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CONFERENCE PROCEEDINGS

BOOK OF ABSTRACTS

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Prof. Dr. Hassan is currently working at Shaikh Saleh Kamil Center of Islamic Banking at Department of Economics, College of Business Administration, King Saud University, Riyadh, Saudi Arabia. He earned Master and Ph.D. degrees from Nagoya City University, Japan and worked in Japan at Nagoya City University, Institute of Developing Economies (IDE) and Kyoto University. He has served as Foreign Professor at International Islamic University, Islamabad and University of Karachi, Karachi. He has worked as Head of Department of Management Sciences, PAF-KIET and Dean of Faculty of Management Sciences, Sindh Madresatul Islam University, Karachi.

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Dr. Hassan is trying to build synergies between classrooms, market places and institutions for promoting equitable and sustainable economic and social development with the inclusive approach in education, training, finance and banking sector. He believes that academic institutions, business organizations and government planning authorities must also cater to the faith-based preferences of the people. He developed many training programs at academics as well as business organizations for young researchers and professionals.

Last but not least, he is cooperating as the editor and international referee of well-known research journals.

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The Potential Protective Role of Chamomile Extract on Rat Liver Ultrastructural Changes Induced by 2, 4-Dichlorophenoxyacetic Acid

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Abstract

The current study aimed to demonstrate the hepatoprotective effect of chamomile extract and its role in relieving the ultrathin structure changes in liver tissue caused by 2, 4-Dichlorophenoxy acetic acid (2, 4-D) using electron microscopy. This experiment was performed on 12 -14 weeks old male Wistar rats divided into six groups (six animals each). The first group was kept as control. The second and third groups received orally accumulative doses of 75 and 150 mg/kg body weight (b.wt.), of 2, 4- D respectively**.** The forth group received orally Chamomile extract (500 mg/kg b.wt.) alone**.** The last two groups received Chamomile extract with either doses of 2, 4-D (75 or 150 mg/kg b.wt). At the end of the experimental period (4 weeks), the liver was dissected and examined by electron microscope. Histopathological examination of liver sections of rats administered 2, 4-D_{75} mg/kg showed differences in nuclear shapes and size, envelope and increase in heterochromatin masses. Adminstration of 2, 4-D_{150} mg/kg showed pyknosis and changes in mitochondria, endoplasmic reticulum, Kupffer cells, increases in lysosomes and lipid droplets. Chamomile group showed the normal control ultra structure of the liver. In group treated with chamomile and 2, 4-D_{75}, there was improvements in all degenerative changes induced by 2, 4-D_{75}. Chamomile and 2, 4-D_{150} group showed partial improvement in both nucleus and the mitochondria. Chamomile reduces the oxidative damage induced by 2, 4-D due to its antioxidant properties. It is recommended that Chamomile extract can be taken to ameliorate hepatotoxicity.

Keywords: Chamomile, 2, 4-Dichlorophenoxyacetic acid, Ultrastructural changes.

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Molecular Analysis of Genetic Stability of Citrus Algerian Varieties Regenerated By Somatic Embryogenesis

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Abstract

Somatic embryos were regenerated *in vitro* by style–stigma of different Algerian citrus species. Is one of the efficient methods in virus and virus like elimination? However Somaclonal variation could occurs in plants regenerated by somatic embryogenesis .Therefore, the source plant and fifteen regenerants, resulting from different embryogenic events, were selected for genetic stability analysis. Inter simple sequence repeats technique was used to analyze the genetic variability of regeneted plantlets. A total of twelve primers were used to amplify the DNA. Only bands showing consistent amplification signals in the range of 200 bp to 2.6 kb were considered. No somaclonal variability was observed in *C.limon* platelet. However, the amplification while smeared and weak bands were excluded. In *C. limon*, the ISSR primers gave rise to a mean of 111 amplification products, all monomorphic among the analysed plants while in group Navel of *C.sinensis* the markers have generated a mean of 113.5 well resolved bands which were observed to be polymorphic.

Keywords: Citrus, Algerian varieties, ISSR, Somaclonal variation.

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Remote Sensing of Evapotranspiration in a Southern Mediterranean Forest. Application to Bissa Forest, Algeria

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Abstract

Remote sensing is an important technological trend that can assist the estimation of evapotranspiration at each point of the globe. In this context, the Simplified Surface Energy Balance Index (S-SEBI) algorithm was used in this study with four Landsat-5 Thematic Mapper (TM) images, i.e., one image by season to assess the daily evapotranspiration in Bissa forest, one of the healthiest Algerian forests located south of the Mediterranean Sea. Results showed that evapotranspiration varies over the different seasons, the highest ET values were reached during spring (April) due to water availability, with a daily mean value of 7.86 mm/day, the lowest ET values were shown during the dry season i.e., summer (July) with a daily mean ET of 3 mm/day, autumn and winter (October and January) showed an intermediates mean values of 3.5 and 3.8 mm/day respectively. The relationship between normalized difference vegetation index (NDVI) and ET (mm/day) showed that the highest ET values coincide always with the highest NDVI values except for January where even the lowest NDVI values correspond to higher ET.

