miktarlarda (hacimce %3, %6, %9) ve farklı narinlikteki (40, 55) çelik lifler eklenerek SIFCON numuneleri hazırlanmıştır. Hazırlanan SIFCON numunelerinin mekanik özelliklerini belirlemek amacıyla basınç ve eğilme dayanımı deneyleri yapılmıştır. Ayrıca darbe performansını belirlemek için darbe dayanımı deneyi yapılmıştır. Yapılan deney sonuçlarına göre, SIFCON numunelerinde lif miktarı arttıkça mekanik özelliklerin olumlu yönde etkilendiği ve darbe performansının da arttığı tespit edilmiştir.

Anahtar Kelimeler: SIFCON, uçucu kül, yüksek fırın cürufu, alkali aktivasyon sistemleri, çelik lif.

Akıllı şehirlerde sürdürülebilir ulaşım planlaması için CBS tabanlı VIKOR tekniği ile otopark uygunluk analizi

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Özet: Şehirlerde nüfus yoğunluğu ve bunun paralelindeki araç sayısındaki artış şehir içi ulaşım sistemlerini olumsuz yönde etkilemiştir. Şehirlerde sürdürülebilir ulaşım ve trafik yönetiminde önemli bir rol oynayan otopark alanlarının eksikliği, yanlış yerlere planlanması ve tesis edilecek otoparklara yapım önceliği verilmemesinden kaynaklı problemler yaşanmaktadır. Bu çalışmada akıllı şehirlerde sürdürülebilir ulaşım planlaması için literatüre dayalı olarak otopark uygunluk analizinde etkili kriterler Ulaşım, Ekonomi & Finans ve Potansiyel Çekim ana grupları içerisinde 23 kriter ağılıkları ile tanımlanmıştır. İstanbul'un Tuzla ve Pendik ilçeleri ile Kocaeli'nin Gebze, Çayırova ve Darıca ilçelerinde tanımlanan kriterler ve kriter ağılıkları ile CBS tabanlı otopark uygunluk analizi gerçekleştirilmiştir. Tüm ilçelerde belirli alanlarda uygun yerler tespit edilmiştir. Uygun alanlar genellikle doğrudan nüfusun ve çeşitli kentsel donatıların yoğun olduğu yerler olarak gözlemlenmiştir. Uygun otopark alanların kendi içerisinde sıralanabilmesi için öncelikle çalışma alanı için üretilen final otopark uygunluk analiz sonuçlarındaki yüksek uygunluk değerine sahip alanlar tespit edilmiştir. Tespit edilen yüksek uygunluktaki alanlar Urban Atlas Kentsel Arazi Sınıfları ile CBS ortamında çakıştırılmıştır. Bu bağlamda Pendik ilçesinde 5, Tuzla ilçesinde 3, Gebze ilçesinde 1 alternatif otopark alanı bölgesel olarak belirlenirken, Çayırova ve Darıca ilçesi için alternatif tespit edilmemiştir. Belirlenen alternatiflerin her birinin ilgili kriterlerden aldığı değerler CBS ortamında belirlenerek, VIKOR tekniği ile uygun otopark alanlarının kendi içerisinde önceliklendirilmesi gerçekleştirilmiştir.

Anahtar Kelimeler: Akıllı Şehirler, Otopark Uygunluk Analizi, Sürdürülebilir Ulaşım Planlaması, VIKO.

Ayarlı sıvı sönümleyicili yapıların deprem etkisindeki davranışlarının deneysel olarak incelenmesi

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Özet: Bir yapının dinamik özelliklerini değiştirmek ve titreşimini sönümlemek için rijit dikdörtgen bir tank içindeki sıvının hareketine dayanan pasif sönümleyici türü olan ayarlı sıvı sönümleyici (Tuned Liquid Damper: TLD) incelenmiştir. Deprem yer hareketlerine maruz kalan bir yapıya monte edilmiş ve uygun şekilde tasarlanmış bir TLD'nin yapının bu yer hareketlerine tepkisini önemli ölçüde azaltabileceğini göstermektedir. Bu çalışmada üç katlı indirgenmiş bir kayma çerçevesi modelin tek eksenli sarsma tablasında gerçek deprem yer hareketleri etkisindeki davranışı deneysel olarak incelenmiştir. Gerçek deprem kayıtları olarak El Centro (1940), Kobe (1995) ve Northridge (1994) depremleri kullanılmış ve seçilen ölçeklendirme faktörü λ kullanılarak küçültülmüş ve tek eksenli sarsma tablasında çerçeve sisteme etki ettirilmiştir. Bu çalışmada da uygulandığı gibi TLD'ler genellikle yapının en üst katına yerleştirilir. TLD'nin tasarım parametrelerinden birisi olan durgun haldeki sıvının yüksekliği değiştirilerek üç farklı gerçek deprem yer hareketleri altında davranışı incelenmiştir. Bu çalışmada sıvı olarak su kullanılmıştır. Su yükseklikleri 20 mm - 120 mm arasında 20 mm arttırılarak TLD'li sistemin gerçek deprem yer hareketlerinde deneyleri yapılmıştır. TLD'deki suyun ağırlığı kadar kütleler TLD'siz sisteme eklenerek aynı deneyler tekrarlanmıştır. Modelin referans katlarındaki ivme ve deplasman değerleri bu üç yer hareketi koşullarında ölçülmüş, TLD'li ile TLD'siz sistemler karşılaştırılmıştır. Deprem etkisindeki TLD'lerin en üst kat pik ivme ve her bir kat pik deplasman değerlerini TLD'siz sisteme göre belirgin bir şekilde düşürdüğü görülmüştür. Doğru tasarlanmış bir TLD su yüksekliğinin deprem etkisindeki bir yapının davranışını önemli ölçüde iyileştirebileceği görülmüştür.

Anahtar Kelimeler: Ayarlı sıvı sönümleyici (TLD), deprem, sarsma tablası deneyi, titreşim deneyi, ölçeklendirme.

The methods to improve asphalt ductility: a review

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Özet: This study focuses on various methods of increasing ductility to improve the durability of asphalt roads. Polymer additives increase the elasticity of asphalt, making surfaces more resistant to deformation. Resin modification has the potential to strengthen the strength of asphalt mixtures, minimizing cracking and fatigue damage. Rubber additives increase the durability and flexibility of asphalt, contributing to long-term road construction. The use of nanomaterials in asphalt modification has also attracted attention in recent years. The addition of materials such as nano titanium dioxide to asphalt can increase the lifetime of asphalt roads by reducing negative effects such as thermal oxidation aging and deformation. These various methods allow asphalt roads to be built in a more durable, sustainable and safe manner by improving ductility of asphalt.

Anahtar Kelimeler: Asphalt ductility, polymer additives, resin modification, rubber additives, nano materials.

Türkiye bina deprem yönetmeliği 2018 tekrarlanma periyotlarına göre sahaya özel deprem analizi yapılması ve deprem tasarım spektrumu ile karşılaştırılması

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Özet: Bu çalışmada marmara bölgesinde yapılması planlanan yüksek bir yapının (BYS=1) tasarımında kullanılacak olan deprem yüklerinin en doğru şekilde hesaplanıp kullanılabilmesi için, sahaya özel deprem analizi yapılmıştır. Sahaya özel deprem analizi yapılırken olasılıksal sismik tehlike analizi yöntemine başvurulmuş ve TBDY 2018'de yer alan tekerrür sürelerine bağlı olarak oluşturulan deprem yer hareketi düzeyleri kullanılmıştır. Elde edilen deprem spektrum grafikleri TBDY 2018'e göre interaktif deprem tehlike haritasından elde edilen tasarım spektrumu ile karşılaştırılmıştır.

Anahtar Kelimeler: Deprem tepki spektrumu, sismik tehlike analizi, sahaya özel deprem analizi.

BIOLOGY AND BIOTECHNOLOGY

Биологические особенности *Fritillaria walujewii* Regel в условиях Кыргызстана

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АННОТАЦИЯ: В зависимости от физико-географического положения Кыргызстана существует флора, состоящая из разных видов растений. В республике произрастает 4100 видов высших растений. Охватывая 2% мировой флоры, включает в себя 875 родов и 140 семейств. Во всем мире род Fritillaria насчитывает 158 видов. Цель исследования – описать биологические особенности вида *Fritillaria walujewii* из рода Fritillaria, семейства Liliaceae. Проанализирован научный материал, в которых были проведены разносторонние исследования с данным объектом. *Fritillaria walujewii* – однодольный эфемероид, описанный впервые русским ботаником Е.Л. Регелем в 1879 г. Растет на высоте 1500-2600 метров над уровнем моря. В Кыргызстане данный вид произрастает в еловых и арчевых лесах, в зарослях, на лугах среди кустарников. Цветки, также как и у других видов Fritillaria, поникшие, колокольчатые. Изнутри они красно-бардовые с белыми крапинками, снаружи бледные, но тоже с рисунками. Коробочки граненные. По нашим исследованиям стало известно, что климатические факторы имеют большое значение для роста и развития эфемероидов в горной местности. В зависимости от климатических условий изменяются их морфологические и биологические характеристики. В условиях Кыргызстана, нередки весенние снегопады и холода, которые губительно действуют на ранневесенние виды растений. В Кыргызстане *Fritillaria walujewii* распространен во Внутреннем и Центральном Тянь-Шане. Из-за своей ценности как декоративного растения местные жители, данный вид выкапывают и выращивают у себя во дворе. По литературным данным луковица этого растения богат алкалоидами, сапонинами и используется в фармакологии. *Fritillaria walujewii* в Китае занесен в Красную книгу. Из за малочисленности данного вида в Кыргызстане, следовало бы тоже занести в список охраняемых растений.

Ключевые слова: Кыргызстан, *Fritillaria walujewii,* биологические особенности, условия выращивания, эфемероид, охрана.

Biological characteristics of *Fritillaria walujewii* Regel in the conditions of Kyrgyzstan

Summary: Depending on the physical and geographical position of Kyrgyzstan, there is a flora consisting of different types of plants. 4100 species of higher plants grow in the republic. Covering 2% of the world flora, it includes 875 genera and 140 families.

Worldwide, the genus Fritillaria contains 158 species. The aim of the study is to describe the biological characteristics of the species *Fritillaria walujewii* from the genus Fritillaria of the family Liliaceae. The scientific material was analyzed, in which versatile studies were carried out with this object. *Fritillaria walujewii* is a monocotyledonous ephemeroid, first described by the Russian botanist E.L. Regel in 1879. It grows at an altitude of 1500-2600 meters above sea level. In Kyrgyzstan, this species grows in spruce and juniper forests, in thickets, in meadows among shrubs. The flowers, like those of other species of Fritillaria, are drooping, bell-shaped. From the inside they are red-burgundy with white specks, outside they are pale, but also with drawings. Faceted boxes. According to our research, it became known that climatic factors are of great importance for the growth and development of ephemeroids in mountainous areas. Depending on climatic conditions, their morphological and biological characteristics change. In the conditions of Kyrgyzstan, spring snowfalls and cold are not uncommon, which have a detrimental effect on early spring plant species. In Kyrgyzstan, *Fritillaria walujewii* is distributed in the Inner and Central Tien Shan. Because of its value as an ornamental plant, locals dug up this species and grow it in their backyard. According to the literature, the bulb of this plant is rich in alkaloids, saponins and is used in pharmacology. *Fritillaria walujewii* in China is listed in the Red Book. Due to the small number of this species in Kyrgyzstan, it should also be included in the list of protected plants.

Keywords: Kyrgyzstan, *Fritillaria walujewii*, biological characteristics, growing conditions, ephemeroid, protection.

Implicatons of the recent aphid (Aphidoidea: Hemiptera) studies conducted in different localities of Türkiye

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Abstract: Aphids are one of the most important insect group that are fascinated researchers due to their unique features such as telescopic generations, cyclical parthenogenesis, higher adaptive capacity and being a model population to study ecological consequences of the global warming. Recent climatic fluctuations are going to effect both Türkiye and other Turkic countries and in turn result in significant amount of agricultural crop loose are caused by aphids feeding. Recently studies carried at the different localities of Türkiye clearly indicated that there should be more studies organized as each detailed study made about 10% contribution to Türkiye aphid fauna and list of the aphid species was increased to 644. Furthermore, there are also non-ignorable potential to met with alien-invasive species, even more than 0.50 alien-inasive species per year based on long term calculations. During each detailed study, undetermined colony appearances, new host plant-aphid interactions and ant attendance was incorporated into the world aphid literature. Findings of the recent studies clearly supported the idea that there are going to be more contribution to World aphid fauna both from Türkiye and Turkic World countries as there are wider unstudied landscapes and agriculture still play important role in countries development.

Keywords: Aphid, global warming, Türkiye.

Türkiye'nin farklı lokalitelerinde son zamanlarda afitlerle (Aphidoidea: Hemiptera) gerçekleştirilen çalışmaların ortaya koydukları

Özet: Afitler kendilerine özgü teleskopik nesiller, döngüsel partenogenez, yüksek adaptasyon kapasitesi ve küresel ısınmanın ekolojik sonuçlarının çalışılmasında model bir popülasyon olmaları nedeniyle araştırmacıların dikkatini çeken en önemli böcek gruplarından biridir. Son zamanlardaki iklimsel değişimler hem Türkiye'yim hemde Türk dünyası ülkelerini etkileyecek ve afitlerin beslenmelerinden kaynaklanan tarımsal ürün kayıpları artacaktır. Türkiye'nin farklı loklalitelerinde son zamanlarda gerçekleştirilen çalışmaların herbirinde Türkiye afit faunasına ortalama %10 katkıda bulunulmuş olmasıyle Türkiye afit faunasının tür sayısının 644'e yükselmiş olması daha fazla detaylı çalışmanın gerekliliğini ortaya koymuştur. Buna ek olarak ihmal edilemeyeck düzeyde istilacı afit türünün olduğu, uzun yıllar verilerine dayanan hesaplamalara göre yıllık 0.5 bireyden fazla istilacı türün olduğu belirlenmiştir. Her bir çalışma süresince, yeni koloni görünümü, yeni konak bitki-afit etkileşimi ve yeni karınca-afit ilişkisi bilgileri dünya afit faunası literatürüne kazandırılmıştır. Son zamanlarda düzenlenen çalışmalar gerek Türkiye'de gerekse Türk dünyası ülkelerinde çalışılmamış alanların fazlalığı ve tarımın önemli rol oynaması nedeniyle daha fazla

katkının detaylı çalışmalarla yapılabileceği yaklaşımını güçlü bir şekilde desteklemektedir.

Anahtar Kelimeler: Afit, küresel ısınma, Türkiye

Argiope bruennichi (Araneae: Araneidae) kokonunun biyoadsorban olarak kullanımı ile ilgili ön çalışmalar

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Özet: Örümcekler birçok amaç için örümcek ağı olarak bilinen bir biyomateryal üretirler. Dişi örümcekler yumurtaları korumak için kokon adı verilen ağdan yapılmış bir kese örerler. Bu çalışmada, *Argiope bruennichi* türüne ait kokonların sulu ortamdaki Pb (II), Cd (II), Cr (III), Ni (II), Co (II) ve Cu (II) ağır metallerinin gideriminde kullanılabilirliğini araştırılmıştır. pH 7 değerinde en yüksek giderim değerlerinin olduğu tespit edilmiştir. Ayrıca, örümcek kokonlarının sulu çözeltideki metal iyonlarından Pb (II), Cd (II), Cr (III) ve Cu (II) iyonları için pH 7'deki giderim değerleri %90 ve üzerinde olduğu saptanmıştır. Ni (II) ve Co (II) metal iyonları için giderim değerleri %70-80 aralığında gerçekleşmiştir.

Anahtar Kelimeler: Kokon, Ağır metal, Adsorban, Kitin, Örümcek, Araneae.

Bazı yer örümcekleri (Araneae: Gnaphosidae) cinslerinin seta morfolojilerinin karşılaştırılması

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Özet: 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 3 cinse ait 3 türün seta morfolojileri çalışılmıştır. *Micaria formicaria* (Sundevall, 1831), *Berlandina plumalis* (O. Pickard-Cambridge, 1872) ve *Civizelotes caucasius* (L. Koch, 1866) türlerinin genellikle abdomen ve sefalotoraks gibi vücut kısımları üzerinde yer alan setaların morfolojileri Scanning Electron Microscopy (SEM) kullanılarak belirlenmeye çalışılmıştır.

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

Akkaya Baraj Gölünün metagenomik olarak değerlendirilmesi

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Özet: Çevresel DNA (eDNA) toprak, sucul habitatlar, biyofilmler gibi çeşitli alanlardan izole edilebilir ve serbest yaşayan ya da komunitelerde bulunan mikroorganizmaların taksonomik ve işlevsel durumu hakkında bilgi verir. Yeni nesil teknolojiler, bulut ve bilişim sistemlerinin gelişmesi ile büyük biyolojik topluluklar hakkında bilgi edinmek kolaylaşmıştır. Niğde Ömer Halisdemir Üniversitesi Kampüsünde bulunan ve Niğde ili atık deşarj alanı olan Akkaya Baraj gölünün mikrobiyal florası metagenomik olarak belirlenmiştir. Akkaya Baraj gölünden mayıs ayında Niğde Ömer Halisdemir Üniversitesi Kampüs alanı içinde yer alan otobüs duraklarına yakın kıyı kenar çizgisinden örnek alınmıştır. Su örneğine ait sıcaklık değeri 22.5°C, pH değeri 7.91, ve ORP değeri -61 mV olarak ölçülmüştür. Yapılan analizlerde örnekte %90,88 oranında bakteriyel genom, %9,12 oranında ise tanımlanmamış genom tespit edilmiştir. Cins analizlerinde en yüksek oranda Zoogloea (%9,6) bulunduğu görülmüştür. Bu cins üyeleri ise organik maddenin bol bulunduğu ortamlarda baskın halde bulunabilirler.

Anahtar Kelimeler: Metagenomik analiz, yeni nesil dizileme, Akkaya baraj gölü, mikrobiyal flora

Endemik *Achillea ketenoglui* H.Duman bitki özütünün antimikrobiyal, anti-biyofilm ve anti-quorum sensing özelliklerinin belirlenmesi

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Özet: *Achillea* cinsi *Astraceae* familyasından, çoğunluğu Avrasya'da yayılış gösteren yaklaşık 150 tür içermekte, Anadolu'da 24'ü endemik 48 taksonla yayılış göstermektedir. *Achillae ketenoglui* H. DUMAN tıbbi aromatik özelliklerinden dolayı en önemli endemik çalılardan bir tanesidir. *Achillea* türlerinin iltihabı azaltmak, romatizmayı iyileştirmek, grip ve ateşli soğuk algınlığı için kullanıldığı bilinmektedir. *Achillea* türlerinin birçok biyolojik ve farmasötik özelliği zaman içinde yapılan çalışmalarla ortaya konulmuştur. Bu özelliklerden bazıları; anti-inflamatuar, antifungal, antibakteriyel, antimikrobiyal, antioksidan, antiyabetik, yara iyileştirici, antikanserdir. Yapılan çalışmanın amacı, Türkiye'de endemik bir tür olan *A. ketenoğlu* H. DUMAN bitki özütünün antimikrobiyal, anti-biyofilm ve anti-quorum sensing özelliklerinin belirlenmesi ile günümüzde ciddi halk sağlığı problemlerine yol açan, antibiyotik direnci, biyofilm oluşumuyla gıda kontaminasyonu ve hastane enfeksiyonlarının yayılımı gibi durumlara alternatif çözüm oluşturacak bir ajan belirlenmesidir. Bu amaçla toz haline getirilmiş kuru bitkiden metanol özütü çıkarılmış, belirlenen bakteri ve maya suşları üzerine, mikrodilüsyon yöntemiyle, antimikrobiyal özellikleri, biyofilm inhibisyonu ve giderimi ve *Chromobacterium violaceum* bakterisi üzerinde anti-quorum sensing etkileri belirlenmiştir. Araştırmamızda yapılan çalışmalar sonucunda, *A. ketenoglui* H.DUMAN metanol özütünün en iyi antimikrobiyal etkiyi çalışılan gram pozitif bakterilerden *E. faecalis* ve *B. cereus* bakterileri üzerinde gösterdiği, 5 ve 10 mg/ml konsantrasyonlarda biyofilm oluşumunu en iyi *C. tropicalis* ve *B. cereus* suşlarında engellediği, *C. tropicalis, C. albicans* ve *E. faecalis* suşlarında biyofilm giderimini sağladığı belirlenmiştir. Bitki özütü, 20 ve 40 mg/ml konsantrasyonlarda anti-quorum sensing etkisi bulunduğu görülmüştür. Çalışmalarımız sonucunda *A. ketenoglui* H.DUMAN bitkisinin metanol özütünün düşük konsantrasyonlarda antimikrobiyal, anti-biyofilm ve anti-quorum sensing özelliği bulunan, alternatif ve doğal bir mikrobiyal kontrol ajanı olabileceği yönünde gelecek vadettiği düşünülmektedir.

Anahtar Kelimeler: *Achillea ketenoglui* H.Duman, antimikrobiyal, anti-biyofilm, anti-quorum sensing

Determination of genetic variations in *Nannospalax xanthodon*, distribution in Turkey, using the NADH dehydrogenase 1 (ND1) gene

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Abstract: In this study, the molecular phylogeny of *N. xanthodon* mole rats distributed in Turkey was studied using the ND1 gene region. N. xanthodon Bolu 2n=52 cytotype populations formed an independent monophyletic group in phylogenetic analyzes and K2P genetic distance values between other cytotypes were found to be greater than 0.07. This indicates the possibility of this cytotype being a cryptic species.

Keywords: *N. xanthodon*, Mitochondrial DNA, ND1, Blind mole rat.

Antioxidant properties of *Trifolium pratense* in peroxidation of lipids

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Absract: Antioxidants in the body are involved in the neutralization of free radicals formed in the process of lipid peroxidation. The antioxidant mechanism prevents the development of pathological processes in the body. Vitamin E, which has high antioxidant properties, is found in plants including *Trifolium pratense*. In addition to vitamins, the extract of the plant *Trifolium pratense* contains glycosides (trifolin and isotrifolin), essential oils, organic acids (coumaric and salicylic), flavonoids, higher fatty acids (palmitin, stearin, linol). In this study, the antioxidant effect of *Trifolium pratense* on the processes of lipid peroxidation in the body of laboratory white mice was determined. It is known that saturated fatty acids are formed from the primary product of lipid peroxidation in cells. The end product of lipid peroxidation is malondialdehyde. Therefore, to study lipid peroxidation, we studied antioxidant enzymes - catalase, superoxide dismutase and products of lipid peroxidation: diene conjugates, malondialdehyde according to qualitative criteria. The intensity of lipid peroxidation was studied by determining the concentration of diene conjugates of malondialdehyde and the activity of enzymes of the antioxidant system - superoxide dismutase and catalase. As a result of the study, it was found that after feeding *Trifolium pratense* plants into the feed of experimental animals, the activity of enzymes of the antioxidant defense system increases in the body and the concentration of lipid peroxidation products decreases.

Keywords: *Trifolium pratense,* Antioxidant, Peroxide Oxidation of Lipids, Superoxide dismutase, Catalase.

Антиоксидантные свойства *Trifolium pratense* при перекисном окислении липидов

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Аннотация: антиоксиданты в организме участвуют в нейтрализации свободных радикалов, образующихся в процессе перекисного окисления липидов. Антиоксидантный механизм предотвращает развитие патологических процессов в организме. Витамин Е, обладающий высокими антиоксидантными свойствами, содержится в растениях в том числе и *Trifolium pratense*. Помимо витаминов экстракт растения *Trifolium pratense* содержит гликозиды (трифолин и

изотрифолин), эфирные масла, органические кислоты (кумаровую и салициловую), флавоноиды, высшие жирные кислоты (пальмитин, стеарин, линол). В данном исследовании определено антиоксидантное действие *Trifolium pratense* на процессы перекисного окисления липидов в организме лабораторных белых мышей. Известно, что насыщенные жирные кислоты образуются из первичного продукта перекисного окисления липидов в клетках. Конечным продуктом перекисного окисления липидов является малоновый диальдегид. Поэтому для изучения перекисного окисления липидов нами были исследованы антиоксидантные ферменты - каталаза, супероксиддисмутаза и продукты перекисного окисления липидов: диеновые конъюгаты, малоновый диальдегид по качественным критериям. Интенсивность перекисного окисления липидов изучали путем определения концентрации диеновых конъюгатов малонового диальдегида и активности ферментов антиоксидантной системы - супероксиддисмутазы и каталазы. В результате исследования установлено, что после скармливания в корм опытным животным растения *Trifolium pratense* в организме повышается активности ферментов системы антиоксидантной защиты и снижается концентрация продуктов перекисного окисления липидов.

Ключевые слова: *Trifolium pratense*, антиоксидант, перекисное окисление липидов, супероксиддисмутаза, каталаза.

Determining the stress levels of the host plants treated with some fungi used in controlling aphids

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Özet: Aphids are a very important agricultural pest in the world that feeds on the sap of many herbaceous and woody plants and increases the damage rate by reaching a large number of individuals in a short time. In controlling the aphids, biological control methods are more effective and environmentally friendly due to the negative effects of chemical applications on the plant and the environment. For this reason, the use of fungi has recently become widespread in the control of aphids. In this study, it is aimed to obtain some information about whether the *Trichoderma* spp. and Be*auveria bassiana* fungi, which are used as biocontrol agents, cause stress in the host plant. For this reason, antioxidant activity and changes in phenolic compounds were investigated in cabbage *Brassica oleracea* plant treated with fungi.

Anahtar Kelimeler: Aphid, *Beauveria bassiana*, Biological control, *Brassica oleracea,* Global warming, *Trichoderma spp*, stress.

