

## المؤتمر الدولي الخامس للعلوم والتنمية

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## تقديم

انطلاقاً من حرص كلية العلوم في الجامعة الإسلامية على مواكبة التطورات المتلاحقة في قضايا البحث العلمي والتنمية، وتحديد ومعالجة الإشكاليات التي تواجهها، دأبت الكلية على عقد الأيام الدراسية لأقسامها المختلفة، كما عقدت مؤتمرات عدة بدأت بمؤتمرها الدولي الأول عام 2005.

### واليوم تعقد الكلية المؤتمر الدولي الخامس للعلوم والتنمية

ويأتي هذا المؤتمر لتحقيق مجموعة من الأهداف تتمثل بما يلي:

جمع العلماء والباحثين من داخل فلسطين وخارجها، - ومن خلال الاستعانة بوسائل الاتصال الحديثة - لعرض نتائج أبحاثهم ومناقشتها، مما يتيح التعرف على هذه النتائج وتطويرها والاستفادة منها. وهذا يؤدي إلى اتساع دائرة المعرفة ويدفع عجلة البحوث العلمية الموجهة لخدمة الفرد والمجتمع إلى الأمام.

ونطمح أن يؤدي هذا التجمع إلى تشجيع الأساتذة والباحثين على التعاون معا في مشاريع مشتركة مستقبلية، حتى تزداد كفاءة ونوعية البحوث الموجهة للتغلب على المشكلات التي تواجهها الصناعة والزراعة والبيئة في المجتمع الفلسطيني.

كذلك يمثل هذا المؤتمر فرصة لطلبة الدراسات العليا للتعرف على الأبحاث في مجالات تخصصهم، ومنهجية البحث العلمي، وطريقة عرض البحوث ومناقشتها والاستفادة منها، وهذا قد يساعدهم في تحديد خطهم البحثي المستقبلي، واختيار مواضيع لرسائلهم الجامعية. ومع وجود عدد كبير من الباحثين من الأساتذة المختصين في كل مجالات العلوم من مختلف الجامعات والمؤسسات البحثية المحلية والعربية والدولية نأمل أن نتمكن من تحقيق الأهداف السابقة، وأن يمثل هذا المؤتمر لبنة من اللبنة اللازمة للتقدم العلمي في فلسطين الغالية.

والله ولي التوفيق

عميد كلية العلوم

الأستاذ الدكتور / بسام هاشم السقا

**الفيزياء**

**Physics**

## The sensitivity of LH-antiferromagnetic waveguide sensors

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### Abstract

Left-handed materials (LHMs) known as Metamaterials (MTMs) have simultaneous negative permeability and permittivity. Various studies have been conducted on antiferromagnetic waveguides. We propose a three layer waveguide structure sensor consists of LHMs film surrounded by dielectric cladding and antiferromagnetic substrate. The dispersion relation is derived for TE modes only. The surface waves at the interface between dielectric and LHMs are studied. Furthermore, the polariton at the interface between antiferromagnetic and MTM is considered. The frequency is chosen such that the Voigt permeability,  $\mu_v$ , is negative. Optical waveguide sensors have been widely used for various purposes such as humidity sensing, chemical sensing, biochemical sensing and biosensing. The sensitivity,  $S$ , is defined as the change in the effective refractive index with cladding index. The sensitivity of the system is studied for variant physical parameters such that reduced frequencies,  $\Omega = \omega/4\pi\gamma_1 M_{01}$ , and wave number,  $Q = kc/4\pi\gamma_1 M_{01}$ , where  $\gamma_1$  is the absolute value of the gyromagnetic factor in the antiferromagnetic and  $M_{01}$  is the unscreened saturation magnetization in the direction of magnetic field. The sensitivity as a function of the wave number  $Q$  is plotted at different  $\Omega$ . results show that  $S$  is sensitive to the forward propagating waves (positive  $Q$ ).

Keywords: MTMs, LHMs, antiferromagnetic, optical waveguide sensors, sensitivity.

## **Numerical simulation of grain size distribution in two-phase polycrystalline materials**

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### **Abstract**

Numerical simulations based on Monte Carlo Potts model are used to study the grain size distribution of two-phase polycrystalline materials in the self-similar growth regime. Simulation results showed that after a sufficiently long time, grain growth in two-phase systems in which both phase grow simultaneously can be characterized by a self-consistent scaled grain size distribution function associated with growth law. For two-phase systems, the grain size distribution is characterized over a broad range of the second phase volume fraction. The grain size distribution is found to vary with volume fraction of the second phase. The grain size distribution becomes narrower and higher peaked with decreasing volume fraction of the second phase and fitted to the normal distribution function. The simulation results of grain size distribution for one-phase systems is in excellent covenant with an analytical grain size distribution function based on a statistical mean field theory of grain growth and is completely compatible with the principal physical condition of total volume conservation.

Keywords: size distribution, two phase, Potts model, grain growth, polycrystalline materials.

## **Electromagnetic waves through metamaterial-dielectric Photonics Crystal waveguide structure**

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### **Abstract**

Photonic crystals (PCs) are structures with periodically modulated dielectric constants whose distribution follows a periodicity of the order of a fraction of the optical wavelength. PCs are a revolutionary science which has a great impact on the field of photonics. PCs can control the propagation of light since it can simply defined as a dielectric media with a periodic modulation of refractive index in which the dielectric constant varies periodically in a specific directions. In purpose of extend the applications of PCs, we introduce a new photonic structure which composed of composite structure which is composed of (MTMs/Dielectric) structure. Numerical method will be used to study the electromagnetic waves propagating through photonic crystal structures and determine the optical properties of these periodic structures. Results show improvement in the characteristics of the photonic crystal.

Keywords: photonic crystals, Metamaterials, optical waveguide, periodic structure.

## Optical Orthogonal Frequency Division Multiplexing for Radio over Fiber System

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### Abstract

*Abstract:* The spread of mobile and other wireless devices with increased demand for broadband services are putting weight on wireless systems to increase capacity. This paper investigates the improvement of capacity using Optical Orthogonal Frequency Division Multiplexing (OOFDM) and direct detection for Radio over Fiber (RoF) transmission system to achieve higher data rates with minimum Bit Error Rate (BER). The Quadrature Amplitude Modulation (QAM), 4QAM, 16QAM and 64QAM Orthogonal Frequency Division Multiplexing (OFDM) RoF system have been investigated for different number of subcarriers. The performance of our system shows that our scheme is a practical solution to meet the data rate and cost-efficient of the optical links simultaneously in tomorrow's ROF networks.

*Index Terms:* Radio over Fiber, OOFDM, QAM, Direct Detection.

### Plant seeds-Based Dye-Sensitized Solar Cells

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### Abstract

Dye-sensitized solar cells (DSSCs) are considered the third generation photovoltaic devices that have received an increasing interest for the inexpensive conversion of solar energy to electrical energy. The DSSC structure is based on a nanostructured, mesoporous metal oxide film (TiO<sub>2</sub>, ZnO,...), sensitized to the visible light by a dye. The dye molecules absorb visible light, and inject electrons from the excited

state into the metal oxide conduction band. The injected electrons travel through the nanostructured film to the current collector, and the dye is regenerated by an electron donor in the electrolyte solution.

In this work, we explore the performance of DSSCs based on natural dyes extracted from different plant seeds. The extracts are characterized by UV–VIS absorption spectra. The DSSCs are fabricated using a TiO<sub>2</sub> thin film on FTO-coated glass. The photovoltaic properties of the fabricated cells are investigated under light illumination. We found that the best performance was for the DSSC sensitized with *Eruca sativa* with a solar energy conversion efficiency of 0.725%.

### الإجتهداد في تحديد موافقت القيام

سمير اسماعيل فرحات

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### ملخص

في هذا البحث سوف نستخدم علم الفيزياء لتحديد موافقت القيام التي وردت في سورة المزمل: "إن ربك يعلم أنك تقوم أدنى من ثلثي الليل و نصفه و ثلثه و طائفة من الذين معك و الله يقدر الليل و النهار علم أن لن تحصوه فتاب عليكم ...". سوف نبدأ البحث بإستخدام علمي الاحصاء كما ورد في الآية الكريمة و علم الفيزياء في تحديد وقت الزوال أي وقت بدء صلاة الظهر لنثبت أن طريقتنا صحيحة و نقطع الشك باليقين . بعد معايرة آلة الساعة أمكن إحصاء موافقت ثلث الليل و نصف الليل و ثلثي الليل بدقة كافية لرفع الأذان في هذه الموافقت . الليل يبدأ من لحظة غروب الشمس و ينتهي بلحظة شروقها أو طلوعها .

## **Differences between Hybrid Classical-Quantum Mechanical and Pure Quantum Mechanical Orbits**

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### **Abstract**

It is found that from the equation of the orbit and the probability of classical mechanics we obtain an identical results of five parameters of an ellipse, the apsis,  $r_{max}$ ,  $r_{min}$ , the semi major and minor axes  $a$ ,  $b$  and the eccentricity,  $e$ . By replacing the constants of classical mechanics by the corresponding quantum mechanical values such as the angular momentum and energy we obtain a hybrid classical-quantum mechanics that still give the orbit of an ellipse. Similarly, the probability of pure quantum mechanics must give the orbit parameters. For the  $l = n - 1$  states, pure quantum mechanical parameters give the orbit to be a circle for any value of the principal quantum number  $n$ . Therefore, we have two theories with different results.

## **Novel SiC nanoparticles-containing Sn–1.0Ag–0.5Cu solders with good drop impact performance**

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### **Abstract**

The SiC nanoparticulates reinforced Sn–1.0Ag–0.5Cu (SAC105) composite solder (with 0.75 wt %) were successfully prepared by employing high energy ball milling and mechanically mixing technique at 450 °C for 2 h. In comparison with SAC (105) solder, the addition of SiC nanoparticles can effectively increase the primary  $\beta$ -Sn phase and decrease the percentage of  $Ag_3Sn$  and  $Cu_6Sn_5$  IMC particles, which produce a weak interface with the  $\beta$ -Sn matrix. The formation of few numbers of IMC particles, together with the weak interface have resulted in significant reduction of the ultimate tensile strength (UTS) and 0.2% yield strength (0.2%YS) in the composite solder. The improved plasticity is due to the structural

refinement of primary  $\beta$ -Sn sub-grains, which makes the composite solder to display large total elongation. The addition of SiC nano-sized particles can also effectively reduce the undercooling and pasty range, while the melting temperature is maintained at the SAC105 level, indicating that the novel composite solder is fit for existing soldering process. These effects could increase the elastic compliance and plastic energy dissipation ability of the bulk solder, which play an important role in drop impact performance enhancement.

### **The era of the nano-world and opportunities for Gaza**

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#### **Abstract**

This presentation deals with nanoscience and nanotechnology and how they can be used to successfully address the most serious problems the world is currently facing, with a specific focus on Gaza. The 15 Global Challenges - as annually identified by the Millennium Project - serve as basis to pinpoint related issues and opportunities in research and development in Gaza. It will be concluded that Gaza has high potential in nanotechnology. Aiming at education that fosters interdisciplinary thinking, providing sustainable solutions and ethical codes of conduct for using novel technologies will provide ample ground for successful addressing of the major challenges.

## **Multilayer structure with conducting interfaces**

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### **Abstract**

Multilayer structures have received an increasing interest because of their wide range of applications. By choosing, in an appropriate way, the thicknesses and the refractive indices of the various layers, it is possible to fabricate different optical devices, such as filters, microcavities, waveguides, etc. Moreover, multilayer structures have been widely investigated in the field of porous silicon and optical microcavity. Devices made of porous silicon have shown interesting photoluminescence and electroluminescence properties.

In this work, reflectance and transmittance from a conventional Bragg reflector with alternating layers of high and low refractive indices are studied and analyzed in details. The influence of the interface charge layer is studied for TM or TE polarized light. The effect of a transverse dc voltage on the density of free charges and hence on the reflectance and transmittance is presented.

## **Slab waveguides with conductive interfaces for sensing applications**

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Sameh S. Mahdi*

### **Abstract**

Slab waveguide have been proposed as efficient optical sensors. The principle of operation of optical waveguide sensors can be summarized as follows: In optical waveguides, although light travels confined within the guiding layer, there is a small part of the guided mode called the evanescent field that extends to the surrounding media. The evanescent field detects any

refractive index variation of the covering medium in homogeneous sensing. The interaction of the evanescent field with the measurand causes a change in the effective index of the guided mode. The change in the effective index is the sensing criteria.