Keywords: Evapotranspiration, Forest

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Crack and Corrosion Monitoring of Pipelines Using Multi-Sensors

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Abstract

The present work investigates the structural health monitoring of pipelines using multi sensors for early detection of cracks to prevent possible failures during operation. Presenting cracks in the pipe wall may significantly alter the stiffness of the pipes. Changing the flow in pipelines results in changing the pressure, and thus, the deformation of the pipe' wall. Pipe's wall deformation leads to changing the electrical voltage generated in PVDF sensors, which is used as an indicator for possible failure in the pipeline. Most of the available works in this field are based on the single sensing which may provides significant errors in the size and location of the cracks. In order to detect the size and location of the cracks and damage, one may needs several sensors mounted at different locations close to the defected region. In this paper, four PVDF sensors are mounted at the defected area of the pipelines to achieve an accurate estimation of the size and location of the damage. It is observed that using multi sensors may provides an efficient method to detect the damage and to predict the possible failure in the pipeline structures.

Keywords: Pipelines, Multi-sensors, Signal processing, Crack detection.

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Protective Effects of Sweet Orange Peel (Citrus Sinensis L.) The Induction of Micronuclei Induced By Cyclophosphamide in Human Peripheral Lymphocytes

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Abstract

Recycling of fruit waste is one of the most important ways of utilizing it in a number of novel products , as well as in medicine, so came this research to verify the protective role of the extracts of sweet orange (*Citrus sinensis* L.) peels against genotoxicity induced by cyclophosphamide on human peripheral lymphocytes using the micronucleus and chromosomal aberration tests. Conducted overlap between Aqueous and alcohol extracts orange peel with the drug, through three types of transactions (before, after, with treatment). In order to test the effectiveness of the extracts, three concentrations of 5, 10 and 15 µg / ml where tested the prevention or minimization the effect of the drug (80 µg / ml) on human blood lymph . The extracts of the orange peel has antimutagenic potential induced by cyclophosphamide this may prevent the mutagenic effect of various genotoxic or carcinogenic agents, and thus utilization of fruit waste and products for therapeutic purpose.

Keywords: Cytogenetic, Sweet orange (*Citrus sinensis* L.) peels, Cyclophosphamide, Micronucleus.

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Thermo and Photo-Oxidation Degradation of Poly (4-Vinylbiphenyl) in Solid Films

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Abstract

The photo and thermal stability of thin films of poly (4-vinylbiphenyl) were studied by irradiation with UV- light, in presence of air at room temperature and solid films were heated in vacuum oven, at different temperatures. Irradiated and thermally heated samples were investigated with absorption, fluorescence and FT-IR spectroscopic methods. The influence of phthalate and terephthalate plasticizers on photo-oxidative and thermo-oxidative degradation processes was also investigated. It has been found that the stability of the polymer decreases with the increase of the irradiation and heated times, and increases by the increase of the amount of added plasticizers. Irradiated and thermally heated pure and blended polymer solid films resulted in the appearance of new fluorescence bands at longer wavelength, as well as, quenching and change in the shape of the fluorescence spectra. The FT-IR spectra of irradiated and heated films of pure and blended polymer with phthalate and terephthalate plasticizers showed a decrease in some absorption bands and increase in the other bands, this is also another factor for the occurrence of photo and thermal degradation of the irradiated and heated polymer. The UV-irradiation effects on stability of poly (4-vinylbiphenyl), in dichloroethane, dichloromethane, tetrahydrofuran, and N, N-dimethyl formamide solutions were studied in the presence of dissolved air by fluorescence spectroscopy. Fluorescence quenching and a change in the shape of the fluorescence spectra were noticed, which indicate the occurrence of photodegradation of polymer chains.

