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# Abstracts

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4<sup>th</sup> ISC CASE-2015 Malaysia

4<sup>th</sup> International Scientific conference on Applied Sciences and  
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## **Inducing the Systemic Resistance of Tomato Plants by Root-Knot Nematode Females Extract against *Meloidogyne Javanica* Infection**

**Ahmed El-Sayed Ismail<sup>1</sup>**

<sup>1</sup>*Plant Pathology Department, National Research Center, Giza, Egypt*

### **Abstract**

Females of *Meloidogyne javanica* were homogenized with distilled water in the proportion of 20 individuals / 3 ml of water. The dilute homogenate was applied as foliar spray at the rate of 3 ml / plant to tomato plants inoculated with *Meloidogyne javanica*. While some nematode females extract (NFE) treatment were pre-inoculation, others were post-inoculation. NFE treatment was also given to uninoculated groups of pots. Evidently, nematode females extract (NFE) significantly ( $P \leq 0.05\%$  and or  $0.01\%$  levels) increased growth of plants and reduced nematode infection. The pre-inoculation treatment was more effective than post-inoculation one. Clearly, the nematode females extract is thought to induce systemic resistance in tomato plants.

**Keywords:** Systemic resistance, Tomato, Root-knot nematode, *Meloidogyne javanica*.

## **Bacteriological Quality Assessment of Surface Water from Some Portion of Lake Chad Basin, Borno State, Nigeria**

Kolo, B. G<sup>1</sup> --- Ogugbuaja, V.O<sup>2</sup> --- Ameh, J.A<sup>3</sup>

### **Abstract**

Water samples were collected during the dry season (March-May) and wet (August-September) season from six locations of Lake Chad basin, Nigeria portion. The samples were collected in an already pre cleaned container and examined for bacteriological parameters using standard methods. Results showed variations in quality grading in order of frequency of occurrence. It was observed that 0% was excellent; 6.25% satisfactory; 93.75% intermediate While 0% was grossly polluted. The frequency distribution of physical appearance of water sample tested also showed that 33.33% were clear, 22.92% cloudy, 16.67% slightly cloudy and 27.08% turbid. The most probable number (MPN) value showed high values in raining season (10-20/100ml) as compared to dry season (1-5/100ml). Thus, pollution of lake during raining season might be due to the accumulation of debris and pollutants in the lake.

**Keywords:** Bacteriology, water, quality, Lake Chad, Maiduguri, season.

## **Optimization of a Cryopreservation Protocol for the Malaysian Fresh Water Microalgal Strain**

Nor AfiqahBinti Anua<sup>1</sup>---SitiSaizahBtMd Said<sup>2</sup>

### **Abstract**

Microalgae is important in many biotechnological exploitations in producing valuable products, services and processes. The technology of cryopreservation is useful in the long-term storage of many microalgal strains able to survive post cryopreservation. In this study, *Chlorella vulgaris* was conducted to determine the effects of different concentrations of cryoprotectant to preserve the fresh water microalgal strain employing three types of protocol. Dimethyl sulfoxide (DMSO) with different concentrations of 0%, 10%, 20% and 30% were added to the microalgal suspension in three types of protocol. Protocol 1 involves direct plunging into liquid nitrogen, Protocol 2 is slow cooling to -80 °C and Protocol 3 is slow cooling to -20 °C. The absorbance value at 540nm was used as as measurement to determine the growth post cryopreservation. The absorbance value with 30% DMSO in Protocol 2 showed the highest at 0.387 + 0.015 and was significant at  $p < 0.05$  compared to Protocol 1 and 3. The best protocol for the cryopreservation of *Chlorella vulgaris* was Protocol 2 using slow cooling to -80 °C treated with 30% DMSO as the cryoprotective agent.



## **Microwave Assisted Thermal Cracking of Castor Oil with Zeolite ZSM-5 as Catalyst for Possible Biofuel Production**

**Ghazi Faisal Najmuldeen<sup>1</sup> --- Ali Abdul Rahman Al Ezzi<sup>2</sup> --- Tharmathas A/L Alagappan<sup>3</sup>**

### **Abstract**

The aim of this investigation was to produce biofuel from castor oil through microwave assisted thermal cracking with zeolite ZSM-5 as catalyst. The obtained results showed that microwave assisted thermal cracking of castor oil with Zeolite ZSM-5 as catalyst generates products consisting of alcohol, methyl esters and fatty acids. The products obtained from this experimental procedure by the cracking of castor oil are components of biodiesel. Samples of cracked castor oil containing 1, 3 and 5wt % catalyst was analyzed, however, only the sample containing the 5wt % catalyst showed significant presence of condensate. FTIR and GCMS studies show that the condensate obtained is an unsaturated fatty acid, is 9, 12-octadecadienoic acid, suitable for biofuel use. 9, 12-octadecadienoic acid is an unsaturated fatty acid with a molecular weight of 280.445 g/mol. Characterization of the sample demonstrates that functional group for the products from the three samples display a similar peak in the FTIR graph analysis at 1700 cm<sup>-1</sup> and 3600 cm<sup>-1</sup>. The result obtained from GCMS shows that there are 16 peaks obtained from the sample. The compound with the highest peak area is 9, 12-octadecadienoic acid with a retention time of 9.941 and 24.65 peak areas. All these compounds are organic material and can be characterized as biofuel and biodiesel.