In this work, slab waveguide structures with conducting interfaces as optical sensors are investigated. Detailed derivations of the dispersion equation and the sensitivity of the effective refractive index to changes in the index of the cover layer are presented. The variation of the sensitivity with the parameters of the proposed structure is plotted using numerical techniques and studied to find out the optimal structure corresponding to the maximum sensitivity.

### **Drift Waves And Vortices In Shear Magnetized Plasma With Low Beta And Finite Ion Temperature Gradient**

*By M. K. Ayyash and S. S. Yassin*

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#### **abstract**

The derivation of reduced nonlinear fluid equations for the description of drift wave turbulence and vortices in low beta confinement, systems with magnetic shear is considered, where the effects associated with trapped particles could be neglected. In this work, a set of reduced equations governing the slab-type ion temperature gradient driven mode in a shear magnetized plasma with low frequency, is derived which is generalization of the model equations of Horton, Estes, and Biskamp (1992).

With the use of consistent orderings in  $\delta = k_{\perp} \rho_s$  and  $\varepsilon = \rho_s/a$  model equations are derived for the drift instabilities from the electrostatic two-fluid equations. The electrical resistivity  $\eta$  included in the system allows the dynamics of both the collisionless ion temperature gradient driven instability ( $\varepsilon_{\eta} = 0$ ) and the collisional drift wave instability of plasma ( $\varepsilon_{\eta} \neq 0$ ). The model equations used extensively in earlier nonlinear studies are obtained as appropriate limits of the model equations derived in the

present work, The effects of sheared velocity flows in the equilibrium plasma.

The compressible two fluid equations is considered, when fluctuation of magnetic field and electron temperature are ignored. It is also assumed that the mode is localized on a particular magnetic field line (*i.e.*  $k_{\perp} \gg k_{\parallel}$ ) and typical frequency and growth rate of the mode are much smaller than the ion cyclotron frequency. The dispersion relation of the slab-type ion temperature gradient driven mode is obtained for both collisionless and collisional drift waves in sheared magnetic fields of plasma.

### **Assessment of Level Radiation Emitted from Mobile Phones Base Stations for Mobile Installation in Gaza Governorate**

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#### **abstract**

Mobile or cellular phones are now an integral part of modern telecommunications. In many countries, over half the population use mobile phones and the market is growing rapidly. The radio waves used in mobile telephon are, like visible light and X-rays, electromagnetic waves that consist of both an electric and a magnetic component which vary periodically in time. The frequency of variation determines the wave properties and uses .

Electromagnetic radiation may be classified as ionizing and non-ionizing radiation. Ionizing radiation has enough energy to remove bound electrons from the orbit of an atom such that it becomes an ionized atom which may cause health hazard. About 437 mobile phone station are subject to environmental protocol for mobile installation Palestinian, which includes a set of criteria for the establishment of mobile stations, which was prepared according to the international standards organizations and to the extent allowable radiation emitted from those stations such as (ICNIRP, WHO), and participated in the preparation of this protocol (Environmental Quality Authority Health, Ministry of Health and Ministry of Telecommunications). Exposure to high doses of electromagnetic radiation emitted

by mobile stations cause very significant damage to health and the lack of laws and regulation Palestinian to radiation emitted mobile stations recommend this study.

The number of mobile phone base stations in the governorate Gaza 197 stations and its area of 55 km<sup>2</sup>, so researcher will examine each one station for one kilometers. A total of 50 sites (mobile station) will be selected for assessment study of radiation emitted from mobile phones base stations.

Mobile station sites will be identified using Global Positioning System(GPS.)

This study will assess the levels of radiation emitted from Mobile Phones Base Stations in Accordance with Environmental Protocol for Mobile Installation Palestinian in Gaza Governorate and compare the level of radiation according to (ICNIRP, WHO) in addition to assess some of the other criteria such as:

- Heights of the stations
- Heights of the buildings compared to adjacent buildings.
- Protective fence around the mobile station.
- The distance between the mobile station and adjacent buildings

### **Ising and Potts model with semi-directed spins on semi-directed Barabasi-Albert networks**

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#### **Abstract**

The Barab'asi–Albert model is one of several proposed models that generates scale-free networks. It incorporates two important general concepts: growth and preferential attachment. Both growth and preferential attachment exist widely in real networks.

In directed Barab'asi Albert networks, the network itself was built in the standard way, but when agents (spins) were put on the network nodes, the neighbor relations were such that if A has B as a neighbor, B in general does not have A as a neighbor.

The undirected Barab'asi Albert network, a usually is grown in the same way, but then the neighbor relations were such that if A has B as a neighbor, B has A as a neighbor.

We introduce a directedness already when building the network. In the undirected Barab'asi Albert network, if a new node selects  $m$  old nodes as neighbors, then the  $m$  old nodes are added to the Kert\_esz list, and the new node is also added  $m$  times

to that list. Also in our semi-directed version, the new node makes connections with  $m$  randomly selected old nodes of the Kert\_esz list.

But if one adds the  $m$  old nodes, plus only once (and not  $m$  times) the new node, then one has what we call here a semi-directed network.

In Potts model with  $q = 3$  and 8 states was studied through Monte Carlo simulations. We have obtained also for  $q = 3$  and 8 states a first-order phase transition for values of connectivity  $z = 2$  and  $z = 7$  of the directed Barabási Albert networks.

Now we study the behavior of Ising and Potts model with semi-directed spins on semi-directed Barabasi-Albert networks.

**Keywords:** Directed BA networks - Undirected BA network – Ising Model – Potts Model - Semi-directed BA network

## TE Waves in a Cylindrical Superlattices(LANS) and Left Handed Material (LHM) Waveguide Structure

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### Abstract

The propagation characteristics of TE waves in a cylindrical waveguide structure of a lateral antiferromagnetic -non magnetic superlattices (LANS) bounded by a left handed material (LHM) are investigated.

We found that, adjusting the thickness of the waveguide to small reduced radius will support backward TE wave modes which can have very large effective index  $n_x$ . At large reduced radius the forward waves of definite wave index and lower frequency are observed. High power flow is switched by decreasing wave frequency. We found that increasing of the magnetic field supports forward and backward waves of higher power and larger propagation lengths. Larger propagation lengths and constant power of the backward waves are realized by decreasing the values of negative electric permittivity  $\epsilon_h$  of LHM .

Larger propagation lengths and lower power of the forward waves are realized by decreasing the values of negative magnetic permeability  $\mu_h$  of LHM.

**Keywords**— Dispersion relation, Left handed material, Magnetic superlattices, TE waves.

## **Electromagnetic Fields in Tissue-Equivalent Liquids for Different Frequencies by Means of Flux Density**

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### **Abstract**

It is possible to use the dielectric parameters (effective permittivity and equivalent conductivity) of tissue equivalent liquids to evaluate electric and magnetic field for different electromagnetic wave frequencies. The electric and magnetic field in tissue equivalent liquids has been evaluated by means of flux density. Electromagnetic waves with different frequencies has been simulated used the finite difference time domain method. Found that the electric field amplitude decrease by increasing the frequency. The effect of magnetic field on tissue is stronger than electric field. The results reveal many interesting properties for measuring specific absorption rate in life tissue.

**Keywords:** electromagnetic waves- Tissue equivalent liquid-FDTD-flux density

## **Near Dirac Point In Metamaterial Ferrite Waveguide Structures**

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### **Abstract**

Electromagnetic surface waves propagating in a nonlinear dielectric film bounded by a ferrite cover and negative –zero-positive index metamaterial substrate (NZPIM) is examined theoretically. Jacobian Elliptic Functions are implementing through the mathematical works. The new mathematical results are expressed in terms of physical parameters of the system. We have found that the nonlinear NZPIM waveguide cannot support the  $TE_0$  mode due to the nonlinear dispersion when the angular frequency is smaller than Dirac Point (DP). It is shown that the proposed waveguide structure depends on the refractive index efficiently controlled by tuning the operating frequency. Newly artificial waveguide materials is obtained and discussed.

**Keywords:** Dirac point- Left handed material - FDTD- slab waveguide

## Shape-Finding Of Tensioned Fabric Structures Using Nonlinear Stress Analysis Approach

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### Abstract

The combination of shape and internal forces for the purpose of stiffness and strength is an important feature of tensioned fabric surface. For this purpose, shape-finding need to be carried out. Various computational strategy for shape-finding analysis have been proposed over the years. The nonlinear stress analysis approach was among the first to be proposed for the purpose of shape-finding. However due to some inherent disadvantages, the method has not been fully explored and developed. In this method, numerical strategy of shape-finding analysis using the nonlinear stress analysis approach is proposed. For the purpose of verification, numerical examples on shape-finding analysis on Catenoid and Helicoids have been carried out. Both the obtained shape and pre-stress pattern are checked with classical solutions for the above minimal surfaces. Results of the numerical analysis have shown that shape-finding analysis on tensioned fabric structures using nonlinear stress analysis approach in combination with properly formulated numerical strategy to overcome the disadvantages can make the proposed method a simple tool for structural designers.

**KEYWORDS:** Shape-finding, nonlinear stress analysis method, tensioned fabric structures, minimal surfaces.

## **The Sensitivity of The Left-Handed Photonic Crystal Sensors**

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### **Abstract**

The permittivity ( $\epsilon$ ) and permeability ( $\mu$ ) are the basic physical parameters for describing the medium-electromagnetic wave interaction. They determine the propagating behavior medium of electromagnetic waves in the medium. For most natural media  $\epsilon$  and  $\mu$  are positive. However, Veselago first proposed in 1968 the possibility of electromagnetic wave propagation in a medium with simultaneously negative  $\epsilon$  and  $\mu$  [1]. Such a medium came to be known as left-handed media (LHM) or metamaterials [2, 3]. Photonic crystals (PhCs) also attracted intensive studies in the last decade due to their unique electromagnetic properties and possible applications. PhCs are novel class of optical media represented by natural or artificial structures with periodic modulation of the refractive index [4]. Optical waveguide wave sensors have been widely used for various applications such as chemical sensing, humidity sensing, biochemical sensing, and biosensing. The effective refractive index of the propagating mode depends on the structure parameters, e.g., the guiding layer thickness and dielectric permittivity and magnetic permeability of the media constituting the waveguide. So, any change in the refractive index of the covering medium leads to a change in the effective refractive index of the guiding mode. The sensing concept of the planer waveguide sensor is to determine the change in the effective refractive index of the covering medium [5, 6].

In this paper, a multilayer one dimensional photonic crystal slab waveguide with alternating left-handed material layers has been investigated for sensing applications. TM polarization is presented and the dispersion relation of the proposed sensor is obtained. The sensitivity of the effective refractive index to variations in the refractive index of the cladding is obtained. The proposed photonic crystal sensor has higher values of the sensitivity than the sensitivity of the conventional sensors. It could lead to design future sensors with specified higher sensitivity. The numerical solution of the equations and the calculations were performed using MAPLE 13 software.

## **Investigation of plasma properties of a Laser-ablated solid target in air**

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### **Abstract**

The optical emission of the plasma generated by a 1.06  $\mu\text{m}$  Nd: YAG laser irradiation of solid target contains of small traces of Silicon in air was recorded and analyzed in a spatially resolved manner. Electron temperatures and densities in the plasma were obtained utilizing the relative emission intensities and the Stark-broadened line widths of Si(I,II) at 288.15, Si(II) at 413.08 and 634.71nm emission lines, respectively. Besides, the electron density was measured using the  $H_{\alpha}$ -line at 656.27nm appeared in the spectra. The measured electron density values obtained in spatially-integrated measurements are discussed: similar values are obtained for the  $H_{\alpha}$ -line and Si(II)- ionic lines reminiscent of these lines are optically thin (free from self absorption), while the SiI-line at 288.15nm exhibits some optical thickness and should be corrected against self absorption. Under the assumption of local thermodynamic equilibrium (LTE), the electron density of the generated plasma was found in the range from  $1.69 \times 10^{18} \text{ cm}^{-3}$  down to  $4.6 \times 10^{16} \text{ cm}^{-3}$  at longer delay time, while the electron temperature centered around 1.02eV .