Keywords: Thermo, Photo-Oxidation

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Thermal, Mechanical and Rheological Properties of Agro Fiber Filled High Density Polyethylene Biocomposites

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Abstract

The effects of four agro wastes viz. corncob, rice hull, walnut shell and flax shive fibers on the thermal, mechanical and rheological behavior of high density polyethylene biocomposites was investigated. It was discovered that the fibers showed two and three mass loss steps due to moisture evaporation and decomposition of hemicelluloses, cellulose and lignin. The flax shive was thermally more stable and showed a decrease in activation energy with increase in conversion rate, while the other three fibers showed increased activation energy with conversion rate. The apparent activation energy values of the fibers was 161±11.06 to 200±4.69 kJ/mol. Particle size distribution of 60-100 mesh of the fibers was 0.295 mm to ‹ 0.125 mm. Mechanical analyses of the composites showed remarkable increases in flexural modulus and un-notched Izod impact strength and a decrease in flexural strength compared with the neat HDPE. The rice hull composites showed superior flexural strength of 22.5 MPa. The flax shive composite gave superior flexural modulus of 3.3 GPa and the walnut shell composites gave superior un-notched Izod impact strength of 52.5 J/m. Rheological analyses showed that the complex viscosities of the composites decreased with increase in frequency. The corncob composite showed higher complex viscosity of 3,600,000 Pas. The walnut shell composite exhibited higher storage modulus of 800,000 GPa at low frequency but decreased with increase in frequency. Corncob composite showed superior loss modulus of 200,000 GPa. The damping factor of the composites decreased with increasing frequency with walnut shell composites showing superior damping factor. The study has shown that the properties of the composites varied substantially based upon the type of fiber utilized.

Keywords: Agro fiber, Thermal properties, Mechanical properties, Rheological properties.

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Seroprevalence of *Toxoplasma Gondii* among HIV Positive Patients in an Antiretroviral Therapy Center in Northern Nigeria

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Abstract

Toxoplasmosis is an important zoonotic disease caused by a protozoan parasite *Toxoplasma gondii* an emerging opportunistic parasite. In immune compromised individuals the infection leads to life threatening conditions. Thus the importance of understanding the burden of coinfection. There is a paucity of published information on the prevalence of this infection among people infected with the Human Immunedeficiency virus in the study area..This study was carried out to investigate the prevalence of infection and identify some possible risk factors in the study area. One hundred and eighty four consenting patients aged 10-59 years accessing healthcare in an antiretroviral clinic were recruited for this study. They were screened for *Toxoplasma gondii* IgG using a Toxo IgG ELISA kit (Clinotech Laboratories and Pharmaceuticals Canada). The test was carried out according to the manufacturer's instructions. Their CD4 count was estimated using Flow cytometry. An ethical clearance for the study was obtained from the Ethical Committee of the Medical Center. The prevalence of latent *Toxoplasma gondii* infection in the study population was evidenced by seropositivity for anti-Toxoplasma IgG among 17.4% (32) of them. Patients aged 10-19 years had the highest rate of infection (27.3%). The prevalence of infection among males was 28.8% and 12.9% among females ($p<0.05$). Most of those infected (78.1%) did not have a CD4+ count above 400. The 17.4% seroprevalence of *Taxoplasma gondii* infection reported in this study is high and suggests that exposure to the protozoan is present in Northern Nigeria. Gender, age and CD4+ count were reported as possible risk factors to infection. There is a need to carry out further studies on a larger scale and include more socio-demographic parameters. Meanwhile, the outcome of this study calls for an urgent awareness campaign of this infection especially among the immunocompromised persons in Nigeria with emphasis on prevention and control of infection.

Keywords: Seroprevalence, *Toxoplasma Gondii,* HIV

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Urban Growth and Cleaning Up Problems: Case of the Annaba City (N-E of Algeria)

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Abstract

After the independence the city of Annaba has known a solid industrialization which is now the capital of Algerian industry and power of jobs. In fact, this has expressed an important rural migration. Obviously, in lapse time the population of Annaba city has relatively trebled and gone up from 200,000 to 600,000 inhabitants. This situation has meant in a rush for housing construction regardless of elementary rules of hygiene and cleaning up, degrading the frame of life citizen. The cleaning up problems has been taken over in the beginning of the eighty years with the construction of canal of security which has been allowed to convey the waste water from the west plain to the sea, passing by the Wadi Boudjemaa. Later, in the ninety years the lagoons has been installed to recycle the waste water of Annaba city.

Keywords: Discharge, Wastewaters, Lagoon, Annaba.

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Unsteady Plane Couette Flow of an Incompressible Couple Stress Fluid with Slip Boundary Conditions

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Abstract

In this work, the unsteady flow of an incompressible couple stress fluid between two parallel plates is studied. Slip boundary conditions are applied on the two plates and vanishing couple stress condition at the boundaries is assumed. The upper plate is suddenly moved with time dependent velocity while the other plate is fixed. The problem is solved analytically in the Laplace domain through the use of Laplace transform technique. The inverse transform of the fluid velocity is obtained numerically. The velocity profiles for different times and different physical parameters are plotted and the numerical results are discussed.