Priestia aryabhattai'nin bazı fitopatojenlere karşı antifungal aktivitesinin belirlenmesi

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Özet: Son zamanlarda, çeşitli fitopatojenlerin biyolojik kontrolüne katkıda bulunan biyoaktif bileşikler üreten endofitik bakterilere ilgi artmıştır. Bu çalışma, yeni izole edilip moleküler olarak tanımlanmış *Priestia aryabhattai'*nin bitki hastalıklarına neden olan ve önemli kayıplara neden olan fitopatojenik fungusların biyokontrolünde kullanılabilirliğini araştırmayı amaçlamıştır. Gerçekleştirilen denemeler sonucunda *P. aryabhattai'*nin en yüksek antifungal etkiyi % 50,42±0,52 inhibisyon oranı ile *Sclerotinia minor* 'a karşı gösterdiği, *Fusarium solani*'ye karşı ise inhibisyon etkisi göstermediği bulunmuştur. Bulgularımız, kimyasal pestisit kullanımının azaltılmasında ve bazı önemli bitki hastalıklarının biyokontrolünde *P. aryabhattai*'nin kullanılabileceğini göstermektedir.

Anahtar Kelimeler: Biyokontrol, antifungal aktivite, endofitik bakteriler, fitopaatojenik fungus, *Priestia aryabhattai*.

New host plant aphid interactions from Karaman, Antalya, Muğla provinces

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Abstract: Aphids are obligate phytophagous insects, they have dynamic relations with their host plant, and therefore the determination of the aphid-host plant relationship is crucial. Related to environmental conditions aphids have the ability to develop new host plant interactions. During the detailed study conducted in study area, there are new aphid-host plant relations were detected. *Myzus antirrhinii* was recorded on *Morus alba* for the first time*, Ficus carica* was incorporated into the host of *Rhopalosiphoninus staphyleae* and both *Brachycaudus cardui* and *Aphis spiraecola* were determined *Picnomon acarna* for the first time. Moreover, *Phloemyzus paasserini* was identified for the first time on leaves of *Populus* spp., and *Anthemidaphis oligommata* on the stem of *Anthemis* spp. One of the most interesting findings is that recording *Aphis multiflorae* on *Erica bocquetii* and determining *Aphis narzikulovi* on *Nepeta nuda* which are endemic plant species for Türkiye.

Keywords: Aphid, Host plant, Relation, Türkiye.

Биологические особенности *Fritdillaria pallidiflora* в условиях Кыргызстана

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Абстракт: Кыргызстан является уникальным природным хранилищем генофонда видов и на небольшой ее территории представлены все физико-географические пояса. Растения семейства *Liliaceae* распространены почти по всему земному шару; для них характерны длинные линейные листья и образование запасающих органов луковиц. Многие виды являются декоративными растениями.

Род Fritillaria – один из крупнейших родов семейства лилейных, насчитывающий около 1301-165 видов. Виды рода Fritillaria используются в качестве лекарства и пищи во всем мире. Были подробно рассмотрены различные хемодинамические компоненты, выделенные из рода Fritillaria, их структура и фитохимия, а также фармакология этих соединений. Во флоре Кыргызстана произрастают 4 вида рода Fritillaria. К ним относятся: *Fritillaria eduardii*, *F. pallidiflora*, *F. walujewii* и *F. ferganensis*. *Fritillaria pallidiflora* – эфемероид семейства Liliaceae порядка Liliales. В природных условиях произрастает на склонах гор в субальпийском поясе Средней Азии. *Fritillaria pallidiflora* Schrenk – редкий субэндемичный вид, встречающийся в основном поодиночке или небольшими популяциями на лугах на высоте 1200-2000 м над уровнем моря. Листья узколанцетные, бледно-зеленые. Цветки колокольчатые, поникающие, кремового цвета, с внутренней стороны – шахматный рисунок светло-коричневого оттенка, длиной 5-6 см. Луковица не имеет плотных чешуек. Из семян цветение растений происходит через 6-7 лет после посадки. Цветочки имеют резкий, не очень приятный запах. Fritillaria является важным родом и источником фармацевтически активных соединений, используемых в традиционной народной медицине. По литературным данным, *F. pallidiflora* содержит наименее токсичные алкалоиды по сравнению с другими видами рода Fritillaria. В связи с высокой чувствительностью горных экосистем Тянь-Шаня к антропогенному воздействию возникает необходимость особо тщательного контроля природопользования. Практическое решение многих задач по охране горных экосистем связано с охраной уникальной растительности гор.

Ключевые слова: Кыргызстан, *Fritillaria pallidiflora*, биологические особенности, условия выращивания, эфемероид, охрана.

Biological characteristics and growing conditions of *Fritillaria pallidiflora*

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Summary. Kyrgyzstan is a unique natural repository of the gene pool of species and all physical and geographical zones are represented on its small territory. Plants of the

family Liliaceae are distributed almost throughout the globe; they are characterized by long linear leaves and the formation of storage organs of the bulbs. Many species are ornamental plants.

The genus Fritillaria is one of the largest genera of the lily family, with about 1301-165 species. Species of the genus Fritillaria are used as medicine and food throughout the world. Various chemodynamic components isolated from the genus Fritillaria, their structure and phytochemistry, as well as the pharmacology of these compounds have been considered in detail. Four species of the genus Fritillaria grow in the flora of Kyrgyzstan. These include: Fritillaria eduardii, F. pallidiflora, F. walujewii and F. ferganensis. Fritillaria pallidiflora is an ephemeroid of the Liliaceae family of the order Liliales. Under natural conditions, it grows on the slopes of mountains in the subalpine belt of Central Asia. Fritillaria pallidiflora Schrenk is a rare sub-endemic species found mostly singly or in small populations in meadows at an altitude of 1200-2000 m above sea level. The leaves are narrow-lanceolate, pale green. The flowers are bell-shaped, drooping, cream-colored, on the inside - a checkerboard pattern of a light brown shade, 5-6 cm long. The bulb does not have dense scales. From seeds, flowering of plants occurs 6-7 years after planting. Flowers have a sharp, not very pleasant smell. Fritillaria is an important genus and source of pharmaceutically active compounds used in traditional folk medicine. According to the literature, F. pallidiflora contains the least toxic alkaloids compared to other species of the genus Fritillaria. Due to the high sensitivity of the Tien Shan mountain ecosystems to anthropogenic impact, there is a need for particularly careful control of nature management. The practical solution of many problems in the protection of mountain ecosystems is associated with the protection of the unique vegetation of the mountains.

Keywords: Kyrgyzstan, Fritillaria pallidiflora, biological features, growing conditions, ephemeroid, protection.

Bioethical arguments relevant to the use of genetically modified organisms

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Abstract: Today, new inventions that emerged with the development of the biotechnology industry allow the processing and shaping of the genome structures of organisms with agricultural value by biotechnological methods. With this point of view, gene transfers between different living species, where it is possible and/or not possible to change genetic materials by natural means, can be made by Recombinant DNA methods, and the genetic structures of these organisms are changed for different purposes. Due to these and similar reasons, genetically modified plants producing higher quality and more products have increased in the last quarter-century. In this study, the basic bioethical arguments of genetically modified organisms are mentioned. Five groups of key bioethical concerns have been expressed about genetically modified (GM) crops:

•Possible harm to human health
•Potential damage to the environment
•Unfavorable effects on conventional farming methods
•Excessive institutional domination (monopolization) • Social and cultural aspects of GM foods.

Keywords: Bioethics, Biorisk, Biodiversity, GM crop.

Microbiological analysis of vitamins produced by the pharmaceutical plant "Biovit"

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Absract: A study was made of the microbiological purity of vitamins, the pharmaceutical plant "Biovit" in Kyrgyzstan, in order to improve and strengthen the health of the population. In addition to proteins, fats and carbohydrates necessary for the body, vitamins are of particular importance for the body. Therefore, the study of hypo- and hypervitaminosis states of vitamins is considered one of the urgent problems. In most countries, off-label vitamin consumption is underdeveloped. For the safety of the population, it was determined by special methods that the microorganisms contained in the vitamins produced at the factory correspond to the generally accepted norm. The following methods were used in the study: surface cultivation, deep cultivation, cultivation, microscopy. As a result of microbiological analysis, it was found that yeast fungi, aerobic microorganisms and the bacterium Escherichia coli contained in vitamins C and D3 correspond to the norm. The daily dose of a complex of vitamins should be ingested with food. As a result of this study, it is recommended to use vitamins produced at the factory of the Biovit pharmaceutical plant if the body does not receive enough vitamins from food. Since this is one of the social problems of most countries, and is considered an urgent problem for biologists, medical workers, biomedical and biotechnological industries.

Keywords: Hypo-, Hyper- and avitaminosis, Vitamin C, Vitamin D_3, Microorganisms, Microscope.

Микробиологический анализ витаминов фармацевтического завода "Биовит"

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Аннотация. Проведено исследование микробиологической чистоты витаминов, фармацевтического завода «Биовит» в Кыргызстане, с целью улучшения и укрепления здоровья населения. Помимо необходимых для организма белков, жиров и углеводов, особое значение для организма имеют витамины. Поэтому изучение гипо- и гипервитаминозных состояний витаминов считается одной из актуальных проблем. В большинстве стран потребление витаминов не по прямому назначению развито недостаточно. Для безопасности населения специальными методами было определено, что микроорганизмы, содержащиеся в витаминах, выпускаемых на производстве, соответствуют общепринятой норме. В исследовании использовались следующие методы: поверхностное

культивирование, глубинное культивирование, культивирование, микроскопия. В результате микробиологического анализа установлено, что дрожжевые грибы, аэробные микроорганизмы и бактерия Escherichia coli содержащиеся в витаминах C и D_3, соответствуют норме. Суточная доза комплекса витаминов должна поступать в организм человека с пищей. В результате данного исследования рекомендуется использовать витамины, выпускаемые на производстве, фармацевтического завода "Биовит", если организм не получает достаточное количество витаминов с пищей. Поскольку это один из социальных проблем большинства стран, и считается актуальной проблемой биологов, медицинских работников, биомедицинских и биотехнологических производств.

Ключевые слова: Гипо-, Гипер- и авитаминоз, Витамин C, Витамин D_3, Микроорганизмы, Микроскоп.

Bitki gelişimini teşvik edici rizobakteriler ve kullanım alanları

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Özet: Rizosfer mikroorganizmalarının aktiviteleri ile havayı, suyu ve toprağı kirletmeksizin bitkisel üretimde verim ve kaliteyi arttırmak mümkündür. Özellikle PGPR olarak adlandırılan bitki gelişimini teşvik eden rizobakteriler kullanılarak topraktaki biyolojik aktivitenin arttırılmasıyla allelopatik kimyasalların parçalanması, topraktaki besin element miktarlarının arttırılması, azot fiksasyonu, bitki hormonları ve/veya sekonder metabolitlerinin üretilmesi, bitkilerde gelişimi engelleyen ve verim kaybına neden olan patojen etmenlerin engellenmesi sağlanabilmektedir. Bu bildiride PGPR'lerin genel özellikleri, etki mekanizmaları, bitki hormonları ve sekonder metabolitlerinin üretimine etkileri, abiyotik stres koşullarında kullanımları ve biyogübre olarak kullanımları yer almaktadır.

Anahtar Kelimeler: Biyogübre, Biyostimülatör, PGPR, Rizobakteri.

Liken sekonder metabolitlerinin tıbbi kullanım potansiyeli

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Özet: Likenler, özellikle ılıman ve arktik bölgelerde olmak üzere dünya genelinde çeşitli kültürler tarafından geleneksel tıpta yaygın bir biçimde kullanılmaktadır. Geleneksel tıpta en yaygın şekilde yaraların, cilt bozukluklarının, solunum ve sindirim sorunlarının, obstetrik ve jinekolojik rahatsızlıkların tedavisinde kullanılırlar. Geçmişte sıklıkla kullanılan likenler zengin sekonder metabolit içerikleri nedeniyle günümüzde de çeşitli hastalıkların tedavisi için araştırılmaktadır. Bu bildiride liken sekonder metabolitlerinin antimikrobiyal, antioksidan, antikanser, antinörodejenerik ve antidiyabetik özellikleri ile tıbbi kullanım potansiyellerinden bahsedilmiştir.

Anahtar Kelimeler: Alzheimer, Diyabet, Kanser, Liken, Sekonder Metabolit.

Edinburgh (ingiltere) herbaryu'munda bulunan Marrubium l. (lamiaceae) cinsine ait bazı türlerin polen morfolojisi

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Özet: Edingburgh Herbaryumu'nda bulunan Ballıbabagiller (Lamiaceae) ailesinden *Marrubium* L. cinsine ait 5 türün (*M. alysson* L., *M. incanum* Desr., *M. leonuroides* Desr., *M. supinum* L. ve *M. velutinum* Sm.) polen morfolojileri Işık mikroskobu (LM) ve Taramalı elektron mikroskobu (SEM) ile incelenmiştir. İncelenen türlerin polen şekli sferoidal (*M*. *alysson*), prolate-sferoidal (*M*. *incanum)* ve oblate-sferoidal (*M. leonuroides, M*. *supinum, M. velutinum*)'dır. Apertür tipleri ise trikolpate olup, ornamentasyonları psilate-perforate (*M*. *alysson*, *M*. *incanum*), perforate (*M. leonuroides*), rugulate-perforate (*M*. *supinum*) ve perforate-retikulate (*M. velutinum*)' tır. Genellikle polenler apertür tipi (trikolpate) bakımdan benzer, polen şekli, polar ve ekvatoral eksen ortalamaları, ornamentasyon, kolpus uzunluğu ve genişliği bakımından ise birbirinden farklılık göstermektedir. Çalışmada elde edilen verilere göre *Marrubium* türlerinin filogenetik hipotezinde polen şekli ve ornamentasyonları tiplere (tip I, II ve III) ayrılmıştır. Tip I türlerinin polen şekli oblate-sferoidal olup, polen ornamentasyonu bakımından A, B ve C gruplarına ayrılmaktadır. A grubu perforate (*M. leonuroides*), B grubu rugulate-perforate (*M. supinum*) ve C grubu perforate-retikulate (*M. velutinum*) ornamentasyonuna sahiptir. Tip II'de polen şekli prolate-sferoidal olup, ornamentasyonu psilate-perforate (*M. incanum*)'dır. Tip III'de polen şekli sferoidal olup, polen ornamentasyonu psilate-perforate (*M. alysson*)'dır. Buna göre, çalışılan türlerin sıralaması filogenetik hipotez dikkate alınarak yapılmıştır. Bu çalışma ile elde edilen veriler cinsin dünya genelindeki sınıflandırılmasına katkı oluşturacaktır.

Anahtar Kelimeler: Ballıbabagiller, Lamiaceae, Marrubium, Polen morfolojisi, Edinburgh herbaryumu.

Diversity systematics and population dynamics of family Cicadidae (Homoptera) from Punjab, Pakistan

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Abstract: Cicadidae family contains different species of cicadas belonging to a diverse order Homoptera. Cicadidae is a big family which occurs worldwide, comprising 3200 different species. The species of Cicadas can be recognized by their larger body and loud calling sounds they produce. Although they are used as foodstuff and in medicines but also, they cause a little damage to plants and trees by sucking their xylem sap. They do not damage the plants at large scale because they are eaten up by predatory insects, spiders and birds due to their bigger size. This research was analyzed species of Cicadas from Punjab, Pakistan. Different species of Cicadas was collected from various places by hand net, swift net and hand picking. After collection all the specimens were killed in insect killing jar. Collected specimens were pinned on thorax to preserve them in a wooden box. All the specimens were identified with the help of taxonomic keys present in literature. The collected specimens were identifies as Pycna repanda, Polyneura ducalis, Platyplura jivisa, Cicadatra sankara and Angamiana aetherea. The collected specimens were infesting wide reanf of host plants.Complete morphological description of the body parts like head, thorax and abdomen along with body measurements have been presented. The results obtained were analyzed by applying Shannon Weiner diversity index. Richness values vary between 1.63 to 1.78. Evenness values vary between 0.78 to 0.97. It has been observed that abundance and population dynamics were lower in early season of winter but their abundance raised during spring and summer season from May to June.

Keywords: Diversity, Population, Cicadidae dynamics Pakistan.

Taxonomic study of Curculionidae (Coleoptera) from Punjab (Pakistan)

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Abstract: Curculionidae is a family of weevils, belongs to the order Coleoptera. Generally, the members of this family are referred as weevils (Snout beetles). There are around 5800 recognized genera and 62,000 identified species among them. The most distinctive feature of this family is the expansion of the frontal region of head into a rostrum, which may match or even exceed the length of the body. Females use rostrum to bore deep cavity in tissues of plants, into which they place the ovipositor to lay one or more eggs. Curculionidae is a very important group economically. It covers the most damaging pests of horticultural, agricultural and woodland products in a variety of environments, such as grasslands, deserts and rainforests. These species represent a severe threat to the world's agricultural and forestry products. Present research analyzed the species of family Curculionidae from different sites of Punjab, Pakistan. Different species of Curculionidae were collected from twigs, agriculture fields, branches, shrubs, tree holes, stem and stored grain products. Collection was done by using different pitfall traps, flight interception traps, sweep nets, hand picking, light traps and aspirators. Specimens were killed by using killing jars which contained ethyl acetate. Killed specimens were pinned in wooden boxes by using specific pins to preserve them. The present research was conducted during the year 2022-2023 and the collected species were: *Tanymecus albomarginatus, Tanymecus indicus, Tanymecus hispidus, Tanymecus versicolor, Tanymecus circumdatus, Rhynchophorus ferrugineus, Odoiporus longicollis, Myllocerus undecimpustulatus* and *Myllocerus discolor*. Collected specimens were identified by using taxonomic keys. Different indices for biodiversity measurement were applied. In the present research, Shannon diversity index was used to study the richness and evenness of species.

Keywords: Taxonomy, Population, Curculionidae dynamics, Pakistan

Diversity systematics and population dynamics of sub family Cetoniinae (Coleoptera, Carabaeidae) from Punjab, Pakistan

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Abstract: Cetoniinae, a subfamily of Scarabaeidae belonging to one of the largest orders of the insects Coleoptera. These insects are often referred to as fruit or flower chafer beetles. There is a description of over 5,000 species globally. They play a very crucial role in pollination, nutrient recycling in the soil and in chain of biological diversity. Their larvae are involved in soil softening and help in growth of young shoots and they are also food material for birds and predatory insects. Besides as pollinators, they are also agricultural pests and cause yield losses in some crops. This research analyzed the taxonomy the species of Cetoniinae beetles from Punjab, Pakistan. Different species of beetles were collected from various places by aerial fruit-baited traps, light traps, sweep nets and hand picking. After collection all the specimens were killed in insect killing jar. Collected samples were pinned on thorax to preserve them in a wooden box. These samples were identified with the help of taxonomic keys present in literature. A total of 11 species of flower chaffer beetles belonging to 10 different genera have been described morphology. Species include Torynorrhina opalina, Rhomborrhina glaberrima, Anthracophora crucifera , Anatona stillata, Protaetia impavida, Protaetia neglecta, Chiloloba acuta, Cetonia bensoni Thaumastopeus pullus, Clinteria spilota, Jumnos roylei. A complete description of head, thorax and abdomen is given. The results obtained were analyzed by applying Shannon Weinerr diversity index. It has been observed that the abundance and population dynamics were lower in early season of winter but their abundance raised during spring and summer season from March to June.

Keywords: Cetoniinae (Coleoptera, Scarabaeidae), Punjab, Pakistan.

Chemistry

Green Synthesis of Silver nanoparticles using leaf extract of Endemic plant *Aubrieta* Vulcanica

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Abstract: In recent years, metallic nanoparticles have been the focus of attention of many scientists. Chemists, physicists, biologists and engineers have started to use nanoparticles in different application areas. In this study, silver nanoparticles were synthesized from *Aubrieta* Vulcanica using aqueous silver nitrate ($AgNO_3$) solution (1mM). The silver nanoparticles were synthesized with green synthesis method, an eco-friendly technique. The bio-reduced silver nanoparticles were characterized by Energy Dispersive Spectroscopy (EDX) and Scanning Electron Microscopy (SEM).

Keywords: Nanoparticules, Green synthesis, Endemic plants, Solvent free,

Treatment by electrocoagulation process of iron and steel industry cooling wastewater

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Abstract: Water is consumed in many production stages in iron & steel production plants. As a result, wastewater that will cause environmental pollution emerges. In this study, the treatment of cooling wastewater originating from the iron & steel industry was carried out with a batch electrocoagulation (EC) process using iron electrodes with monopolar parallel electrode connection mode to assess their removal efficiency. At optimum conditions (15 A/m^2 and EC time = 40 min, the results obtained from the EC process are extremely efficient and able to achieve removal efficiency (%) of Zn, Mn, Fe, Ba, Si, Cu, Ni, Pb, As, COD, and TOC as 99.9, 99.5, 98.9, 97.9, 97.3, 97.1, 96.0, 93.3, 93.3, 46.7, and 46.2, respectively. The operating cost of this process is also calculated as 1.15 €/m^3.

Keywords: Iron & steel plants, Cooling wastewater, Electrocoagulation, Iron anodes.

Arsenic removal by electrocoagulation process from naturally arsenic-contaminated groundwater

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Abstract: Due to the serious effects of arsenic (As)on people's health, both the World Health Organization (WHO) and the United States Environmental Protection Agency (US-EPA) in January 2001 set new arsenic maximum contaminant level (MCL) at 10 µg/L in drinking water, after the new revision on As it has been announced as a significant problem related to arsenic pollution in natural water resources all over the world. Electrocoagulation (EC) process is a very efficient method for As removal from water and has received considerable attention recently. In this study, As from natural groundwater samples containing As concentrations of GW-2: 538.8 $\mu g\ As/L$, and GW-3: 1132.1 $\mu g/L$ were removed by EC reactor without air supply using iron plate anodes. Arsenic removal efficiencies, EC times, and operating costs at an applied current of 0.025 A were obtained as 98.75%, 40 min, and 0.026 US \$/m^3 for GW-2 and 99.2%, 50 min, and 0.032 US \$/m^3 for GW-3, respectively. The GW containing (GW-1: 285 µg As/L) by EC reactor with airflow feed EC reactor using iron plate was arsenic removal efficiency of 98.75 and EC time of 4 min at 0.3 A, and the OC was calculated as 0.026 US \$/m^3. According to the above results, Fe electrodes are more suitable for removing arsenic from the GW samples.

Keywords: Arsenic removal, Electrocoagulation, Groundwater, Operating cost.

Vortex assisted (VA) supramolecular solvent (SUPRAS) based dispersive liquid-liquid micro-extraction (DLLME) for micro-spectrophotometric determination of Erythrosine (E127) in food and drug samples

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Abstract: In the present study, vortex assisted (VA) supramolecular solvent (SUPRAS) based dispersive liquid-liquid micro-extraction (DLLME) method was developed for micro-spectrophotometric determination of Erythrosine (E127) food dye at 538 nm. In the method, an alkanol compound 1-pentanol for extraction and a dispersive solvent tetra hydro furan (THF) for dispersion were used. VA-SUPRAS-DLLME parameters including pH, amounts of SUPRAS and dispersive phase, vortex and centrifuge time were optimized. Interference effects of matrix ions and other food dyes were investigated. Limit of detection (LOD), limit of quantification (LOQ) and preconcentration factor (PF) were determined as 3.2 µg/L, 8.4 µg/L and 15, respectively. Relative standard deviations (RSD) were lower than %3.9. Linear dynamic range (LDR) of the method was obtained between 0-8 µg/mL. The method was applied to various real samples including juice powder, jelly, drug, syrup. The method validation was performed by analyte addition technique. E127 contents of real samples were determined between 6-315 µg/g with satisfactory recovery results ranging between 95-102%.

Keywords: DLLME, Erythrosine, E127, SUPRAS, UV-Vis spectrophotometry.

Karbon nanotüp katkılı PMMA/PCL nanokompozitinin sentezi ve karakterizasyonu

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Özet: Günümüzde polimerik malzemelerin kullanım alanlarının artması sonucu nano boyuttaki özelliklerinin geliştirilmesi çalışmaları artmış ve nano ölçekteki gelişmelerin bulunmasıyla nano boyuttaki hangi katkı malzemelerin daha etkili olduğu yönünde çalışmalar da artmıştır. Bu çalışmada farklı oranlardaki PCL/PMMA/CNT (polikaprolakton/ polimetilmetakrilat/ karbon nanotüp) blendlerinin farklı miktarlarda nanokompozitlerin üzerine etkisi çalışılmıştır. Bu amaç doğrultusunda %10'luk PCL, %10'luk PMMA, 1/1 oranında PCL/PMMA, %10'luk PMMA ve PCL çözeltilerine ayrı ayrı 0,05g CNT ve 1/1 oranındaki PCL/PMMA çözeltisine 0,05g CNT eklenerek polimer blendleri hazırlanmıştır. Çözücü olarak DCM (Diklorometan) kullanılmıştır. Hazırlanan polimer blendleri elektrospinning ile nanolif eldesi edilmiştir. Nanokompozit polimer blendleri, SEM (Taramalı elektron mikroskobu) ile karakterize edilmiştir.

Anahtar Kelimeler: Karbon nanotüp, Nanokompozit polimer, PCL, PMMA, Elektrospinning

ЖОЖдо ТАБИГЫЙ ИЛИМДЕР ДИСЦИПЛИНАЛАРЫН ОКУТУУДА ИННОВАЦИЯЛЫК ТЕХНОЛОГИЯЛАРДЫ КОЛДОНУУ ("Органикалык химия" мисалында)

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Abstract: Табигый илимдерди түшүнүү эксперименталдык иштерди ишке ашыруу аркылуу теориялык материалдарды тереңирээк үйрөнүүнү билдирет. Окуу жайларында эксперименттерди жургузуу учун дайыма эле жетиштуу материалдык-техникалык база боло бербейт. Мындай учурларда окуу процессине акыркы технологияларды активдүү киргизүү пайдалуу болот. Бул макалада мындай технология катары QR кодун колдонуусу каралат.