## **Association between Iron Status and Thyroid Function of Pregnant Mothers in Jaffna District, Sri Lanka**

**T. Yoganathan<sup>1</sup> --- V. Arasaratnam<sup>2</sup> --- M. Hettiarachchi<sup>3</sup> --- C. Liyanage<sup>4</sup>**

<sup>1</sup>*Nuclear Medicine Unit, Faculty of Medicine, University of Jaffna, Sri Lanka*

<sup>2</sup>*Department of Biochemistry, Faculty of Medicine, University of Jaffna, Sri Lanka*

<sup>3,4</sup>*Nuclear Medicine Unit, Faculty of Medicine, University of Ruhuna, Sri Lanka*

### **Abstract**

Background: Studies on association between iron status and thyroid function of pregnant women was never conducted in Jaffna District of Sri Lanka. Therefore, this study was carried out to find the relation between maternal iron status and thyroid function at third trimester. Materials and Methods: Four hundred and seventy seven pregnant mothers were randomly selected among six Medical Officers of Health (MOH) divisions from twelve in Jaffna District, Sri Lanka. Maternal serum thyroid stimulating hormone (TSH), free thyroxine (fT4), thyroxine binding globulin (TBG) and ferritin levels were assessed. Results: Among the 477 pregnant women mean age, weight, height and gestational period were 28.95(±5.46) years, 63.02 (±11.56) kg, 154.39 (±6.00) cm and 39.33(±1.37) weeks respectively. In this study, maternal median serum ferritin level was 23.4 µg/L and it ranged from 1.2 to 197.0 µg/L and the 21.0 % (n=100) were iron deficient. Inter quartile range (IQR) of serum ferritin was (Q1=14.3 and Q3=36.6) 22.3 µg/L. Further IQR of deficient and sufficient groups of mothers on iron status were 4.80 and 20.17 µg/L respectively. Median values of the serum TSH, free T4 and TBG levels were 1.9 mIU/L, 12.6 pmol/L and 21.4 IU/mL respectively. The serum TSH level ranged from 0.20 to 16.40 mIU/L while serum fT4 and TBG levels ranged from 10.1 to 28.2 pmol/L and 0.8- 86.9 IU/mL respectively. Among the total subjects, only 3.4 % (n=16) were biochemically hypothyroid. Maternal serum ferritin level was positively significantly correlated with serum TSH level (r=0.110, p=0.022) and positively correlated with free T4 level (r=0.003, p=0.945) and TBG level (r=0.059, p=0.220). Conclusion: Among the study subjects in Jaffna district, iron deficiency (Serum ferritin <12 µg/L) was 21.0 % while only 3.4 % were biochemically hypothyroid

(TSH > 5.2 mIU/L). Maternal serum ferritin level was positively significantly correlated with maternal serum TSH level ( $r=0.110$ ,  $p=0.022$ ) and positively correlated with free T4 level ( $r=0.003$ ,  $p=0.945$ ) and TBG level ( $r=0.059$ ,  $p=0.220$ ).

**Keywords:** Ferritin, Free thyroxine, Thyroid stimulating hormone, Thyroxine binding globulin

## **Incorporation of Chitosan and Glass Substrate for Improvement on Adsorption, Separation and Stability of TiO<sub>2</sub> Photocatalysis**

**NurhidayatullailiMuhd Julkapli<sup>1</sup> --- Muhammad Nurlman Amir<sup>2</sup> ---  
Sharifah Bee Abd Hamid<sup>3</sup>**

### **Abstract**

It has been demonstrated that the single TiO<sub>2</sub> has high capabilities for photodegradation process for all types pollutants. However, TiO<sub>2</sub> are still far from becoming a potential candidate for photocatalytic system due to weakness for the adsorption process, separation as well as dissolution during the treatment. Therefore, this study highlights on the highly adsorption, easy separation and promising stability of TiO<sub>2</sub>(SY) photocatalyst by fabrication of Chitosan-TiO<sub>2</sub>(SY) supported glass substrate (Cs-TiO<sub>2</sub>(SY)/Glass substrate) photocatalysts. Cs with abundant R-NH and NH<sub>2</sub> groups promotes adsorption sites of synthetic dyes. Meanwhile, present of glass substrate support increase the stability and easy separation of the photocatalysts. The fabrication process Cs-TiO<sub>2</sub>(SY)/Glass substrate has been done through dip-coating methods. The distribution and interface between photocatalysts components have been then characterized by FESEM, EDS, FTIR and UVDR analysis. UV-Vis analysis of the multi layers of photocatalysts (2, 4, 6 and 8 layers) to further analyzed by the adsorption-photodegradation with Methyl Orange (MO) as a model of synthetic dyes compound. Approximately, 70% of total removal of MO by optimize 8 layers of photocatalyst analysis has been achieved within 1 hour of UV irradiation. Besides that, the adsorption photocatalyst has been achieved about 50% when no exposure of light for 15 minutes irradiation. It concluded that, a suitable photocatalytic conditions and sample parameters, possessing the Cs-TiO<sub>2</sub> gave the benefits of adsorption photodegradation practice in the abatement of wastewater contaminants.