Keywords: Couple stress fluid, Couette flow, Unsteady flow, Slip boundary condition, Laplace transform.

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Parallel and Overlapping Prevalence of Hepatitis B and C Virus Infection in Apparently Healthy Youths in Northern Nigeria

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Abstract

The asymptomatic nature of Hepatitis B and C virus infection is a factor that has a major impact on the disease burden. The knowledge of such blood transmissible infections among youths, who are the fulcrum of blood donation especially in developing countries where there are many ailments that require blood transfusion, is pertinent. This study was therefore to determine the prevalence of these viral infections among apparently healthy youths. Two hundred consenting youths aged 17-45 years participated in the study. There were 52% (104) males and 48% (96) females. A blood sample was collected from each participant and screened for HBsAg and anti-HCV antibody using a chromatographic test kit for each virus (ABCON Laboratories USA). The general prevalence of hepatitis infection among the youths was 14.5%. While HBsAg was prevalent in 11.5% of them, 3% were HCV positive and 0.5% had a coinfection with HBV and HCV. Gender specific prevalence was 18.7% and 4.8% for males and females respectively ($p<0.05$). The highest prevalence of HBV (20.0%) was recorded among those aged 33-39 years. A HCV prevalence of 5.2% and 0.9% was recorded among males and females respectively ($p>0.05$). Coinfection of HBV and HCV was recorded only in one participant aged 24 years. Most of the risk factors evaluated in this study only showed an arithmetically not a statistically significant association with the viral seropositivity. The high prevalence of HBV(11.5%) and relatively low prevalence of HCV (3.0%) in this study population is a cause for alarm. This is because this is the age group that is usually recommended for blood donation. Moreso, this is a sexually active group in a region that has a high prevalence of Human immunedeficiency virus with which both HBV and HCV share common routes of transmission. This study also demonstrated the obscurity of risk factors associated with HBV and HCV transmission in this environment. There is therefore an urgent need to make screening and vaccination available and affordable in the study area. This is in order to enjoy the gains of early diagnosis which curbs the progression of the infection to the disease and also allows for correct medication choice for HIV positves. Key words: HBV, HCV, prevalence, Nigeria, youth

Keywords: Parallel, Hepatitis, Virus Infection

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Ontology with SVM Based Diagnosis of Tuberculosis and Statistical Analysis

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Abstract

As per WHO report, Tuberculosis remains one of the world's deadliest communicable diseases. In 2013, an estimated 9.0 million developed TB and 1.5 million died from the disease, 360,000 of which whom were HIV positive. Tuberculosis is still a major problem in advanced countries due to specific socioeconomic factors. From a global perspective, many laboratories use the same methods today that were in use long time ago for the detection of tuberculosis, because most of innovative current technologies for the detection of tuberculosis incurs high cost and cannot be afford for all the countries. The detection of tuberculosis remains a challenge from the point of diagnosis and confirmation and there is a growing need of accurate diagnosis process. In this research, an ontology based classification on tuberculosis laboratory tests, environmental factors and other vital signs are studied along with support vector machine for the diagnosis of the tuberculosis disease. Through this method, we are able to measure of the weightage of the disease, future onset of the disease and produces an alert. Ontology based classification is widely used for knowledge based information grouping and structuring while SVM is used for accurate and fast machine learning algorithm. By combining Ontology and the training data based on various characteristic of the tuberculosis are passed onto linear SVM. The results we are able to achieve on this method is helpful for diagnosis support and future onset.

Keywords: Statistics, Ontology, Machine learning, Infectious disease, SVM, Decision support.

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Characterisation of Weathered and Granitised Fractured Bedrock Aquifer Based on WISH and FC Methods

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Abstract

The hydrodynamic properties of the weathered-fractured layer of a hard-rock in a granitic terrain are characterized using hydraulic tests at different scales in Pallisa District. The WISH (Windows Interpretation System for Hydrogeologists) and FC (Flow Characteristic) methods used required short-duration pumping cycles on an unconfined aquifer with differing seasonal water-table fluctuations. The interpretations of several pumping tests at a site in Pallisa District under various initial conditions provide information on the change in hydrodynamic parameters in relation to water-table level. The transmissivity linearly decreases compared with the available water level, suggesting a non-homogeneous distribution of hydraulic conductivity with depth. The hydraulic conductivity is estimated from the slope of this linear relationship .The extrapolation of the relationship between transmissivity and water level provides an estimate of the aquifer thickness that is in good agreement with geophysical investigations. The hydraulically active part of the aquifer is located in both the shallow weathered and the underlying densely granitic fractured zones of the crystalline basement. It appears that the extension of the most conductive part of the weathered-fractured layer is limited down to 50 metres depth. However, no significant relationship is found between the aquifer storage coefficient and water level. These methods contribute to filling the methodological gap between single pumping test and hydraulic tomography, by providing information on the variation of the regional transmissivity according to depth. They can be applied to any unconfined and semi-confined aquifers that experience seasonal water-table fluctuations and short pumping cycles.