## **Fast quantitative analysis of pharmaceutical products using LIBS-techniques**

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### **Abstract**

Laser induced breakdown spectroscopy has been used to evaluate the potentiality of the technique for the identification and concentration of the different elements in various material . The quality of some commercially available pharmaceutical products can be quantitatively examined using the

laser interaction with product ; hence elemental as well as concentration of the different elements can be directly evaluated without preparation of samples or long time consumed . The temporal evolution of the plasma properties are investigated using time-resolved laser induced breakdown spectroscopy (LIBS) . In particular , the electron density and the excitation temperatures of the generated plasma are reported as a function of its time decay. We demonstrate finally that, under certain conditions, the calibration-free LIBS (CF-LIBS) procedure can be applied to determine the concentrations of trace elements in the tablet .

### **Dye-sensitized solar cells using natural dyes extracted from leaves, flowers, and roots**

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#### **Abstract**

A dye sensitized solar cell (DSSC) is considered the third generation photovoltaic device for low cost conversion of solar energy into electrical energy. DSSCs have received an increasing interest due to the simple fabrication process and relatively high conversion efficiency. The principle of operation of DSSCs is based on sensitization of a wide band-gap metal oxide semiconductor to the visible light region by an adsorbed molecular dye.

In this work, a set of natural dyes were extracted from three trees and used as photosensitizers of DSSCs. Thin layers of nanocrystalline  $\text{TiO}_2$  were coated on transparent fluorine doped tin oxide (FTO) conductive glass using Doctor blade method. The absorption spectra of these dyes were performed. The J-V characteristic curves of all fabricated cells were conducted. The parameters related to the solar cell performance were presented and compared.

## **Thulium Doped Fiber Amplifier (TDFA) gain and noise figure Optimization WDM systems**

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### **Abstract**

This article aims to evaluate a comprehensive numerical model based on solving rate equations of a thulium-doped silica-based fiber amplifier. The pump power and thulium-doped fiber (TDF) length for single-pass Thulium-Doped Fiber Amplifiers (TDFA) are theoretically optimized to achieve the optimum Gain and Noise Figure (NF) at the center of S-band region. The 1064 nm pump is used to provide both ground-state and excited state absorptions for amplification in the S-band region. The theoretical result is in agreement with the published experimental result.

Keywords-component; Thulium-Doped Fiber Amplifiers, Rate Equations, Gain, Noise Figure

الرياضيات

**Mathematics**

## On Codes over the Rings $Fq + uFq + vFq + uvFq$

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### Abstract

In this paper, we study the structure of linear and self dual codes of an arbitrary length  $n$  over the ring  $Fq + uFq + vFq + uvFq$ , where  $q$  is a power of the prime  $p$ , and  $u^2 = v^2 = 0$ ,  $uv = vu$ . Also we obtain the structure of constacyclic codes of length  $n = q - 1$  over the ring  $Fq + uFq + vFq + uvFq$  in the light of studying cyclic codes over  $Fq + uFq + vFq + uvFq$  in [6]. This study is a generalization and extension of the works in [7],[8], and [10].

## On Primal Compactly Packed Modules

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### Abstract

Let  $R$  be a commutative ring with identity and let  $M$  be a unitary  $R$ -module. A proper submodule  $N$  of  $M$  is said to be primary compactly packed if for each family  $\{P_\alpha\}_{\alpha \in \Delta}$  of primary submodules of  $M$  with  $N \subseteq \bigcup_{\alpha \in \Delta} P_\alpha$ ,  $N \subseteq P_\beta$  for some  $\beta \in \Delta$ . A module  $M$  is called primary

compactly packed if every proper submodule of  $M$  is primary compactly packed. This concept was introduced by El-Atrash and Ashour in ref. [11]. In this paper we generalize the concept of primary compactly packed modules to the concept of primal compactly packed modules. We say that a proper submodule  $N$  of  $M$  is primal compactly packed if for each family  $\{P_\alpha\}_{\alpha \in \Delta}$  of primal submodules of  $M$  with  $N \subseteq \bigcup_{\alpha \in \Delta} P_\alpha$ ,  $N \subseteq P_\beta$  for some  $\beta \in \Delta$ . A module  $M$  is called primal compactly packed if every proper submodule of  $M$  is primal compactly packed. We also generalize the Primary Avoidance Theorem for modules that was Proved by El-Atrash and Ashour in ref. [12] to the Primal Avoidance Theorem for modules.

## **A Mathematical Model for Cluster Applications**

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### **Abstract**

In this paper, we derive formulas to determine the needed number of computer nodes to execute applications on a cluster of computers so that application response time can be satisfied. In our model, we account for the workload conditions (in terms of the number of applications or jobs being received per unit time) as well as the processing power of each node. We present a numerical example showing how our model can be used.

## **Kernel Estimation of the Regression Mode for Fixed Design Model**

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### **Abstract**

In this paper, we study the problem of estimating nonparametrically the regression mode for fixed design model. We suppose the error random variables are independent. The joint asymptotic normality of the regression mode estimator at different fixed design points is established under some regularity conditions. The performance of the proposed estimator is tested via a simulation study.

**Keywords:** Fixed design model, kernel estimation, regression mode, asymptotic normality.

## **Comparative Study of Portmanteau Tests for the Residuals Autocorrelation in ARMA Models**

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### **Abstract**

Time series model diagnostic checking is the most important stage of time series model building. We introduce the most common Portmanteau tests such as Box and Pierce (1970), Ljung-Box (1978), Monti (1994), Pena and Rodriguez (2002, 2006), and Fisher (2011).

We compare the performances of portmanteau tests through an extensive numerical simulation for different model parameters and sample sizes.

These simulations examine the sensitivity of choosing model parameters to different sample sizes. In particular, how do these tests perform for different model parameter specifications and for small, moderate and large sample sizes? In addition, determine the most powerful portmanteau test based on both simulation study and real data set.

**Keywords:** Portmanteau Tests; residuals; Autocorrelation; Diagnostics; Simulation

### **® Compact Topology**

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### **Abstract**

Let  $X$  be a locally convex space, using the definition of ® compact set, I will define a new topology on  $X$ , called ® compact topology, and prove some properties of the new topology.

## On Chains Of Permutable Polynomials

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### Abstract

Two functions  $f$  and  $g$  are said to be permutable iff  $f \circ g = g \circ f$ . A chain of permutable polynomials is a set contains only one polynomial of each nonnegative degree where any pair of them are permutable. In this paper, we give a modified proof of the fact that there is only two chains (up to conjugation) namely, the set of monic monomials and the set of chebyshev polynomials. We restrict our study over algebraically closed field of characteristic zero. Also, we proved that there in no change if we change the condition (only one) by the condition (at least one) in the definition of chains.

## The Structures Of Min-Plus Algebra

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### Abstract

The main objective of this research is to study the structure of algebra and matrices in min-plus algebra. Min-plus algebra is one of many idempotent semirings which have been considered in various fields of mathematics[2]. One-other is max-plus algebra. But, in this paper we will only be concerned with min-plus algebra. Min-plus algebra is more becoming popular because it takes systems that are non-linear in conventional algebra and makes them linear[2].

In min-plus algebra we work with the min-plus semiring which is the set  $\mathbb{R}_{\min} = \mathbb{R} \cup \{+\infty\}$  together with operations  $a \oplus b = \min(a, b)$  and  $\otimes b = a + b$ . the additive and multiplicative identities are taken to be  $\varepsilon = -\infty$  and  $e = 0$  respectively. Its operations are associative, commutative and distributive as in conventional algebra[2]. Further, given a set which is equipped with a matrix whose elements are in  $\mathbb{R}_{\min}$ . The set is a dioid.

**Keywords:** Dioid, Min-plus algebra, matrix, semiring,

## **Obstacles To Teaching Mathematics In The Classes (5-12) From The Viewpoint Of Teachers In The Directorate Of Education \ North Hebron.**

*Conducted by  
Dr. Adel Nassar Fawarah & Dr. Idrees Jaradat  
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In cooperation with the supervisors Khaleel Moheisn & Kefayeh Medeah*

### **Abstract**

This study aimed to identify obstacles to teaching Mathematics in the classes (5-12) from the viewpoint of teachers in the directorate of education North Hebron. The study specifically attempted to answer the following questions:

1. What are the main obstacles to teaching Mathematics from the perspective of teachers?
2. Are there significant statistical differences at the level of indication ( $\alpha = 0.05$ ) among the estimates of sample study individuals concerning to obstacles of teaching Mathematics from the perspective of teachers based on the variables: the gender, the scientific qualification, the specialization, and the years of experience, the gender of the school. The level of school?

The researchers used questionnaire, validated through Cronbach's alpha reliability coefficient reached (0.90).

The study population is formed by all teachers of Mathematics in the directorate of education in North Hebron, counting roughly (160) teachers. The study was applied to a sample consisting of (133) teachers.

The results showed that obstacles to teaching mathematics were moderate, with an average account (3.62) according to the five-point Likert scale measure. There were no statistically significant differences based on the variables of study.

The results also indicated that obstacles relating to the teachers and the management and supervision and the local community were high . And the obstacles relating to the students and the textbooks and the teaching methods were moderates,

The study documented the relationship between school and parents in order to initiate follow up on there children, reduce the burden on mathematics teachers and establish a rewards and incentives system of them, give importance to the preparation of pre-service teachers in collaboration with universities, provide in-service training in the use of modern methods and its divers elements.

# البيئة وعلوم الأرض

**Environment and Earth  
Sciences**

## Effects of physio-chemical parameters on removal efficiency of iron and zinc from synthetic wastewater using microwaved olive stone activated carbon

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### Abstract

The removal of Fe<sup>2+</sup> and Zn<sup>2+</sup> from synthetic wastewater using olive stone activated carbon prepared via microwave (MHOS) was investigated in this study. The effects of different physio-chemical parameters, such as adsorbent dosage, contact time, stirring speed, and initial pH, on metals removal efficiencies were determined. The optimum conditions obtained were 0.25 g dosage, 3 h contact time, 200 rpm stirring speed and 5 pH. This resulted in 98.17% removal of Fe<sup>2+</sup> and 90.94% removal of Zn<sup>2+</sup>. Besides, MHOS has a strong ability for regeneration, where the recovery efficiencies at the fifth cycle were dropped by 3.97% and 5.62% for Fe<sup>2+</sup> and Zn<sup>2+</sup> respectively. The results revealed that MHOS can be used for the efficient removal of Fe<sup>2+</sup> and Zn<sup>2+</sup> from contaminated wastewater.

**Keywords:** Activated carbon; Adsorption; Microwave; Heavy metals; regeneration; synthetic wastewater.

## Evaluation of Environmental Infection Control at Intensive Care Units in Gaza Governorates

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### Abstract

**Background:** Patient safety is one of the most important aspects in evaluating the quality of healthcare. However, healthcare associated infection is a major cause of morbidity and mortality in the critical care units. It is imperative for health care administrators to ensure implementation of the infection control program in healthcare facilities. This study aimed to evaluate the environmental infection control (EIC) measures in the general intensive care units in Gaza.

**Methodology:** A three-months descriptive cross sectional study was done to evaluate the two main general ICUs in Gaza "Shifa Complex and European Gaza Hospital (EGH)". Walk around fitness checklist was developed to evaluate existing EIC measures. A total of 196 microbiological samples for air, water, and inanimate surfaces were surveyed. Both ambient air and inspiratory air from mechanical ventilator machines (MV) were sampled and cultured for bacterial and fungal count. Also, 20 water specimens were tested for bacterial presence. In addition, 120 swabbed cultures from surfaces and equipments were growing in a pre-enrichment media before incubation. Moreover, a total of 516 reading for temperature and relative humidity were gathered as the most important factors assist in bacterial multiplication. On the other hand, self-administered questionnaire was constructed to assess the health care providers (HCPs) knowledge and attitude toward EIC. Furthermore, HCPs practices were evaluated through an observation checklist.