Keywords: табигый илимдер, окутуу, QR код, эксперименттердин видеолору

Application of crown ethers in chemical analysis

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Abstract: In recent years, the synthesis of organic ligands with high selectivity against Me^{n+} ions, their application in analytical chemistry is of particular importance. In this regard, the synthesis of Schiff-based open and macrocyclic ethers, their high selectivity towards Me^{n+} ions, is one of the less studied areas in analytical chemistry.

Our research work is devoted to the synthesis of crown ethers (Schiff-based open and macrocyclic) by capping bis-phenols with capping components and studying their ion selectivities. For this purpose, bifunctional acyclic and macrocyclic Schiff bases were synthesized. For the synthesis, salicylic aldehyde was condensed with ethylenediamine and o-phenylenediamine and non-cyclic Schiff bases and their dialkyl derivatives were synthesized with a high yield (75-80%). Since these compounds do not have high selectivity, we synthesized macrocyclic dibenzo-diazocrown ethers (Schiff bases), which are important in chemical analysis, using 1,2-dibromoethane and trans 1,4-dibromobutene-2 as the capping component. The degree of purity of obtained dialkyl ethers and macrocyclic Schiff bases was studied by chromatographic analysis methods, and their structures were confirmed based on IR and PMR spectra. The fields of application of the obtained open-chain and macrocyclic compounds were studied.

Our synthesized crown ethers (macrocyclic compounds) were also tested as a stationary liquid phase for the analysis of chlorinated derivatives of hydrocarbons in the gas-liquid chromatography method, and the microquantity of chlorinated hydrocarbons in the allyl chloride raw material was determined. It was determined that the separation coefficient of the crown ethers we synthesized is 2.5-3 times better than the adsorbents used in gas-liquid chromatography. Based on the conducted experimental studies, it can be concluded that dibenzo-diazocrown ethers can be successfully used in one or another field of analytical chemistry.

On the basis of synthesized crown ethers, ion-selective electrodes with high selectivity and sensitivity were prepared and their relationship to different Me^{n+} ions was studied. It was established that non-cyclic Schiff bases are transition Me^{n+} ions (Cu(II), Fe(II), Co(II), Ni(II), Mn(II), Cu(II), etc. .) with high yield, they form stable chelate complexes. However, since these crown ethers have low selectivity, they are not of analytical importance.

Other synthesized macrocyclic Schiff bases allow selective capture of Me^{n+} ions from their solutions. It was determined by the method of ionometric research that the ion-selective electrode prepared from crown ethers (macrocyclic Schiff bases) whose spatial structure is regulated shows higher selectivity in the determination of Ag^{+} ion.

Thus, for the first time, a diazacrown ether (DACE) meeting 3 important principles was obtained by targeted synthesis.

1. T

he dimensions of the obtained diazacrown ether cavity exactly correspond to the ionic radius of the Ag^{+} ion.

2. Synthesized DACE satisfies Pearson's principle, as the nitrogen atoms are connected by double bonds, their softness corresponds to the softness of Ag^{+}ion.
3. The number of nitrogen atoms in the macrocyclic ring corresponds to the coordination number of silver.

Synthesized crown ethers are of great importance in ecological control and environmental protection. Noncyclic and macrocyclic Schiff bases can be used for the determination of trace amounts of heavy metals (Fe, Co, Cd, Pb, As, Cr, Mn, Cu, etc.) in oil, well water, soil, fresh water, and food products.

Our research in this direction continues.

Keywords: Crown ethers, Schiff bases, macrocyclic, noncyclic

Organik ve konvansiyonel yöntemlerle yetiştirilen Lamiaceae familyasına ait bazı bitkilerde kimyasal bileşenlerin belirlenmesi

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Özet: Organik tarım; üretimde hiçbir kimyasal girdi kullanmadan kültürel önlemler alarak gerçekleştirilen, planlı tarımdır. Ürün tüketiciye ulaşıncaya kadar tüm kontroller gerçekleştirilerek, sürdürülebilir üretim modeli oluşturulmaktadır. Konvansiyonel tarım, genetik olarak değiştirilmiş yüksek verimli bitki çeşitlerinin tek ürünlü tarımı, kimyasal maddelerin yoğun şekilde kullanılması ile sürdürülmektedir. Organik ve konvansiyonel tarım arasındaki fark kimyasal girdi kullanımından oluşmayıp, verimi, gıdanın görüntüsünü, lezzetini, besin değerlerini ve sağlık üzerindeki etkilerinide farklı kılmaktadır.

Bu çalışmada organik ve konvansiyonel yöntemlerle yetiştirilen lamiaceae familyasına ait *Thymus spp.* ve *Salvia officinalis* gibi tıbbi ve aromatik bitkilerin kimyasal bileşenleri soxhlet ekstraksiyon metodu ile dört farklı çözücüde belirlenmiştir.

Çalışmada organik ve konvansiyonel olarak yetiştirilen bitkilerdeki kimyasal bileşenler karşılaştırılmıştır. Kimyasal bileşenler arasındaki farklar ve benzerlikler tespit edilecektir. Organik ve konvansiyonel olarak yetiştirilen *Thymus spp.* ve *Salvia officinalis* bitkilerinin kimyasal bileşenler belirlemek üzere Gaz Kromatografisi-Kütle Spektrometresi (GC-MS) yöntemi kullanılmıştır.

Organik yöntemlerle üretilmiş *Salvia officinalis* da soxhlet ekstraksiyonda 78 adet, konvansiyonel yöntemlerle üretilmiş *Salvia officinalis* da 50 adet bileşik tespit edilmiştir. Organik yöntemlerle üretilmiş *Thymus spp.* soxhlet ekstraksiyonda 38 adet, konvansiyonel yöntemlerle üretilmiş *Thymus spp.* de 36 adet bileşik tespit edilmiştir.

Bileşenler kimyasal yapıları bakımından, hidrokarbonlar, monoterpen hidrokarbonları, monoterpenoitler, seskiterpen hidrokarbonları, seskiterpenoitler, diterpen hidrokarbonları, diterpenoitler, yağ asitleri ve yağ asit türevleri, vb. farklı sınıflara ayrılmıştır. Thymus spp.' te en fazla %74,34 karvakrol, %7,61 linalool ve organik *Thymus spp.*' te %7,26 linalool, %10,85 linolenic asit, %53,33 karvakrol tespit edilmiştir. Organik *Salvia officinalis' da* %14,58 thujone, %14,99 (+)-2-bornanone, %13,15 manool, %16,43 camphor, %17,34 tetrapentacontane ve konvansiyonel *Salvia officinalis*' da %14,17 1,8-cineol, %18,05 thujone, %8 veridiflorol, tespit edilmiştir.

Anahtar Kelimeler: organik tarım, konvansiyonel tarım, thymus, Salvia officinalis

The Eco-friendly synthesis of Zinc Oxide Nanoparticles using Ethanolic extract of Curcuma: Characterization and stability analysis

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Abstract: In this study, ethanolic extract of curcuma was used to synthesize zinc oxide nanoparticles. It was chosen as a viable alternative for green nanoparticle synthesis because using herbal extracts in nanoparticle synthesis has a number of advantages over biological synthesis based on microorganisms, including several factors like eco-friendliness, cost-effectiveness, availability, ease of extraction, and decreased risk of contamination. Transmission electron microscope (TEM), energy dispersive analysis (EDX), and scanning electron microscope (SEM) analyses of the synthesized particles were performed. Additionally, UV analysis was performed and the zeta potential of ZnO particles was measured. Granular nanoparticles with particle sizes ranging from 29 to 70 nm were synthesized, and it was found that they were sufficiently stable, in accordance with the results.

Keywords: Green synthesis, ZnO nanoparticles, TEM, SEM-EDX, zeta potential.

Green synthesis and photocatalytic dye degradation activity of CuO nanoparticles

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Abstract: The degradation of dyes is a difficult task due to their persistent and stable nature; therefore, developing materials with desirable properties to degrade dyes is an important area of research. In the present study, we propose a simple, one-pot mechanochemical approach to synthesize CuO nanoparticles (NPs) using the leaf extract of Seriphidium oliverianum, as a reducing and stabilizing agent. The CuO NPs were characterized via X-ray diffraction (XRD), scanning electron microscopy (SEM), photoluminescence (PL) and Fourier-transform infrared spectroscopy (FTIR). The photocatalytic activity of CuO NPs was monitored using ultraviolet-visible (UV-Vis) spectroscopy. The CuO NPs exhibited high potential for the degradation of water soluble industrial dyes. The degradation rates for methyl green (MG) and methyl orange (MO) were 65.231% ± 0.242 and 65.078% ± 0.392, respectively. Biomechanochemically synthesized CuO NPs proved to be good candidates for efficiently removing dyes from water.
Keywords: Photocatalytic Degradation, Green synthesis, Nanoparticles.

Poli(laktik asit) (PLA) ve poli(laktik asit) (PLA)/hidroksiapatit (HA) nano-kompozit'e ait temel eğrilerin farklı referans sıcaklıkları için oluşturulması

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Özet: Bu makale Poli (laktik asit) (PLA) ve Poli (laktik asit) (PLA)/Hidroksiapatit (HA) nanokompozitin çeşitli sıcaklıklarda gerinim gevşemesi davranışı ve temel eğrilerinin oluşturulmasına odaklanmaktadır. PLA, biyomedikal uygulamalarda kırık onarımı, girişim vidaları, dikiş çapaları ve menisküs onarımı için yaygın olarak kullanılan biyobozunur ve biyouyumlu bir polimerdir. PLA'nın mekanik özelliklerini iyileştirmek için hidroksiapatit güçlendirici olarak kullanılmıştır. Bu çalışmada, PLA/HA nanokompozitinin gerinim gevşemesi üzerine sıcaklık etkisi ve temel eğrisinin oluşturulması incelenmiştir. Tek eksenli çekme testleri 23, 30, 35, 40, 45, 50 ve 55 ºC'de 1 mm/dak hızda gerçekleştirilmiş, numuneler %1.5 gerinim seviyesine kadar yüklenmiş bu noktada 20 dakika süreyle gerinim gevşeme testi uygulanmıştır. Elde edilen mevcut gevşeme test verilerine dayanarak sırasıyla 23 ºC, 40 ºC ve 55 ºC farklı sıcaklık değerlerindeki verileri referans alarak PLA ve PLA-HA kompozit için temel eğriler oluşturularak geçiş faktörleri karşılaştırılmıştır.

Anahtar Kelimeler: Poli (laktik asit) (PLA), Poli (laktik asit) (PLA)/Hidroksiapatit (HA) nanokompozit, Gerilme Gevşemesi, Temel Eğri, Geçiş Faktörü.

Method of obtaining essential oil from *Lavandula angustifolia* and its chemical composition

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Abstract: *Lavandula angustifolia* is widespread in the Mediterranean, Southern Europe and East Africa. Lavender essential oils have been widely used in medicine, cosmetology and aromatherapy for centuries. The main purpose of the study is to analyze scientific research on lavender essential oil, conduct phenological observations of the growth and development of Lavandula angustifolia, study agricultural practices, possible pests and methods for obtaining essential oil from this plant, and subsequently determine the chemical composition of the essential oil. Lavender essential oil has a pleasant aroma and highly healing properties. Literature data on the chemical composition of essential oils of the genus Lavandula show antibacterial, antifungal, carminative (relax smooth muscles), sedative, antidepressant, anti-burn properties. Over the past five years, more than 600 scientific studies have been conducted. These studies examined the morphological features of the plant, methods of growing in laboratory conditions, the effect of essential oils on wound healing, clinical studies on neurological diseases of humans and animals, bioactive properties of essential oil, etc. Currently, lavender is grown in all countries as a cost-effective and ornamental plant.

Kyrgyzstan is a mountainous country, the cultivation of this kind of plant, its cultivation requires painstaking work. Since all parts of the plant contain essential oil, the cultivation of this plant is economically beneficial and also contributes to the renewal of the flora. The plant is grown from seeds. From the moment the plant matures, its collection is carried out. Essential oil is obtained from the collected material by gas chromatography. After obtaining the essential oil, its composition is determined using a chromato-mass spectrometric apparatus.

The plant of the genus lavender in Kyrgyzstan has been grown since 2020 by farmer Aisuluu Duishebayeva, in the villages of Toru-Aigyr and Chyrpykty of Issyk-Kul region. In an eco-farm with a total area of 3 hectares, the plant has been grown for 3 years. This variety, grown in an eco-farm, is a variety of Lavandula angustifolia verani. The eco-farm is located at an altitude of 1600-1800 m above sea level. Our research is also carried out in this eco-farm, after harvesting, the chemical composition of Lavandula angustifolia essential oil will be investigated.

Keywords: Kyrgyzstan, Lavandula, essential oil, gas chromatography, chromato-mass spectrometry.

Inhibition of acidic corrosion of mild steel by using olive leaf extract grown from the southeast Anatolia region

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Abstract: In this study, the effects of the aqueous extract of olive tree leaves grown in the Southeast region on the corrosion behaviour of mild steel in 1.0 M HCl solution were investigated. This natural inhibitor effect was investigated using three experimental methods such as potentiodynamic polarization, electrochemical impedance spectroscopy (EIS) and linear polarization (LPR) methods. According to the findings, it is seen that the polarization resistance of mild steel increases in presence of olive leaf extract and the current values determined from the potentiodynamic polarization curves decrease. It was determined that the adsorption of organic molecules from the olive leaf content on the mild steel surface caused an inhibitor film to form on the surface, which decreased the rate of corrosion. It was thought that the inhibition in question was caused by compounds such as oleuropein, hydroxytyrosol, tyrosol, caffeic acid and ligstroside, which are known to be commonly found in the leaf content and called secondary metabolites. Finally, the surface morphologies of the working electrodes in 1.0 M HCl solutions without and with olive leaf extract after 1 h immersion were analysed by field emission scanning electron microscope (FE-SEM), it was concluded that the surface containing olive leaf extract had a smoother compared to the blank surface.

Keywords: *Olea europaea*, Green inhibitor, Acidic corrosion, FE-SEM.

Synthesis and characterization of chitosan ethers: hydroxypropyl chitosan (HPCH) and hydroxyethyl chitosan (HECH)

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Abstract: HPCH and HECH are multifunctional chitosan derivatives with biocompatible and biodegradable properties. Due to their hydroxypropyl and ethyl groups, they have water solubility, moisture retention, and gelling properties. HPCH is obtained by the reaction of chitosan and propylene oxide under alkaline conditions. HECH is obtained by the reaction of chitosan and ethylene oxide under alkaline conditions. In this study, HECH and HPCH were obtained in two steps alkalization and etherification. For alkalization; chitosan was kept in an alkaline medium at -18^{o}C for 7 days. For etherification; the reaction was carried out for 48 hours by mixing alkaline chitosan with propylene oxide and ethylene oxide separately in a pressure reactor. The structures of the obtained HPCH and HECH were characterized by FT-IR, ^{1}H(^{13}C)-NMR, XRD, and TG analysis methods. Since the degree of deacetylation (DA) of chitosan is 75-85%, chitosan units contain N-acetyl (-N-(CO)-CH_3)) groups in addition to –NH_2 functional groups. When the ^{1}H(^{13}C)-NMR spectrum of chitosan was examined, the peak value of these acetyl groups was observed at δ1.89 ppm. When the XRD spectra were examined, it was observed that the strong peak in chitosan at 2θ=20° weakened in HPCH and HECH. In addition, the thermal stability of HPCH and HECH was found to be higher than chitosan in TG analysis.

Keywords: Etherification, Hydroxyethyl Chitosan, Hydoxypropyl Chitosan, NMR.

Effective removal of Cd (II), Co (II) and Ni (II) ions by using *Hypnum Cupressiforme* bioadsorbent

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Abstract: In this study, Hypnum cupressiforme, an effective bio-adsorbent was subjected to preconcentration, determination and removal of Cd (II), Co (II) and Ni (II) heavy metals in aqueous solutions. The Hypnum cupressiforme samples were collected from nature and dried for 24 hours at 40 °C after washing with distilled water. The optimization of preconcentration steps were evaluated for solution pH, sample volume and flow rate. The surface morphology of the adsorbent was evaluated by micrographic analysis. The heavy metal concentrations were determined by using flame atomic absorption spectroscopy. The Hypnum cupressiforme bio-adsorbent showed up to 95 % removal performance for Cd (II), Co (II) and Ni (II) heavy metals under optimum conditions. The obtained results suggest that Cd (II), Co (II) and Ni (II) heavy metal ions in aqueous solutions can be successfully removed by optimized technique.

Keywords: Hypnum cupressiforme, Heavy metals, preconcentration, FAAS.

Development of a method for obtaining polysaccharide complexes from Xanthium strumarium plants

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Absract: Nature is rich in a variety of plants; the aroma refreshes the person and gives a new boost of energy. The plant itself, which is called poisonous, is useful, of them in the shower is the cure. Medicinal plants are used in medicine and veterinary medicine for the treatment and prevention of diseases. More than five hundred species of plants growing in Kazakhstan are medicinal plants, but not studied properties and values.
Xanthium strumarium is an annual plant of the complex family (Compositae), widely distributed in Eurasia, North and South America, Australia, Africa, as well as in Kazakhstan. Most of the representatives of this group, both cultivated plants and wild species, is one of the breeds of interest to scientists of the world in the XXI century. One of the representatives of this genus, which is found in Kazakhstan is Xanthium strumarium. Since the representative of this genus has a natural medicinal value, mainly a plant that is widespread in the local flora as an elegant, growing in all places and has a natural medicinal value, a broad study of this plant is one of the urgent problems. This study presents the results of a study of the polysaccharide complex Xanthium strumarium. It has been established that the carbohydrate complex of the aboveground part of Xanthium strumarium is represented by water-soluble polysaccharides, pectin substances, hemicellulose A and B; their monosaccharide composition has been established. The polysaccharide complexes obtained were studied by IR and NMR spectroscopy.

Keywords: Xanthium strumarium, water-soluble polysaccharides, pectin substances, hemicellulose A and B.

Synthesis and determination of the physico-chemical properties of manganite

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Abstract: A complex transition metal manganite oxide with promising prospects for various technological applications. Its excellent thermal stability, carrier mobility and redox properties, as well as its wide availability and environmental friendliness, have made manganite oxide a prototype cathode material. Ability to produce bimetallic oxide nanomaterials from multiple metal combinations in a variety of structures (e.g., spinel, perovskite, mixed metal oxide) and morphologies (e.g., particle, wire) with capabilities superior to monometallic. The properties of these materials are being intensively studied for numerous nanotechnology applications such as catalysis, supercapacitors, solar cells, and sensors.

Double-phase complex oxide manganites of rare earth elements and suspended metals have been synthesized. The nanomaterial was synthesized by the Pechini method (sol-gel). The sol-gel method involves hydrolysis (sol formation) and condensation (gel formation) of metal alkoxides, followed by solidification of the gel, drying and calcination to remove residual organic components and hydroxyl groups. The next step is the addition of ethylene glycol and its transesterification reaction with citric acid. The result of this reaction is the formation of a covalent polymer network with trapped metal ions. As a result of heating this mixture, a gel is formed, and the final stage is firing (600-1300°) to achieve combustion of the organic matrix and the formation of the final ceramic product. The phase composition and structure of the isolated nanomanganite were determined by X-ray phase analysis, and the elemental composition and microsizes were analyzed and identified by a scanning electron microscope.

Keywords: manganite oxide, Pechini method, nanomaterial.

ENVIRONMENTAL ENGINEERING

Green packaging: An environmental concept

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Abstract: This study discusses the pressing need for environmentally sustainable packaging solutions in the face of increasing global population and economic development. Focusing on the challenges posed by plastic waste and non-renewable energy consumption, the study highlights the urgency of addressing these issues through innovative packaging approaches. The concept of "green packaging" is introduced, encompassing both biodegradable materials and reusable packaging models. Detailed exploration of biodegradable materials, including synthetic polymers derived from renewable sources and natural biopolymers from biomass, underscores their potential to reduce environmental impact and enhance sustainability. The significance of reusable packaging is also examined, with various models outlined and examples like Kamupak's RePaaS and Waxwraps showcased as effective alternatives to disposable options. The impacts and economic benefits of green packaging are discussed, emphasizing the initial investment required for reusable systems and their long-term cost-saving potential. This study underscores the pivotal role of green packaging in driving innovation, research, and positive consumer perceptions, propelling us towards a more sustainable future. Furthermore, the study delves into the multifaceted advantages of adopting green packaging practices, ranging from waste reduction, and decreased environmental burden to biodiversity preservation and improved human health.

Keywords: Biodegradable materials, Environment, Green packaging, Reusable, Sustainable economy.

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Greenwashing: Concept and applications

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Abstract: Public awareness of environmental issues has increased in recent years. In response to the needs of their customers, many companies are moving towards greenwashing, which has become very popular in the business world. The purpose of this study is to explore the concept of greenwashing and possible strategies to counteract this phenomenon. In this study, the origin and prevalence of greenwashing, the factors driving its persistence, its potential environmental consequences and impact on consumer behavior, its environmental implications, and strategies and solutions to combat it are addressed.

Keywords: Consumer awareness, Environment, Greenwashing, Marketing, Sustainability**.**

Becoming carbon neutral

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Abstract: In the face of the growing threat of climate change (CC), achieving carbon neutrality has become an imperative of global climate policy. This study focuses on various aspects of the drive towards carbon neutrality, exploring key mechanisms and practices that contribute to reducing carbon dioxide (CO_2) emissions. The sections cover issues such as the role of CO_2, carbon capture and storage (CCS) technology, the impact of renewable energy sources (RES), and sustainable practices on CO_2 emissions. The study summarizes the key conclusions of individual chapters, showing that achieving carbon neutrality is a challenge that requires global cooperation, technological innovation, and conscious actions at the local and global level. Striving for carbon neutrality is critical for the future of our planet and the sustainable development of societies.

Keywords: Carbon capture and storage technology, Carbon neutral, CO_2, Renewable energy sources, Sustainable development.

Carbon footprint and its applications for some Turkish ports

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Abstract: The carbon footprint (or greenhouse gas footprint) serves as an indicator to compare the total amount of greenhouse gases emitted from an activity, product, company, or country. It is usually reported in tons of emissions (CO_2) per unit of comparison, such as per year, person, kg of protein, km traveled, and alike. It is commonly expressed as the carbon dioxide equivalent (CO_2eq) per unit of comparison. It sums up the total greenhouse gas emissions (not just CO_2) caused by economic activities, events, organizations, services, etc. Commercial ports are important sources of carbon emissions. The International Association of Ports and Harbors (IAPH) developed a carbon footprint tool online and worked together with several ports to develop guidance for carbon foot printing in terms of inventory methods and measurement. This study addresses carbon footprint, port emission sources, green port and Turkish ports.

Keywords: CO_2, Environment, Footprint, Greenhouse Gas, Green Port.

Şarap fabrikası atıklarından tartarik asit eldesi

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Özet: Endüstrinin her sektöründe oluşan atıklardan kaynakları geri kazanımı uygulanması geri dönüşüm ekonominin zorluklarından biridir. Bu değerlendirme, ana unsurlardan biri olmalıdır, ekonomik ve finansal olarak endüstriyel düzeyde hedefler sürdürülebilir ve aynı zamanda çevresel etkiyi azaltır.

Bu çalışmanın temel amacı, şarap imalathanelerinde endüstriel bir atık olan sarap taşının değerlendirilmesi ve sarap taşındaki tartarik asıt miktarının belirlenmesidir. Şarap üretim teknolojisi bir tartarik asit kaynağı olmuştur ve olmaya devam etmektedir. Tartarik asit elde edilmesi mümkün olan atıklar: üzüm cibresi, maya, vinasa, şarap çekirdeği, soğuk muameleden kaynaklanan tortular. Şarap endüstrisinden geriye kalan atık ve yan ürünler verimli, uygun maliyetli ve çevre dostu kullanımı olan, yüksek karlılık ve minimum çevresel etki göstermektedir.

Şarap atıklarından tartarik asit elde etmek için Ayu Holding şirketinin Bişkek'teki Vindelia tesisinden şarap atıkları temin edilmiştir. Bu atık şarap taşından tartarik asit izolasyonu için optimum şartlar belirlendi. En yüksek verim; pH = 6, sicaklık 70 ^{o}C, zaman 60 dakika ve HCl mıktarı 10 mL %35 lik olarak bulunmuştu ve bu ortamda 100 gr şarap taşından 3,02 g tartarik asit elde edilmiştir.

Anahtar Kelimeler: Kalsiyum tartrat, pH, Şarap taşı, Tartaric asit, Üzüm

Extraction of tartaric acid from wine factory wastes

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Özet: The resources obtained from the wastes generated in every sector of the industry are one of the challenges of the recycling economy at the end of the recovery. This assessment should be one of the key elements, economically and financially industrial level targets are sustainable and at the same time reduce the impact of yield.

The main purpose of this study is to evaluate wine stone, which is an industrial waste in wineries, and to determine the amount of tartaric acid in wine stone. Winemaking technology has been and continues to be a source of tartaric acid. Wastes from which tartaric acid can be obtained: grape pomace, yeast, vinasa, wine tanks, residues from

cold treatment. Waste and by-products of the wine industry show high profitability and minimal environmental impact, which is efficient, appropriate safety and environmentally eco-friendly use.

Wine waste was provided to obtain tartaric acid from wine waste in Bishkek, from Ayu holding company. Optimum conditions are determined for tartaric acid isolation from this waste wine stone. The highest efficiency; pH = 6, temperature 70 ^{o}C, time 60 minutes, and the amount of HCl 10 mL 35% were found and 3.02 g of tartaric acid was obtained from 100 g of wine stone in this war.