Keywords: Groundwater hydraulics, Pallisa district, Crystalline rocks, Granitic fractured rocks, Pumping tests.

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DFT Study of the Electronic Properties of Benzene and Hydroxylbenzene Molecule Group in Gas Phase

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Abstract

In this paper, theoretical study of Optimized geometry and Infrared (IR) Spectrum for Benzene and Hydroxybenzene molecule group by using Density Functional Theory (DFT) at Becke3Lee Yang Parr (B3LYP) level of theory with basis set 6-31G(d,p) in a gas phase have been studied. The optimized electronic properties of benzene and hydroxylbenzene molecule group in gas phase have been performed using Gaussian 03 program. Benzene Molecule is the original Molecule before substituting Hydrogen by Hydroxyl (OH) radical. The substituting of hydrogen by Hydroxyl (OH) radical on Benzene molecule at different positions led/resulted in the study of eleven molecules. The electronic properties optimized include bond length, bond angle, total energy and energy gap. It was observed that the presence of the substituent's decreases the energy gap and 1,2,4,5- Tetrahydroxybenzene(TTHB) has the lowest energy gap from the studied molecules. Also the total energy decreases with the increase of hydroxyl radical, this means the molecules become more stable with increase of OH radical in the benzene ring. The IR Spectrum of the studied molecules has also been discussed.

Keywords: DFT, Bond length, Bond angle, IR spectrum, Energy gap.

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E-Navigation System for Maritime Harbor Entrance Employing Groundwave Signals

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Abstract

Enhanced Loran (eLoran) is a radio navigation system which uses groundwave signals transmitted from a network of terrestrial transmitters synchronized in a time division multiplexed manner. eLoran is of two forms: eLoran for maritime harbor entrance and eLoran for aviation. For each mode of eLoran transport, four system performance parameters are assessed at any location in the coverage area. These are accuracy, availability, continuity and integrity. The maintenance of all the Loran transmitters in North West European Loran System (NELS) is regulated at LORAN Control Centre in Brest, France (CBB). The Control Centre keeps all the records of the off air times, blink times and times taken to restore the transmitters back in service. These off-air times are useful for calculating the mean time to repair (MTTR) and mean time between failures (MTBF). The problem of eLoran coverage in Europe is that there is poor coverage to the west coast of the United Kingdom. Poor coverage means that the results of the system performance parameters fall below the standard set by regulation bodies. The system performance parameter that has been tested previously is only accuracy. There is no eLoran continuity and availability work so far that has been done in the NELS coverage area. This paper develops an algorithm for calculating availability and continuity in eLoran for maritime and harbor entrance and approach employing MTTR and MTBF obtained from transmitter off-air statistics. This research attempts to find out if the current scheduled repair times taken by the Control Centre are long or not, and if they are; then to suggest an optimum time taken to repair an eLoran transmitter. Too many scheduled maintenance times leads to low availability and continuity figures and hence to the disruption of the eLoran service. The availability and continuity results are useful in accessing if the scheduled maintenance times are too many per year or not. This work is useful to authorities overseeing the movement of ships into their harbors as they may want to warn mariners on which geographical area of the coverage, the continuity and availability service is poor. This work is also useful in radio planning of the coverage area. This research produces continuity and availability plots and attempts to find out if there will be an improvement in continuity and availability results to the west coast of the Isle of United Kingdom if two

transmitters are installed in the republic of Ireland. The results of this work suggest that continuity and availability are dependent on the off-air and on-air transmitter times. This work proposes that the Control Centre should resort to short scheduled maintenance times of eLoran transmitters. This will increase availability and continuity figures across the coverage area. Better availability of eLoran service means Fishermen are able to do fishing at given time. This paper suggests an installation of two new transmitters at specific location in Ireland in order to increase the availability and continuity figures in the coverage area. The results of this work are useful for authorities regulating traffic at sea as well as harbor entrance and approach.

Keywords: eLoran, Availability, Continuity, Accuracy, Integrity.

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Mutagenic and Genotoxic Effects of Guelma's Urban Wastewater, Algeria

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Abstract

In this study, the mutagenicity and genotoxicity of urban wastewater of the city of Guelma in Algeria were examined between April 2012 and April 2013. For this, two biological tests, namely Ames and chromosomal aberrations (CA) test in Allium cepa root tips were employed on the samples collected from five different sampling stages (S1–S5). In Ames test, two strains of Salmonella typhimurium TA98 and TA100 with or without metabolic activation (S9-mix) were used. All water samples were found to be mutagenic to S. typhimurium TA98 with or without S9-mix. A significant decrease in mitotic index (MI) was observed with a decrease in the percentage of cells in the prophase.