**Results:** The study revealed that 62% of the infection prevention and control (IPC) measures in Shifa ICU were unfit, in comparison with EGH ICU (53%). Also, the total bacterial count within indoor air in both ICUs ranged from (1170 to 1470) cfu/m<sup>3</sup>. Moreover, results revealed the presence of bacterial count that ranged from 73 to 90 cfu/m<sup>3</sup> in the inspired air from MVs of the two units. However, fungal count was 830 cfu/m<sup>3</sup> at Shifa MVs, while free at EGH MVs. The temperature average during day hours was significantly far than the standard in about 4°C, thus 79.73% of HCPs (**P=0.000**) saw that their provided care was affected negatively by

unsatisfactory temperature. Relative humidity average was 59% in both units, at a high limit of the international standard. On the other hand, count of total and fecal coliform in all water sources were negative. Although, the study supported using of pre-enrichment media rather than direct culture, (96%) of all inanimate pre-enriched swabbed cultures in Shifa were positive, closely the same as EGH ICU (93%). Bacterial findings were: *Pseudomonas* 48% (n=15), *E-coli* 35% (n=11), and *klebsilla* 12% (n=4) in Shifa ICU. However, both *Pseudomonas* and *E-coli* were 29% (n=9) in EGH ICU, followed by *klebsilla* 19% (n=6) and then *Staph arues* 16.1% (n=5).

Self-administered questionnaire results revealed that nearly 40% of the HCPs acquired influenza followed by chest infection more than twice in the same year. In addition, about 68% of them had knowledge deficit. Regarding HCPs attitude headed for EIC, 80.68% agreed to use hand rub instead of hand washing (**t-value** 8.217 more than 2.0, **P-value** 0.001 less than 0.05). Also 85% (**P=0.000**) considered the unavailability of aid nurses as a barrier against EIC measures application, that letting nurses to spend unnecessarily long time doing nursing assistants' tasks.

HCPs practices were in about 50% compliance. However, nurses were more adherent than physicians in about 10%. Nearly 80% of HCPs hadn't experienced follow up/supervision of their practices regarding IPC implementation. Both hand hygiene practices and invasive procedures IPC measures were not applied in both ICUs with a percentage of 60%.

**Conclusions:** Periodic monitoring of ventilation system efficiency is needed to ensure optimal indoor air quality. Urgent interventions are required to improve methods of disinfecting the hospital environmental surfaces and equipments especially MVs. Educational courses, auditing and monitoring programs are advised to be more assertive. Addition of the influenza vaccine for all HCPs working in ICUs seems to be an obligatory need as the same as aid nurse and hand rub availability.

## **Impacts Evaluation of Sewage Discharge on the Microbiological Characteristics of Seawater in Khan Yunes Coastal Area-Gaza-Palestine**

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### **Abstract**

The Gaza beach of the coastal line is an important area for recreation purposes. It is exposed to various sources of pollutants (treated, partially treated and untreated sewage) from point and non-point sources. A new wastewater treatment facility was installed in Khan younes area. Eight bathing sites in the Khan Yunes beach were monitored for 3 months (fortnightly) during summer season of 2011 using microbiological parameters. A total of 48 water samples and 18 beach sand samples were collected and tested for were subjected to microbiological analysis (fecal coliforms and fecal enterococci).

The results of the current study showed that all studied locations were polluted and failed to comply with WHO standards in terms of fecal enterococci, and showed that the enterococci bacteria are more restrictive standard of coastal water quality, as compared with the coliform bacteria. Furthermore, the locations close to discharge point showed the highest level of pollution for all tested parameters. The levels of pollution decreased with distance from the sewage outlets. Moreover, the level of fecal coliform and fecal enterococci bacteria in sand beach was higher than the water column. Moreover, The study recommended that discontinue the flow of sewage into the marine environment, which is the main source of pollution to both seawaters and sand beach according to the results of this study. The effluent discharge method should be reconsidered. A distance of not less than 400 meters inside seawater is recommended by many international agencies. And establishment of the main wastewater treatment plants in Khan Yunes governorates, as much as possible to minimize environmental risks to the marine and recreational environment.

## **Enhancing Waste Reduction and Materials Recovery in Gaza Strip - Palestine "Rafah City – Case Study"**

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### **Abstract**

The paper will present the general solid waste management aspects in Gaza strip and will highlighted the invented economic and environmental sound approach of the material recover system of Rafah City case study in Gaza Strip – Palestine.

**Keywords:** Solid waste, Waste Reduction, Material Recovery, Municipal Waste recovery, Gaza Palestine, Municipal Wate Composting.

## **Toxicity of Erythromycin and Amoxicillin on Fish and Mosquitoes as Single and Binary Mixture**

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### **Abstract**

This study is designed to characterize the toxicity of erythromycin (ER) and amoxicillin (AM) on fish and mosquitoes as single and binary mixture. Toxicity of antibiotics was measured by calculating %death of mosquitoes or fish in the tested sample related to the %death of control sample. Relative toxicity of the tested compounds were calculated by subdividing the calculated LC<sub>50</sub> of each compound that of endosulfan (EN), a standard toxic substance. Values below 1 indicate high toxicity whereas values above 1 indicate less toxicity.

Results showed that ER and AM have considerable toxicity on fish and mosquitoes . LC<sub>50</sub> values on fish indicate that AM is more toxic than ER or EN. The relative toxicity of AM is lower than EN indicating more toxicity . Toxicity on fish is in the following sequences AM > EN > ER. Calculated LT<sub>50</sub> (Lethal time) indicates that EN has the lowest value. Furthermore the toxicity to mosquitoes is in the following sequence ER > EN > AM indicating more toxicity of erythromycin on mosquitoes . Relative toxicity indicates that ER and EN, nearly, have similar values whereas AM has higher value indicating less toxicity. Calculated LT<sub>50</sub> values indicate that EN has the lowest value in mosquito test. Whereas AM and ER have nearly close values. Statistical analysis indicate significant difference in the toxicity on fish and mosquitoes. Comparison of LC<sub>50</sub> values of fish and mosquitoes indicate that mosquitoes is more sensitive than fish to the tested antibiotics. An interesting outcome of this study is that AM is more toxic than EN to fish and ER is more toxic than EN to mosquitoes . These results are unique in this field and the first time in Gaza to be achieved. It is highly recommended to established an antibiotics residue analysis test to avoid discharge of antibiotics waste to the ecosystem.

**Key words:** Erythromycin, Amoxicillin, Fish, Mosquitoes, Toxicities

### **Phytotoxicity of Glyphosate , Taifon and 2,4-D to Essential crops in Gaza**

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#### **Abstract**

This study investigated the phytotoxicity of three herbicides (Glyphosate ,Taifon and 2,4-D) currently in intensive use in Gaza strip. The study used bioassay techniques using wheat, Molokhia and melon as test plants. The phytotoxicity were evaluated by calculating the % growth inhibition and drawing the LC50 in 2 different soil types.

Results showed that effect of glyphosate, 2,4-D, and Taifon were more pronounced in clay soil than in sandy soil. Glyphosate and Taifon were more phytotoxic to

watermelon plants whereas 2,4-D was more phytotoxicity to wheat than Molokhia and Wheat. Calculated LC50 values indicated that wheat is the most sensitive plant to 2,4-D and watermelon is the most sensitive plant to Glyphosate and Molokhia is the most resistant one. It may be advantageous to recommend using Glyphosate to control the weeds in Wheat plants and 2,4-D watermelon.

Keywords: Phytotoxicity, Glyphosate, Taifon, 2,4-D, Wheat, Watermelon and Molokhia.

### **Toxicity of Diuron, Diquat, Terbutryn and their Mixtures to Cyanobacterial Mats**

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#### **Abstract**

A application of herbicides in agricultural section creates environmental problems for plants and ecosystems. The present study investigates the toxicity of diuron, diquat and terbutryn, as single or mixture, to cyanobacterial mats collected from Wadi Gaza-Palestine. Toxicity of herbicides to cyanobacterial mats were investigated by growth inhibition of cyanobacterial mats exposed to various concentrations of herbicides. Growth of cyanobacterial mats was evaluated by maintaining the optical density of suspension from time zero (culturing the cells) up to 8 days. The most suitable wavelength monitoring culture growth was 680 nm. There was a positive relationship between growth and OD<sub>680nm</sub> in all tested cyanobacterial mats. The toxicity of selected herbicides to cyanobacterial mats were evaluated by calculating (% growth inhibition) and toxic units as individuals, binary mixture and tertiary mixture during 0-4days by using spectrophotometer. The EC50 and ET50 was estimated by using the linear regression equation. The tested concentrations were: diuron from 0.0- 15.44  $\mu$  mole/l, diquat from 0.0- 9.59  $\mu$ mole/l and terbutryn from 0.0-10.36  $\mu$ mole/l. Results showed that cyanobacterial mats grow very fast under laboratory conditions. The adaptation period was very short, then the bacteria grow exponentially the 100 h of growing cultures. The stationary phase was 50h and the decay phase starts after 150h and went down to the minimum loud at 200h. Single toxicity tests showed that the growth inhibition of diuron, terbutryn and diquat to cyanobacterial mat were 89.35, 76.02 and

71.24% respectively . Binary toxicity tests of ( diuron and diquat), indicate antagonistic effects .

EC50 values for diuron, terbutryn and diquat were in the following order: 0.009 , 0.031 and 0.381  $\mu$  mole/l while ET50 values were 32.32, 35.89 and 23.45 h respectively. In the binary mixture tests, The EC<sub>50</sub> of (0.70 diuron :0.30 diquat) was 0.004 TU<sub>S</sub> while ET50 was 40.23h.

**Key words :** Toxicity, Herbicides , Cyanobacterial mats , EC50 , ET50, Toxicity Units

### **Adsorption and leaching potential of Diuron and linuron in Gaza Soils**

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#### **Abstract**

The increasing use of pesticides in Gaza governorates raises the potential risk of groundwater contamination, thus the Adsorption and leaching potential of two phenyl-ureas herbicide, diuron and linuron in selected soil samples from Gaza governorates soil were studied.

The adsorption behavior was studied using the batch equilibrium technique and UV-Spectrophotometer method was used to determine the concentration of the both herbicides.

Soil samples from three locations in Gaza governorates from the top 30 cm layer were selected. Primary investigations of selected soil indicate that the clay fraction was ranged 10% - 27.5%. The content of organic matter was found less than 1%.

Columns technique and bioassay method were used to determine the leaching potential of the herbicides in the selected soils. Mulukhia was used as a test plant in the bioassay method.

Results of adsorption experiment showed that linuron and diuron are adsorbed in various amount in Gaza soils according to variation in pH, organic matter and clay content.

Fitting the adsorption data to Freundlich equation showed that the Freundlich constant “k” increases in the same order as the organic matter. The leaching results showed that linuron and diuron were retained in the soil columns and field plots at various depths of soil. Bioassay technique detected high concentration of diuron and linuron in the top soil layer (0-13 cm) of Middle Governorate and in the top soil layer (0-10 cm) of Khanyounis Governorate and North Gaza Governorate. The results were also evident by severe growth inhibition restricted in the top soil layers (0-10 cm) generally whereas showed normal growth at deeper layers in soil columns and field plots. A bioassay technique was a sensitive tool and detected diluted concentration of diuron and linuron at deeper layers.

Key words: Diuron, Linuron, Leaching, adsorption

## **Egyptian Potential Geoparks As A Tool For Regional Sustainable Tourism**

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### **Abstract**

Egypt is a rich country with its cultural heritage that can be traced from the remote prehistoric past through the various stages of world civilization. Egyptian heritages link us to the past and make us aware of our geological and paleontological fortunes. It is our duty to protect and preserve thus heritages so that we, and future generations, can share it .

Despite these areas contain magnificent and very special places given its geological and paleontological content which make it world famous and scientifically important, showing great potentials supporting the suggesting of establishing some of them as a geopark .

Raising from that the need to design a management plan to foster socio-economic development which will aim to enhance the value of such sites while at the same time creating employment and promoting regional economic development,

encouraging the citizens and visitors to get involved rather than remain tourism spectators. So the choice to involve women is a choice for sustainability and will empower the choices that will lead to the conservation of natural resources besides increasing the benefits which are close linked with conservation responsibilities. Help in designation of it as a geopark and contribute in changing the knowledge of geotourism culture, geoeeducation culture and lack of funds which caused not to bring enough attention to these areas.