Anahtar Kelimeler: Calcium tartrate, Grape, pH, Tartaric acid, Wine stone

Günlük Hayatta STEM

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Absract: Öğrencilerin derslerde, örneğin fen derslerinde ilk başta en çok sordukları sorulardan biri de bu derslerde öğrerilen kavramlar, bilgiler ne işimize yarayacak, neden öğrenelim gibi sorulardan oluşmaktadır? Bu nedenle biz öğretmenler öğrencilerimize bilgiyi araştırıp sorguladıkları, bilgilerini günlük hayatta kullanabilecekleri bir eğitim ortamı hazırlamakla yükümlüyüz. Öğrencilerimizin hayal kurup yaratıcılıklarını ortaya koyabilecekleri ve keşfetmelerine olanak sağlayan imkanlar sunabilmeliyiz. İşte bu noktada STEM çalışmalarının iyi planlanarak yürütülmesi çok önemli rol oynayabilir. Bu çalışmada, okulda etkinlik veya projeler yoluyla STEM fen derslerine nasıl entegre edilebilir bunun cevabını arayacağız. Ayrıca, günlük hayatta STEM ile ilgili olabilecek uygulama örnekleri de sunulacaktır.

Keywords: Fen eğitimi, STEM, Öğretmen adayları

Thermodynamic modeling of the destruction process of antimony furnace wastes and prediction of the formation of antimony-containing components and particles in the gas phase

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Abstract: The paper considers antimony furnace wastes and establishes their elemental and phase compositions. It is noted that antimony occurs in the wastes of furnace waste in the form of calcium antimonate $CaNaSb_2O_6(OH)$ and antimony hydroxide $SbSb_2O_6(OH)$. The content of antimony in furnace wastes is in the range of 168235 – 166090 ppm, i.e. 16.8%; arsenic 3387-3455 ppm or 0.34%. On the basis of the established elemental and phase compositions, the chemical matrix of the antimony furnace wastes was compiled and the high-temperature processes of its destruction were studied. Equilibrium compositions are calculated and the concentration distribution of the main elements of antimony in the furnace and their compounds in the gas phase is found depending on the temperature of solid phase destruction. It is noted that during the destruction of antimony furnace wastes, condensed antimony $Sb_{(c)}$ and $Sb_2O_{3(c)}$ are formed in the range of 800–1200K, and Sb_4O_6, SbO, SbH, Sb, Sb_4, Sb_2 at higher temperature ranges (800–2400 K).

Keywords: Antimony, Component, Destruction, Furnace waste, Modeling.

Investigation of color removal from textile dyehouse effluent containing disperse dyes

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Abstract: The textile industry is one of the major contributors to wastewater generation worldwide. Discharging untreated wastewater containing various types of dyes with different characteristics into receiving environments leads to significantly adverse environmental impacts. In order to mitigate these negative effects and safeguard the receiving environments, it is imperative for textile industry wastewater to undergo proper treatment.

This study focuses on the treatment of wastewater originating from one of the most significant processes within the textile industry, namely the dyeing process, which produces highly colored effluents. Commercial polymers were employed for the treatment. Through the coagulation-flocculation method, the study determined that the optimal coagulant dosage was 0.4 mg/L, the optimal pH level was 7.8, and the optimal polymer dosage was established at 0.8 mg/L. The study's outcomes revealed an impressive 92% color removal efficiency from the wastewater.

Keywords: Textile wastewater, Disperse dye, Polymer.

Underwater eco-monitoring – assessment of the potential of selected materials for eutrophication

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Abstract: The estimations show that between 30% and 40% of the freshwater has been affected by the eutrophication of the water caused by human activity. Despite the natural eutrophication caused by the accumulation of allochthonous and indigenous matter which is a very slow process, the uncontrolled human activity, including the overuse of fertilizers used in agriculture and huge production of sewage, produced a large number of nutrients and the results of extensive eutrophication. As a result, the freshwaters are touched by unfavorable phenomena, such as changes in the structure of hydrobionts, reduction of species diversity, and limiting the economic use of water. In addition to the direct causes of eutrophication mentioned earlier, there are also areas indirectly affecting the development of this problem. One of them may be the types of materials used that have eutrophication potential. The main aim of the research carried out is to compare eutrophication models used for life cycle assessment for different materials and to analyze the eutrophication potential for selected materials. The article is a review and presents current knowledge in the area of assessment material's potential for eutrophication supported by selected case studies. Based on an example of concrete materials is presented the evaluation of the particular composition for the environment, taking into consideration eutrophication potential. Moreover, concrete materials are compared with others with reduced eutrophication potential – geopolymers. The article ends with a summary of the current state of the art and a discussion of the possibilities of limitation eutrophication process by usage of proper construction materials and relevant technologies.

Keywords: Eutrophication, Fresh water, Nutrient, life cycle assessment, Eco-monitoring.

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Balık çiftliklerinin sucul ortama etkileri

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Özet: Dünya nüfusunun hızla artması, küresel ısınma ve iklim değişikliği, kirlilik, plansız ve çarpık kentleşme doğal kaynakların her geçen gün azalmasına ve kullanılamaz hale gelmesine sebep olmaktadır. Artan dünya nüfusunun protein ihtiyacını mevcut karasal protein kaynakları karşılayamamaktadır. Bu durum sucul protein kaynaklarına talebi artırmıştır. Ancak, avcılıkla elde edilen sucul protein kaynakları aşırı ve bilinçsiz avcılık yapılmasıyla azalmaktadır. Bu da karasal ya da deniz ortamında başta balık olmak üzere su ürünleri yetiştiriciliğinin gelişmesinin yolunu açmıştır. Ülkemizin üç tarafının denizlerle çevrili ve pek çok tatlı su kaynağına sahip olması balık yetiştiriciliğinin yapılabilmesine olanak sağlamaktadır. Kaliteli protein elde edilmesi, doğal kaynakların korunması, istihdam sağlaması, bölgesel ekonomiye katkısının yanında balık çiftliklerinin çıkış suları alıcı ortamı kirletmektedir. Özellikle balık dışkı ve yem artıkları organik atık kirliliğine, alıcı sularda besin elementi yoğunluğunun artmasına, ötrofikasyona ve buna bağlı olarak oksijen miktarının azalmasına, bulanıklığın artmasına, suyun renk, koku ve tat değişimine neden olmaktadır. Yemlere katılan ilaç ve kimyasal maddeler sulara karışmaktadır. Ayrıca, balık çiftliklerinde çalışanlar ve kullanılan ekipmanlar da kirlilik kaynağı olarak karşımıza çıkmaktadır.

Bu çalışmada, balık çiftliklerinin sucul çevre üzerindeki etkilerine ve bunlarla ilgili alınabilecek önlemlere yer verilecektir. Balık çiftliklerinin sucul ortama olumsuz etkilerini azaltabilmek için çiftliğin kurulacağı yerin seçimi son derece önemli olup, çevreye verebilecekleri etkiler önceden hesaplanmalıdır. Yemler ve yemleme sistemleri doğru seçilmelidir. Çiftlikte hastalık çıkmadan koruyucu önlemlerin alınması ilaç kullanımının önüne geçebilecektir.

Anahtar Kelimeler: Balık çiftliği, Sucul çevre, Su kalitesi, Su kirliliği.

Antibiyotik gideriminde hidroksil radikali esaslı ve sülfat radikali esaslı ileri oksidasyon proseslerinin kullanımı

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Özet: Sucul ortamlardaki toksik maddelerin giderimleri önemli bir sorun oluşturmaktadır. Bu kirleticiler arasında antibiyotikler önemli bir yer tutmaktadır. Antibiyotiklerden kaynaklanan çevre kirliliği, insan sağlığını ve gelişimini ciddi şekilde etkilemektedir. Antibiyotiklerin daha az zararlı bileşiklere ayrışması veya mineralizasyonu için etkili yöntemlere ihtiyaç duyulmaktadır. Bu yöntemler içerisinde, son yıllarda su ve atık su arıtımı için ileri oksidasyon prosesleri olarak adlandırılan yeni yöntemler dikkat çekmektedir.

Bu çalışmada, ileri oksidasyon proseslerinden olan hidroksil radikali esaslı ve sülfat radikali esaslı proseslerle antibiyotik giderimi konusunda yapılan çalışmalar değerlendirilmiştir. Antibiyotiklerin su ortamlarındaki varlığına/davranışına, her iki proses ile arıtma metotlarına ve arıtma verimlerine yer verilmiş, karşılaştırma yapılarak antibiyotiklerin uygun arıtım alternatifleri sunulmuştur.

Anahtar Kelimeler: Antibiyotik Giderimi, İleri Oksidasyon Prosesleri, Sürdürülebilir Teknoloji.

Study on COD and turbidity removals from municipal wastewater (Bishkek, Kyrgyzstan) by a continuous electrooxidation reactor

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Abstract: In recent years, the scarcity of clean water in the world creates the need for different water sources such as municipal wastewater (MWW). MWW is the water that is produced after people use clean and fresh water for their commercial and daily needs. In this study, COD and turbidity removal of the MWW (Bishkek, Kyrgyzstan) was investigated by a continuous electrooxidation (CEO) reactor. The COD and turbidity removal efficiencies from MWW in the CEO process were found to be 90% and 96% at optimum conditions (flow rate = 15 mL/min, EO reactor residence time = 120 min, and current density 100 A/m^2), respectively. In addition, the total operating cost was calculated as 0.40 $\$/m^3$. As a result of the study, it was concluded that the CEO reactor can be applied in the treatment of municipal wastewater containing COD and turbidity.

Keywords: Municipal wastewater, Electrooxidation, Treatment, Operating cost.

Olive leaf waste: Exploring diverse applications and environmental benefits

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Abstract: Olive leaf waste is an overlooked by-product of olive cultivation and oil production, which is widely practiced in the world, especially in the Mediterranean and tropical climate regions. In this study, the utilization potentials of olive leaf waste for health, agriculture, industry, energy, and industrial purposes were investigated. Olive leaf waste can be a useful raw material for the environment for many reasons besides its bioactive properties. Producing organic fertilizer and biodiesel from olive leaf waste promotes sustainable agriculture and is an environmentally responsible management style. On the other hand, the seasonality of this waste, the problems of selecting environmentally friendly extraction methods, and the necessity of economic viability in circular processes have been identified as issues that need to be further evaluated. Thanks to its high production rates and wide range of applications, olive leaf waste is an area where benefits can be achieved through a combination of efficiency and environmental awareness.

Keywords: Agricultural residues, Olive leaf waste, Recovery, Sustainability.

Optimization using response surface methodology of textile wastewater treatment by electrocoagulation process

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Abstract: In the present paper, the electrocoagulation (EC) process has been employed for the reduction of chemical oxygen demand (COD), total organic carbon (TOC), and turbidity (NTU) reduction of the textile wastewater in an EC reactor using a Fe electrode. The individual and interactive effects of the three main independent parameters (Initial pH_i = 4-8, current density (CD) = 30-100 A/m^2, and operating time (t_{EC}) = 10-40 min) have been studied on the COD, TOC, and turbidity removal efficiencies using a central composite experimental design (CCED) and response surface methodology (RSM). The quadratic models developed for the three responses (COD, TOC, and turbidity), and the experimental data agreed well with model predictions statistically ($R^2 \geq 92$ and Adjective $R^2 \geq 82$, Prob>F = < 0.004). This study clearly showed that CCD was one of the suitable methods to optimize the treatment systems. In this study, the optimum results are obtained as removal efficiencies of COD, TOC, and turbidity as 82, 77, and 95% respectively at pH 5.50, CD = 63.23 A/$m^{2,}$ and t_{EC} = 30.42 min. The operating cost for the process was calculated as 2.10 €/m^3 (1.00 €/kg COD). EC process was shown to be an effective treatment process for textile wastewater treatment.

Keywords: Textile wastewater, Electrocoagulation, Treatment, Response surface methodology.

Co-kültür kullanımının biyohidrojen üretimine etkisi

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Özet: Fosil yakıt kullanımı ile sera gazları atmosferde birikmekte ve bunun sonucunda da küresel ısınmaya sebep olmaktadır. Fosil yakıtların tükenmesi ve kontrolsüz bir şekilde çevreye salınan gazların çevre kirliliğine neden olmasından dolayı çevre dostu, doğada bol miktarda bulunan, sürdürülebilir alternatif yakıtlar üzerinde araştırmalar artmaktadır. Sağladıkları sürdürülebilir enerji ve düşük sera gazı emisyonlarından dolayı biyokütle ve hidrojen enerjisi diğer yenilenebilir enerji kaynaklarına göre daha fazla ilgi çekmektedir. Hidrojen kütle bazında en yüksek enerji yoğunluğuna sahip olduğundan alternatif bir enerji taşıyıcısıdır. Biyohidrojen, mikroalglerin (yeşil algler) ve siyanobakterilerin (mavi-yeşil algler) fermantatif ve biyofotolitik işlemleriyle üretilen üçüncü nesil bir biyoyakıttır. Mikroalgler, biyoyakıtların artan enerji talebini ve güvenilirliğini karşılamak için etkili bir hammaddedir. Bununla birlikte, mikroalg kullanılarak hidrojen üretiminde ışık, sıcaklık, besin, pH ve tuzluluk gibi çeşitli çevresel ve fiziksel kısıtlamalar bulunmaktadır. Mikroalg kullanılarak hidrojen üretiminin ana inhibitörlerinden biri, fotosentez sırasında üretilen oksijendir. Hidrojenaz enzimi, esas olarak oksijene duyarlı olan hidrojen üretiminden sorumludur. Bu hassasiyet, hidrojen üretiminin ana engelidir. Oksijen üretim seviyesini azaltmak için çeşitli teknikler bulunmaktadır. Bunlar arasında; mineral yoksun bırakma, çeşitli antioksidanların/oksijen indirgeyici ajanların (nanopartikül) eklenmesi, oksijen toleranslı enzimler ve mikroalglerin bakterilerle birlikte co-kültür olarak kullanılmasıdır. Saf bakteri hücreleri ve mikroalglerin co-kültürü ile, anaerobik fermantasyon, atık su arıtımı ve biyokütle üretimi sırasında biyohidrojen potansiyeli artmaktadır Co-kültür kullanılması ile hidrojen üretiminde, alglerin VFA'larla, özellikle asetik asitle beslendiği ve bakterilerin algler tarafından üretilen oksijeni tükettiği alg ve bakteriler arasındaki simbiyotik ilişkinin, hidrojen üretim potansiyelini artırabileceği öne çıkmaktadır. Bu çalışmada co-kültür kullanımının biyohidrojen üretim performansı üzerindeki etkileri araştırılmıştır.

Anahtar Kelimeler: Mikroalg, Bakteri, Biyohidrojen üretimi, Co-kültür.

Effects of operating parameters on the treatment of a slaughterhouse plant wastewater by electrooxidation process

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Özet: Slaughterhouse plants are generally large consumers of fresh water during the slaughtering process and the cleaning of machinery, which is exhausted as wastewater characterized by a high concentration of organic matter (e.g., proteins, blood, fat, and lard). This study investigated the effects of important process parameters such as anode type, current density, initial pH, and oxidation time on the treatment of slaughterhouse wastewater (SWW) by electrooxidation process. The optimum conditions for this study were found to be (anode material = BDD, EO experiment duration = 5 h, current density = 300 A/m^2, and initial pH = 7.5). The COD removal efficiency under optimum conditions was found to be 99.42% (effluent COD = 68 mg/L). The energy consumption, COD removed per m3 treated wastewater, and total operating cost were calculated as 148.50 kWh/m^3, 11.73 kg COD/m^3, and 4.90 US $/$m^3$, respectively. This study showed that the EO process has a satisfactory potential for the treatment of SWW with high chemical oxygen demand (COD).

Anahtar Kelimeler: Slaughterhouse wastewater, Electrooxidation, Treatment, Operating cost.

Sürdürülebilir ve yeni nesil atıksu arıtma tesislerinde biyorafineri konseptlerinin Türkiye potansiyeli

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Özet: Türkiye'de köylerden büyükşehirlere kadar tüm yerleşkelerde ve ürün üretim ve geliştirme süreçleri olan tüm tesislerde atıksu arıtma sistemleri bulunmaktadır. Avrupa yeşil mutabakatının sektörel bazda ihracatı etkilemesinden bu yana atıksu arıtma sistemleri su ve ürün geri kazanımı yaklaşımı olarak benimsenmiştir. Atıksu arıtma tesislerinde biyorafineri konseptleri, atıksu arıtım süreçlerinin yanı sıra atıksulardan değerli ürünler elde etmeyi amaçlayan yaklaşımlardır. Bu konseptler, sadece atıksuların arıtılmasını değil, aynı zamanda bu atıksulardan enerji, kimyasallar ve diğer ürünlerin üretimini içermektedir. Dahası biyorafineri konseptleri, sadece atıksu arıtımının ötesine geçerek atıksulardan sürdürülebilir ürünler ve kaynaklar elde etme fikrine dayanmaktadır. Çevresel sürdürülebilirliği artırmak ve atık yönetimini daha etkili hale getirmek amacıyla son yıllarda araştırılan ve uygulanan alan haline gelmiştir. Biyogaz, fermentasyon ve biyoplastik, fotosentetik organizmalarla biyoyakıt, kimyasal ürünler ve biyokimyasalların üretimi ve su ve değerli metallerin geri kazanımı biyorafineri konseptlerinden bazılarıdır. Atıksu geri kazanımı, kullanılmış suyun ve atık suyun işlenerek, içerisinde bulunan değerli bileşenlerin geri kazanıldığı ve tekrar kullanılabilir hale getirildiği bir süreçtir. Bu yaklaşım, suyun sürdürülebilir bir şekilde yönetilmesi ve su kaynaklarının korunması amacıyla önemli bir rol oynamaktadır. Bu amaçla bu çalışma Türkiye'deki atıksu arıtma sistemlerinin biyorafineri konseptinde uygulama uygulanma süreci ve tesise olan katkılarının değerlendirildiği bir çalışmadır.

Anahtar Kelimeler: Biyorafineri konsepti, Atıksu tesisleri, Çevresel sürdürülebilirlik, Kaynak geri kazanımı.

Enhancing cotton crop tolerance against drought stress using molecular approaches

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Abstract: Cotton is a vital source of raw material for the food and fiber industry. Limited availability of water for irrigation results in reduced growth of plants. Water scarcity is an upcoming dilemma globally that needs attention to develop strategies to overcome the situation. Development of plant varieties that can withstand the limited availability of water is the dire need of the day particularly in the case of economically vital crops. Cotton crop being the backbone of the country's economy needs significant attention. There are many strategies to improve the varieties including conventional and modern approaches. Conventional approaches are being utilized for the last many years. However, these are time consuming and laborious. Molecular approaches are accurate, time effective, and of broad spectrum as compared to conventional approaches. Over the years many genes and QTLs related to drought stress have been detected and utilized in cotton to enhance its drought tolerance. Additionally, the genome-editing approaches can hold the promise for the improvement of mechanisms related to drought stress directly or indirectly. Many studies have been conducted so far to explore and improve the ability of cotton to combat drought stress and recent advances in genomics research for cotton crop having emphasis on genetic linkage maps, genetic engineering, and gene/QTL mapping for drought stress tolerance.

Keywords: Drought, QTLs, MAS, Cotton.

Logistics and sustainable development ın terms of environmental awareness

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Abstract: Considering environmental factors and protecting the environment are among the issues that societies give the most importance in today's world. Climate change as a result of the increase in greenhouse gases and global warming is a concern all over the world. In this sense, while the sectors turn to environmentalist approaches, they try to determine their policies in accordance with international declarations. In an increasingly competitive environment with the effect of globalization, the increase in consumer expectations and demands, the decrease in profitability and costs, and the increase in legal environmental obligations cause businesses to focus on green practices. Logistics operations are of particular importance in all sectors and at all production stages. Compared to other sectors, logistics ranks high in the world economy in terms of both dynamic and competitive advantage. The concept of green logistics, which represents an environmentalist orientation by gaining importance in terms of sustainability, also expresses the environmentalist change in the sector. Green logistics does not only express an approach put forward by the companies operating in the sector and on which policies are produced, but also includes the processes followed by all companies engaged in international trade to eliminate the negative effects of their supply chains on the environment. Since transportation is the stage with the highest carbon emission in logistics, the trend towards modes that offer.

Keywords: Sustainable development, Environmental awareness, Logistic.

Океаны – глобальная экосистема Земли

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Abstract: Океаны играют огромную роль в глобальной экосистеме Земли, и их состояние имеет прямое влияние на климат, биологическое разнообразие, экономику и жизнь людей. Возможны различные сценарии глобальных катастроф, связанных с океанами. Некоторые из них могут включать: изменение климата и поднятие уровня морей; увеличение кислотности океанов; изменение морских течений и циркуляции; загрязнение океанов; потеря биологического разнообразия; угрозы для морских видов.

Как известно, большинство морей впадают в океаны. Для Украины большое значение представляет Чёрное море, которому предшествует значительная угроза. И этот факт касается не только долгосрочных военных действий на территории Украины сейчас, но и губительного воздействия со стороны многочисленного курсирования морем большинства крупнотоннажных морских суден.

В свою очередь, запад и восток Турции омывается Чёрным морем, которым курсируют многочисленные судна. Турция имеет самый широкий доступ к акватории Черного моря (35 % береговой линии). Большинство морских суден привносят локально в Мировой океан новые, неизведанные инвазивные биологические морские виды животных, посредством сброса балластных вод (используемых в качестве правильной осадки и устойчивости).

Совместными усилиями и разработками украинских и турецких ученых была предложена инновационная технология очистки и обеззараживания балластных вод морских суден, опираясь на стандарт качества D-2 Международной морской организации IMO.

Данный проект был любезно одобрен Советом Турции по научно-техническим исследованиям TÜBİTAK в рамках двухстороннего сотрудничества (2 года), с турецкой стороны – Стамбульский технический университет, лидер, профессор Танзер Сатир.

Поддержка данной разработки осуществляется на международном уровне и принесет значительный успех развитию судоходной отрасли обеих стран-партнеров. Преимуществом является значительное достижение конкретных целей устойчивого развития, предлагаемых к осуществлению до 2030 года. А, как известно, 6, 13, 14-я цели Повестки дня в области устойчивого развития направлены на сохранение морских экосистем и ресурсов в целом, изменение климата и т.д.

Поэтому, предопределяющий факт взаимного сотрудничества компетентных ученых в данной области является неоспоримым и досягаемым.

Keywords: океан, опасность, экологическая катастрофа, охрана морских экосистем, загрязнение океанов

FOOD ENGINEERING

Brokoli sebzesinin ultrases destekli ekstraksiyon ile kalite özelliklerinin incelenmesi

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Özet: Bu çalışmada brokoli (Brassica oleracea var. italica Plenck) sebzesine farklı süre ve güç parametreleri ile ultrases destekli ekstraksiyon işlemi uygulanarak toplam fenolik, antioksidan aktivite, askorbik asit ve renk değişimlerin incelenmesi amaçlanmıştır. Brokoli örneklerinin en fazla toplam fenolik miktarına %60 genlik / 15 dk parametrelerinde ulaşılmıştır. Brokoli örneklerinin antioksidan aktivite değerleri incelendiğinde en yüksek EC50 değeri 11.29 ile %60 genlik / 10 dk parametreleri uygulandığında tespit edilirken, en düşük değere ise 6.94 EC50 ile %60 genlik / 5 dk koşullarında belirlenmiştir. Ekstraksiyon koşulları arasında %60 genlik / 5 dk parametreleri en yüksek askorbik asit miktarı olarak tespit edilmiştir. Brokoli örneklerine uygulanan farklı ekstraksiyon parametreleri renk değerlerine anlamlı bir etkisi olmuştur. Sonuç olarak yenilikçi teknolojilerden biri olan ultases destekli ekstraksiyon yöntemi hem çevreci olması hem de gıdaların kalite parametrelerine olumlu etkisi yapması nedeniyle daha fazla araştırma yapılmasına ihtiyaç vardır.

Anahtar Kelimeler: Brokoli, ultrases, toplam fenolik, antioksidan aktivite

Функциональный кисломолочный продукт, обогащенный тыквой

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Абстракт: В последние годы в условиях неблагоприятного изменения экологической обстановки качество питания ухудшается, что в свою очередь влияет на ухудшение здоровья населения планеты. В связи с этим увеличивается значимость функциональных пищевых продуктов, которые содержат необходимые ингредиенты, повышающие сопротивляемость организма человека заболеваниям, позволяя ему долгое время вести активный образ жизни.Функциональные пищевые продукты - это продукты, созданные человеком с целью придания ему каких-либо определенных свойств, направленных на профилактику для укрепления и поддержание здоровья. Это очень широкий круг пищевых продуктов, к которым в первую очередь, можно отнести обогащенные продукты в которые добавлены витамины, микроэлементы, белки, пищевые волокна и т.п. Таким образом, к функциональным продуктам питания относятся только те продукты растительного и животного происхождения, которые содержат физиологически активные вещества, способствующие укреплению здоровья, в дополнение к традиционным питательным веществам, которые полезны для здоровья человека и снижают риск хронических заболеваний.Одним из ценнейших сырьем для создания функциональных продуктов относят тыкву. В связи с богатым содержанием микронутриентов тыквы, особенно мякоть плодов тыквы широко используется для создания продуктов питания детского и функционального назначения. В данной работе рассматривается использование мякоти тыквы с сахарным сиропом для кисломолочного напитка из пастеризованного молока с массовой долей жира 3,2%. Для проведения исследований были выработаны образцы с внесением наполнителя в виде тыквенного пюре с сахарным сиропом и контрольный образец без наполнителя. В готовом продукте были изучены органолептические показатели, пищевая ценность, динамика титруемой и активной кислотности. А также установлен оптимальный срок хранения образцов, что составило 7 дней. На основании результатов экспериментальных исследований был сделан вывод о целесообразности внесения в состав кисломолочного напитка наполнителя в виде тыквенного пюре – 15 %.

Ключевые слова: Функциональные продукты, тыква, кисломолочные продукты, обогащение, питание.