## Fuzzy Logic Based Energy Management System for Hybrid Electric Vehicle

Z. Tareq<sup>1</sup> --- N. Sulaiman<sup>2</sup> --- M.A. Hannan<sup>3</sup> --- A. Mohamed<sup>4</sup> --- E.H.  
Majlan<sup>5</sup> --- W.R.W. Daud<sup>6</sup>

<sup>1</sup>*Faculty of Engineering and Technology Infrastructure, Infrastructure University  
Kuala Lumpur*

<sup>2</sup>*Faculty of Engineering and Technology Infrastructure, Infrastructure University  
Kuala Lumpur; Fuel Cell Institute, UniversitiKebangsaan Malaysia*

<sup>5</sup>*Fuel Cell Institute, UniversitiKebangsaan Malaysia*

<sup>3,4,6</sup>*Faculty of Engineering and Built Environment, UniversitiKebangsaan Malaysia*

### **Abstract**

Hybrid electric vehicles have gained attention throughout the globe with its advantage of green technology and reduced greenhouse gases emission. Moreover, hybrid vehicles being powered by battery would be the best option of replacing current petrol or gas dependent vehicles. There are drawbacks though; battery has limited lifetime and is very costly. Hence, it is hybridized with other energy storage systems such as supercapacitor. This paper focuses on the energy management system for the energy storage system consisting battery and supercapacitor of a hybrid electric vehicle using fuzzy logic based controller. The energy management system, which manages energy feed between battery and supercapacitor, is then simulated in Matlab/Simulink to verify its reliability and validity of operation.

**Keywords:** Battery, Supercapacitor, Energy management, Fuzzy logic, Hybrid electric vehicle.

## **Enhanced Isolation Multi-Input Multi-Output Antenna for LTE Systems**

**I. Messaoudene<sup>1</sup> --- M. A. Belhocine<sup>2</sup> --- S. Aidel<sup>3</sup> --- N. Djefal<sup>4</sup>**

<sup>1,4</sup>*School of Computer and Communication Engineering, University of Perlis, Kangar, Perlis, Malaysia*

<sup>2,3</sup>*Laboratoire d'Electronique et des Télécommunications Avancées, Université de BordjBouArréridj, BordjBouArréridj, Algérie.*

### **Abstract**

In this communication, a new multi-antenna system based on two microstrip antennas is analyzed and proposed for LTE (Long Term Evolution) terminals. The multi-input multi-output (MIMO) antenna is printed on a FR4 substrate with size of 60×100×1.6 mm<sup>3</sup>. The proposed design, in its basic form, operates around 2.3 GHz, and provides a transmission coefficient of -19 dB. In order to improve the isolation between the two antenna ports, some rectangular and circular slots are inserted in the ground plane between the two antennas. With this modification, the mutual coupling of -59 dB was achieved, which are 40 dB improvements over the initial antenna. The simulated results are presented and discussed in term of reflection coefficients, transmission coefficients and radiation patterns.

**Keywords:** Microstrip antenna, Isolation, LTE terminals, MIMO system.

# Aperture Coupled Microstrip Antennas with High Isolation for MIMO Systems

L.Chouti<sup>1</sup> --- I. Messaoudene<sup>2</sup> --- N.Sahnoun<sup>3</sup> --- A.Behloul<sup>4</sup> --- A. Benghalia<sup>5</sup>

<sup>1,3,4,5</sup>*Laboratoire Hyperfréquences et Semiconducteurs, Université Frères Mentouri Constantine, Constantine, ALGÉRIE.*

<sup>2</sup>*Laboratoire Hyperfréquences et Semiconducteurs, Université Frères Mentouri Constantine, Constantine, ALGÉRIE ; School of Computer and Communication Engineering, University of Perlis, Kangar, Perlis, Malaysia*