Keywords: Mutagenicity, Genotoxicity, Urban wastewater, Ames test, Allium test.

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Ascorbic acid Versus Placebo in Postoperative Pain Relief of Patients Status Post Photorefractive Keratectomy: A Double-Masked, Randomized, Prospective Study

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Abstract

Purpose: Ascorbic acids are currently being used anecdotally for postoperative pain following photorefractive keratectomy (PRK) despite the lack of evidence. The purpose of this study is to evaluate the effectiveness of Ascorbic acid in mitigating pain after PRK compared to the standard of care. Methods: Fifty-two patients scheduled for PRK at the Baqiyatallah Refractive Surgery Center in Tehran,Iran were randomized to receive either oral Ascorbic acids 250 mg once daily for 5 days or placebo, in addition to the standard pain care regimen. Post operative pain ,Corneal Haze,corneal repithelialization and lid edema were the main outcome. Results: There was no statistically significant difference in the primary outcome of subjective pain scores along with Corneal Haze and corneal repithelialization between the treatment and placebo groups at any point during the postoperative period, but there was a statistically significant difference and trend for lower lid edema in the Ascorbic acids group on postoperative day 1 ($P < 0.05$). Conclusions: This study demonstrates that Ascorbic acids may provide an alternative or add-on option for lid edema relief after PRK.

Keywords: Ascorbic, Postoperative

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Investigating Moringa Oleifera and *Psidium Guajava* Leaves Extract as Low-Cost, Eco-Friendly Inhibitors of Corrosion on Mild Steel in an Acidic Environment

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Abstract

This work investigated the inhibitory properties of low-cost, eco-friendly corrosion inhibitors (*Moringa Oleifera* and Psidium *guajava* Leaves Extract). In particular, the effect of different volumes in the range 25-50 cm^3 of *Moringa Oleifera* and Psidium *guajava* Leaves Extract on the Corrosion Susceptibility of Mild Steel at different concentrations of an acidic environment (hydrogen tetra-oxosulphate VI, H_2SO_4), was used in the study. The experiment included casting the mild steel into rods; which were machined and subsequently cut into coupons averaging a total surface area of 6.284 cm^2. The coupons were weighed and immersed into different beakers containing 0.5M and 1.0M of hydrogen tetra-oxosulphate VI acid, and the different volumes of the *Moringa oleifera* (MO) and *Psidium guajava* (PG) were introduced in the respective beakers and then labelled for easy and proper identification. The total exposure time was between 7 to 28 days, with the coupons removed every 7 days for weight loss measurements using the normal procedures. The results indicate that the corrosion penetration rate was very high in the control (without inhibitor), and was decreased when the inhibitor was introduced. However, the decrease was more pronounced (>80%) at a volume of 100 cm^3 of *Moringa oleifera* leaf extracts at 0.5M and 1.0M of the acidic media respectively. According to the findings, it was concluded that the volume of 100 cm^3 of *Moringa oleifera* leaf extracts at a concentration of 0.5M and 1.0M of the acidic media is the optimum conditions for reduced corrosion rate of mild steel in an acidic environment.

Keywords: Acidic media, Corrosion rate, Inhibitor, Concentration.

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A Simple Method for the Determination of the Thermoelectric Behaviour of Antimony Trisulphide (Sb_2S_3) Thin Films

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Abstract

The thermoelectric behavior of antimony trisulphide (Sb_2S_3) thin film was investigated based on band structure analysis, figure of merit calculation, and Boltzmann transport properties using ab initio thermodynamics simulations on MATLAB software. The results indicates that Sb_2S_3 exhibits thermoelectric performance at temperatures ≥ 600K, which strongly suggests that under appropriate doping conditions, thin films of antimony trisulphide can be utilised in exhaust waste heat recovery applications. The calculated values for the optical constants (energy bandgap) is within the range reported by other experimental research groups, and also consistent with recent calculations using similar approaches on density function theory.

Keywords: Figure of merit, Thermoelectric effect, Thermopower, Transport properties.

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Approximated Bayes Estimators for the Parameters and Reliability Function of Inverse Weibull Distribution based on Fuzzy Data

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Abstract

In this paper, we provide Tierney and Kadane's approximation to compute Bayes estimates of the parameters and reliability function of inverse Weibull distribution based on fuzzy data under symmetric and asymmetric loss functions. It assumed that the parameters behaves as a random variable have a gamma prior. Finally, the obtained estimators compared empirically via Monte Carlo simulation study.