Functional fermented milk product enriched with pumpkin

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Abstract: In recent years, in the face of adverse changes in the environmental situation, the quality of nutrition has been deteriorating, which in turn affects the deterioration of the health of the world's population. In this regard, the importance of functional foods is increasing, which contain the necessary ingredients that increase the resistance of the human body to diseases, allowing it to lead an active lifestyle for a long time. Functional foods are products created by man in order to give him any specific properties aimed at prevention to promote and maintain health. This is a very wide range of food products, which, first of all, include enriched products that have added vitamins, microelements, proteins, dietary fiber, etc. Thus, functional foods include only those foods of plant and animal origin that contain physiologically active substances that promote health, in addition to traditional nutrients that are beneficial to human health and reduce the risk of chronic diseases. One of the most valuable raw materials for creating functional products is pumpkin. Due to the rich content of micronutrients in pumpkin, especially the pulp of pumpkin fruits is widely used to create food for children and functional purposes. This paper discusses the use of pumpkin pulp with sugar syrup for a fermented milk drink made from pasteurized milk with a fat mass fraction of 3.2%. For research, samples were developed with the addition of a filler in the form of pumpkin puree with sugar syrup and a control sample without filler. In the finished product, organoleptic indicators, nutritional value, dynamics of titratable and active acidity were studied. And also set the optimal shelf life of the samples, which amounted to 7 days. Based on the results of experimental studies, it was concluded that it is expedient to introduce a filler in the form of pumpkin puree - 15% into the composition of the fermented milk drink.

Keywords: Functional foods, pumpkin, fermented milk products, enrichment, nutrition.

Şalgam suyu fermantasyonu artık ürünü setiklerin Tarhana fermantasyonu üzerine etkisi

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Özet: Ülkemize özgü özellikle Türkiye'nin güney illerinde yüksek miktarlarda üretimi gerçekleştirilen geleneksel bir ürünümüz olan şalgam suyu, kırmızı/mor renkte, ekşi bir içecektir. Üretiminde siyah havuç, bulgur unu (setik), ekşi hamur, tuz, su ve istenirse şalgam turpu kullanılmakta olup, son yıllarda üretim ve tüketim miktarlarında ciddi artışlar meydana gelmekte, küçük ölçekli ve merdiven altı işletmelerin yerini sanayi tipi işletmeler almaktadır. Üretimdeki bu artışa paralel olarak, atık/artık ürün miktarlarında da ciddi bir artış vardır. Bu artık/atıklardan biri şalgam suyu üretiminde önemli bir hammadde olan bulgur unu (setik) olup, fermantasyon sırasında mikroorganizmalar için besin kaynağı olarak rol oynamaktadır. Bu artık ürünün katma değeri yüksek bir ürüne dönüştürülmesi amacıyla bu çalışma kapsamında farklı miktarlarının tarhana üretiminde buğday unu ikamesi olarak kullanımı ile tarhana fermantasyonu üzerine etkisi değerlendirilmiştir. Kullanılmadan önce, şalgam suyu uzaklaştırılarak, bulgur unu ayrılmış, etüvde kurutulduktan sonra öğütülerek tarhana üretiminde kullanılmıştır. Bu amaçla 1000 g un üzerinden hesaplanarak tarhana hamuruna %5 artık bulgur unu tozu, %10 artık bulgur unu tozu, %15 artık bulgur unu tozu, %20 artık bulgur unu tozu ikame edilmiştir. Ardından elde edilen tarhana hamurlarında, fermantasyon boyunca pH, toplam asitlik, L*, a* ve b* değerlerindeki değişim takip edilmiştir.

Anahtar Kelimeler: Şalgam suyu, artık ürün, bulgur unu, fermantasyon, tarhana

Reaktif ekstraksiyon yöntemi ile pravastatinin geri kazanımının incelenmesi

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Özet: Statinler kardiyovasküler hastalıkların tedavisinde yaygın olarak kullanılan ve HMG-CoA (3-hidroksi-3-metilgluraril-koenzim A) redüktaz enzimini inhibe ederek hem karaciğer hücrelerinde kolesterol sentezini engellemektedirler hem de dolaşımdaki LDL (düşük yoğunluklu lipoprotein) kolestrol düzeyini azaltmaktadırlar. Statinler belirli dozlarda vücuda alındıklarında LDL kolestrol seviyesini %25-45 oranında düşüren ilaçlar içerisinde yer almaktadırlar. Bu etkilerinin yanı sıra vücutta HDL (yüksek yoğunluklu lipoprotein) kolesterol seviyesini %5-15 oranında artırmaktadırlar. Statinler doğal ve sentetik olmak üzere iki gruba ayrılmaktadır. Doğal olanlar lovastatin, mevastatin, simvastatin ve pravastatin sentetik olanlar ise serivastatin, atorvastatin, pitavastatin, fluvastatin ve rosuvastatindir. Pravastatin sodyum bir [HMG-CoA] redüktaz inhibitörüdür ve lipid düzenleyici bir ilaçtır. Kandaki yüksek kolesterol seviyelerini düşürerek bilhassa kardiyovasküler hastalık riski taşıyan kişilerde kullanılan bir ilaçtır. Bu çalışmada, pravastatin sodyumun reaktif ekstraksiyon yöntemi ile sulu çözeltilerden geri kazanılması açısından incelenmiştir. Reaktif ekstraksiyon prosesinde 10 mg/L Pravastatin sodyum stok çözeltisi hazırlanmıştır. Ayrıca çözücü oranlarının prosese etkisini belirlemek için üç farklı çözücü oranları (hekzan/saf su) ve reaktant olarak adogen 464 reaktifi kullanılmıştır. Hem reaktif ekstraksiyon hem de fiziksel ekstraksiyon sonuçları verimlilik, dağılma katsayısı, yükleme faktörü ve times (KDn/KD0) olarak kıyaslanmıştır. En yüksek verimliliğe (%69. 37) ve dağılma katsayısına (2.27) 3:5 çözücü oranlarında, en yüksek yükleme faktörüne (0,0721) 5:5 çözücü oranında ve dağılma katsayısının başlangıç dağılma katsayısına oranları bakımından en yüksek değere 91.04 kat artışla yine 5:5 çözücü oranlarında ulaşılmıştır. Fiziksel ekstraksiyon sonuçlarında ise en yüksek verimlilik %5.97 olarak tespit edilmiştir.

Anahtar Kelimeler: Statinler, pravastatin sodyum, reaktif ekstraksiyon, fiziksel ekstraksiyon, adogen

Sarı ve mor et rengine sahip (Agria ve İlk Mor) patates çeşitlerinin kabuklarının genel bileşimi üzerine bir araştırma

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Özet: Bilimsel adı Solanum tuberosum L. olan patates temel diyetin bir parçası olan, dünya genelinde pek çok insan tarafından günlük olarak önemli miktarlarda tüketilen, besin değeri yüksek olan önemli bitkisel gıdalardan biridir. Patates genellikle taze tüketilen bir ürün olup, nişasta ve patates cipsi gibi endüstriyel ürünlerin üretiminde de büyük miktarlarda kullanım alanına sahiptir. Bu kullanım genellikle etli kısım ile sınırlı olup, arta kalan patates kabukları günümüzde yeterince kullanılmamakta ve israf edilmektedir. Dünya genelinde patates ile ilgili genellikle sarı et renginde çeşitler bilinmekle birlikte, mor çeşitlerde bulunmaktadır. Dolayısıyla bu çalışmada Sarı ve mor et rengine sahip (Agria ve İlk Mor) patates çeşitlerinden artık olarak kalan kabuklarının bazı özellikleri belirlenmiştir. Artık sarı patates kabuklarında kurumadde, kül, L*, b* ve protein değerleri daha yüksek bulunmuşken, toplam asitlik, a*, toplam nişasta, karbonhidrat, antioksidan kapasite ve toplam fenol değerleri mor patates kabuklarında daha yüksek bulunmuştur. Ayrıca, mor patates kabuklarında toplam monomerik antosiyanin miktarının 1202 mg/kg olduğu belirlenmiştir.

Anahtar Kelimeler: Sarı patates, mor patates, patates kabuğu, Agria, İlk mor

A research on the general composition of the skins of potato varieties with yellow and purple flesh color (Agria and ilk Mor)

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Abstract: Potato, whose scientific name is *Solanum tuberosum* L., is one of the important plant foods with high nutritional value, which is a part of the basic diet and consumed in significant amounts daily by many people around the world. Potato is a product that is generally consumed fresh, and it has a large amount of use in the production of industrial products such as starch and potato chips. This use is generally limited to the fleshy part, and the remaining potato skins are not used enough and are wasted today. Although yellow flesh-colored varieties are known around the world, there are purple varieties. Therefore, in this study, some characteristics of the residual skins of potato varieties with yellow and purple flesh color (Agria and ilk mor) were determined. While dry matter, ash, L*, b* and protein values were found to be higher in leftover yellow potato skins, total acidity, a*, total starch, carbohydrate, antioxidant capacity and total phenol values were higher in purple potato skins. In addition, it was determined that the total amount of monomeric anthocyanin in purple potato skins was 1202 mg/kg.

Keywords: Yellow potato, purple potato, potato peel, Agria, ilk mor

Farklı haşlama yöntemlerinin mor etli patatesin fizikokimyasal özellikleri üzerine etkisinin kemometrik incelenmesi

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Özet: Haşlama işlemi gıdaların tüketilmesinde en fazla kullanılan yöntemlerden biridir. Uygulanan haşlama yöntemine bağlı olarak gıdanın içeriğinde bulunan bileşenlerin miktarında değişiklik meydana gelmektedir. Günümüzde ise geleneksel (suda) haşlama yöntemi diğer haşlama yöntemlerine kıyasla en fazla kullanılanıdır. Bu araştırmada mor etli patatesler suda, buharda ve mikrodalgada haşlama yöntemiyle haşlanmış, farklı haşlama işlemleriyle değişen fizikokimyasal özellikleri incelenmiş, haşlama sıcaklığına maruz bırakıldığı süre peroksidaz enziminin %90 ve üzerinde olduğu durum baz alınarak belirlenmiştir. Suda ve sitrik asit çözeltisi (% 1) kullanılarak; suda, mikrodalgada (180, 300, 450, 600, 800 W) ve buharda haşlanan mor etli patateslerde toplam fenolik madde, antioksidan aktivite, toplam monomerik antosiyanin, askorbik asit ve renk değerleri belirlenmiştir. Toplam fenolik madde miktarı su içerisinde 800 W gücünde mikrodalga haşlama, antioksidan aktivite ve toplam monomerik antosiyanin miktarları %1 sitrik asit içeren çözeltide 300 W gücünde mikrodalga haşlama ve askorbik asit miktarı ise %1 sitrik asit çözeltisinde suda haşlama yöntemlerinde en iyi sonuçlar elde edilmiştir. Elde edilen sonuçlardan yaralanarak temel bileşen analizi yapılmış ve haşlama yöntemlerinin farklılaşma durumları incelenmiştir.

Anahtar Kelimeler: Fizikokimyasal özellikler, haşlama yöntemleri, mor etli patates, temel bileşen analizi

Using vis transmission spectra to determine colorimetric parameters of transparent and translucent food materials

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Abstract: Color, an essential physical attribute of food, plays a crucial role in quality control, adhering to specifications, and assessing the impacts of processing on edibles. When light encounters a food substance, it undergoes reflection, absorption, or transmission. Food items can be categorized as opaque (i.e., bread, meat, fruits, cheese, milk), translucent (i.e., fruit juices, jelly, marmalade, honey, beer) or transparent (i.e., oil, white wine), based on their interaction with light. According to this category, it is decided to use the appropriate color measurement instrumentation. The color of opaque foods is measured using reflected light values, while the color of transparent foods is measured using transmitted light values. UV-Vis spectrophotometers are laboratory devices that can measure absorbance and transmittance in the wavelength range of 190-1100 nm. The wavelength of visible light is between 380-780 nanometers. Over the years, the International Commission on Illumination (CIE) has developed various color space systems to serve different applications. CIELAB (based on the L*: lightness-darkness, a*: redness-greenness, b*: yellowness-blueness coordinates) is one of the color space systems, which are mathematical models used to define colors in an organized and measurable manner. It is the most applied color space system in food color analysis. To calculate the LAB values of a transparent or translucent sample, we need the visible transmission spectra of the respective sample. The visible transmission spectra of the sample are determined using a spectrophotometer. Afterward, the illuminant, observer, and visible transmittance spectra are combined, and the Tristimulus coordinates (X, Y, Z) are calculated using the equations provided in the CIE Technical Report (CIE 12:2004 3rd Edition). Subsequently, CIELAB coordinates (L*, a*, b*) can be derived from the tristimulus values X, Y, and Z.

Keywords: Colorimetric parameters, Spectrophotometer, Tristimulus coordinates

Citrus peel powder

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Abstract: Citrus peel is the primary by-product of citrus juice processing. It contains many valuable substances and imparts several health benefits linked with its high levels of bioactive ingredients. Citrus peels are dried to obtain powder with low water activity and high fibre content. Citrus peel powder is utilized in the food industry as a functional ingredient, not only for its high nutritional value, but also because of its techno-functional features. Drying treatment is very important for the quality of final product. This review covers the literature studies on drying of citrus peels and the use of citrus peel powder in food formulations. The aim is to provide reference for further research on improving existing drying techniques or developing novel drying approaches, for enhancement of dried citrus peel quality.

Keywords: Citrus peel, Drying, Rutaceae, Powder.

Rheological and physicochemical properties of fermented milk product with fruit additive

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Abstract: Protein deficiency is a disease state of the human body, which is associated either with increased protein breakdown or with insufficient intake and subsequent assimilation. A really severe deficiency in the intake of proteins with food can develop in those who are undernourished for a long time, adhere to a mono diet, or practice vegetarianism. Dairy products are considered one of the most protein-rich foods. Süzmö is obtained by dehydration of the fermented milk product - Ayran, which contains about 10 % proteins. In this study, the effect of the addition of fruit purees on rheological parameters was investigated in shear steady rheological experiments. The flow behaviours of Süzmö with fruit puree addition were evaluated at six temperatures (20, 30, 40, 50, 60, and 70°C) and suitable rheological models were found. The flow properties of samples at 20 and 70°C correspond to the Bingham model with correlation coefficients of R=0.950 – 0.997. The flow curves of Süzmö with fruit purees at investigated temperatures have yield stress (τ0) values between 135.7 Pa and 54.1 Pa, whereas by Süzmö without fruit purees was 285.87 Pa and 32.64 Pa. The effective viscosity (ηeff) of Süzmö with increasing temperature from 20 and 70°C decreased from 70.71 to 13.6 Pa·s, whereas by Süzmö without fruits was 15.88 to 0.26 Pa·s. Thus, the addition of fruit purees stabilizes the consistency of Süzmö. Homogenization process also showed an effect on the rheological parameters. The measured parameters are essential for the industrial production of new food products based on ethnic food Süzmö and other concentrated fermented milk products.

Keywords: Süzmö, milk product, apricot puree, rheological properties, flow behaviour

Prospects for processing apricots in Central Asia

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Abstract: Apricots are an important source of income and food security for many farmers in Central Asia, especially in Uzbekistan, Kyrgyzstan and Tajikistan, where they have a high export potential. Fresh, dried, and processed apricot (Prunus armeniaca L.) fruit consumption has a good impact on human nutrition and health. They are high in antioxidants, potassium, carotenes and vitamin C. With a worldwide production of over 3.6 million tons, they are among the most important fruits of the temperate zones. According to FAO, the top three countries by apricot production in 2021 were Turkey with 807,501 tonnes. Uzbekistan with 496,057 tonnes and Iran with 342,479 tonnes. Due to its favorable climatic and geographical conditions, horticulture plays a significant role in Kyrgyzstan. According to Tridge, the production volume of fresh apricots in Kyrgyzstan has fluctuated between 20,000 and 30,000 tonnes in the past decade and ranking 29th in the world. Apricot plantations are estimated to cover more than 15,000 ha in Kyrgyzstan, of which more than 10,000 ha are located in the country's south. The article discusses the opportunities for developing this field of agriculture as well as the economic indicators for apricot production in Central Asian countries.

Keywords: Apricots, Production, Harvested area, Yield

Climate change and possibility effects on food security in Pakistan

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Abstract: Pakistan is one of the developing countries that has suffered as a result of climate change, which is currently a worldwide concern. This study describes climate change and its possible effects on Food Security in Pakistan. The investigation uncovered proof of climate change and its serious effects on the nation's already insufficient and degraded natural resources. The findings of this investigation demonstrated The minimum temperature varied from 3.5 °C in January to 23.6 °C in July. The average temperature ranged from 29.8 °C in June to 9.3 °C in January. The maximum temperature varied from 16.2 °C in January to 35.8 °C in June. The total precipitation ranged from 258 mm in July to 34 mm in November. The rainy days ranged from 18 mm in August to 3 mm in November and December. August saw the highest humidity at 79%, while May recorded the lowest at 40%. The longest period of daylight (12.3 hours) was observed in May, while the shortest was 8.2 hours in January. The study indicates Pakistan's food security and shortage. The major reason for this food crisis is the low crop yield. The primary crops and farms of Pakistan have suffered significant damage as a result of extreme weather events, such as unexpectedly heavy rain and flash floods in mountainous areas. Given the importance of agriculture to Pakistan's national economy and food security, it is necessary to consider climate change adaptation methods.

Keywords: Climate Change, Food Security, Agriculture, Pakistan

GEOLOGICAL, GEOMATICS AND MINING ENGINEERING

Niğde volkanik kompleksi (KB Niğde) erken-geç pliyosen yaşlı Melendiz volkanitlerinin hidrotermal alterasyonu

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Özet: Niğde ilinin kuzeybatısında Niğde Volkanik Kompleksine ait Erken-Geç Pliyosen yaşlı piroklastik akma çökelleri, bazalt, bazaltik andezit, andezit ve dasit dayklarından oluşan Melendiz volkanitleri içerisinde hidrotermal alterasyon zonları gelişmiştir. Çoğunlukla piroklastik (ignimbirit) ve kısmen lav ürünlerini etkileyen alterasyon beyaz-sarımsı beyaz renkli silis ve kil mineral oluşumlarına neden olmuştur. Bu çalışmada alterasyona uğramış kayaçların mineralojik-petrografik ve jeokimyasal özelliklerinin incelenmesi amaçlanmıştır. Bu kapsamda optik ve elektron mikroskop, X-ışınları kırınımı, X-ışınları fluoresans spektrometresi, indüktif eşleşmiş plazma-kütle spektrometresi incelemeleri gerçekleştirilmiştir. Altere örnekler başlıca silis (kuvars, kristobalit, opal-CT), kil (simektit, kaolinit), sülfat (alünit) ve demir oksit-hidroksit (hematit, götit/limonit) mineralleri içermektedir. Hidrotermal alterasyon büyük ölçüde asidik (pH<6) ve kısmen de nötr-alkalin (pH=7-8) ortamda ve düşük sıcaklık (<200°C) koşullarında (arjilik alterasyon) gelişmiştir. Baskın mineral birlikleri ve oluşum sırasına göre (I) silika (opal-CT+kristobalit+kuvars), (II) sülfat (alunit) (III) kil (dioktahedral simektit veya kaolinit) ve (IV) demiroksit (hematit+götit/limonit) alterasyonu olmak üzere dört alterasyon türü belirlenmiştir. Taze ve alterasyona uğramış kayaçların kondrit normalize ana oksit ve iz/nadir toprak element dağılımları birbirlerine benzer yönelim, ancak zenginleşme ve fakirleşme açısından alterasyon türlerine göre farklılıklar sergilemektedir. Bu durum birbirini izleyen alterasyonlar sırasında oluşan minerallerden arta kalan çözeltinin bileşiminin değişimiyle ilişkilidir. Simektit ve kaolinitlerin oksijen ve hidrojen izotop jeokimyası verileri hipojen (derin-hidrotermal) ortamı, bu mineralleri oluşturan suların ise meteorik/jeotermal sulardan türediğini göstermiştir. Mineral-su izotop ayrımlaşma verilerine göre; simektitler ~ 100 °C, kaolinitler ~ 200 °C sıcaklıklarda oluşmuşlardır. Mineralojik ve jeokimyasal veriler bölgedeki magmatik faaliyetlerle ilişkili “steam-heated” tip arjilik alterasyonla ilişkili olarak birbirini izleyen alterasyon süreç ve türlerinin geliştiğini göstermiştir.

Anahtar Kelimeler: Niğde Volkanik Kompleksi, Hidrotermal alterasyon, Mineraloji, Jeokimya

Hydrothermal alteration of the early-late pliocene Melendiz volcanics from Niğde volcanic complex (NW Niğde)

Abstract: The hydrothermal alteration zones are developed in Early-Late Pliocene Melendiz volcanics belonging to Niğde Volcanic Complex, composed of pyroclastic flow deposits, basalt, basaltic andesite, andesite and dacite dykes in the north-western part of Niğde. The alteration affected mostly pyroclastic (ignimbrite) and partly lava

products caused the white-yellowish white colored silica and clay mineral occurrences. In this study, it is aimed to investigate the mineralogical-petrographical and geochemical properties of the altered rocks and to determine their mineralogical-petrographical and geochemical characteristics. In this context, optical and electron microscope, X-ray diffraction, X-ray fluorescence spectrometry and inductively coupled plasma mas spectrometry investigations were carried out. Altered samples include silica (quartz, cristobalite, opal-CT), clay (dioctahedral smectite, kaolinite), sulfate (alunite) and iron oxide-hydroxide (hematite, goethite / limonite) minerals. Hydrothermal alteration was developed mainly in acidic (pH<6) and partially neutral-alkaline (pH=7-8) conditions and low temperature (<200°C) conditions (argillic alteration). Four different alteration types were determined according to the dominant mineral associations and their order of occurrence: (1) silica (opal-CT + cristobalite + quartz), (2) sulfate (alunite) (3) clay (smectite or kaolinite) and (4) iron oxide (hematite + goethite/limonite) alteration. The chondrite normalized major oxide and trace/rare earth element distributions of fresh and altered rocks show similar trends, but some differences according to alteration types in terms of enrichment and depletion. This is related to the change in the composition of the solution remaining from the minerals formed during the successive alterations. Oxygen and hydrogen isotope geochemistry data of smectites and kaolinites have shown that the hypogene (deep-hydrothermal) environment and the mineral-forming waters are derived from meteoric/geothermal waters. According to mineral-water isotope fractionation data; smectites were formed at temperatures of ~ 100 °C and kaolinites at temperatures of ~ 200 °C. Mineralogical and geochemical data have shown that successive alteration processes and types developed in relation to the "steam-heated" type argillic alteration associated with magmatic activities in the region.

Keywords: Niğde Volcanic Complex, Hydrothermal alteration, Mineralogy, Geochemistry

Use zeolite and lime for the stabilization of an expansive clay

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Abstract: Expansive clays are a worldwide problem that poses several challenges for civil engineers. Such clayss swell when given an access to water and shrink when they dry out. Expansive clays can be stabilized by using admixtures. In this study the effect of using zeolite and lime in reducing the swelling potential of an expansive clay is examined. According to the ASTM C-618 standard zeolite is considered as a pozzolanic material. Grain size distribution, Atterberg limits and swell percent of the zeolite-lime- expansive clay mixtures are determined. Specimens are cured for 7 and 28 days. As a result of the experimental study, it was seen that addition of zeolite and lime mixture decreased swelling potential of the artificially prepared expansive clay specimen. The swell percentage of the stabilized specimens are affected positively by curing. The decrease in swell potential is due to zeolite - lime - expansive clay reactions, In the first phase, Ca^{2+} cations of the lime replace the sodium (Na^{+}) ions of expansive clay, this reaction reduces the thickness of the diffuse double layer which will cause flocculation and reduction in the plasticity of the soil. Hydration of lime with water liberates $(OH)^{-}$ ions which will cause increment in the pH of the soil solution, this will lead to increment in the solubility potential of silica and alumina and leads to a pozzolanic reaction and in the second phase, the cementing compound (CSH and CAH) gradually bonds the clay particles together. Curing positively affects the pozzolanic reactions.

Keywords: Expansive clay, Soil stabilization, Swelling potential, Zeolite, Lime

Modeling the contaminant migration in soils with Matlab

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Abstract: In civil and environmental engineering, analytical simulation models help engineers understand the physical and chemical processes that influence contaminant transport through a saturated soil layer, including advective and dispersive transport and sorption. The MATLAB program was developed based on an existing analytical solution for the two-dimensional transport of contaminants in a saturated soil layer. The computer program is prepared for the pulse source. The simulation is used to obtain the profiles of contaminant concentration as a function of distance from the source and time for a steady groundwater velocity. It is shown that the contaminant concentration profiles obtained by simulation demonstrate the processes involved.

Keywords: Computer program, contaminant migration, modeling, simulation, soil

Effects of various parameters on the rheology of bentonite–water suspensions

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Abstract: It is crucial to characterize bentonite-water systems' rheological and colloidal characteristics to establish their industrial application domains. In this study, the rheological characteristics of three different types of bentonite samples (Na bentonite, Na-Ca bentonite, Ca bentonite) were examined in relation to the impacts of solid ratio, mixing time, mixing speed, standby time, and soda activation. Based on the experimental parameters investigated, no significant change in viscosity was observed in the Ca bentonite suspension. In Na-bentonite and Na-Ca bentonite suspensions, values above 8% solids ratio increased the suspension viscosity, while the suspension viscosity was approximately fixed at values above the mixing time of 15 minutes and the standby time of 4 hours. The mixing speed is a more influential parameter for Na bentonite suspensions. Na-Ca bentonite's swelling index and viscosity values decrease above activation rates of 2%. However, a similar trend is observed for Ca bentonite after a 4% activation rate, but at relatively smaller rates.