## Abstract

This paper introduces a novel design of aperture coupled microstrip antenna for MIMO array applications. The proposed antenna uses 2x4 patches excited from two ports via rectangular slots. HFSS (High Frequency Structure Simulator) and CST (Computer Simulation Technology) softwares are used to simulate the antennas performance. The results are given in term of S-parameters, radiation patterns and gain. In addition a parametric study is done to evaluate the effect of certain antenna parameters on the antenna performances. Form the simulated result, it is concluded that the proposed concept provides a good isolation between the two antenna ports (with low mutual coupling,  $S_{12/21} < -28$  dB) and high gain. In addition, the obtained results are in good agreement. This paper introduces a novel design of aperture coupled microstrip antenna for MIMO array applications. The proposed antenna uses 2x4 patches excited from two ports via rectangular slots. HFSS (High Frequency Structure Simulator) and CST (Computer Simulation Technology) softwares are used to simulate the antennas performance. The results are given in term of S-parameters, radiation patterns and gain. In addition a parametric study is done to evaluate the effect of certain antenna parameters on the antenna performances. Form the simulated result, it is concluded that the proposed concept provides a good isolation between the two antenna ports (with low mutual coupling,  $S_{12/21} < -28$  dB) and high gain. In addition, the obtained results are in good agreement.

**Keywords:** Aperture coupled microstrip antenna (ACMA), Mutual coupling, MIMO systems.

## Quantum Key Distribution for Wavelength Division Multiplexing

N. Djefal<sup>1</sup> --- M. Benslama<sup>2</sup> --- I. Messaoudene<sup>3</sup>

<sup>1,2</sup>*Laboratoire d'Electromagnétisme et de Télécommunication, Université  
Frères Mentouri Constantine. Constantine, Algérie.*

<sup>3</sup>*School of Computer and Communication Engineering, University of Perlis,  
Kangar, Perlis, Malaysia*

### **Abstract**

In this work, we study the ability of quantum networks to support both random and non-random data traffic single-photon quantum communications signals on a shared infrastructure. The effect of wave length on distance coverage with the quantum bit error rate (QBER) of a quantum key distribution (QKD) system is increasing. The results of random phase showed minimal distance coverage over non-random phase. For fluctuating amplitude of random show a change in system performance improved sending capabilities. Hence, it is found that rare fluctuations should not degrade system performance significantly, but the data sending mode has a significant effect on channel integrity.

**Keywords:** Quantum bit error rate, Quantum key distribution, Wavelength division multiplexing.



## Integrated Single/Array DR Antenna for WLAN Applications

A. Behloul<sup>1</sup> --- I. Messaoudene<sup>2</sup> --- L. Chouti<sup>3</sup> --- A. Benghalia<sup>4</sup>

<sup>1,3,4</sup>*Laboratoire Hyperfréquences et Semiconducteurs, Université Frères Mentouri Constantine, Algérie.*

<sup>2</sup>*Laboratoire Hyperfréquences et Semiconducteurs, Université Frères Mentouri Constantine, ALGÉRIE ; School of Computer and Communication Engineering, University of Perlis, Kangar, Perlis, Malaysia*

### Abstract

In this paper, a novel integrated dual-port rectangular dielectric resonator antenna (DRA) is presented for 802.11a WLAN system applications. The antenna structure is formed by integrating the concept of antenna array with a single DRA element to produce a radiation characteristic necessity. The array is composed of four identical rectangular DRA elements placed on a horizontal ground plane and separated by a distance of  $0.54\lambda$  at design frequency of 5.97 GHz, excited through rectangular shaped aperture slots by a microstrip transmission line from port 1. The central element fed from port 2 by 50 Ohm microstrip line via a slot etched on the ground plane. The designed proposed antenna sized of  $60 \times 80 \times 0.672$  mm<sup>3</sup> operates over the frequency band between 5 and 6 GHz for VSWR < 2. The simulated average gain is 10.55 dB for port 1, and 5.92 dB for port 2. Simulations are performed using both CST Microwave studio employing the Finite Integration Technique (FIT) and Ansoft HFSS employing the Finite Element Method (FEM). Good agreement is obtained for main antenna characteristics such as the reflections coefficient and transmission coefficient. The results confirm that the proposed structure suitable for reconfigurable gain applications with good isolation between the two structure ports.

**Keywords:** Integrated antenna, Dielectric resonator antenna array, WLAN system.

## **Efficient Low Cost Online Signature Authentication System**

**A. Oulefki<sup>1</sup> --- B. Abbadi<sup>2</sup> --- M. Mostefai<sup>3</sup> --- I. Messaoudene<sup>4</sup>**

<sup>1,2,3</sup>*Electronic Department LMSE Laboratory, BP 64- University of BordjBouArreridj*

<sup>4</sup>*School of Computer and Communication Engineering, University of Perlis, Kangar, Perlis, Malaysia*

### **Abstract**

This paper presents an efficient non-constraining and low cost online signature authentication system which has been developed to enhance the performances of an existing multimodal biometric authentication system (based initially on both voice and image modalities). A laboratory prototype has been developed and validated for an online signature authentication.