### **Meteorites and their Environmental Impacts across Geologic Eras**

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#### **Abstract**

Meteorites have been objects of fascination, speculation, and fear for most of recorded human history. Early peoples thought that fiery streaks in the sky were omens of ill fortune and sought refuge from their evil powers. Impacts of meteorites with Earth are now recognized as the main cause for several periods of mass extinction on the planet, including termination of the dinosaurs 66 million years ago. During Earth's long history, our planet was repeatedly bombarded by meteorites, asteroids and comets. The first 4 billion years, or about 90% of geologic time, comprise the Archean Era. Also, during Proterozoic Era (1.85 billion years) and the end of Palaeozoic Era (~250 million years), end of Triassic period (210 million years) and Cenozoic Era (65 million years to present-day) large meteorites slammed into the Earth, creating impact structures in several localities of the world such as Manicouagan impact structure in Quebec, Canada, Barringer Crater, north Arizona, USA and Gabal Kamel, SW sector of the Egyptian Western Desert. Several remnants of ancient meteorite craters suggesting it was just as heavily bombarded as the rest of the solar system. In addition, the present talk will discuss the global effects of large meteorite impacts through the geologic eras.

Keywords: Meteorites. Environmental impacts, geologic eras

### **Non-Farming Ostriches Cares On Taman Safari Indonesia Ii: With Problematics And Review**

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### **Abstract**

Ostriches (*Struthio camelus* Linnaeus, 1758) are large flightless birds, which has been farmed around the globe. Main products from ostriches are meat and eggs, with leather, feather oil, and egg shells as side product. Ostriches farm are not restricted on native continent, but also spread out to Asia-Australia, Europe and America. Those are tropic to temperate climate countries, yet Indonesia hasn't shown up to build ostriches industry while it has potencies to be success. This paper comprises review from short observation on care and behavior of Taman Safari Indonesia II's ostriches. Likewise review on problematic in Indonesia and growth of ostriches farms in other countries. We are conducted as keeper assistance, observation with focal-animal behavior sampling methods can be done and so literature studies. Taman Safari Indonesia II was ex situ conservation breeding agent as well as tourism zoo. While the care was in artificial environment and non-native food sources. The ostriches are having no health problems, except lack of their eggs production. Captive behavior modification also occurred in them. Ostriches are alternative solution for Indonesian food security issues, while ostriches farms are growing and developing in neighbor countries and so the other develop countries.

Keywords: Ostriches farm, *Struthio camelus*, Taman Safari Indonesia II, behavior, literature studies.

### **Micronutrients in soil and squash plant organs grown under different rates from minerals and organic fertilizers**

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### Abstract

Squash (*Cucurbita pepo*) is an important vegetable crop cultivated in Egypt for local market. Field experiment was carried out at Banha (Qalubia Governorate) to evaluate the effect of different rates of mineral fertilizers (NPK) and chicken manure on the distribution of micronutrient in soils and two varieties (Fransawy and Mabroka) of squash organs. The rates of mineral fertilizers and chicken manure were 100% mineral fertilizers, 75% mineral fertilizers plus 25% chicken manure, 50% mineral fertilizers plus 50% chicken manure, 25% mineral fertilizers plus 75% chicken manure and 100% chicken manure. The study revealed that all available metals (Fe, Mn and Cu) are increasing in soil with cultivation. Mabroka variety resulted in increasing the availability of measured metal in soil. The highest total yield was recorded in case of using 75% mineral fertilizers plus 25% chicken manure, while the lowest total yield was found in case of using 100% chicken manure. Mabroka variety was recorded higher total yield compared with Fransawy variety.

- **Key words:** Soils, Squash (*Cucurbita pepo*), Mineral fertilizers, Chicken manure, Heavy metals, Yield.

سياسة الحماية من الأخطار الطبيعية بالأوساط الحضرية

مدينة باتنة نموذجا

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### المُلخَص

لطالما كان الحديث عن الأخطار الطبيعية و التكنولوجيا من الأمور الثانوية إن لم نقل غير المهمة في مشاريعنا العمرانية فصيغة الخطر و طريقة التعامل معه كانت من آخر الانشغالات التي يمكن التنبؤ بوقوعها في تصميم مجالاتنا الحضرية ، إلى أن بدأت الكوارث الطبيعية و التكنولوجيا تضرب المدن الكبرى الجزائرية نذكر منها فيضانات باب الواد زلزال بومرداس، انفجارات المنطقة البيترو كيميولوجية بسكيكدة ... الخ، لتبدأ أخطاء التعمير و سوء التسيير تحصد خسائر مادية و بشرية خالدة في تاريخ الجزائر .

و بما أن تشريعاتنا أصبحت تأخذ صفة تشريعات المواقف فحدوث هذه الأزمات هو الذي حدد إلزامية وجود قوانين تنظيمية لإجراءات التحكم فيها بموجب القانون رقم 20/04 المؤرخ في 2004/12/25 المتعلق بالوقاية من الأخطار الكبرى و تسيير الكوارث في إطار التنمية المستدامة.

غير أن ثقافة الخطر لا زالت لم تلق و عيا واسعا لدى المسؤولين عن الإنتاج الحضري (الدولة و المواطن) كما هو الحال عليه بمدينة باتنة ، فوضعها المهديد بخطر الفيضانات مع استمرار استهلاك إمكانياته الواسع و اللاعقلاني و في غياب آليات تتحكم وتضمن الحماية من الخطر جعل من أحيائها الكبرى ذات الطبيعة الفوضوية و الموجودة على ضفاف الأودية دون احترام لنطاقات ارتفاقها تهدد سلامة السكان و الحياة الحضرية ككل بانتشار الأوبئة و القمامات و تلوث المياه وغيرها من المظاهر اللاحضرية بمدينة تعد من أكبر المدن وأهمها بالشرق الجزائري أين تشكل استدامتها الحضرية و التحكم في تسيير و تخطيط حمايتها من خطر الفيضانات رهانا لاستمراريتها .

الكلمات الأساسية: الاخطار الطبيعية - الاوساط الحضرية- سياسة الحماية - مدينة باتنة.

### من أجل تنمية بيئية مستدامة للأنظمة الحضرية

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### الملخص

إن العديد من المشكلات البيئية الرئيسية تنتج بالأساس عن المدن وعمليات التحضر المستمرة، فالمدن تعد اليوم المصدر الأهم لغازات الاحتباس الحراري والمواد المدمرة لطبقة الأوزون، كما يؤدي الطلب العمراني المستمر للموارد الطبيعية والتخلص من المخلفات العمرانية إلى تدهور العديد من البيئات الطبيعية أو تدميرها تماماً وإلى فقد التنوع الحيوي بها، وعليه فإن حل مشكلات البيئة الحضرية سوف يؤدي بالضرورة لتقليل أثر المشكلات البيئية بشكل عام.

وكما أن الأنظمة الحضرية هي أحد أهم أسباب المشكلات البيئية، ومن أكثر المتأثرين بأضرارها، فهي في ذات الوقت الأقدر على معالجة قضايا البيئة ومشكلاتها. وذلك لامتلاكها الموارد القادرة على تجنب ومعالجة المشكلات البيئية وهذا من خلال آلية الفعل ورد الفعل التي يعرفها النظام الحضري.

لذا جاءت هذه المداخلة لإلقاء نظرة تحليلية على إحدى آليات التأثير الإيكولوجي للمدن وطرق قياس هذا الأخير من خلال ما يعرف بالبصمة البيئية أو الإيكولوجية ، لأن إدارة التنمية المستدامة تحتاج إلى الأدوات والطرق لحساب الطلب على الموارد البيئية وكذلك لحساب قدرة هذه الموارد على الاستمرارية.

سنحاول أيضا في هذه المداخلة فهم وتفسير الآليات المتداخلة في النظام البيئي الحضري والتي تجعل النشاط البشري في تجانس مع النظام الطبيعي أو في صراع معه أو مهددا لمقوماته، وكذا تساهم الورقة في إعطاء بعض الحلول لتقليص البصمة البيئية للإنسان وكذا البصمة الحضرية الإيكولوجية، أي حلول من شأنها أن تقلص من التأثيرات السلبية للمدن على المجالات المجاورة وكذا الوصول إلى مؤشرات تنمية بشرية ومؤشرات إيكولوجية مناسبة ، وكذا معدلات الاستهلاك البشري وعلاقتها بقدرة الطبيعة على الإنتاج، وهذا للوصول في النهاية إلى مفهوم جديد للتنمية المستدامة بعيدا عن مفهومها الكلاسيكي. الكلمات الأساسية: البصمة البيئية للمدن، الإيكولوجية الحضرية، الإيكوسيستام الحضري، التدفقات الحضرية، التنمية الحضرية المستدامة.

### **Assessment of the health effects associated with the flies, mosquito and rodent indices in KhanYounis City**

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### **Abstract**

The study designed to characterize the environmental situation in KhanYounis (Kh.Y), to identify the health effects associated with flies, mosquitoes and rodent in Kh.Y city. Different breeding sites of mosquitoes, files and rodents were identified and monitored during the study period. Mosquitoes, files and rodents were collected from the breeding sites to the laboratory for breeding and identification. Health data in KhY were collected using 246 Questionnaire distributed randomly among population.

Data were analyzed using Turkey's and ANOVA tests.

Results showed that mosquito were abundant in all sites and the peak season was observed in May-June due to rise in temperature. Sex ratio was 58% for female and 42% for male. Identification of mosquito indicated that culex species was most dominant in all sites.

Flies were abundant in all breeding sites and their densities were very high in the center of the breeding sites and decreased far away from the center and become very light 16 m away from the site. Abundant of flies in fish market was more than in animal or Alnamsawy breeding site. Identification of flies indicated that houseflies is most dominant in all sites, whereas blue bottle or green bottle fly were less abundant in all sites. Average sex ratio was  $29.5 \pm 2.6$  for male flies whereas female flies average  $26.67 \pm 4.97$ .

Mouse and rats were abundant in all blocks of Kh.Y with averages of  $209 \pm 164$  and  $171 \pm 146$  respectively. Mouse sex ratio was 53% male and 47% for female.

Socio economic evaluation of health and environmental records are in agreement with mosquito flies and rodent evaluation in Kh.Y. Pest control system indicated effectiveness of the used pesticides.

Key words: Mosquitoes, flies, rodents, six ratio, Khan Younis.

### **Assessment of Traffic Emissions in Few Urban Areas of Khan Younis City and its Associated Impacts**

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### **Abstract**

Cars, busses, trucks and other motorized vehicles are major air pollution contributors. Developing countries are largely contributing in this pollution due to the urban development and industrialization and the lack of control measures. Locally, few studies focus on the measurements of traffic emissions and its effects on ambient air quality, this made the need for this kind of study urgently needed. Despite this need, in Gaza strip air quality management is not considered a priority and there is a little data on the effects of traffic emissions on air quality or on the human health and no actions are made to control these emissions. Khan Younis is the second populated city of Gaza, it was chosen as study area for this research. Levels of carbon monoxide (CO) and carbon dioxide (CO<sub>2</sub>) were measured at six major sites, the measurements were done at both morning and afternoon peak at each site. Simultaneously counting of traffic flow was done beside the monitoring every quarter of an hour. Results showed that CO concentrations didn't exceed the WHO standard in selected sites, but sometimes it had a high range such as in Rafah taxi-station intersection. CO<sub>2</sub> concentrations were fluctuated and it exceeded the WHO standard (350 ppm) in many sites such as Bany sohaila, Abo Ehmaid and Rafah taxi station intersections. Measurements were analyzed by Emission Factors Toolkit and Sidra model. CO<sub>2</sub> emissions and emission reductions associated with fuel consumption were estimated by Emission Factors Toolkit. CO<sub>2</sub> levels were compared with EU standard and it was higher than EU standard (130 g/km). Simulation of traffic volume by Sidra Model was done and the results of CO and CO<sub>2</sub> emissions with fuel consumption rate were estimated. These results showed a high level of CO<sub>2</sub> and CO which was higher than EU standard.

Keywords: CO, CO<sub>2</sub>, Emissions, Gaza, Traffic.

### **Heavy Metals Water Pollution Control Using Sol-gel Immobilized Fulvic Acid Abstract**

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Alaqa university*

### **Abstract**

In this work fulvic acid (FA) was entrapped in solid matrix of polysiloxane polarized microscope photographs were taken and particles of FA are immobilized in the pores of silica.