Keywords: Bentonite, Montmorillonite, Rheology, Swelling, Viscosity

Betonda darbe enerjisine bağlı tokluk indeksinin agrega darbe testleri ile ilişkilerinin incelenmesi

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Özet: Bu araştırmada, betona uygulanan darbe testlerinden elde edilen darbe tokluğu değeri ile agrega darbe testleri arasındaki ilişkiler incelenmiştir. Beton darbe dayanımı için 15 farklı agrega kullanılarak 15 farklı beton dökülmüştür ve 28 gün sonunda sertleşmiş beton örneklerinden 30mm kalınlığında disk şeklinde örnekler hazırlanmıştır. Beton karışımlarında kullanılan 15 farklı agreganın; Protodyakonov dayanım indeksi (PSI), Agrega darbe değeri (AIV), Agrega ezilme değeri (ACV), Kayaç dayanım katsayısı (CRS), Kayaç darbe sertlik numarası (RIHN), Kırılabilirlik indeksi (CI), Darbe dayanım indeksi (ISI), Los Angeles aşınma deneyi (LA), Darbe deneyi (SZ) özellikleri belirlenmiştir. Sonuçlar agrega özellikleri ile üretilen basit regresyon denklemlerinin, betonun darbe direnci gibi önemli bir özelliğinin tahmininde güvenle kullanılabileceğini göstermiştir.

Anahtar Kelimeler: Beton, Agrega, Darbe testleri, Darbe tokluğu, Darbe enerjisi

Investigation of the relationships between the impact energy-dependent toughness index and aggregate impact tests in concrete

Abstract: In this study, the relationships between the impact toughness value obtained from the impact tests applied to concrete and the aggregate impact tests were investigated. For concrete impact resistance, 15 different concretes were poured using 15 different aggregates, and 30 mm thick disc-shaped samples were prepared from the hardened concrete samples at the end of 28 days. 15 different aggregates used in concrete mixtures; Protodyakonov strength index (PSI), Aggregate impact value (AIV), Aggregate crushing value (ACV), Coefficient of rock strength (CRS), Rock impact hardness number (RIHN), Crushability index (CI), Impact strength index (ISI), Los Angeles abrasion test (LA), Impact test (SZ) properties were determined. The results showed that simple regression equations produced with aggregate properties can be used safely to predict an important property of concrete such as impact resistance.

Keywords: Concrete, Aggregate, Impact tests, Impact toughness, Impact energy

Suya doygunluğun kayaların kazılabilirliğine etkisinin disk keskiler için araştırılması

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Özet: Mekanize kazı yöntemlerinin ilk yatırım maliyeti fazla görünse de, ilerleme hızlarının fazla olması, işletme masraflarının düşük olması ve daha güvenli sistemler olmaları nedenleri ile tercih edilmektedir. Ancak mekanize kazı yöntemlerinin seçiminde ve uygulamasında kazı performansını etkileyebilecek tüm parametrelerin iyi bir şekilde analiz edilmesi oldukça önemlidir. Aksi durumda büyük mali kayıplar ve hatta projenin başarısız olması durumları ortaya çıkabilmektedir. Aşırı su geliri, kazısı yapılan formasyon özelliklerini etkileyebilmekte ve özellikle kil içerikli zemin veya kaya formasyonlarının kazısında bu etki daha fazla olmaktadır. Artan su içeriği ile birlikte kil türüne bağlı olarak kazılan formasyon kesici uçlara veya kesici kafaya yapışabilmekte ve kazı işlemini zorlaştırarak kazıcı performansını olumsuz etkilemektedir. Literatürde tünel açma makineleri için zemin kazılarında bu problem üzerine yapılan çalışmalar bulunmasına rağmen, kil içerikli kayaçlar için detaylı bir çalışma yoktur.

Yapılan bu çalışma kapsamında kil içerikli kayaların kazısında artan su içeriği etkisiyle değişen kaya özelliklerinin keskiler üzerine etki eden kuvvet değerleri ile spesifik enerji ve optimum keskiler arası mesafe (s)/ kesme derinliği (d) oranına etkisi araştırılmıştır. Bu kapsamda İmbat Madencilik işletme sahasından temin edilen kil içerikli kaya numunesi üzerinde kuru ve suya doygun şartlarda disk keski kullanılarak kaya kesme deneyleri yapılmıştır. Deney sonuçları analiz edilmiş ve suya doygunluğun kil içerikli kayaların kazısı sırasında kuvvet ve spesifik enerji değerleri ile optimum s/d oranına etkileri araştırılmıştır.

Anahtar Kelimeler: Suya doygunluk, kazılabilirlik, kil içeriği, kesme parametreleri.

Öğütme yardımcılarının karıştırmalı bilyalı değirmen öğütme sıcaklığına ve akış özelliklerine etkisi

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Özet: Bu çalışmada, kalsitin kuru olarak karıştırmalı bilyalı değirmende öğütülmesinde pirina yağı ve triizopropanolamin öğütme yardımcısı olarak kullanılmasının ürünün akışkanlığına ve değirmen içi sıcaklığına etkisi incelenmiştir. Elde edilen sonuçlar tane boyutu ve akışkanlık analizleri açısından değerlendirilmiş değirmen içi sıcaklık ölçüm değerleri ile etkiler yorumlanmıştır.

Anahtar Kelimeler: Öğütme yardımcısı, Akışkanlık, Sıcaklık, Kuru öğütme

Mineral dolgu malzemelerinin özellikleri ve yüzey modifikasyonu

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Özet: Dolgu amaçlı olarak kullanılan endüstriyel mineraller, ucuz olmalarının yanı sıra sahip oldukları fiziksel ve fiziko-kimyasal özellikleri de fark edildiğinden beri, günümüzde birçok amaç için kullanılmaktadırlar. Fonksiyonel dolgu maddesi terimi, genellikle maliyeti azaltmaktan daha fazlasını yapan malzemeleri tanımlamak için kullanılır. Mineral dolgu malzemeleri ve matris arasındaki uyumluluğu geliştirmek ve kompozit malzemenin özelliklerini iyileştirmek için yüzey modifikasyonu (kaplama) yapılmaktadır. Bu derlemede, mineral dolgu maddelerinin özellikleri ve yüzey modifikasyonu hakkında bilgi verilmektedir.

Anahtar Kelimeler: Mineral dolgu malzemeleri, Yüzey modifikasyonu, Kompozit, Dispersiyon

MATHEMATHICS

Investigation of solitary wave solutions of a nonlinear mathematical model

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Abstract: This study aims to investigate solitary wave solutions of a fractional mathematical model using the modified generalized Kudryashov method, which has proven to be highly effective. The research has successfully identified the standard structures of fractional optical soliton wave solutions in rational forms. Additionally, non-singular solutions have been proposed with specific constraint conditions and displayed in 3D graphs to confirm their validity. The impact of a local fractional parameter on predicted non-singular solutions has been demonstrated in 2D graphs. Overall, the findings suggest that the suggested method is a useful and straightforward approach for discovering solitary wave solutions to different nonlinear differential equations.

Keywords: Modified generalized Kudryashov method, Solitary wave solutions, Mathematical modeling, Fractional derivative.

On the metallic pseudo-Riemannian manifolds

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Absract: In this paper, using torsion-free linear connection ∇ instead of Levi-Civita connection ∇^g with pseudo-Riemannian metric g, we present the new classifications of locally metallic pseudo-Riemannian manifolds and quasi metallic pseudo-Riemannian manifolds. Moreover, we introduce metallic-like pseudo-Riemannian manifolds.

Keywords: Statistical manifold, metallic pseudo-Riemannian manifold, conjugate connection, anti-Hermit metric.

On the classifications of Kâhler and anti-Kâhler manifolds

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Absract: In this paper, we investigate quasi-statistical structures of a linear connection ∇ with a Hermit metric g and the anti-Hermit metrics h and $\tilde{h}$. We show that an almost complex structure L is integrable if L is d^{∇}-closed and $T(LX,Y) = -T(X,LY)$ for any vector fields X and Y. After then, using $d^{\nabla}L = 0$ and $d^{\nabla}g = 0$ (resp. $d^{\nabla}h = 0$), we present two new classifications for Kâhler and anti-Kâhler manifolds. Moreover, we obtain the necessary conditions for the classification of quasi-Kâhler-Norden manifolds

Keywords: Kâhler manifold, anti- Kâhler Manifold, Quasi Statistical Structure, Hermit and anti-Hermit Metrics.

Power-law boundary layer in the hyperbolic system differential equations

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Absract: In the article, a regularized asymptotics is constructed for the solution of the Cauchy problem for a hyperbolic system of a differential equation when the limit equation has a regular singularity. The constructed asymptotics contains n boundary layer functions. The asymptotics of the solution is constructed by a special class of functions corresponding to the structure of the fundamental system of solutions.

We construct the asymptotics of the solution to the system

$$\begin{gathered}(\varepsilon + t)\partial_t u + A(x)\partial_x u + B(t)u = f(x,t), (x,t) \in Q, \\ u(x,t,\varepsilon)|_{t=0} = u^0(x).\end{gathered} \tag{1}$$

here $\varepsilon > 0$ is a small parameter,

1. $A(x) \in C^\infty([0,1], \mathbb{C}^{n\times n}), B(t) \in C^\infty([0,T], \mathbb{C}^{n\times n}), f(x,t) \in C^\infty(\Omega, \mathbb{C}^n), u = col(u_1, u_2, \dots, u_n)$;
2. the eigenvalues $\lambda_i(t), i = \overline{1,n}$ of matrix $B(t)$ satisfy the conditions: $Re\,\lambda_i(t) > 0, \lambda_i(0) \neq \lambda_j(t), \forall\, t \in [0,T], i,j = \overline{1,n}$.

Introducing the regularizing function

$$\xi_i = \varphi_i(t,\varepsilon), \quad i = \overline{1,n}$$

for the extended function

$$\tilde{u}(x,t,\xi,\varepsilon)|_{\xi=\varphi(t,\varepsilon)} \equiv u(x,t,\varepsilon).$$

We will define the solution of iterative problems in the class of functions

$$U = \Bigg\{ u(x,t,\xi): u = \sum_{i,j=1}^{n} c_{ij}(x,t)\,\psi_i(t)\exp(-\xi_j) + \sum_{i=0}^{n} q_i(x)\,\psi_i(t)\exp(-\xi_i) + \sum_{i=0}^{n} v_i(x,t)\;\psi_i(t), \qquad v_i(x,t), c_{ij}(x,t) \in C^\infty(\overline{\Omega}) \Bigg\},$$

Keywords: Asymptotics of the solution, mixed problem, hyperbolic equation, power-law boundary layer.

A study on the exact wave solutions of ISLWs and DJKM equations through $(m + 1/G')$-expansion method with conformable derivative

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Absract: In this study, a system of the ion sound wave and the Langmuir wave and a water wave model with low surface tension and long wavelengths are considered. The time-fractional ion sound and Langmuir waves (ISLWs) equation and time-fractional Date-Jimbo-Kashiwara-Miwa (DJKM) equation are analyzed to obtain the exact wave solutions. In order to achieve this aim, $(m + 1/G')$-expansion method is employed for the first time with the help of symbolic Software. The travelling wave solutions of the fractional equations are presented and the graphs are presented in distinct dimensions to observe the behaviors of the analytical solutions.

Keywords: $(m + 1/G')$-expansion method, Time-fractional ion sound and Langmuir waves equation, Time-fractional Date-Jimbo-Kashiwara-Miwa equation

On generalized magnetic curves

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Absract: In this paper, we examine generalized magnetic curves in the context of para-Kähler manifolds. Our work includes a detailed analysis of these curves and their associated properties. We also enrich our work by providing illustrative examples that are closely related to the topic at hand.

Keywords: Pseudo inner product, F-planar curve, Paracomplex structure, Magnetic curve

On common random fixed point results of the random operators in separable banach spaces

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Abstract: In this paper, we defined a random iterative process with errors. With this iteration, we proved that the random operators converge to the common fixed point. Moreover, the outcomes presented extend and enhance the corresponding findings put forth by Plubtieng in 2007.

Keywords: Random operators, common random fixed point, uniformly convex seperable Banach spaces.

On upper bounds of $H_{2,1}(f)$ and $H_{2,2}(f)$ Hankel determinants for a subclass of analytic functions

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Abstract : In this paper, we define a subclass of analytic functions as follows: A function $f \in \mathrm{A}$ is said to be starlike of order $\alpha,$ for $0 \le \alpha < 1,$ if and only if

$$\mathrm{Re}\left[\frac{z\left(D_\lambda^n f(z)\right)'}{D_\lambda^n f(z)}\right] > \alpha,$$

where f is analytic in the open unit disk and normalized so that $f(z) = z + a_2 z^2 + a_3 z^3 + \ldots$
We denote this class by $S^*_{(\lambda,n)}(\alpha)$.

We give upper bounds of the Hankel determinants $H_{2,1}(f)$ and $H_{2,2}(f)$ for the classes $S^*_{(\lambda,n)}$..

Keywords: Analytic and Univalent Functions, Coefficient Estimates, Hankel Determinant, Starlike Functions, Convex Function.

The problem with a nonsmooth regular functıon

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Abstract: Let's study the problem:

$$L_\varepsilon u \equiv \partial_t u - \varepsilon^2 a(x)\partial_x^2 + b(x)\partial_x u = f(x,t), \quad (x,t) \in \Omega, \qquad u|_{t=0} = u^0(x), \;\; u|_{x=0} = u|_{x=1} = 0. \tag{1}$$

This problem refers to a problem in which the regular asymptotic function of the solution is non-smooth. Such a problem was studied earlier by other researchers, where an asymptotics of the boundary layer type is constructed and the asymptotics of the solution includes several boundary layer functions as components.

Let us regularize problem (1), for which we introduce two regularizing variables:

$$\xi_1 = \varphi_l(x,t), \qquad l = 1,3, \;\; \varphi_1(0,t,\varepsilon) = 0, \;\; \varphi_2(1,t,\varepsilon) = 0.$$

Then we get an extended problem:

$$\begin{aligned} \tilde{L}_\varepsilon \tilde{u} \equiv \sum_{l=1}^{2} \Big[& \partial_t \varphi_l \partial_{\xi_l} \tilde{u} - \varepsilon^2 (\partial_x \varphi_l)^2 a(x) \partial_{\xi_l}^2 \tilde{u} + b(x)\partial_x \varphi_l \partial_{\xi_l} \tilde{u} \\ & - \varepsilon^2 a(x)\big(2\partial_x \varphi_l(x,t,\varepsilon)\partial_{x\xi_l}^2 \tilde{u} + \partial_x^2 \varphi_l(x,t,\varepsilon)\partial_{\xi_l}\tilde{u}\big)\Big] + \partial_t \tilde{u} - \varepsilon^2 a(x)\partial_x^2 \tilde{u} \\ & + b(x)\,\partial_x \tilde{u} = f(x,t), \\ & \tilde{u}|_{t=0} = u^0(x), \;\; \tilde{u}|_{x=0,\xi_1=0} = \tilde{u}|_{x=1,\xi_2=0} = 0. \end{aligned} \tag{2}$$

The resulting extended problem is regular in ε. The solution of problem (2) will be defined as:

$$u_{\varepsilon n}(\mathrm{M}) = \sum_{k=0}^{n} \varepsilon^k u_k(\mathrm{M}).$$

Keywords: Regular Function, Asymptotics, Boundary Layer.

Задача с негладкой регулярной функцией

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Абстракт: Изучим задачу:

$$L_\varepsilon u \equiv \partial_t u - \varepsilon^2 a(x)\partial_x^2 + b(x)\partial_x u = f(x,t), \quad (x,t) \in \Omega, \qquad u|_{t=0} = u^0(x), \;\; u|_{x=0} = u|_{x=1} = 0. \tag{1}$$

Эта задача относится к задаче, в которой регулярная функция асимптотики решения является негладкой. Такая задача изучалась ранее другими исследователями, в которых строится асимптотика типа пограничного слоя и асимптотика решения в качестве составляющих включает несколько погранслойных функций.

Произведем регуляризацию задачи (1), для чего введем две регуляризующую переменную:

$$\xi_1 = \varphi_l(x,t), \qquad l = 1{,}3, \quad \varphi_1(0,t,\varepsilon) = 0, \ \ \varphi_2(1,t,\varepsilon) = 0.$$

Тогда получим расширенную задачу:

$$\begin{aligned} \tilde{L}_\varepsilon \tilde{u} \equiv \sum_{l=1}^{2} \Big[& \partial_t \varphi_l \partial_{\xi_l} \tilde{u} - \varepsilon^2 (\partial_x \varphi_l)^2 a(x) \partial_{\xi_l}^2 \tilde{u} + b(x) \partial_x \varphi_l \partial_{\xi_l} \tilde{u} \\ & - \varepsilon^2 a(x) \big(2 \partial_x \varphi_l(x,t,\varepsilon) \partial_{x\xi_l}^2 \tilde{u} + \partial_x^2 \varphi_l(x,t,\varepsilon) \partial_{\xi_l} \tilde{u} \big) \Big] + \partial_t \tilde{u} - \varepsilon^2 a(x) \partial_x^2 \tilde{u} \\ & + b(x)\, \partial_x \tilde{u} = f(x,t), \\ & \tilde{u}|_{t=0} = u^0(x), \ \ \tilde{u}|_{x=0,\xi_1=0} = \tilde{u}|_{x=1,\xi_2=0} = 0. \end{aligned} \tag{2}$$

Решение задачи (2) будем определять в виде:

$$\tilde{u}_{\varepsilon n}(\mathrm{M}) = \sum_{k=0}^{n} \varepsilon^k u_k(\mathrm{M}).$$

Ключевые слова: регулярная функция, асимптотика, пограничный слой

Inverse problems for multi-dimensional loaded equations of heat-conducting type in the ground water theory

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Abstract: In this paper, we investigate an n-dimensional loaded inverse problem for nonlinear equations of heat-conducting type with a fixed viscosity parameter of an unbounded domain, and the constructed solutions have the property of conditional smoothness at all times. Studying problems have been reduced to loaded Volterra integral equations of the first and second kinds by means of Sobolev methods, auxiliary function and regularization. Deciding of this problem, it is possible to probe the conditional correctness (or the Tychonoff correctness) of the problem under study, which is the relevance of the studying problem.

Keywords: Inverse Problems, Regularization, Fixed Parameter, Multidimensional Problems.

A nonlocal inverse problem of parabolic type in a bounded domain

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Abstract. In this paper, we consider issues related to the integration method based on the Green function and the uniqueness of the solution of a nonlocally inverse parabolic problem in a bounded domain. When the first kind integral equations are degenerated in inverse problems, then various variants of the regularization method can be used to solve these equations in certain spaces. We note that many classes of parabolic type inverse problems belong to the class of conditionally well-posed problems, and in our case, the problem under study belongs to this class, which is the relevance of the problem under study.

Keywords: Inverse Problem, Differential Operator, The Green Function, Regularization Method, Unique Solvability of The Problem.

Reduction of second-order curves to canonical form using the Maple package

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Absract: This work is devoted to the reduction of the general equation of second-order curves to canonical form using the Maple package. The use of computers and other information and communication technologies in education optimizes learning management, saves students and teachers time, increases the efficiency of the educational process and the desire for new knowledge, strengthens the acquired knowledge and skills. In system of computer mathematics Maple using the methods of invariants and transformations of the coordinate system program has been written that classifies the type of equation, plots curves in different bases, outputs a canonical equation and formulas for the transformation of coordinate systems.

Keywords: Curve of The Second-Order, Invariant, Parallel Transform, Turn, Canonical Form, Maple Packages.

Gauss diagrams for disoriented knots

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Abstract: In this study, the Gauss codes for disoriented knot and link diagrams are defined by considering disoriented crossings, and the Gauss diagrams are drawn on disoriented circles with the help of these Gauss codes. In order to determine the equivalence of Gauss diagrams, it is important to determine Gauss diagrams corresponding to the disoriented Reidemeister moves. For this, it is enough to draw Gauss diagrams corresponding to the minimum generating set of the Reidemeister moves. Here, the Gauss code corresponding to each moves of the minimum generating set of Disoriented Reidemester moves is determined and Gauss diagrams are drawn. The Gauss moves of disoriented diagrams can be used as an important diagramatical method for researchers who want to study disoriented homology and disoriented cohomology.

Keywords: Disoriented Knots, Disoriented Moves, Disoriented Gauss Code, Disoriented Gauss Moves.

Light focusing by randomly distributed index gradient medium

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Abstract: In this study, we introduce a novel approach to designing photonic crystals (PCs) with disordered structures by incorporating random distributions of elements within unit cells. The key innovation lies in maintaining constant structural distances along the propagation direction while introducing randomness to the positioning of PCs' unit cells along the transverse direction, resulting in inhomogeneous refractive index profiles. We systematically and quantitatively analyze the light focusing phenomenon at different frequencies, demonstrating that the randomly generated graded index (GRIN)-like photonic medium achieves sub-wavelength light focusing on air, with a spot size below λ/3 (where λ is the wavelength of light). The minimum numerically obtained spot size is 0.260λ. Utilizing a Gaussian probability function, we explore multiple random designs to investigate the optical characteristics of the photonic medium. Specifically, we have examined similarities of transmission efficiencies and focusing abilities at low frequency regime of the designed random PC structures. Obtained results show that at low frequencies designed random PC structure can achieve strong focusing effect. Both off-centered and directional radiation patterns can be generated. The idea of merging randomness with index gradient yields rich light manipulation capabilities. This concept opens exciting possibilities for advanced optical design, offering a fresh perspective on light manipulation in disordered media. The approach's potential impact spans various domains, including imaging, communication, and sensing, paving the way for innovative technologies, and furthering our understanding of light-matter interactions. We validate our findings through experimental verification in the microwave region, establishing good agreement with numerical results. Overall, our work introduces a novel avenue for achieving sub-wavelength light focusing using all-dielectric materials, showcasing the potential for enhanced light manipulation capabilities, and paving the way for advances in various scientific and engineering applications.

Keywords: Photonic Crystals, Light Focusing, Graded Index medium, Electromagnetic Waves, In-plane light Coupling

Об одном классе интегрируемых уравнений в частных производных первого порядка

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Özet: Абстракт: В данной работе строится некоторый класс интегрируемых уравнений в частных производных первого порядка, связанных с уравнениями Риккати. Известно, что в общем случае решения уравнения Риккати в виде квадратур от элементарных функций не существует. Мы опираемся на некоторый класс уравнений Риккати, общее решение которых можно найти методом прямого интегрирования.

Ключевые слова: уравнения в частных производных, уравнение Риккати, общее решение, прямое интегрирование.

Growth of solution for a couple of parabolic type Kirchhoff equations

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Abstract: In this work, we consider a couple of parabolic type Kirchhoff equations. We prove the growth of solutions.

Keywords: Growth, Parabolic type equation, Multiple nonlinearity.

Nonexistence of solutions for a parabolic-type equation with viscoelastic term

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Absract: In this presentation, we consider the parabolic type equation with viscoelastic term. This type problem occurs in many mathematical models in engineering and physical sciences, such as nuclear science, chemical reactions, heat transfer, population dynamics. We prove the nonexistence of global solutions.

Keywords: Nonexistence, parabolic-type, variable exponent.

Viskoelastik terimli parabolik tipten bir denklem için çözümlerin yokluğu

Özet: Bu sunumda, viskoelastik terimli parabolik tipten bir denklemi ele alacağız. Bu türeden problemler; nükleer bilim, kimyasal reaksiyonlar, ısı transferi, nüfus dinamiği gibi mühendislik ve fizik bilimlerindeki birçok matematiksel modelde ortaya çıkar. Global çözümlerin olmadığını ispatlayacağız.

Compatibility method and its application for finding exact solutions to the time-fractional KdV equation

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Abstract: In this study, we propose the concept of compatibility between the time-fractional KdV equation and an integer-order one. Imposing a compatibility criterion, we obtain a proportional compatible equation with the fractional-order one. Then, using the general solutions of integer--order equations, we derive the exact solutions to the time-fractional KdV equation.

Keywords:Compatibility method, Time-fractional KdV equation, Exact solution, Riemann-Liouville derivative

Blow up of solutions of nonlocal singular viscoelastic system with nonlinear source term

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Absract: İn this work, we investigate the explosion of finite time solutions of a nonlocal singular viscoelastic system under suitable conditions using the Georgiev Todorova method for negative initial energy.

Keywords: İntegral equation, Nonlocal, Blow up, Viscoelastic equation

Blow up of solutions for a wave equation with variable coefficients and negative initial energy

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Absract: This presentation, we investigate the wave equation with variable coefficients. The variable coefficients wave equation is a kind of evolution equation. The evolution equations, namely partial differential equations with time *t* as one of the independent variables. We consider the blow up of solutions with negative initial energy under suitable conditions.

Keywords: Blow up, Wave equation, Variable coefficients

Değişken katsayılı ve negatif başlangıç enerjili bir dalga denklemi için çözümlerin patlaması

Özet: Bu sunumda değişken katsayılı dalga denklemini inceliyoruz. Değişken katsayılı dalga denklemi bir tür evolüsyon denklemdir. Evolüsyon denklemler, yani bağımsız değişkenlerden biri *t* zamanı olan kısmi diferansiyel denklemler. Negatif başlangıç enerjisi için çözümlerin patlamasını inceleyeceğiz.

Investigation of generating functions of sequence d_n and related identities

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Abstract: Modular groups have been studied extensively in the literature and have been associated with different number sequences. Modular group is obtained via linear fractional transforms $f(z) = -\frac{1}{z}$ and $g(z) = z + \lambda$ where λ is a positive real number. Erich Hecke related to the discrete groups of the modular group examined for which values of λ this group is discrete (Hecke, 1936). Hecke demonstrated the group is discrete for $\lambda \geq 2$ or $\lambda = \lambda_q = 2cos\left(\frac{\pi}{q}\right), q \in \mathbb{N}, q \geq 3$.

In addition, Yılmaz Özgür (2002) examined in case of $\lambda = \sqrt{q}$ for prime numbers $q \geq 5$. Then, this group was denoted with $H(\sqrt{q})$. Moreover, the n^{th} power of matrix $\begin{pmatrix} 0 & -1 \\ 1 & \sqrt{q} \end{pmatrix} \in H(\sqrt{q})$ was attained as

$$\begin{pmatrix} 0 & -1 \\ 1 & \sqrt{q} \end{pmatrix}^n = \begin{pmatrix} -d_{n-2} & -d_{n-1} \\ d_{n-1} & d_n \end{pmatrix} = \begin{pmatrix} -d_{n-2} & -d_{n-1} \\ d_{n-1} & \sqrt{q}d_{n-1} - d_{n-2} \end{pmatrix}.$$

From here, recurrence relation $d_n = \sqrt{q}d_{n-1} - d_{n-2}$ was found with initial conditions $d_0 = 1$ and $d_1 = \sqrt{q}$.