**Keywords:**Multimodal authentication systems, Biometrics, Online signature authentication.

## **Effect of Nitrogen Content on PVD ZrN Coating Behavior on AZ91 as a Biomaterial**

**Seyed Rahim Kiahosseini<sup>1</sup> --- Abdollah Afshar<sup>2</sup> --- MajidMojtahedzadeh Larijani<sup>3</sup> --- Mardali Yousefpour<sup>4</sup>**

<sup>1</sup>*Department of Engineering, Damghan Branch, Islamic Azad University, Damghan, Iran*

<sup>2</sup>*Department of Materials Engineering, Sharif University of Technology, Tehran, Iran*

<sup>3</sup>*Agriculture Medical and Industrial Research School, Nuclear Science and Technology Research Institute (NSTRI), Karaj, Iran*

<sup>4</sup>*Department of Materials Science and Engineering, Semnan University, Semnan, Iran*

### **Abstract**

Zirconium nitride (ZrN) films were deposited on AZ91 magnesium alloy substrate using the technique of reactive ion beam sputtering at a varying nitrogen flow rate  $F(N_2) = f(N_2) / f(N_2 + Ar) = 0.3 - 0.6$ . The purpose of this study was to investigate the effect of the  $F(N_2)$  ratio on evaluations for structural and corrosion resistance of the produced ZrN film. The ZrN(111) orientation was the dominant and preferred orientation in all coated samples. For most of the samples, crystallite sizes of the ZrN film reduced according to an increment of nitrogen flow rate but the microstrain value increased. The best corrosion resistance was observed for the nitrogen flow rate of 0.5.

**Keywords:** Crystallographic structure, XRD, Polarization.

## Analysis of the Efficiency of Sludge Dewatering Using *Moringa Oleifera* as Natural Phytocoagulant

Qabas Marwan Abdulazeez<sup>1</sup> --- Mohammed Saedi Jami<sup>2</sup> --- Md. Zahangir  
Alam<sup>3</sup> --- Masashi Iwata<sup>4</sup>

<sup>1,2,3</sup>*Bioenvironmental Engineering Research Centre (BERC), Biotechnology  
Engineering Department, Faculty of Engineering, International Islamic University  
Malaysia (IIUM), Kuala Lumpur, Malaysia*

<sup>4</sup>*Department of Chemical Engineering, Graduate School of Engineering, Osaka  
Prefecture University, Sakai, Osaka, Japan*

### Abstract

In order to evaluate the efficiency of sludge dewatering, specific parameters such as settling velocity (Vs) and sludge volume index (SVI) have to be measured. However, problems arise when these parameters are used for the evaluation of efficiency using *M. oleifera* as natural phytocoagulant or sludge conditioner. Using statistical optimization, it was found despite good results of Vs and SVI, the concentration of residual suspended solids in supernatant liquid or turbidity was very high. Thus, turbidity of supernatant liquid was selected as a criteria to evaluate the efficiency of dewatering process. In this research, two optimization steps were run under two factors for each optimization; i.e., mixing time and concentration of *M. oleifera* seeds extract with NaCl (1 M). The range of these factors was 100 – 1000 mg/L for *M. oleifera* seeds extract concentration, and 5 – 30 min for mixing time. In the first optimization, Vs and turbidity were used as responses. While in the second optimization SVI and turbidity were used as response parameters. Both optimization steps were run under pH = 7, mixing speed = 120 rpm for the first minute, and 40 rpm during the rest period of experiment. Through using Design-Expert software v9, for the first optimization of settling velocity, the optimum Vs is 1 cm/min and the turbidity of the supernatant is found to be 350.7 NTU. Whereas in the optimization of the sludge volume index (SVI), the optimum value is 24.7 mL/g, corresponding turbidity value of suspended solids in supernatant liquid was 341.5 NTU. Since the turbidity was very high, second optimization by redesigning the factors was conducted resulting in optimum values of dosage of 462.8 mg/L, mixing time of 13.4 min, turbidity of 67.2 NTU (further

80.2 % reduction compared to the 350.7 NTU of the first optimization) and settling velocity of 0.93 cm/min were obtained. For the optimization of SVI, dosage of 447.5 mg/L and mixing time of 8.3 min gave 33.5 mL/g of SVI with 67.2 NTU. These optimized dewatering parameters can be used to improve the efficiency of sludge dewatering.

**Keywords:** Moringaoleifera, Sludge dewatering, Settling velocity, Sludge volume index, Phytocoagulant, Environmentally friendly.

# **Sulfur Dioxide, Carbon and Nitrogen Oxides Effects on the Environment of Zarqa Governorate**

**Bassam A. Al-Helou<sup>1</sup>**

<sup>1</sup>*Mechanical Engineering Department, Zarqa University, Jordan*

## **Abstract**

This study embarks on monitoring the air pollution affecting Al-Hashimyeh town in Zarqa governorate by sulfur dioxide (SO<sub>2</sub>), carbon oxides (CO, CO<sub>2</sub>), and nitrogen oxides (NO<sub>x</sub>) compared to the limits of the surrounding air as defined by Jordanian standards. Three sites in the area have been chosen with a view to making appropriate commendations to improve the air quality there on the one hand, and to considering both the environmental and economic aspects in the course of enduring development on the other. It has also come out with the fact that sulfur dioxide and nitrogen oxides have exceeded the limits of Jordanian standards, whereas carbon oxides maintained their low levels, with no record of violation of the standard limits. The study submits a set of recommendations to achieve this goal; they include the construction of a sulfur elimination unit from the heavy fuel at the Jordanian Petroleum Refinery, the substitution of the heavy fuel, which contains high rate of sulfur, at Al Hussein Thermal Power Plant by natural gas which is environmentally clean compared to heavy fuel, and for the installation of SO<sub>2</sub> elimination units emanating from smokestacks.