The immobilized matrix is used to reduce the concentration of lead, iron and mercury

The IR spectrum of immobilized FA and the metals interact with immobilized FA indicate that there is an interaction between metals under study and imm.FA.

Parameters such as pH, buffer type, buffer concentration, temperature, particle size of the matrix were investigated and optimized for each metal.

Kinetic study for each metal was performed at optimum condition for each metal and it was found that metal uptake reaches plateau after three hours.

It was found that the matrix can be reused for metal uptake without any treatment with a good performance. But its performance can be further improved when it is treated with EDTA

### **Eco-toxicity of Carbaryl, Chlorpyrifos, and Diuron, as Individual and in Mixtures on *Daphnia magna* and *Tilapia nilotica***

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#### **Abstract**

Application of pesticides creates a lot of environmental problems and toxicity to the ecosystems. The aims of this study are to determine, and compare the toxicities of three pesticides frequently used by farmers at Gaza- Palestine (Carbaryl, Chlorpyrifos, and Diuron) singly, with their binary mixtures, and with their ternary mixtures. All experiments were conducted on laboratory using the fresh water Cladoceran (*Daphnia magna*), and the Red fish *Tilapia nilotica* as biomarkers in accordance with the static OECD standardized Acute Tests. Results showed that Chlorpyrifos was the most toxic ( $LC_{50} = 0.08 \mu\text{mol/l}$ ) followed by Carbaryl ( $LC_{50} = 43.19 \mu\text{mol/l}$ ), while Diuron was the least toxic one ( $LC_{50} = 43.48 \mu\text{mol/l}$ ). The LT50 values (the time required to kill 50% of the exposed population of the tested organism) of the tested pesticides ranged between 60.86-68.04 h for the tested pesticides. The toxicity to *Daphnia magna* showed the following sequence: Chlorpyrifos ( $LC_{50} = 0.001 \mu\text{mol/l}$ ), carbaryl ( $LC_{50} = 0.031 \mu\text{mol/l}$ ) and Diuron ( $LC_{50} = 32.11 \mu\text{mol/l}$ ). Binary, and the ternary mixtures of

these pesticides showed antagonistic effects. Statistical analysis showed significant difference among mixture toxicities to fish and *D.magma*. Relative toxicity evaluation indicate more sensitivity of *D.magam* to the tested pesticides than fish. These results indicate that aquatic populations may be exposed to an equal expected toxicity of mixture.

Key words : Carbaryl, Chlorpyrifos, Diuron, *Daphnia magna*, fish, LC50, LT50, mixture toxicity, antagonistic effect.

### **Development of Controlled Release Formulations of Thiabendazole Yasser El-Nahhal,**

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#### **Abstract**

This study aimed to develop controlled release Thiabendazole formulation for reduced contaminations to soil water and agricultural produces. The idea behind this work based on changing the ionization status of Thiabendazole throughout pH changes to become a cation then adsorbing it to bentonite clay surfaces. Equilibrium concentrations of Thiabendazole in the adsorption solutions were determined by HPLC. Results showed that Thiabendazole was better adsorbed to clay at the lowest pH value (pH 3). Furthermore, raising the temperature of the adsorption reaction increased the adsorbed amount of Thiabendazole. Release experiments showed that Thiabendazole is extremely slower at pH 3 than at pH 5.5 or pH 9. These promising results suggest that application of Thiabendazole clay based formulation may reduced the applied rate and the released fraction consequently reduce the environmental contamination. It is also advantageous to use these formulations in the acidic soil for plant disease control.

Key words: Thiabendazole , adsorption, Controlled release, pH, Bentonite

### **Indoor Environment and Health Symptoms among the Palestinian Students in Gaza Strip**

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## Abstract

The characteristics of thermal comfort and indoor air quality (IAQ) in classrooms affect children and teachers health and productivity. Thermal comfort and ventilation rate were monitored in 36 the classrooms of twelve naturally ventilated schools located in Gaza strip, Palestine during fall season in 2011. CO<sub>2</sub>, ventilation rate, relative humidity and temperature were monitored during school hours. Meanwhile, data on subjective perception of air quality and health aspects were gathered by using a validate questionnaire which was distributed to random sample of 364 students. The results show that the characteristics of the classrooms environments had high room temperature ranged from 24.5°C to 30.6°C, and the relative humidity ranged from 46.9% to 72%. Moreover, the ventilation rate ranged from 5.5 L/s to 20 L/s.person where 50% of the schools were below the ventilation standard. In addition, the student's perception of the indoor air quality was unsatisfactory which negatively affect their performance. The most widely-reported symptoms among the students were feeling uncomfortable, heavy sweating, and difficulties in concentrating which were mainly caused by inefficient ventilation rate and unsatisfactory thermal comfort. As children and vulnerable group, this situation negatively affects their performance and health.

Keywords: *Thermal Comfort, Natural Ventilation, Children, Indoor Air Quality.*

الكيمياء

chemistry

## **The Characteristics of Zinc Deposition in Electroless Nickel-Copper Plating**

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Hot Laboratory Center, Atomic Energy Authority, P. O. 13759,  
Cairo, Egypt.*

### **Abstract**

In this article, the addition of  $ZnCl_2$  as reducing agent in Ni-P-Cu bath prepared for using in electroless plating technique was introduced. The optimum procedure before plating aimed to activated sites and adjustment

of the composition of the electroless Ni-P-Cu-Zn plating bath to increase the deposition rate. Energy dispersive X-ray (EDX) analysis indicates that the chemical composition of the plating layer alloy Ni-P-Cu-Zn. SEM images showed that the surface of copper as the base metal is successfully coated with continuous alloy layer. The properties of electroless deposits were examined by electrochemical corrosion test indicated that the corrosion resistance of electroless Ni-P-Cu-Zn deposit could be improved in comparison with electroless Ni-P-Cu deposits.

**Key words:** Electroless; Coating properties; Ni-P-Cu-Zn film; Corrosion.

### **Nanomolar Detection of Alkyl Dimethyl Hydroxyethyl Ammonium Surfactant by a Lipophile-doped Solid Contact Electrode**

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*<sup>b</sup>Chemistry Department, Faculty of Science, Tanta University, Tanta, Egypt*

#### **Abstract**

Various methods for improving the lower detection limit of polymeric membrane ion-selective electrodes have been approached recently. The ion-selective electrode with solid-state membrane is described. Tetraphenyl borate as a lipophilic anion, is incorporated into the membrane of the electrode to improve its detection limit and selectivity. The detection limit was significantly lowered where nanomolar quantities were traced. Other favorable characteristics of the electrode are noticeably short response time of 5 seconds and good selectivity over the common interfering chemical species as well as its proven usefulness for determination of the surfactant in miscellaneous samples.

Keywords: Ion-selective electrode, Solid-contact ion-selective electrodes, PVC membrane electrode

### **Double Divisor Mean Centering of Ratio Spectra as a Developed Spectrophotometric Method for the Analysis of Five-Component Mixture in Drug Analysis**

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### **Abstract**

In this paper a simple method was developed for the simultaneous determination of five-component mixtures, without prior separation steps. The method is based on the combination between double divisor-ratio derivative method and mean centering ratio spectra method. The mathematical explanation of the procedure is illustrated. The linear determination ranges were 0-30, 0-20, 0-20, 0-45 and 0-100  $\mu\text{gml}^{-1}$  for paracetamol, methylparaben, propylparaben, chlorpheniramine maleate and pseudoephedrine hydrochloride in 0.1 M HCL, respectively. The proposed method was validated by using synthetic five-component mixtures and applied to the simultaneous determination of these drugs in Decamol Flu syrup. No published spectrophotometric method has been reported for simultaneous determination of the five components of this mixture. So that the results of the double divisor mean centering of ratio method (DD-MCR) were statistically compared with those of a proposed classical least squares method (CLS).

**Keywords:** Methylparaben- Propylparaben- Chlorpheniramine - Pseudoephedrine – Double Divisor Mean centering ratio - Classical least square

### **The Role Of Production Chemicals In Produced Water Management**

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### **Abstract**

Produced water is the water produced when oil and gas are extracted from the ground. To achieve maximum oil recovery various recovery technologies are often

used depending on reservoir, suitability, economics and resources availability. For economic and environmental reasons it is crucial to utilize the best available technologies for treating produced water, making it suitable for reuse, disposal or injection to reservoir. With the increase in water production from aging productions wells oil companies are faced with serious challenges of managing and treating the huge volumes of produced waters.

This talk would present the “The **Role of Production Chemicals In Produced Water Management**” and would include highlights for main components of produced water, challenges associated with produced water, how to chemically treat it and how chemical and engineered solutions could help operators achieve their commercial targets and protect our environment.

### Natural astaxanthin, an antioxidant produced from the algae

*Haematococcus pluvialis*

#### Abstract

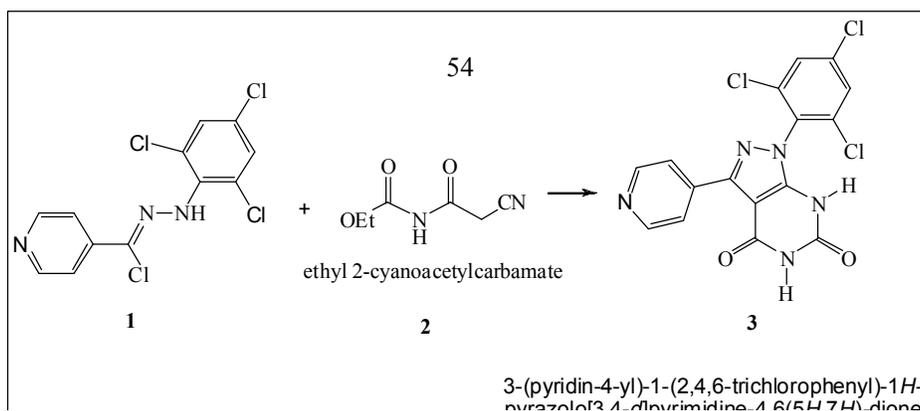
Astaxanthin is the most powerful antioxidants, greater than Vitamin E and vitamin C. Astaxanthin protects the skin, strengthen the immune system and for cardiovascular health. Global astaxanthin market demand are soaring. It is estimated annual worldwide market reached U.S. \$ 200 million. Currently 95% of this market consumes synthetic astaxanthin, however synthetic astaxanthin is very dangerous because it causes residues in tissues and cause adverse effects to the environment. The solution is the production of natural astaxanthin from *Haematococcus pluvialis*. *H.pluvialis* cultivated, after passing through the vegetative and aplanospora phase it can be harvested.

#### Synthesis and X-Ray Structure Analysis of 3-(Pyridin-4-yl)-1-(2,4,6-trichlorophenyl)-1H-pyrazolo[3,4-d]pyrimidine-4,6(5H,7H)-dione

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#### Abstract

The reaction of Hydrazoyl chloride (1) with ethyl cyano carbamate (II) in presence of sodium ethoxide produced compound **3** via cyclocondensation reaction followed by intramolecular cyclization. The structure of compound **3** was confirmed by X-ray structure analysis.

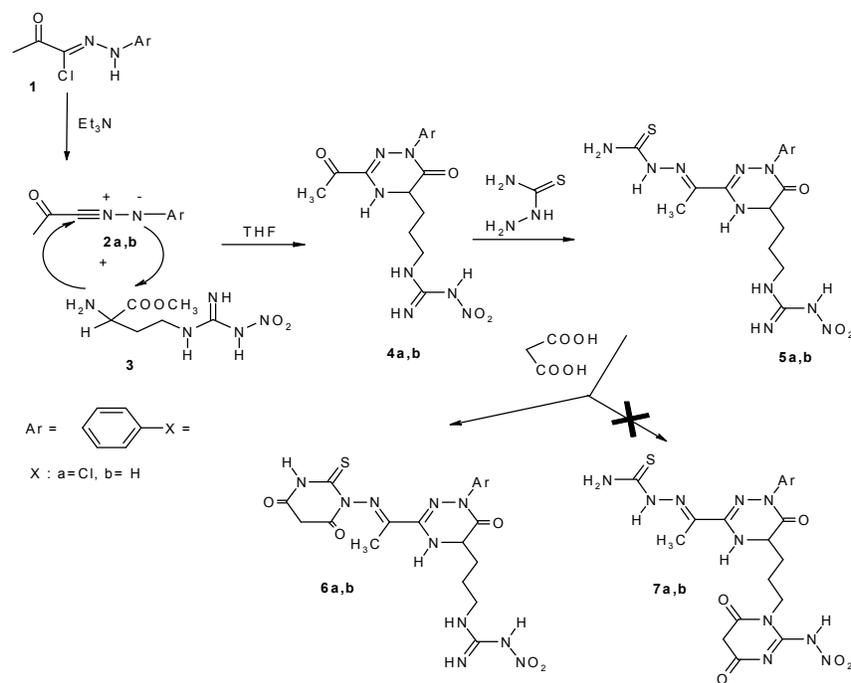


## **Incorporating Thiobarbituric Acid with 1,2,4-Triazin-6-one containing Nitroarginine Moiety**

*Naser S. El-Abadla*<sup>a\*</sup>, *Bassam A. Abu Thaher*<sup>b</sup>, *Reda M. Abdel-Rahman*<sup>c</sup>, *Khaled A. EL-Nwairy*<sup>d</sup>.