Keywords: Inverse Weibull distribution, Bayes estimation, Loss function, Tierney and Kadane's approximation, Fuzzy numbers.

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Evaluation of Improved Varieties of Teff in West Belessa, Northwest Ethiopia

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Abstract

An experiment was conducted at West Belessa district of Northwestern Ethiopia during 2013 main cropping season in order to identify and promote well adapted and promising genotypes of teff. The experiment was laid out in a randomized complete block design with three replications. The data recorded were plant height, spike length, number of tillers per plant, grain yield, biomass yield and harvest index. The data was analyzed using SAS software and means were separated using least significant difference. The analysis showed that varieties varied significantly for plant height, spike length ($P<0.001$), grain yield, biomass yield ($P<0.01$) and harvest index ($P<0.05$). Varieties were not significant for number of tillers per plant. Dukem was shown to be high yielder variety followed by the varieties Boset and Mechare with the values of 1963.7, 1772.0 and 1743.7 kg ha^{-1}, respectively. The varieties Dukem, Kunch and Mechare were found to be having high biomass with the values of 6111.3, 5833.3 and 5555.3 kg ha^{-1}, respectively. Dukem was superior in almost all the agronomic traits evaluated while the local varieties Awra tef and Bunign were out performed by most of the improved varieties of teff tested. The varieties evaluated had a wide genetic background for the studied traits, thus showing grain yield ranges from 1012.0 to 1963.7 kg ha^{-1}. Therefore, based on objectively measured traits, the variety Dukem was found most promising having the potential to increase the average yield of tef in West Belessa district and is therefore recommended for general cultivation.

Keywords: Tef, Variety, Grain yield.

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Molecular Characterization of Extended Spectrum B-Lactamase Producing *Escherichia Coli* Isolated From Urine in Kurdistan Region-Iraq

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Abstract

Molecular characterization of ESBL-related *bla* genes including *bla*TEM, *bla*SHV, and *bla*CTX-M has been performed for *Escherichia coli* isolated from urine and collected from three cities in Kurdistan/region/Iraq (Erbil, Sulymani and Duhok). One hundred sixty nine isolates of *E. coli* have been identified and their production of ESBLs enzymes have been determined using phenotypic methods. All these isolates were successfully amplified producing a single band of the *uidA* locus in all strains with a molecular weight of about 670bp in order to confirm at molecular level that all these isolates were *E. coli*. One hundred sixty ESBL *E. coli* isolates out of 169 appeared to have one or more ESBLs genes accounting for 94.7 %. CTX-M constituted the high prevalent type of ESBLs genes compared to the others represented by 94.1% of all isolates in all the three cities of Kurdistan region followed by TEM and SHV in a percentages of 43.8% and 2.5 %, respectively. In Duhok, TEM showed the higher prevalence (60.8 %) in comparison to the other two cities in percentages of 36.2 % for Sulaimania while Erbil represented by 25 %. Furthermore, it was clear that SHV type of ESBLs had the lower prevalence of all types and there were only four isolates out of 160 appeared to carry this type of gene representing 2.5 %. The presence and/or absence of the three genes in all isolates were also investigated and it was shown that 86/160 isolates (53.75%) had the CTX-M gene only while the rest of genes were lacking. Moreover, 69/160 isolates had both CTXM and TEM. Interestingly, 3/160 harbored all three involved genes. The isolates characterized by the presence only TEM gene and those that had both CTX-M and SHV, shared the same percentage (0.6%). after taking sequencing of the PCR product of studied genes for 12 *E coli* isolates into consideration, it was obvious that all the PCR products of CTX-M were belonged to type CTXM-15; while TEM-1 type appeared predominant among all sequences PCR product for TEM gene. Finally, from the three isolates which revealed positive PCR amplification for the SHV gene, two isolates showed 100% similarity to the SHV-12 genome type while the rest single isolate was similar (99%) to SHV11.

Keywords: PCR assay, ESBLs, *Escherichia coli.*

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Probability Analysis of Slope Stability Analysis

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Abstract

The aim of this paper is to present a probability analysis using the Monte Carlo simulation method of uncertainty (MCSM). The results of this method will be compared to all recognized method of slope stability such as Bishop simplified, Fellenuis, Janbu simplified and corrected, Spencer and Lowe-Karafiath which are in general in limit equilibrium. This study has been done by a normal frequency distribution relative for all the parameters taken in considerations. From the mean values and the standard deviations of the pore water pressure, cohesion and the internal angle of friction with the correlation relation between these parameters, a set of random values of pore water pressure, cohesion and internal angle of friction where generated by computing a Critical Probabilistic Slip Surface. The analysis of the obtained results indicates that the failure probability is affected by the standard deviation of the pore water pressure, cohesion, internal angle of friction and correlation coefficient. However, all methods of equilibrium limit are affecting the failure probability by taking in account one of these parameters following each case. Nevertheless the probability of failure is not significantly affected by the standard deviation of the unit weight for all methods.