**Keywords:** Air pollution, Concentration, Sulfur dioxide, Carbon Oxides, Nitrogen Oxides Jordanian Standards, Wind Speed, Wind Direction.

## **Design Optimization Parameters for Tractor Mounted Mulcher Blades**

**B.G. Jahun<sup>1</sup> --- D. Ahmad<sup>2</sup> --- S. Sulaiman<sup>3</sup> --- M.R. Mahdi<sup>4</sup>**

<sup>1,2,4</sup>*Department of Biological and Agricultural Engineering, Universiti Putra Malaysia, Serdang, Selangor DarulEhsan, Malaysia*

<sup>3</sup>*Departments of Mechanical and Manufacturing Engineering, Universiti Putra Malaysia Serdang, Selangor DarulEhsan, Malaysia*

### **Abstract**

This paper aims to introduce a finite element model to investigate the performance of different Tractor Mounted Mulcher blades. The continuous fluctuating impact of soil crust, clods, stone and fronds develops high stress areas on the blade tip or blade cutting edges. Four types of blade for tractor mounted drawn rotary Mulcher was designed and developed. Computer Aided Design package for designing of the blade and Solid Works was used for the simulation and optimization of the blades. Based on the simulation results, optimized design of blade was suggested. It is imperative to optimize the design of blade so that these blades experience less stress and thereby reduces wear. From the results, effects of the Tractor Mounted Mulcher Blades geometry on blades performance were studied and the results were verified as Blade IV (900) has the least stress and deformation ( $1.28 \times 10^3$  MN and  $4.5 \times 10^{-3}$ m) while Blade II (Curved) has the highest stress and deformation ( $4.07 \times 10^3$  MN and  $1.15 \times 10^{-2}$ m) respectively. To finalize the selection of the optimized blade, a field experiment would be conducted to know the effect of pulverization, level of torque, fuel consumption on the blades and noise and vibration effects on the operator.

**Keywords:** Blade, Deformation, Pulverization, Stress/strain

## **Anticancer Effect And Apoptosis Induction Of Dracaena Cinnabari Balf.F On H400 Human Oral Squamous Cell Carcinoma (OSCC)**

**Aied M Alabsi<sup>1</sup> --- Lim K Li<sup>2</sup> --- Ian C Paterson<sup>3</sup>**

*<sup>1,2,3</sup>Department of Oral Biology and Biomedical Sciences, Faculty of Dentistry,  
University of Malaya, Kuala Lumpur, Malaysia*

### **Abstract**

Oral squamous cell carcinoma (OSCC) is the sixth most common malignancy worldwide and the 5-year survival rate of around 50% has not improved significantly during the past 30 years. New approaches to treat the disease are urgently needed. Chemotherapy with anticancer agents derived from natural products offer a promising new approach in an attempt to improve patient prognosis. *Dracaena cinnabari*, is a deep red resin that possesses various pharmacological properties, but its anticancer properties have not been elucidated. This study to determine the cytotoxic and apoptosis-inducing effects of *D. cinnabari* on OSCC cells. The cytotoxicity of *D. cinnabari* crude extract was examined using six OSCC cell lines. *D. cinnabari* crude extract exhibited the greatest cytotoxicity activity on H400 cells with an IC<sub>50</sub> of 5.9 µg/mL and it was selected as targeted cell line for further experiments. On the other hand, *D. cinnabari* crude extract showed selectivity towards OSCC cells, compared to normal human oral fibroblasts. *D. cinnabari* was able to inhibit the proliferation of H400 cell and this was achieved primarily via apoptosis, where externalization of phospholipid phosphatidylserine and chromatin condensation were observed using DAPI/Annexin-V fluorescence double staining. Mechanistic studied through mitochondrial membrane potential (MMP) Assay, cytochrome c enzyme-linked immunosorbent assay, caspases Assay and apoptotic proteins array revealed depolarization of MMP, leading to the translocation of SMAC and cytochrome c into cytosol and subsequent activation of initiator caspase 9 and executioner caspase 3/7. Cell cycle analysis by flow cytometry demonstrated an increase in H400 cells in the S phase upon treatment with *D. cinnabari*. Therefore *D. cinnabari* induced apoptosis in OSCC via activation of the intrinsic



pathway and is associated with the depolarization of MMP, caspase 9 activation, as well as released of cytochrome c. The results of this study indicate that specific extracts of *D. cinnabari* have promise to be developed as novel therapeutic agents for the treatment of OSCC.