### **Abstract**

Nitrilimines (**2a,b**), react with nitroarginine methyl ester (**3**) at room temperature, through cyclocondensation reaction, to give 1-aryl-3,5-disubstituted-1,2,4-triazin-6-ones (**4a,b**). Condensation of these compounds with thiosemicarbazide give the thiosemicarbazone derivatives (**5a,b**) which upon heterocyclization with malonic acid give the thiobarbituric acid derivatives (**6a,b**). The structures of these compounds were deduced from: IR, mass, <sup>1</sup>H and <sup>13</sup>C NMR spectra.



**Scheme 1: Synthesis of the target molecules 6**  
**Synthesis, structural characterization, and computational study of**  
**novel (*E*)-*N*-(1-*p*-tolylethylidene)furan-2-carbohydrazide**

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**Abstract**

An efficient synthesis of the novel (E)-N0-(1-p-tolyethylidene)furan-2-carbohydrazide is described. The molecular structural features were then confirmed by single crystal X-ray diffraction. Quantum chemical calculations including molecular geometry, intermolecular H-bonds, and vibrational frequencies were carried out for the structures to explain stability and geometry using both density functional (DFT/B3LYP) and the Hartree–Fock (HF) with 6-311+G(d,p) basis set. The calculated structural parameters are presented and compared with their experimental X-ray counterparts. The E-isomer is a global minimum on the potential energy surface. However, validation of the computational methods here via comparison with the observed X-ray data enabled computational analysis to predict that head-to-tail E/E-dimer of the observed E-isomer has significantly stronger intermolecular hydrogen bonding compared with the non-observed Z/Z-dimer. It was observed that the stretching mode of N-H and C=O shifted to lower frequencies, due to pairwise intermolecular N-H...O hydrogen bonds. This provides a clear rationale for the isomeric specificity obtained and provides a validation of the optimized method which could be applied to predict structures of other useful carbohydrazides. Generally, it has been concluded that the findings of B3LYP hybrid functional fit better to the observed geometrical and vibrational parameters than the results of the HF.

### **Template Synthesis of Iminodiacetic Acid Polysiloxane Immobilized Ligand Systems and Their Metal Uptake Capacity**

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#### **Abstract**

Two different routes for the synthesis of insoluble porous solid functionalized ligand system bearing iminodiacetic acid chelating ligand of the general formula P-(CH<sub>2</sub>)<sub>3</sub>N-(CH<sub>2</sub>COOH)<sub>2</sub> (where P- represents [Si-O]<sub>n</sub> polysiloxane network) were achieved by sol-gel template method in presence of CTAB surfactant to improve the matrix mesostructure. The first

route was achieved by the modification of 3-aminopropylpolysiloxane with ethylchloroacetate, followed by hydrolysis with HCl to form the polysiloxane iminodiacetic acid ligand system; P-(CH<sub>2</sub>)<sub>3</sub>N-(CH<sub>2</sub>COOH)<sub>2</sub> (P-IDA-I). The second route was achieved by the reaction of diethyliminodiacetate with 3-iodopropylpolysiloxane to form immobilized-polysiloxane diethyliminodiacetate system. The diethyliminodiacetate polysiloxane immobilized ligand system was then hydrolyzed by HCl to form the iminodiacetic acid ligand system P-(CH<sub>2</sub>)<sub>3</sub>N-(CH<sub>2</sub>COOH)<sub>2</sub> (P-IDA-II). Elemental analysis, <sup>13</sup>C NMR, XPS and FTIR results showed that the surfactant have improved the silica network structure and increased the metal uptake capacity of the ligand system. Thermogravimetric analysis studies showed significant stability of the immobilized ligand systems upon complexation with metal ions. The new functionalized ligand systems exhibit high capacities for uptake of the metal ions (Ni<sup>2+</sup>, Cu<sup>2+</sup> and Pb<sup>2+</sup>).

**Keywords:** Metal Uptake, iminodiacetic Acid, diethyliminodiacetate, surfactants, immobilized-polysiloxane ligand systems.

### **Activity Behavior of Human Serum Albumin Doped in Silica Sol-Gel Thin Film**

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*A Thesis Submitted in Partial Fulfillment of Requirements for the Degree of Master of*

*Science in Chemistry*

*Chemistry Department*

*Gaza – Palestine*

### **Abstract**

Transparent sol-gel thin films immobilized with human serum albumin (HSA) were made via the acid catalyzed sol-gel reaction of tetraethoxysilane (TEOS) in presence of the human serum albumin. Different surfactants that include cationic

cetyl trimethyl ammonium bromide (CTAB), anionic sodium dodecyl sulfate (SDS) and nonionic Triton X-100 (TX-100) were tested for the improvement of the host material mesostructure, increasing its porosity and well accommodation of the HSA protein within the silica matrix. The thin films show similar behavior in presence of SDS surfactant as their free counterparts in aqueous solution with a significant shift in the wavelength ( $\sim 10$  nm) of UV absorption spectra. The immobilized human serum albumin retained its activity by immobilization. Different parameters include concentration of protein and surfactant, type of surfactant, life time and number of measurements were investigated. The HSA thin film sensor showed stability, repeatability, reproducibility and long life time behavior. Maximum stability of HSA thin films were achieved by drying at  $37^{\circ}\text{C}$ .

**Keywords:** Human serum albumin; Sol-gel; Biosensors; Encapsulation; Immobilization of bioactive substance.

## **Design and Simulation of a Valveless Piezoelectric Micropump for Fuel Delivery in Fuel Cell Devices**

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### **Abstract**

Micro- and nano-electromechanical systems (MEMS or NEMS)-based fuel delivery in direct methanol fuel cell (DMFC) devices offer opportunities to address unmet fuel cells related to fuel delivery. By applying an alternating electrical field across the actuator, the resultant reciprocating movement of the pump diaphragm can be converted into pumping effect. Nozzle/diffuser elements are used to direct the flow. To make the power system applicable for portable electronic devices, the micropump needs to meet some specific requirements: low power consumption but sufficient fuel flow rate. In this study, a theoretical method have been used to investigate the effects of materials properties, actuator dimensions, driving voltage, driving frequency, nozzle/diffuser dimension, and other factors on the performance

of the whole system. As a result, a viable design of micropump system for fuel delivery in DMFC devices has been achieved and some further improvements are suggested. A mathematical model was used to simulate the behaviour of the micropump. The results of mechanical calculations and simulations show good agreement with the actual behaviour of the pumps.

**Keywords:** Simulation, micropump, piezoelectric, fuel cell.

## **Highly Functionalized Terpyridines as Competitive Inhibitors of AKAP-PKA Interactions**

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### **Abstract**

Protein kinase A (PKA) is a ubiquitous kinase phosphorylating a broad variety of substrates. A-kinase anchoring proteins (AKAPs) confer specificity to PKA signaling by tethering the kinase to distinct cellular compartments thereby limiting PKA's access to a defined pool of its substrates.<sup>[1]</sup> Interactions between AKAPs and PKA play key roles in a plethora of physiologically relevant processes such as arginine-vasopressin (AVP)-mediated water reabsorption in renal principal cells; AVP triggers PKA phosphorylation of the water channel aquaporin-2 (AQP2). AQP2 then redistributes from intracellular vesicles into the plasma membrane facilitating water reabsorption from primary urine. The redistribution only occurs if PKA interacts with AKAPs.<sup>[2]</sup> Dysregulation of cellular processes that depend on AKAP-PKA interactions causes or is associated with

diseases.<sup>[1b,3]</sup> For example, in heart failure elevated AVP levels contribute to the excessive water retention. In the failing heart cardiac myocyte contractility is decreased; the control of contractility crucially depends on AKAP-PKA interactions.<sup>[4]</sup>

Here we developed a set of terpyridines as  $\alpha$ -helix mimetics of the PKA anchoring disruptor peptide AKAP18 $\delta$ -L314E. Similar to the original peptide, the compounds bind the D/D domain of RII subunits of PKA. One of them, **1b** represents the first non-peptidic agents that binds the D/D domain of RII subunits and inhibits AKAP-PKA interactions in vitro as well as in vivo

Synthesis of the potential ligands **1a-f** involved two successive Suzuki cross-coupling reactions that were applied to the 2,5-dibromo-pyridines **3a-b**. The key to this strategy was the distinct reactivity of the 2-bromo and 5-bromo substituents allowing for the regio-selective Suzuki coupling of the dibromides **3a-b**.<sup>[4]</sup>

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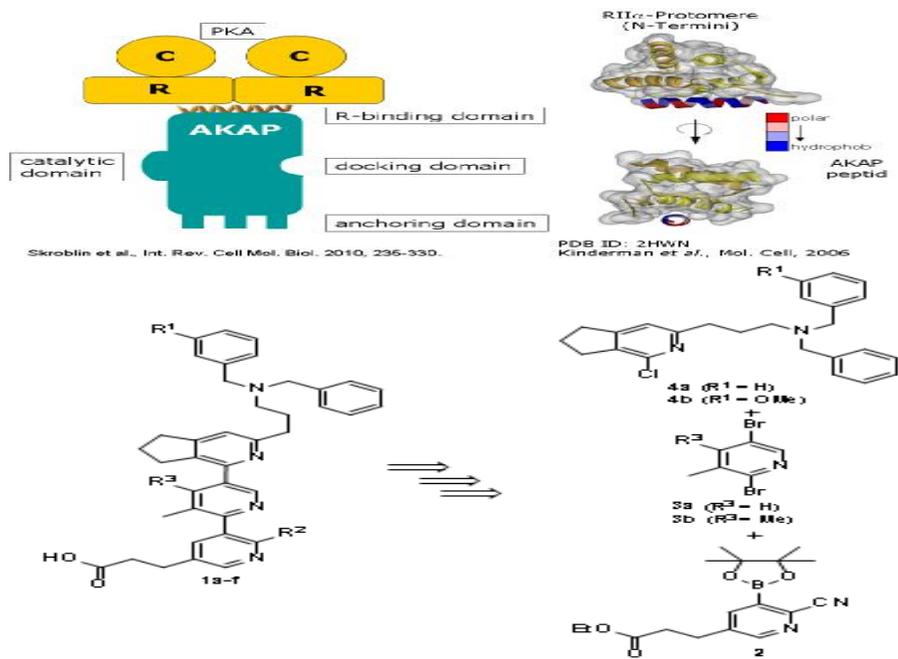


Figure 1: Model of an A-kinase anchoring protein.  
Scheme 1:Planned synthesis of terpyridines **1a-f** by a sequence of Suzuki couplings.

## Kinetics and microstructure of solid phase precipitation in Mg-7 wt. % Al

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<sup>2</sup>Laboratory of Physics and Mechanics of Metallic Materials (LP3M), Ferhat Abbas of Setif 01, Setif 19000, Algeria

<sup>3</sup> Physics department, Faculty of Science, University of M'sila, 28000, M'sila, Algeria

### **Abstract**

The kinetics and microstructure of the discontinuous precipitation in Mg-7% wt. Al has been investigated at different temperatures and time, using the differential scanning calorimetry (DSC), X-ray diffraction, microhardness measurement and optical microscopy. In this paper, we employed methods for calculation of the activation energy, volume fraction and mechanism of precipitation of new phase  $\gamma(\text{Mg}_{17}\text{Al}_{12})$ . At 150°C accelerate relatively the diffusion process and the S-mechanism is more dominating in discontinuous precipitation.