In this study, the generalized sequence $\{G_n\}$ for $n \geq 1$ was transformed into the sequence d_n under the transformation $n \to 2n - 2$. The general term of the sequence d_n was obtained by the characteristic roots of the Fibonacci and Pell sequence of numbers. The formulas giving the sum of terms of the sequence d_n, the sum of odd and even index terms were obtained using recurrence relation $d_n = \sqrt{q}d_{n-1} - d_{n-2}$ with initial conditions $d_0 = 1$ and $d_1 = \sqrt{q}$. Furthermore, identities were achieved by using the recurrence relation. Lastly, Binet formulas were obtained for sequence d_n via characteristic roots of Fibonacci and Pell numbers.

Significant contributions have been made to the sequence spaces with the data obtained in this study. Sequence spaces have important applications in engineering. Sequences are extremely useful in mathematics, especially in studying the properties of functions, polynomials, functional, operators, differential equations, and some other mathematical structures, thanks to their convergence properties. Moreover, Fourier sequences are used in Electrical and Electronics Engineering to represent properties of electrical signals. Similarly, sequences are used in Mechanical Engineering to predict the life of machine components subject to a randomly repeated sequence of loading.

Keywords: Hecke Group, Modular Group, Recurrence Relation, Sequence d_n

Existence of a solution for a Caputo fractional boundary value problem

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Abstract: In recent years, fractional analysis and fractional differential equations gained great importance by the agency of studies and proven applications in many scientific and technical fields such as mathematics, physics, statistics, biology and engineering. When we examined the literature there are many studies on different operators such as Riemann, Caputo, Hilfiger, Erdelyi- Kober, Hadamard and ψ fractional derivatives and integrals.

Inspired by the studies, we carry out a study on the existence of a solution for a nonlinear fractional differential equation containing a general form of Caputo fractional derivative with respect to a new function ψ. First, we write our fractional boundary value problem as an equivalent integral equation. Then, under some assumptions about the nonlinear term f, we obtain the existence and uniqueness results of the problem with the help of fixed point theorems and properties of Green's function. Our analysis is according to the fixed point theorems of Banach, Schafer and Schauder. Finally, we explained our results with the help of an example.

Keywords: Fractional differential equation, ψ fractional derivative and integral, existence result, fixed point theorem, boundary value problem.

A comparative wiev to $\mathcal{H}_\infty$-norm of transfer functions of linear DAEs

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Abstract: In this paper, we evaluated $\mathcal{H}_\infty$-norm of a transfer function of a linear DAE system by two different methods, which are bisection and extended balanced singular perturbation methods. First, we gave the algorithms of the methods and the error analysis, seperately. Then we computed $\mathcal{H}_\infty$-norms of a numerical example about decentralized interconnected systems via the methods, and checked the norms within the appropriate range as per the error bounds, respectively. Finally, the results are compared to value of $\mathcal{H}_\infty$-norm of the problem from MATLAB, one by one.

Keywords: DAE systems, $\mathcal{H}_\infty$-Norm, Bisection method, Extended balanced singular perturbation method.

Distribution of geodesic paths in communities of financial network of Borsa Istanbul

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Abstract: The examination of geodesic distribution within financial networks provides valuable insights into the topology and intrinsic properties of financial markets. It provides a numerical representation of the minimal connections among interconnected financial institutions, elucidating the network's capacity for propagating risk. The distribution under consideration possesses the capability to unveil network clustering characteristics, wherein shorter paths denote direct inter-organizational linkages, while longer paths signify a more segregated structure. The presence of systemic risk can be observed, wherein shorter paths indicate an increased risk attributed to greater interconnectivity. By conducting a rigorous examination of the temporal fluctuations within this distribution, one can effectively discern alterations in the market's organizational framework, thereby identifying heightened interdependencies or the emergence of financial clusters. This study investigates geodesic trajectories within communities by utilizing the correlation network data of Borsa Istanbul. It explores various community distributions and makes predictions about trends based on this network.

Keywords: Financial networks, Dynamic time warping, Kullback-Leibler information, Discrete geodesic paths

On Hyperbolic Fibonacci polynomials and their applications

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Özet: Abstract: We define the Hyperbolic Fibonacci polynomials. Then we give a formula for the Hyperbolic Fibonacci polynomials by using the Fibonacci polynomials. We show that there is a relation between the Hyperbolic Fibonacci polynomials and the Fibonacci polynomials. Some theorems like Cassini's theorem are proved for the polynomials. Their Binet's formulas are obtained. We also define the matrices of the Hyperbolic Fibonacci polynomials. We examine properties of the matrices.

Keywords: Fibonacci polynomials, Hyperbolic numbers, Fibonacci numbers, Hyperbolic Fibonacci polynomials,

A variational method for optimal control of the initial velocity in a hyperbolic system

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Abstract: In this study, we analyze an optimal control problem for the initial velocity in a hyperbolic system by the variational method. The adjoint problem is obtained by the Lagrange multiplier method and the adjoint problem approach is used to obtain the Frechet derivative of the cost functional. Finally, the necessary condition in an integral form for the optimal solution is given.

Keywords: Optimal control, Beam equation.

On the existence of a solution for ψ-Caputo fractional boundary value problems

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Abstract: Fractional differential equations, which emerged as a new branch of applied mathematics with the development of fractional calculus, have received great attention from many researchers as they describe the nature of real-world problems more precisely than ordinary differential equations used in many scientific and engineering studies such as material theory, transport processes, earthquakes, electrochemical processes, wave propagation, signal theory, electromagnetic theory, thermodynamics, mechanics, geology. When we examined the literature there are many studies on different operators such as Riemann, Caputo, Hilfiger, Erdelyi- Kober, Hadamard and ψ fractional derivatives and integrals.

We carry out a study on the existence of a solution for a nonlinear fractional differential equation including a general form of Caputo fractional derivative with respect to a new function ψ. And motivated by the [1-2] articles, we improve the theory of ψ-Caputo fractional derivatives involving p-Laplacian operator the existence result. First of all, we write our fractional boundary value problem as an equivalent integral equation. Then, we present the existence and uniqueness results for -Laplacian fractional boundary value problem by using some fixed point theorem. Finally, we present an explanatory example.

Keywords: Fractional differential equation, ψ fractional derivative and integral, existence result, fixed point theorem, boundary value problem.

General gamma, beta and hypergeometric functions: properties and application to fractional partial differential equations

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Absract: In this paper, we introduce gamma, beta, Gauss hypergeometric and confluent hypergeometric functions with general kernel function f and general special function K, which are constructed to cover the generalized gamma, beta, Gauss hypergeometric and confluent hypergeometric functions studied by scientists since 1994. We then present various properties of these functions such as integral representations, functional relations, summation relations, derivative formulas, transformation formulas and double Laplace transforms. We also present solutions to fractional partial differential equations involving general special functions. Finally, we introduce the general beta distribution and the incomplete beta function.

Keywords: Double Laplace transform, Fractional partial differential equations, Gamma function, Beta function, Gauss and confluent hypergeometric functions.

Bazı graflarda ikili (double) ayrıt roman baskınlığı

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Özet: Graflarda İkili (double) Roma Baskınlık kavramı 2016 yılında Beeler, Haynes ve Hedetniemi tarafından, Stewart, ReVelle ve Rosing tarafından sunulan Roma İmparatorluğu'nu savunma stratejilerinden esinlenen Roma Baskınlığı'na dayanarak tanıtılmıştır. Yayınlandığı ilk andan itibaren konu literatürde önemli bir ilgi görmüştür. Bu araştırmada İkili (double) Roma Baskınlığı ve İkili (double) Roma Baskınlığı'nın İkili (double) Ayrıt Roma Baskınlık varyasyonu ile uyumluluğunu inceleyip hakkında bilinen sonuçları gözden geçiriyoruz ve bazı bilinen graflar üzerinde kontrolünü gerçekleştiriyoruz.

Anahtar Kelimeler: Roma Baskınlığı, Çifte (double) Roma Baskınlık, İkili (double) Ayrıt Roma Baskınlık

Double edge roman dominations on some graphs

Abstract: The concept of Double Roman Domination in graphs was introduced in 2016 by Beeler, Haynes and Hedetniemi, based on the Roman Domination inspired by the strategies for defending the Roman Empire presented by Steward, Revelle and Rosing. Since its first publication, the topic has attracted considerable attention in the literature. In this paper we study Double Roman Domination and its compatibility with the Double Edge Roman Domination variation of Double Roman Domination, review known results about it and check it on some known graphs.

Keywords: Roman Domination, Double Roman Domination, Double Edge Roman Domination

On the correct solvabılıty of a nonlocal boundary value problem for fourth-order loaded hyperbolıc equatıon wıth ımpulsıve actıons

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Abstract: We study the correct solvability of a nonlocal boundary value problem for a fourth-order loaded hyperbolic equation with impulsive actions.

Keywords: hyperbolic equations, impulsive differential equations, nonlocal problem, impulsive actions

On solving the heat equation using the Jacobi method

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Abstract: In this paper, the Jacobi method was applied for the approximate solution of the heat equation. The Jacobi method was analyzed for error analysis and the solutions were presented comparatively on the graph. Depending on the number of basic system functions used in the Jacobi method, the variation in error was examined.

Keywords: Jacobi method, heat equation, error analysis

Analytical approximate solution of fractional order SIR epidemic model

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Absract: In this work, we investigate the application of the Laplace Adomian decomposition method (LADM) for solving a fractional compartmental epidemiological model. This paper introduces fractional order derivatives in the SIR epidemic disease model. Firstly, the models of epidemic diseases, which have an important place in mathematical modeling, are discussed. Finally, an effective analytical LADM is used to simulate the proposed model. All obtained solutions have been analyzed and compared graphically to validate the effiency and applicability of all results.

Keywords: SIR model, Caputo fractional derivative, Laplace Adomian decomposition method (LADM), power series.

The numerical solution of higher order two-point boundary-value problems with Padé Series

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Absract: In this paper, we apply He-Homotopy Perturbation Method and Laplace Transform method to solve linear and non-linear higher order two-point boundary value problems. Firstly, The basic properties of the He-Homotopy Perturbation Method and Laplace Transform method are given. Secondly, we calculate Power series of the given linear and non-linear higher order two-point boundary value problems, then transform it into Padé series form, which gives an arbitrary order for solving higher order two-point boundary value problems. Then, Numerical result of four higher order two-point boundary value problems are compared with the exact solution on table and figure. This means that method is a powerful tool for solving linear and non-linear higher order two-point boundary value problems.

Keywords: Higher Order Boundary Value Problems, Homotopy Perturbation Method, Laplace Method, Padé Series, Approximate Solution.

Решение задачи Навье-Стокса для несжимаемой жидкости с вязкостью

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Аннотация: Основным объектом этой работы является установление существования и единственности решения 3D-системы Навье-Стокса (НС) для несжимаемой жидкости с вязкостью. Трудность решения системы НС обусловлена их нелинейностью, а также необходимостью найти скорость и давление в зависимости от любых значений параметра вязкости (Ch. Fefferman, 2000). В связи с этим, исходная задача с использованием разработанного метода преобразуется в систему интегральных уравнений второго рода. При этом, существование и единственность решения задачи НС доказывается с использованием теории этих систем в специальном пространстве, которое было введено в этой работе. Кроме того, найденный закон распределения давления, которое описывается уравнением типа Пуассона и играет фундаментальную роль в теории систем НС при построении аналитических гладких (условно гладких) решений.

Ключевые слова: уравнение Навье-Стокса, несжимаемая жидкость, давление.

Salgın hastalıkların seyrinin SEIHR-D matematiksel modellemesi için kararlılık analizi

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Abstract: This study was organized on the expression of epidemic diseases with mathematical models and examining the effectiveness of mathematical models. The development of mathematical models and previous studies in the literature were examined, and a new model was created by adding H (hospitalized) and D (dead) compartments to SIR-SEIR compartmentalized models. In the research, Covid-19 Turkey data dated 01.01.2021- 28.04.2021 and Matlab programming language were used. The basic reproduction number (R_0), disease-free and endemic balance point of the created SEIHR-D mathematical model are explained and stability analysis is discussed. Accordingly, the presence of disease-free equilibrium point and asymptotic stability for $R_0 < 1$ have been proven. Similarly, the existence and stability of the endemic balance point for $R_0 > 1$ is explained. Based on the results and graphics we obtained, comments and predictions were made on the effectiveness of the model, the number of cases and recoveries.

Keywords: Covid-19 Pandemic, Stability Analysis, SIR-SEIR Model, Basic Reproduction Number

Existence and asimptotik behavior for wave equation with logarithmic source term

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Absract: In this presentation, we explore the wave equation with a logarithmic source term. The wave equation belongs to the category of evolution equations. Evolution equations are characterized as partial differential equations with time *t* as one of the independent variables. Our initial focus lies in demonstrating the existence of a solution using the semigroup method. Furthermore, we substantiate the decay of solutions through our analysis.

Keywords: Existence, Asimptotic, Delay, Wave equation, Source Term.

Logaritmik kaynak terimli dalga denklemi için varlık asimptotik davranış

Özet: Bu sunumda, logaritmik kaynak terimli dalga denklemini inceliyoruz. Dalga denklemi, bir tür evolüsyon denklemdir. Evolüsyon denklemleri, bağımsız değişkenlerden biri zaman *t* olan kısmi diferansiyel denklemler olarak karakterize edilir. İlk odak noktamız, yarı grup yöntemini kullanarak bir çözümün varlığını göstermektir. Ayrıca, analizlerimiz yoluyla çözümlerimizin bozulmasını doğrularız.

Anahtar Kelimeler: Varlık, Asimptotik, Gecikme, Dalga denklemi, Kaynak terim

Blow up of solutions for $p(x)-$ biharmonic type equations with variable exponent

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Abstract: In this work, we consider the p(x)-biharmonic type equations with variable exponents. We prove the blow up of solutions.

Keywords: Biharmonic equation, Blow up, Variable exponent

Değişken üslü p(x)- biharmonik tipten denklem için çözümlerin patlaması

Özet: Bu çalışmada değişken üslü p(x)-biharmonik tip denkleme çalıştık. Bu denklemin patlamasını ispatladık.

Exact Solution of the Fractional order Schrodinger parabolic differential equation

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Abstract: In this research, the exact solution of the fractional-order Schrödinger parabolic differential equation depends on the initial and boundary value conditions will be studied and presented by using the Laplace transform method. The fractional-order Schrödinger parabolic differential equation is given as the following

$$\begin{cases} i\ {}_0^cD_t^{\beta}u(t,x) = \lambda\ {}_0^cD_t^2u_{xx}(t,x) + f(t,x) \\ u(0,x) = \varphi(x), 0 \le x \le l \\ u(t,0) = u(t,l) = 0, t \ge 0. \end{cases}$$

Where, i is complex number, λ is any constant, $\varphi(x)$ is known and $u(t,x)$ is unknown function. Through involving fractional derivatives, which bring in memory-dependent effects and capture complicated quantum behaviors, this equation expands the classical Schrödinger equation. In order to determine the precise solution for the wave function (x,t), this research intends to build a novel methodology that combines fractional calculus methods with mathematical transformations. This will allow the research shed more light on the interaction between quantum mechanics and fractional calculus while also revealing how quantum systems behave when potential $u(t,x)$ and fractional derivatives of order are present. The objective of this research is to expand our comprehension of the connection between quantum mechanics and fractional calculus by offering insights into the behavior of quantum systems in the presence of potential $u(t,x)$ and fractional derivatives of order β. Ultimately, the paper contributes to the advancement of both theoretical knowledge in quantum mechanics and the practical applications of fractional calculus in diverse scientific and technological domains.

We explore the problem in this section and find exact solutions using the Laplace transform approach.

Keywords: Fractional-order Schrödinger parabolic differential equation, initial and boundry value conditions, exact solution, Laplace transform method.

Newton's method in bigeometric analysis

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Abstract: Solutions of nonlinear functional (algebraic, differential, integral, etc.) equations are very important in applied sciences and engineering. Newton's method is one of the most used methods in classical analysis to analyze the solutions of such equations. In this study, quadratic convergence of Newton's method, known from classical analysis, in bigeometric analysis was investigated. This new method is called the bigeometric Newton's method. For this, the basic definitions and theorems of bigeometric analysis, which is one of the non-Newtonian analysis, are given. Convergence analysis of the bigeometric Newton method is given with the help of the bigeometric Taylor expansion. Then, the classical Newton method, Geometric Newton method and Bigeometric Newton method were compared in detail.

Keywords: Bigeometric analysis, Bigeometric Newton method, Quadratic convergence.

Numerical solution of fractional order advection reaction diffusion equation with Hosoya neural network

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Absract: In this study, Hosoya artificial neural networks were used to solve the fractional-order reaction-diffusion equation. Hosoya neural networks consist of input layer with one perceptron, hidden layer with perceptions and output layer with one perceptron, which are composed of layers of sensors. The Hosoya polynomial's degrees is used as the training point in the hidden layer. Then the fractional order diffusion equation turns into a non-constrained optimization problem. The optimization problem is minimized by using the Marquart's method algorithm. Afterwards, the correctness of the problem was investigated using the Python program. Error and graphics were obtained after solving the example. Finally, tables were composed with the results obtained from numerical and exact solutions.

Keywords: Neural Network, Hosoya Polynomial ,Diffusion equation**.**

Fractional approach for diffusion equations arising in oil pollution using the efficient scheme

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Absract: The fundamental aim is to find the solution for diffusion equations arising in oil pollution using fractional natural decomposition method. We consider a model which illustrate the chemical reactions evolved in helium burning network. The Caputo operator with fractional order considered and hired algorithm is elegant consolidations of nature transform with Adomian decomposition method. To illustrate the competence of the projected algorithm, we examined the anticipated model in a different order with fraction. Moreover, the physical nature of the attained results has been seized in plots for different arbitrary order. The achieved results confirm, the considered algorithm is very effective, highly methodical, easy to apply and accurate to inspect the nature of the system of the fractional differential system associated to the allied disciplines of science.

Keywords: Diffusion equation, fractional natural decomposition method, Caputo fractional derivative.

MECHANICAL ENGINEERING

Renewable solar-wind hybrid power generation for domestic electrification: a review

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Abstract: Energy produced from conventional sources has major drawbacks in terms of current and future ecological balance and security, both locally and globally. Therefore, in the modern world where the energy demand is rapidly increasing, the development of the concept and technical principles of using clean, non-polluting and ecologically clean renewable energy sources and the testing and installation of new systems are among the most important problems. Energy generated from renewable sources, such as solar, wind, sea, geothermal, biomass etc., are carbon free with less pollution and capable enough to compensate the energy generated from coal and other fossil fuels. Wind and solar energy are becoming popular owing to abundance, availability and ease of harnessing for electrical power generation. Sometimes it is desired that two of these renewable energy resources are combined together to generate electricity and these types of systems are called a Hybrid Power System (HPS). HPS therefore, provide increased system efficiency and greater balance in supply of energy. The presentation will be a brief overview of research conducted around the world to design and implement hybrid energy systems that combine wind and solar energy from renewable energy sources to produce reliable and sustainable electricity for local purposes. Also, information about the research conducting at "Novel Materials and Nanotechnology" Research Center of Azerbaijan Technical University (AzTU) in the designing and implementation of solar-wind hybrid energy system at AzTU main campus and AzTU Techno-park in order to supply full electricity demand from green energy sources will be given.

Keywords: Hybrid systems, Solar power, PV, Wind power, Rural electrification

Experimental investigation of the effect of pyrolytic oven working algorithm on performance

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Absract: Pyrolytic ovens reach temperatures of approximately 500°C, allowing the dirt adhered to the surfaces of the cavity during cooking to be burned and easy to clean. These self-cleaning ovens work for a long time in order to reach the temperature of the cavity to about 500°C and to burn the dirt on the surface of the cavity. Considering the energy consumption values of the ovens, long-term operation means high energy consumption. In this study, it is aimed to investigate the effect of the turbo fan being activated at different temperatures, as a pyrolytic oven operation algorithm, on the center temperature. For this purpose, experimental tests were carried out with an oven with a turbo fan activated at the first start-up and an oven with a turbo fan activated at a central temperature of 360°C. In the experimental tests, a thermocouple was placed in the oven center for temperature measurement. When the results of the experiments were examined, it was seen that the oven with the turbo fan, which was activated in the first operation, reached the maximum temperature in the 42nd minute and the other oven reached the maximum temperature in the 59th minute. In addition, as a result of the 1.5-hour operation simulation, it was seen that the oven with the turbo fan, which was activated in the first operation, reached the maximum temperature 15 times and the other oven reached the maximum temperature 6 times. In the first model, the cleaning performance was also better, as the oven cavity reached the maximum temperature 2.5 times more.

Keywords: Pyrolytic oven, Turbo fan motor, Cleaning, Thermal smoothness

Determination of parameters of kinematic hardening material models for Ti-6Al-4V material by finite element optimization method

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Abstract: This work presents an experimental and numerical study on the cyclic tensile-compression behaviour of Ti-6Al-4V, a commonly used titanium alloy in the aviation and healthcare industries. The study aimed to determine the parameters of the Chaboche and Yoshida-Uemori material models for the grade 5 titanium alloy and to verify their accuracy through pulsating hydraulic bulge analyses. Five independent experiments were conducted, with each experiment consisting of three repetitions. The strain was measured by a video extensometer, and the data obtained were optimized using Ls-OPT, an optimization tool of Ls-Dyna software, to determine the parameters of the Yoshida-Uemori and Chaboche material models. The accuracy of the material models was confirmed through pulsating hydraulic bulge analyses, where the results obtained from the analyses were compared with the dome height of Ti-6Al-4V material formed experimentally. The results showed that both material models were accurate in predicting the cyclic behaviour of the alloy, with the Yoshida-Uemori model providing the best fit. In addition to the kinematic hardening models, analysis were made with a linear plastic material model, which is frequently used in forming simulations, and the results were compared. Overall, this study provides valuable insights into the behaviour of Ti-6Al-4V under cyclic loading and the accuracy of different material models in predicting this behaviour.

Keywords: Ti-6Al-4V, Kinematic hardening model, Yoshida-Uemori model, Chaboche model, Hydraulic bulge test

A novel correlation proposal for the thermal conductivity of graphene-water nanofluids

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Absract: The most fundamental property expected from nanofluids is to improve the thermal conductivity and therefore the heat transfer properties of the base fluid. Since its discovery in 2004, studies on graphene have progressed very rapidly in every field. Graphene's high thermal conductivity has made it a high potential particle for nanofluids. Due to the high cost and time consumption of experimental measurements, researchers are trying to find a theoretical relationship to estimate the thermal conductivity of nanofluids. Nowadays, artificial neural networks (ANN) inspired by the behavior of the human brain are one of the suitable methods to predict and model the thermal conductivity of different materials such as gases, liquids, and solids. In this study, experimental data of graphene-water nanofluid belonging to 4 different mass ratios (0.001, 0.005, 0.015 and 0.045) found in the literature were trained in artificial neural networks with MSE and R values of 9.3916E-04 and 0.9998, respectively, and a new correlation based on temperature and mass ratio was proposed using the obtained outputs.

Keywords: Graphene, Nanofluid, Artificial neural networks, Thermal conductivity

Classification of surface roughness during milling of Ti6Al4V: an experimental study through vibration signal processing and KNN

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Absract: The precise classification of surface roughness in machining processes is crucial for ensuring high-quality production outcomes in various industries. This study focuses on the milling of Ti6Al4V alloy and presents an experimental investigation into the classification of surface roughness using vibration signal processing in conjunction with the k-nearest neighbours (KNN) algorithm. The research aims to develop a reliable and efficient method for real-time assessment of surface roughness during milling operations. The experimental setup involves conducting milling tests on Ti6Al4V alloy specimens under controlled conditions. Vibration signals generated during the machining process are acquired and pre-processed to extract relevant features that characterize the surface roughness. These features capture the dynamic behavior of the milling process, which is influenced by factors such as cutting parameters, tool wear, and material properties. The KNN algorithm, a popular non-parametric classification method, is employed to classify the extracted features into distinct surface roughness categories. The algorithm's effectiveness in discerning variations in surface roughness is assessed through extensive experimentation and comparison with ground truth measurements obtained through profilometry or similar techniques. Results indicate that the proposed approach utilizing vibration signal processing and KNN classification yields promising accuracy in distinguishing different levels of surface roughness. The study not only demonstrates the feasibility of real-time surface roughness assessment during milling but also highlights the potential for wider application in machining quality control and process optimization. In conclusion, this experimental investigation contributes to the advancement of surface roughness classification methodologies by leveraging vibration signal processing and the KNN algorithm. The Bayesian optimized KNN model showed the accuracy of 92.61% and AUC of 0.83. The findings underscore the significance of integrating these techniques for enhancing machining processes and ensuring product quality across diverse industrial sectors.