# **Exploration to Find Heat Absorbent Materials from Recycled Solid Wastes for the Design and Development of Low Operational Cost and Affordable Water Heating System for Domestic Application**

**Abdul Talib Din<sup>1</sup> --- NorzawahirMohd Hafiz<sup>2</sup> --- AnikaZafiahMohd Rus<sup>3</sup>**

<sup>1</sup>*Universiti Teknikal Malaysia Melaka, Durian Tunggal, Melaka, Malaysia*

<sup>2</sup>*Universiti Teknikal Malaysia Melaka, Durian Tunggal, Melaka, Malaysia*

<sup>3</sup>*Universiti Tun Hussein Onn Malaysia, BatuPahat, Johor, Malaysia*

## **Abstract**

This research studied the properties and the production of thermal absorbent materials from recycled solid waste and their application in residential house construction. Many recycled materials can be used as heat absorbers such as aluminum, plastic, bagasse, textile, oil palm leaves, twigs, paper, corn cob, rubber, coconut husk, coconut shell, granite, wood, iron, glass, kenaf (*habeiscanabicus*), and concrete. The specimens were produced by using a composite method with epoxy solution as the binder to the loose grain of recycled waste material. Experimental methods of the specimens also have been discussed in this project, which is by recording the temperature of each specimen in several time periods and applying the data in Fourier's equation to determine the heat transfer rate. This project therefore discussed mainly about the theory of heat transfer, which consists of conduction and radiation.

# Phenotypic Characterization of Erashy Cattle Type in El-Gash Area (Kassala State) Compared to Kenana and Butana main Dairy Cattle of the Sudan

Ali, F.M. I.<sup>1</sup> --- Makkawi, A.A.<sup>2</sup> --- Ahmed, S.S<sup>3</sup>

<sup>1</sup>*Faculty of Agriculture and Natural Resource/Kassala University*

<sup>2,3</sup>*Sudan University of Science and Technology, College of Agricultural Studies, Department of Animal Production*

## **Abstract**

The objective of the study was to assess the phenotypic characteristics of one of the most promising dairy cattle (Erashy cattle) in eastern Sudan. The present investigation was carried out in Elgash area, Kassala State. Animal's data were collected from 118 mature cows. The coat colors varied between white, bright red brown, and multi color, represented 63%, 32% and 5% respectively. The color of eyes and eyelids are black, eyelids are white and brown, eyelashes are white and black, the tip hair are black and the hoof are black, brown. The muzzle, brown and black, represented 95%, 54%, 33%, 13%, 68.6%, 31.4%, 70%, 40.7%, 59.3%, 40% and 60% respectively. Dewlap is well developed in all studied animals, goes down in front of the forelegs forming few folds, and it is predominant in both sexes. Hump extended in male and restricted in female, and may be cervical or cervico-thoracic. The temperament of the animals concerned was varied from docile to aggressive. Body measurement data done for fifty one cows divided into three groups on the basis of number of calving. Data was analyzed by using completely randomized design to compute analysis of variance. For meaningful comparison, least significant difference (LSD) test were performed. Analysis of variance revealed that there were no significant differences among animals under this study except some of them, like Heart girth and Pelvic width at significant differences ( $P < 0.05$ ). The overall averages of body measurements (cm) as height at withers, heart girth, barrel circumference, chest depth, chest skin thickness, back length, pelvic width, neck length, body length, ear length, horn length, face length, tail length,

anterior udder length, posterior udder length, udder base length, cranial teats length, caudal teats length, pin bone width, dewlap depth, height at rump, neck skin sickness, body weight were all close to the phenotypic characteristics of Kenana and Butana Sudanese dairy cattle, studied by many re.searchers.

**Keywords:**Phenotypic, Characterization, Erashy Cattle, Beja

## **Comparison of Bioethanol Yield Produced From MoringaOleifera Seeds Husk Removed Manually and Mechanically**

**Eman N Ali<sup>1</sup> --- MohamadSyazwan Bin Abdul Halim<sup>2</sup>**

*<sup>1,2</sup>Faculty of Chemical & Natural Resources Engineering, University Malaysia  
Pahang, TunRazak Highway, Kuantan, Pahang, Malaysia*