Keywords: Probability, slope stability, Monte Carlo simulation, Latin hypercube, Factor of safety.

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Influence of the Retrofitting Technique on the Seismic Response of Reinforced Concrete Structures

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Abstract

In this paper, a numerical investigation has been carried out in order to compare the seismic behavior of an existing non-ductile reinforced concrete (RC) structure under different retrofitting schemes (RC-Jacketing, Steel-Bracing and Steel-cage technique) and the same structure designed according to the Algerian seismic code, RPA 2003, in order to establish the most effective and economic retrofit solution. The construction details for the existing building are typical of constructions prior to the seismic guidelines of 1980.The frame structure is evaluated using both a nonlinear static (push-over) analysis to estimate the inelastic strength and deformation capacities and nonlinear dynamic time-history analyses under a set of different ground motions for comparison purposes. The results indicate that retrofitting with RC-Jacketing yields good performance in terms of ductility resistance capacities, the Steel-Bracing system resistance is increased but may collapse for great PGA of ground motions. , and the Steel-cage system has a large resistance but low ductility compared to the other retrofitting techniques.

Keywords: Retrofitting, Pushover analysis, RC-Jacketing, Steel-cage, Nonlinear dynamic.

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Comparative Study of Antioxidant Properties and Effects of Aqueous Extracts of Cola Nitida and Vitex Doniana on Fe2+ - Induced Oxidative Stress in Rat Testes in Vitro

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Abstract

Male sexual dysfunction (MSD) could be caused by various factors which include psychological disorders, androgen deficiencies, chronic medical conditions, vascular insufficiency, penile disease, pelvic surgery, neurological disorders, drugs, life style, aging and systemic diseases. This study sought to assess the antioxidant properties of the aqueous extracts of the leaves of Black plum (Vitex doniana) and bark of Kola nut (Cola nitida),evaluate their effect on pro-oxidant induced lipid peroxidation in rat's testes; and investigate the effect on arginase which is one of the key enzymes linked to Erectile dysfunction. The results of the total phenol, total flavonoid of aqueous extracts of Cola nitida and Vitex doniana revealed that Cola nitida (10.64 mgGAE/g) had significantly ($P<0.05$) higher total phenol content than Vitex doniana (4.68 mgGAE/g). The result also revealed that Vitex doniana (2.1 mgQE/g) had significantly ($P<0.05$) higher total flavonoid content than Cola nitida (1.3 mgQE/g). Also, Vitex doniana (20.24 mgAEE/g) had significantly ($p<0.05$) higher reducing property than Cola nitida (17.43 mgAEE/g). The results of the 2, 2'-azino-bis (3-ethylbenthiazoline-6-sulphonic acid (ABTS*) radical scavenging ability of the aqueous extracts of Vitex doniana and Cola nitida also showed that the extracts are able to scavenge ABTS* radicals, however, Vitex doniana (1.8 Mmol TEAC/100g) had significantly ($P<0.05$) higher ABTS* scavenging ability than Cola nitida (1.2 Mmol TEAC/100g). Furthermore, the DPPH* free radical scavenging ability of the aqueous extracts of Cola nitida and Vitex doniana revealed that extracts of Cola nitida and Vitex doniana scavenged DPPH* radicals in a concentration-dependent pattern. However, Vitex doniana (IC50 = 1.28mg/ml) had a significantly ($P<0.05$) higher DPPH* scavenging ability than Cola nitida (IC50 = 0.83 mg/ml). Both extracts were able to inhibit FeSO4 induced lipid peroxidation in a dose-dependent manner; however, Vitex doniana (IC50 = 1.07 mg/ml) had a higher inhibition of Fe2+ induced lipid peroxidation than Cola nitida (IC50 = 1.01 mg/ml). Vitex doniana (IC50 = 0.38mg/ml) has the higher arginase inhibitory activity than Cola nitida (IC50 = 0.34mg/ml). High phenolic content and strong antioxidant properties could be part of the mechanisms through which the water extractable phytochemicals of Cola nitida (bark) and Vitex doniana (leaves) exhibits its preventive measure of erectile function. However, Vitex doniana displayed a stronger effect on Male sexual function than Cola nitida.

Keywords: Sexual dysfunction, Vitex doniana, Cola nitida, antioxidant, arginase