Keywords: Milling, Vibration, Surface roughness, KNN, OFAT

Bir minibüs modelinin sürükleme katsayısının uçak kanadı şeklindeki spoiler modeli ile deneysel olarak iyileştirilmesi

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Özet: Bu çalışmada, 1/15 ölçekte üretilmiş minibüs model taşıtına etki eden aerodinamik direnç kuvveti pasif akış kontrol metodu kullanılarak iyileştirilmiştir. Sürükleme kuvvetini azaltmak amacıyla uçak kanadı şeklinde bir spoiler tasarlanmıştır. Model minibüs ve spoilere ait çizim dataları SolidWorks® programında oluşturulmuş ve 3 boyutlu yazıcıda filament kullanılarak üretilmiştir. Spoiler modeli minibüs modelinin arka kısmına iki farklı L/H oranlarında monte edilmiştir. Kara taşıtlarında aerodinamik direncin büyük kısmını oluşturan akış ayrılması ve negatif basınç bölgesinin deneysel olarak azaltılması amaçlanmıştır. Deneyler emme tipi rüzgâr tünelinde 4 farklı Reynolds sayısında gerçekleştirilmiştir. Model 1'de sürükleme katsayısı %0.19 azalmıştır. L/H 0.05 oranında yeteri kadar akış yönlendirmesi yapılamamış ancak sürükleme katsayısı Model 2 (L/H 0.1)'de %6.37 azalmıştır. Bu minibüs modeli için sürükleme katsayında %6.37 oranındaki iyileşme yüksek hızlarda yakıt tüketimini yaklaşık %3 azaltmaktadır.

Anahtar Kelimeler: C_D katsayısı, Rüzgâr tüneli, Aerodinamik, Sürükleme kuvveti

The experimentally improving of drag coefficient of a minibus model with wing shaped spoiler model

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Abstract: In this study, the aerodynamic drag force which acts on the minibus model vehicle which produced in 1/15 scale was improved by using the passive flow control method. An airplane wing shaped spoiler model designed to decrease drag force of model vehicle. The drawing of model minibus and spoiler were created in the SolidWorks® program and produced in 3-D printer using filament material. Spoiler model was mounted on rear section of minibus model at two different L/H ratio. It was experimentally aimed to reduce flow separation and negative pressure area which forms a large part of the aerodynamic drag force of road vehicles. The experiments were conducted four different Reynolds numbers in suction type wind tunnel. In model 1 (L/H 0.05) drag coefficient decreased 0.19%. L/H 0.05 ratio did not provide enough flow direction but drag coefficient reduced 6.37% in model 2 (L/H 0.1). 6.37% improvement in drag coefficient for this minibus model reduces fuel consumption by approximately 3% at high vehicle speeds.

Keywords: C_D coefficient, Wind tunnel, Aerodynamic, Drag force

Influence of alloying elements on the structure and properties of carbon and alloy powder steels

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Abstract: The low strength and hardness of sintered products made of iron powders determines the use of iron-carbon powder alloys, as a result of which some mechanical properties of these materials can increase several times. To obtain iron-carbon powder steels, carbon is introduced into the charge in the form of graphite, cast iron powders, as well as chemical and thermal treatment. In all cases, an increase in the carbon content increases the strength of the material, but reduces plasticity. The highest strength corresponds to a material with a structure of finely dispersed pearlite, to obtain which it is necessary to introduce up to 1.2% of graphite into the initial charge.

Keywords: Iron-carbon, Steels, Chromium, Carbon

Electrical and thermal properties of Al-1.94Mn-5Cu ternary alloy

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Abstract: Al-1.94Mn-5Cu alloy (wt.%) was melted by placing it in a graphite crucible under vacuum atmosphere. The melt of the Al-1.94Mn-5Cu alloy was filled into graphite sample molds in a hot filling furnace. It was then solidified using a Bridgman type directional solidification furnace at different growth rates (8.3, 41.6, 166.3 and 978 μm/s) at a constant temperature gradient (7.1 K/mm). Variations of electrical resistivity [□ (□ m)] of the obtained samples were measured using a DC four-point probe system consisting of a Keithley brand multimeter and a power supply and a muffle furnace in the range of 291.87-590.62 K. The obtained values were transferred to the graphics program and the variation of the electrical resistivity with the growth rate and temperature was observed. The enthalpy of fusion and specific heat for same alloys were determined by means of differential scanning calorimeter (DSC) from heating trace during the transformation from solid to liquid.

Keywords: Al-Mn-Cu alloy, Electrical properties, Thermal properties, Enthalpy

Numerical modeling of wave rotor pressure exchanger for supercritical CO_2 Brayton cycles

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Absract: The supercritical CO_2 Brayton cycle is a novel option for providing efficient and clean power. The pressure exchange between the low-pressure and high-pressure sides consumes much of the energy provided by the cycle. To reduce the back-work ratio, the use of wave rotors to exchange pressure has been proposed as an alternative to turbomachinery in an attempt to reduce rotational speed and shaft work required. However, modeling this method remains a key challenge. In this work, a compressible numerical model for the pressure exchange process in a wave rotor running at 16550 rpm. The mode provides a reliable method to predict the mass flow rates of high-pressure and low-pressure ports at various cycle phases. Results at a pressure ratio of 1.93 indicate that flow velocities at inlet and exit ports are sufficiently high to drive a significant mass flow rate.

Keywords: Pressure exchanger, Wave rotor, Brayton cycle, Fluid dynamics

The influence of the carburizing process on the impact-sliding wear behavior of 14NiCr14 steel

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Absract: At room temperature (RT), this study looked at how the carburizing process affects the impact-sliding wear performance of 14NiCr14 steel, which is widely used in many engineering applications under complex loading conditions. Impact-sliding wear tests were carried out against 10 mm-diameter 52100-grade bearing steel balls for 4297 loading cycles. A 2-D contact profilometer and a light optical microscope (LOM) then examined the wear tracks that had formed on the samples. The carburized steel caused a decrease in the wear rate at the impact and sliding zones of the wear track.

Keywords: Carburizing; Depth of diffusion layer; Hardening; Impact-sliding wear

MEDICINE

Ent-kauranes: newer anti-cancer drug candidates

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Abstract: Natural products have always been an infinite treasure of unique scaffolds which have attested their efficacy as the sources of disease fighting agents. Among such bioactive entities, ent-kauranes is a subclass of diterpenoids which comprise of a group of compounds possessing remarkable anticancer potential against certain human cancers e.g., breast, gastric, esophageal, liver, lung, nasopharyngeal, colon, bladder, cervical cancer and leukemia. The anticancer activity of these unique diterpenoids may be attributed towards cell cycle arrest, induction of apoptosis, metastasis and autophagy. Cell cycle arrest occurs at G2/M phase due to the modulatory action of p53, p21, CDK-2, CDK-4, cyclin D1 and c-Myc while apoptosis is induced via modulation of various proapoptotic (Bax) as well as antiapoptotic proteins (Bcl-2). Ent-kauranes act on the metastatic target proteins like VEGF, VEGFR, MMP-2 and -9, VEGF whereas autophagy has been noticed to be regulated by LC-II and mTOR pathwyas. Further insights into the anticancer mechanisms of these bioactive compounds may affirm them to be anticipated as lead compounds for anticancer drug discovery.

Keywords: ent-kaurane, diterpenoids, Isodon, Stevia, anticancer, antitumor

Areca nut: a journey from addictive seed to traditional therapeutic

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Abstract: The use of medicinal plants for therapeutic purposes has been a practice for millennia and continues to be a valuable source of therapeutic agents. Many modern medicines are indirectly derived from plants or their active compounds. Medicinal plants encompass a wide variety of plant species that possess medicinal properties and contain active compounds with physiological effects on living organisms. The relevant plant areca nut contains a wide range of compounds. Due to this reason, this pant is known to possess any biological activities including anticancer, antioxidant, and neuroprotective properties, by targeting many cellular pathways, making it promising agent for drug discovery. As traditional remedies, particularly those based on terrestrial plants, continue to dominate therapeutic practices worldwide, this plant is a topic of research in recent times regarding the areas of antibiotics and cancer therapies.

Keywords: Areca nut, antibiotics, antioxidant, neuroprotective

Bee venom: an api-toxin with biological potential

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Abstract: Venoms are known for their dangerous as well as harmful effects in general, while they also possess a significant position in medicinal aspect as well. As cancer is a perilous and deadly disease, new techniques and treatments of cancer have always been a hot topic. Treating with naturally occurring compounds are great interest of scientists in recent time. This study mainly focuses on the biological and anticancer activity of bee venom, specifically importance of melittin (MEL), a major peptide of bee venom which contributes to its 40-50% of total dry weight. Bee venom and specially its peptides show many therapeutic activities like anti-fungal, anti-viral, anti-bacterial, anti-atherosclerotic, pro-apoptotic, anti-analgesic and basically anti-cancer activities. Melittin inhibits cancer proliferation by a number of different mechanisms like induction of apoptosis, induction of cell cycle arrest, targeting many signaling pathways like mTOR and NF-κB involved in cancer progression. In this succeeding study under many evidences, it is to be believed that melittin has great medicinal importance and its use as anti-cancer agent would be more improved in coming years.

Keywords: Bee Venom, Melittin, Anti-angiogenesis, Apoptosis, anti-cancer

Anticancer and other Biological Activities of Mushroom Derived Ergosterol Peroxide

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Abstract: From the time immemorial, mushrooms have exceptionally been used as a luscious part of cuisine throughout the world. The medicinal properties of both edible and wild types of mushrooms exhibit the presence of primary and secondary metabolites including ergosterol (ES) and ergosterol peroxide (EP). EP is a sterol found in many edible and medicinal mushrooms and has been reported by various researchers as a potent therapeutic and pharmacological agent against multiple biological activities such as anti-cancer activity, anti-inflammatory activity, anti-proliferative activity, antioxidant activity, apoptotic activity, anti-adipogenic activity, anti-viral activity as well as anti-microbial activity by modulating certain molecular pathways (STAT1, JAK2/STAT3, β-catenin). Out of its numerous activities, EP is a crucial compound because of its role as an anti-cancer agent. This review presents a brief review of pharmacological properties of EP and signaling pathways inhibited by it, thus referring this compound as a viable drug source against many ailments.

Keywords: Mushrooms, ergosterol, ergosterol peroxide, anticancer, antiviral, anti-adipogenic, apoptotic activity

Potentiation of Immunomodulatory Activity by Encapsulating alpha beta unsaturated carbonyl based compounds in PLGA-b-PEG Nanoparticles

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Abstract: 3,5-Bis[4-(diethoxymethyl)benzylidene]-1-methyl-piperidin-4-one (BBP), a novel synthetic curcumin analogue has been revealed to possess strong *in vitro* and *in vivo* immunosuppressive effects. The aim of present study was to prepare and characterize BBP-encapsulated polylactic-co-glycolic acid-block-polyethylene glycol (PLGA-b-PEG) nanoparticles and to evaluate its *in vivo* efficacy against innate and adaptive immune responses. Male BALB/c mice were orally administered with BBP alone and BBP- encapsulated nanoparticles equivalent to 5, 10 and 20 mg/kg of BBP in distilled water for a period of 14 days. The immunomodulatory potential was appraised by determining its effects of non-specific and specific immune parameters. The results showed that BBP was successfully encapsulated in PLGA-b-PEG polymer with 154.3 nm size and high encapsulation efficiency (79%) while providing a sustained release for 48 hours. BBP nanoparticles showed significant enhanced dose-dependent reduction on the migration of neutrophils, Mac-1 expression, phagocytic activity, reactive oxygen species (ROS) production, serum levels of ceruloplasmin and lysozyme, immunoglobulins and myeloperoxidase (MPO) plasma levels when compared to unencapsulated BBP. Enhanced dose-dependent inhibition was also observed on lymphocyte proliferation along with the downregulation of effector cells expression and release of cytokines, and reduction in rat paw oedema in BBP nanoparticles treated mice. At higher doses the suppressive effects of the BBP nanoparticles on various cellular and humoral parameters of immune responses were comparable to that of cyclosporine-A at 20 mg/kg. These findings suggest that the immunosuppressive effects of BBP were enhanced as PLGA-b-PEG nanoparticles.

Keywords: Immunosuppressive, PLGA-PEG polymer, Immunomodulatory

Investigation of antibacterial properties of Salicylic Acid's derivatives

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Abstract: One of the important methods for obtaining antimicrobial polymer materials is the introduction of biologically active monomers into the polymer chain at the stage of macromolecule synthesis. In this regard, the synthesis of monomers with new biological activity attracts the attention of many researchers. Thus, the synthesis of monomers, polymers, co-polymers based on potential antibacterial salicylic acid and the use of obtained high-molecular compounds as antibacterial additives is considered a very promising direction. The presented work is devoted to the study of the antibacterial properties of salicylic acid, acetylsalicylic acid, allyl and vinyl esters of salicylic acid. Both allyl and vinyl esters of salicylic acid and acetylsalicylic acid were synthesized by known methods. The study of the antibacterial properties of the synthesized substances was studied by the serial dilution method. For this, 1:100, 1:200, 1:400, 1:800 dilutions of the 1% solution of substances prepared in ethyl alcohol in sterile distilled water were performed. As a test culture Golden staphylococci (St aures) from gram-positive microorganism, intestinal bacteria (E.coli) from gram-negative microorganism, blue-green pus bacilli (Ps. Aeruginoza) from those that produce pigments, and from fungi C. albicans as the genus candida were taken. MPA (meat-peptone agar) was used to cultivate bacteria, and Saburo nutrient medium was used to cultivate fungi.Based on experiments, it was determined that the synthesized substances have different effects on different types of organisms, and when these substances are diluted at a ratio of 1:100, they show strong antimicrobial activity against all tested test cultures. Based on these, vinylacetate is more active antimicrobic. Thus, in 1:400 dilution, candida fungus was destroyed in 20 minutes, intestinal and blue-green pus bacilli in 10 minutes, while staphylococci were negatively affected by 1:700 dilution in 20 minutes, but the other dilutions did not affect one hour. Based on their antibacterial activity, the studied salicylic group is classified primarily as salicylic acid, vinylsalicylic acid, allylsalicylic acid, vinylsalicylate, and allylsalicylate.
The developed antibacterial monomers can be used as part of polymers in household, medicine, and in the preparation of coatings for corrosion protection.

Keywords: Salicylic acid, antimicrobial, polymer, microorganism

Effective Anti-cancer Genes in Humans Against Heavy Metals' Side Effects in the Body

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Abstract: Heavy metal exposure remains a significant global concern, with adverse health effects on human populations across the world. Simultaneously, cancer continues to be a leading cause of mortality, necessitating continuous research efforts to identify novel therapeutic targets and preventive strategies. This paper delves into the intricate interplay between heavy metal exposure and cancer development, focusing on the role of effective anti-cancer genes within the human genome.The study explores a diverse array of human genes that play pivotal roles in heavy metal detoxification and protection against their deleterious effects. These genes, including Metallothioneins (MTs), Glutathione S-transferases (GSTs), metal transporters, Superoxide Dismutase (SOD), and the Nrf2-Keap1 pathway, act as crucial frontline defenders, neutralizing heavy metal toxicity through metal chelation, antioxidative defense, and DNA repair mechanisms. The genetic variations observed in these anti-cancer genes offer valuable insights into individual disparities in heavy metal susceptibility and cancer risk, thereby paving the way for personalized medicine approaches, targeted interventions, and improved risk assessment strategies. By identifying susceptible populations harboring these protective genes, this study presents opportunities for tailored interventions to optimize the protection of vulnerable individuals from the hazards of heavy metal exposure. Looking forward, ongoing research in this field holds the promise of uncovering additional genetic determinants of heavy metal resilience and cancer resistance, refining our understanding of the molecular basis of protection. The potential integration of genomics and environmental health studies will open new horizons in deciphering the intricate genetic regulatory networks involved in heavy metal detoxification and cancer prevention. This paper sheds light on the pivotal role of effective anti-cancer genes in safeguarding human health against heavy metal-induced toxicity and cancer development.

Keywords: Heavy metals, Cancer, Genes, Human, DNA, GSTs, Health

Exploring the Efficacy of Medicinal Plants in Treating Skin Diseases: A Review of Traditional Iranian Remedies

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Abstract: Skin diseases pose a significant health concern globally, prompting exploration into alternative remedies rooted in traditional medicine. This paper delves into the rich herbal heritage of Iran, presenting a comprehensive review of medicinal plants with potential efficacy in treating diverse dermatological conditions. By merging age-old wisdom with modern scientific insights, this study sheds light on the therapeutic contributions of these plants.The chosen medicinal flora exhibit multifaceted effects, encompassing anti-inflammatory, antioxidant, antimicrobial, and wound-healing properties. Key plant contributors include Curcuma longa (turmeric), renowned for curcumin's anti-inflammatory prowess; Avena sativa (oats) with their beta-glucan-rich soothing abilities; and Ocimum basilicum (basil) offering flavonoids for skin vitality. Neem (Azadirachta indica), Melissa officinalis (lemon balm), and Centella asiatica (gotu kola) further diversify the herbal arsenal, each providing distinctive benefits to skin health. Aloe barbadensis miller (aloe vera), Matricaria chamomilla (chamomile), and Echinacea purpurea (echinacea) represent classic herbal champions, renowned for their wound-healing, calming, and immune-boosting attributes. Additionally, emerging herbs like Rubia cordifolia (manjistha) and Symphytum officinale (comfrey) offer novel prospects with immune-boosting and regenerative potentials for managing skin ailments. While traditional wisdom serves as the foundation, modern research continues to decipher the mechanisms underpinning these effects. However, personalized responses necessitate prudence, urging consultation with healthcare experts before integrating these herbs into skincare regimens. In summation, this paper underscores the fusion of traditional knowledge with contemporary dermatology, spotlighting the potential for these natural interventions to complement conventional treatments. This exploration beckons further investigation, bridging the realms of ancient botanical wisdom and cutting-edge skin health advancements.

Keywords: Medicinal plants, Skin diseases, Traditional medicine, Herbal remedies, Dermatology, Iranian herbal heritage, Phytotherapy

Multi-omics profiling reveals distinct molecular changes in the brains of APP/PS1 Alzheimer's mouse model

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Abstract: Advancements in healthcare have led to increased human life expectancy, resulting in a higher incidence of Alzheimer's disease (AD). Women have been shown to be more impacted by AD than men, yet preclinical studies often overlook sex as a critical biological variable. We aim to address this knowledge gap by investigating sex-specific molecular changes in the brains of APPswe/PSEN1dE9 (APP/PS1) transgenic mice, a widely used AD model, using a multi-omics approach combining proteomics and lipidomics. We found 126 differentially expressed proteins (DEPs) in male mice and 209 DEPs in female mice. Using IPA analysis, we uncovered distinct differentially expressed signalling pathways between the sexes. Additionally, in female APP mice, some group lipids were significantly upregulated, indicating sex-specific changes in the brain lipidome. Overall, the study demonstrated sex-specific alterations in protein and lipid profiles in APP/PS1 mice. The identified alterations were associated with various biological processes relevant to AD, including but not limited to inflammation, lipid metabolism, and intracellular signalling. Interestingly, proteins commonly associated with AD, such as App, Ape, and Clu, were upregulated in both male and female AD mice. Moreover, we found sex-specific differences in various biological pathways including those related to cytoplasmic proteins, epigenetic signaling, nucleotide binding, mitochondrial function, synaptic processes, amyloid-beta clearance. These findings contribute to a better understanding of the molecular basis of sex differences in AD and may pave the way for developing personalised sex-specific targeted therapies for treat this complex debilitating neurodegenerative disease.

Keywords: Alzheimer's disease, Multi-omics, APP/PS1 mice, Brain, Sexual dimorphism

Влияние альфа-токоферола на перекисное окисление липидов

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Аннотация: при нарушении оксидантно-антиоксидантного баланса в организме резко возрастает количество свободных радикалов, что приводит к разрушению клетки и ее структурных единиц. Ненасыщенные липиды, в том числе ненасыщенные жирные кислоты фосфолипидов, являющихся структурными компонентами биологических мембран, легко окисляются молекулярным кислородом. Такое окисление называется «перекисным», а его активаторами являются свободнорадикальные формы кислорода. Продукты перекисного окисления ненасыщенных липидов: гидропероксиды липидов, спирты, альдегиды, кетоны, малоновые и другие диальдегиды, эпоксиды. Антиоксиданты нейтрализуют свободные радикалы, образующиеся в организме при перекисном окислении липидов, и защищают от негативного воздействия окислительных реакций. Эти вещества замедляют старение клеток и предотвращают развитие сердечно-сосудистых, эндокринных и онкологических заболеваний. Витамин Е, или альфа-токоферол обладает самыми высокими антиоксидантными свойствами среди витаминов. Он инактивирует свободные радикалы и предотвращает повреждение ими клеток и ее компонентов. В экспериментальных условиях было установлено, что синтетический альфа-токоферол повышает активность ферментов системы антиоксидантной защиты в крови, одновременно уменьшая количество продуктов, образующихся в процессе перекисного окисления липидов.

Ключевые слова: Витамин Е, антиоксиданты, перекисное окисление липидов.

The Role of Immune boosters against to Allergy in Skin Care

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Abstract: Many different allergens can cause a reaction. Allergic reactions are inappropriate responses of the immune system to a normally harmless substance. Mostly, allergies cause sneezing, watery and itchy eyes, a runny nose, itchy skin, and rash. A skin allergy is when skin becomes irritated because the immune system reacted to something that is usually harmless. This is called an allergic reaction. An allergic reaction can cause rash, itching, burning, redness, bumps, hives, and swelling. Allergy immunotherapy stimulates your immune system to build resistance to the allergens so symptoms diminish over time. Some agents build up the immune system and boost energy levels by delivering premium nutrients, vitamins and minerals directly into the bloodstream. In concluded, allergy immunotherapy and immune booster agents such as vitamins are natural treatments that have been proven to be effective in conquering allergies and boosting immunity.

Keywords: Allergy, Immunotherapy, Immun boosters, Skin care

Withania somnifera ve Paklitakselin'in Kütle Soğurma Katsayılarının Belirlenmesi

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Özet: *W. somnifera* antik çağlardan beri çeşitli hastalıkların tedavisinde dünya çapında kullanılan değerli bir bitkidir. Bu bitkinin kökleri, tohumları ve yaprakları antikanser, antidiyabetik, antistres, antiinflamatuar, anti kanser, anti-COVID-19, immünomodülatör, antimikrobiyal ve hepatoprotektif gibi üstün terapötik özelliklere sahiptir. *W. somnifera* köklerinin antikanser niteliği ile birlikte radyosensitif özellikte olduğu bilinmektedir. Bu çalışmanın amacı *W. somnifera* köklerinin radyasyon etkileşim parametrelerinden kütle soğurma katsayısının belirlenmesidir. Bu amaçla *W. somnifera*'nın deneysel olarak 53.16-356.01 keV enerji aralığında ULEGe dedektör ile radyasyon zırhlama parametrelerinden olan kütle soğurma katsayısı (MAC) deneysel olarak ölçüldü. Ayrıca kemoterapik bir ilaç olan Paklitaksel için teorik kütle soğurma katsayısı EpiXS programı kullanılarak hesaplandı. *W. somnifera*'nın kütle soğurma katsayısı değerlerinin 53,16 keV'de 0,1977 cm^2/g değere sahip olduğu ve artan enerjiyle azaldığı görüldü. İncelenen bu bitki kök ekstresinin MAC değerlerinin Paklitakselin teorik MAC değerleri ile uyumlu olduğu görüldü. Bu bulgularla *W. somnifera*'nın gelecekte radyoterapinin terapötik etkinliğini artırmak için yapılacak çalışmalarda potansiyel ajan olarak kullanılabileceği sonucuna varıldı.

Anahtar Kelimeler: *W. somnifera,* Kütle soğurma katsayısı, Radyosensitif

Gastro-protective effect of the Royal Jelly on ethanol-induced gastric ulcer in rats

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Abstract: Gastric ulcer represents a major public health burden worldwide. A large number of natural products have aroused interest in the treatment of this gastrointestinal disorder, without causing side effects. Royal jelly, which is a very high quality nutritive substance, was the subject of our study, in order to evaluate its gastro-protective potential on gastric ulcer induced by HCl-Ethanol in Wistar rats. Intragastric administration of the pretreatment was established daily for seven days in the groups treated with royal jelly extract at 150mg/kg (U-RJ150), 300mg/kg (U-RJ300) and 500mg/kg (U-RJ500) as well as the standard group (U-STD) which received Lansoprazol at 30mg/kg as the reference drug. While the control (C) and ulcer control (U-C) groups received distilled water. At the end of the pre-treatment period, the ulcerogenic solution (0.6 M HCl/80% ethanol) was administered intragastrically to the animals, except for the control group (C). The ulcer index, the gastric protection and the macroscopic, microscopic examination of the stomach were determined one hour after gastric ulcer induction. The results showed a significantly reduced ulcer index percentage ($P \leq 0.001$) in the group treated with the aqueous royal jelly extract at 500mg/kg (U-RJ500) compared to the ulcer control group (U-C) and the standard group (U-STD). This attenuation was inversely marked by a highly significant increase ($P \leq 0.001$) in the percentage of gastric protection in the U-RJ500 group compared to the standard group. Macroscopic and microscopic examinations of the stomach in the U-RJ300 and U-RJ500 treated groups clearly demonstrated remarkable attenuation of ulcerative and hemorrhagic lesions caused by the ulcerogenic solution. The results of this study suggest that Royal Jelly has very promising gastro-protective property for the development of new Api-therapeutic formulations against gastric ulcer.

Keywords: Royal jelly, gastric ulcer, gastro-protective property, histology, rats

Evaluation Of The Healing Effect Of Honey On The Diabetic Rats.

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Abstract: Diabetic wounds, including diabetic foot ulcers, Healing is impaired and different areas of the wound are not at the same stage of healing. Honey is considered a sweet substance made by bees (Apis mellifera). This precious substance, offered by nature, has been known and used by man since antiquity. The objective of this work is to evaluate the healing effect of Sidr honey on the wounds of diabetic rats by topical application so as to produce a thin layer completely covering the wound once a day for 13 days. The diabetic rats treated with honey had good healing (DM) (78.73+16.05%) and macroscopic appearance almost similar to that of the "Madécassol®" reference ointment (79.39+2.11%), as well as the honey has a very rapid evolution of healing on the 7th day compared to Madécassol ®. The wound healing capacity of honey was measured at the level of wounds in diabetic. His honey has significant wound healing activity in diabetic rats. It was concluded that honey has a healing effect on the wounds of diabetic rats.

Keywords: honey, diabetic wounds, healing wounds, macroscopic appearance, rats.