### **Abstract**

Moringaoleifera is a plant which benefits to mankind from its root until leaves. In this research, the seeds husk of Moringaoleifera were used to compare the bioethanol yield produced from seeds husk removed manually and mechanically. About 30g of Moringaoleifera seeds husk was used for each sample and 450 ml of water was added. Pre-treatment was started by adding NaOH up to pH of 11-12. The samples then left for 24 hours, and the pH was adjusted to 4.5, 5, and 5.5 using 0.5M H<sub>2</sub>SO<sub>4</sub>. The samples were located at autoclave for 2 hours at 120°C. The samples collected from autoclave are left to be cold at room temperature. Then, the Saccharomyces cerevisiae (Baker's yeast) was added with different dose of 1g, 5 g, and 10 g in a closed conical flask at temperature of 32°C and located at shaking incubator with agitation rate of 200 rpm for 72 hours. On a 12 hour basis, the samples were collected and tested using HPLC to determine the bioethanol yield. The results showed that the concentration of bioethanol produced from Moringaoleifera seeds husk that is removed mechanically is higher than that removed manually with a concentration of 15.5058 gm/L and 13.4365 gm/L, respectively. As a conclusion, both method results the best yields at same fermentation time of 12 hours. Therefore, it can be concluded that both methods are good in producing bioethanol with the same concentration, and it is better to use the mechanical method because the manual method is very tough and time consuming which make it not economical.

**Keywords:** Moringaoleifera, Seeds husk, Fermentation, Bioethanol, Hydrolysis.

# **Hydrostatic and Hydrodynamic Characteristics of Swimming Animals-An Inspiration for Hybrid Buoyant Aircraft**

**Anwar UI Haque<sup>1</sup> --- WaqarAsrar<sup>2</sup> --- Ashraf Ali Omar<sup>3</sup> --- Erwin Sulaeman<sup>4</sup> --- JS Mohamed Ali<sup>5</sup>**

<sup>1,2,4,5</sup>*Department of Mechanical Engineering, International Islamic University Malaysia (IIUM), Kuala Lumpur, Malaysia*

<sup>3</sup>*Department of Aeronautical Engineering, University Of Tripoli, Tripoli, Libya*

## **Abstract**

In today's world, the biological sciences are mostly considered separate from the existing modern knowledge of various other fields of sciences and engineering; however there are many properties of nature and known facts of biological sciences that can be proved in the other domains of science and technology as well. Correlation of the geometric and buoyant properties of the swimming animals with the hybrid buoyant air vehicles is an example of this hypothesis. In the present work, some experiments related to the geometric parameters of a California sea lion were carried out. It was found that the fineness ratio of this animal is of the same order as the optimum value of that for the condition of minimum drag and power required for buoyant aerial vehicle. Role of multiple fins on the elongated bodies of shark is also discussed for its application for yaw stability as well as to shroud the antennas that are used in the aircraft for various communication systems.

## **Effect of Selenium Incorporated In Feed on the Hematological Profile of Oreochromis Niloticus**

**Muhammad Younus<sup>1</sup> --- Sonia Iqbal<sup>2</sup> --- Muhammad Sharif Mughal<sup>3</sup> ---  
Arshad Javid<sup>4</sup> --- Muhammad Kamran Rafique<sup>5</sup> --- AmanUllah Khan<sup>6</sup> ---  
Noor Khan<sup>7</sup> --- Usman Atique<sup>8</sup>**

*<sup>1,5,6,7</sup>College of Veterinary and Animal Sciences Jhang, Sub-campus of University of  
Veterinary and Animal Sciences Lahore.*

*<sup>2,3,4,8</sup>Department of Wildlife and Ecology, University of Veterinary and Animal  
Sciences Lahore*

### **Abstract**

Present study was conducted to evaluate the effect of selenium (Se) supplemented in feed on hematology of Tilapia (*Oreochromis niloticus*) and variations in different physico-chemical parameters. Three doses of Se i.e. 2, 4, and 8 mg Se/kg of fish feed were prepared and each dose was considered as an independent treatment. Four cemented rectangular tanks (2.896x0.762x0.914 m, length x width x depth) with three equal partitions were used to maintain the fish. Tank 1, 2 and 3 were designated as treatment tanks whereas the 4th one as control. Fifteen fish per tank (5 fish/replicate) were stocked having weight between 10 to 25g. The fish were fed at the rate of 3% body weight (BW) twice a day. Variations in different hematological parameters viz. red blood cells (RBC's), total leucocyte count (TLC) and hemoglobin (Hb) were noted. However, physico-chemical parameters were recorded fortnightly. The results were statistically analyzed by using one way ANOVA. WBC's were non-significant in treatment-1, 2, 3 and control. Whereas, neutrophils, RBC's and Hb was higher in treatment-1 (2mg Se/kg). Hb level and neutrophils and RBC's count was lower in treatment-3 (8mg Se/kg) and WBC were lower in treatment-2 (4mg Se/kg). Lymphocytes and monocytes were significantly higher in treatment-3 (8mg Se/kg). However, differences in physico-chemical parameters were not significantly different among the treatments of this study and were within the recommended ranges for Tilapia (*Oreochromis niloticus*). In conclusion, supplementation of selenium did not alter any hematological parameters however, had significantly improved the physio-biochemical factors and productivity in Tilapia (*Oreochromis niloticus*).

**Keywords:** Selenium, hematology, WBC's, RBC's, Physico-chemical parameters, Tilapia.



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