Keywords: Mg-Al alloy, G.P zones, Discontinuous precipitation, DSC

### **High performance electrochemical sensor based on task specific ionic liquid mixed palm shell activated carbon for trace level Cd (II) detection**

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### **Abstract**

Ion selective electrodes (ISEs) are potentiometric sensors used to measure some of the most critical analytes in environmental laboratory. Despite their easy fabrication, simple usage, and low cost, ISEs suffer from long response times, low response sensitivity, interference by a number of metal ions, long equilibration times and short lifetimes. Therefore, the development of new ISE materials that can address some of these limitations is a worthwhile and challenging topic of research. In this study, the combination of activated carbon with task specific ionic liquids has resulted in a unique new generation paste in which the traditional components have been replaced with alternate materials. In this study, palm shell activated carbon modified with trioctylmethylammonium salicylate was used as a novel electrode component for the potentiometric determination of cadmium ions in water samples. The proposed potentiometric sensor has good operating characteristics when used to determine Cd(II), including a relatively high

selectivity; a Nernstian response in a working concentration range of  $1.0 \times 10^{-9}$  to  $1.0 \times 10^{-2}$  M, with a detection limit of  $1 \times 10^{-10}$  M and a slope of  $30.90 \pm 1.0$  mV/decade; and a fast response time ( $\sim 10$  s). The proposed sensor can also be used for at least two months without considerable changes in its response characteristics. No significant changes in the electrode potential were observed when the pH was varied over the range of 4-9. Additionally, the proposed electrodes have been successfully used for the determination of the cadmium contents of real samples without a significant interaction from other cationic or anionic species.

**Keywords**

Ion selective electrodes; potentiometric sensors; activated carbon; trioctylmethylammonium salicylate; task specific ionic liquids; cadmium (II) detection

Key word : *Haematococcus pluvialis*, *astaxanthin*

العلوم الحياتية

**Biology**

**Evaluation the use of misoprostol for labour induction at Al Helal Al  
Emirati maternity hospital**

*Khaled I. Abu El-Aish<sup>1</sup>, Haly S. Zourob<sup>2</sup>, Abdul-Razek A. El-Kurd<sup>3</sup>*

*1Master of pharmaceutical sciences. Head of pharmacy department in Al Helal Al Emirati hospital. Gaza strip.*  
*2Master of Obstetrics and Gynecology. Al Helal Al Emirati hospital. Gaza strip.*  
*3Consultant of Obstetrics and Gynecology. Medical director of Al Helal Al Emirati hospital. Gaza strip.*  
*Contact address: Khaled I Abu El-Aish. Head of pharmacy department in Al Helal Al Emirati hospital. Gaza strip. [khaledaish@yahoo.com](mailto:khaledaish@yahoo.com)*

### **Abstract**

**Objective:** To evaluate the safety and efficacy of oral misoprostol in two doses regimen for labour induction.

**Materials & Methods:** One hundred and eight singleton cephalic presentation full term pregnancies with medical or obstetric indication for labour induction were assigned to receive 50 micrograms ( $\mu\text{g}$ ) for nulliparas and low parity group, and 25 micrograms ( $\mu\text{g}$ ) for grand multiparas ( $> 5$ ) misoprostol orally every 6 hours to a maximum of four doses daily. Primary outcome measures were: induction success, induction-delivery interval and number of used doses. Secondary outcome measures included: maternal side effects, caesarean section rate, mode of delivery and neonatal outcome (Apgar score, admission to neonatal intensive care unit "NICU"). This study was conducted at Al Helal Al Emirati Maternity Hospital in Gaza strip. Data was collected from patient case notes and analyzed using software SPSS (version 13.0) and p-value was used to test the statistical significance.

**Results:** Successful induction was achieved in 89(82.4%) cases of the study group. The highest rate (97.56%) was in nulliparas while the lowest was (77.78%) in grand multiparas. Mean induction-delivery interval was significantly shorter in low parity group and grand multiparas compared with nulliparas group ( $16.76 \pm 13.9$ ,  $16.23 \pm 7.38$  hrs vs.  $20.4 \pm 16.2$ ,  $p < 0.010$ ). In the low parity group fewer doses of misoprostol were used ( $2.86 \pm 2.15$ ) and there was reduced need for oxytocin augmentation: 11 (31.43%). Apart from the observed minor complications (24.49%), there were neither serious complications nor maternal death. Vaginal bleeding contributed to 52.38% of the minor complications. Only four neonates were admitted to NICU.

**Conclusion:** In this study Misoprostol proved to be a safe and effective drug for induction of labour (IOL). Because of lower induction success in the

grand multiparas group, dose manipulation might be required after further studies.

Key words: cervical ripening, induction of labour, induction delivery interval, misoprostol

### **Uropathogens And Their Antimicrobial Susceptibility Among Primary School Children In Gaza City**

*Abdelraouf A. Elmanama, Abeer Kandeel, Ghadeer Khail,, Menna El-banna, Yasmine Harara*

#### **Abstract**

**Introduction:** Children in the primary school age are under high risk of developing urinary tract infection (UTI), that are considered as serious health problems affecting children each year .

**Objectives:** The aim of this study was to determine the prevalence of UTI among primary school children and to identify the most common uropathogens and determine their antimicrobial susceptibility to common antimicrobials in Gaza city.

**Materials and methods:** Urine samples were collected from 383 students distributed among 6 schools in Gaza city, each student was provided with sterile urine cup to collect early midstream urine. Written instructions for proper urine collection was provided to each student along with a questionnaire which was filled by the student's family. All urine samples were processed during 2 hours from collection; culture on blood agar and MacConkey agar, urine analysis and microscopic examination were performed and sensitivity test was done for positive sample that has bacterial count  $\geq 100,000$  CFU/ml.

**Results:** The prevalence of UTI was 10.6%, 15.0% among female and 6.2% among male. Gram negative bacteria were responsible for 73.6% of UTIs. *Escherichia coli* was the most predominant uropathogen with 36.8%, followed by *Proteus mirabilis* 18.4% and *Pseudomonas aeruginosa* 15.8%. Antimicrobial susceptibility results showed that *E. coli* is sensitive for Amikacin, Ceftrazidime, Nalidixic acid and Ofloxacin. *proteus group* is sensitive for Amikacin, Ceftrazidime, Ceftriaxone, Cefuroxime and

Ofloxacin. *Pseudomonas specie* is sensitive for Amikacin, Ceftriaxone and Ofloxacin .

**Conclusions:** The overall prevalence of UTI is 10.6% in Gaza City in the age group from 6-12. UTI is more common in female. Gram negative bacteria are responsible for 73.6% of UTIs and *E. coli* is the most predominant uropathogens. The susceptibility of the isolates to antimicrobials was generally higher than those reported for hospital isolates.

**Keywords:** Urinary Tract Infection, urine analysis, microscopic examination, culture, sensitivity

### **Amplification of X- and Y-Chromosome-Specific Regions from Single Human Blastomeres by Polymerase Chain Reaction**

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*Short title : PCR on DNA from single blastomeres.*

*Key Words: Polymerase Chain Reaction (PCR), Whole Genome Amplification (WGA), blastomere, Sex determination.*

#### **Abstract**

**Objective:** This study was conducted in order to investigate the feasibility of applying whole genomic DNA amplification (WGA) and polymerase chain reaction (PCR) techniques for sex determination of single human blastomere for the first time in Gaza Strip.

**Samples and Methods:** In this study, WGA technique was employed on single blastomeres that were biopsied from 30 surplus human embryos donated for this research. The obtained genomic DNAs were then subjected for PCR amplification of the Y-linked SRY (Sex-Determining Region on Y chromosome) and the X-linked glucose-6-phosphate dehydrogenase (G6PD) genes.

**Results:** Whole genomic DNA amplification efficiency from single blastomeres was 100 % and the level of amplification ranged from about 40 to 100 fold. All amplified DNA samples were included in the subsequent

sex determination PCR analysis. Of the 30 embryos, 7 (23%) were found to be male and the remaining 23 embryos (77%) were of female gender. Conclusion: Based on these results, WGA is effective for obtaining sizable amounts of DNA from single blastomeres. Moreover, the obtained DNA proved amenable to PCR and this will pave the way for pre-implantation genetic diagnosis of various inherited disorders and for non-medical sex selection in Gaza strip.

### **Isolation, Characterization and Application of Calcite Producing Bacteria from Urea Rich Soils**

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#### **Abstract**

Calcium carbonate is one of the most common minerals widespread on earth (4% by weight of the earth's crust). Bacteria are incredibly diverse and abundant and many bacterial species contribute to the precipitation of mineral carbonates in various natural environments. Alkaline pH is the primary means by which microbes promote calcite precipitation which results from the hydrolysis of urea.

The study used selective enrichment culture technique to isolate urease-producing bacteria from local urea rich soil and others materials. All isolates were identified using conventional biochemical tests. In addition, all isolates were tested for their ability to enhance the consolidation of sand and compressive strength of mortar as well as absorption reduction properties. One isolate with promising results was selected and optimization of environmental and nutritional conditions was performed. The growth curve of the selected strain with optimized condition was investigated.

Thirty three isolates were obtained from the enrichment culture technique. Among them 13 isolates showed increased consolidation of sand. The

isolate that showed the highest performance was identified as *Bacillus mycooides*. The optimum pH of the isolate was shown to be 7.0 and an optimum temperature of 35 °C was found. The growth curve was constructed with a stationary phase starting after 10 hours. The test results indicated that inclusion of *Bacillus mycooides* isolate in cement mortar enhanced the compressive strength, with a maximum increase of 17% in compressive strength and 32% reduction in water absorption was observed with a 28-day mortar sample.

In conclusion, locally isolated strain identified as *Bacillus mycooides* enhanced the properties of the cement mortar. It is recommended that a larger scale application of this isolate be implemented.

Keywords: Calcite precipitation; Urease, *Bacillus mycooides*; Biocementation; MCP; Palestine

### **Iron Deficiency Anemia (IDA) among kindergarten kids living in marginalized areas of Gaza Strip**

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#### **Abstract**

Iron deficiency (ID) is the most prevalent micronutrient deficiency in the developing and developed worlds today. It is considered to be the main cause of anemia and has negative impacts on human health and productivity. According to the World Health Organization (WHO), children are especially vulnerable and exhibit high rates of anemia. Among children under 5 years of age, the greatest prevalence of IDA occurs during the second year of life, due to low iron content in the diet and rapid growth during the first year. The aim of the present study was to determine the prevalence of IDA among kindergarten kids living at marginalized areas (less fortunate of development) of Gaza strip and implement an appropriate management plan that include the supplementation of oral iron formula (ferrous sulphate) to replenish the iron stores and correct the anemia in the IDA children. The study was conducted on 735 kids (384 males & 351 females) representing 11 kindergartens from nine marginalized areas of the five governorates of the Gaza strip. The tools of present study included filling the study

questionnaire as well as complete blood count. IDA was considered in the microcytic (MCV <80fl) children through the Mentzler mathematical formula  $MCV/RBC > 13$  concomitant to reduced hemoglobin concentration < 11.5g/dl. All iron deficient anemic children were managed through oral iron supplements (ferrous sulfate 50mg/5ml) for 3 months under full supervisor and guidance of practitioner physician at the Palestinian Medical Relief Society (PMRS). The majority (68.8%) of the screened children in the marginalized areas are UNRWA registered refugees. According to the screening protocol of the present work, 246 (33.5%) kids (135 males & 111 females) were found to be anemic. IDA was more prevalent in Rafah (43.9%) and North (24.8%) governorates than the other governorates. No significant differences were reported between anemic and non-anemia group regarding parents' consanguinity, father smoking and housing. After 3 month treatment there were significant improvements in all blood parameters, except MCV, related to IDA. It was concluded that IDA is prevalent (33.5%) in marginalized areas and more efforts and attention should be directed to these areas from all health related sectors in the Gaza strip

### **Institutionalizing the Community Health Programs into Palestinian health care system, 2013**

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#### **Abstract**

Health can be viewed as an important resource for both individuals and communities. The relationship between health and community addresses

individuals health physically, emotionally, and socially well-being that is one of their most important assets to achieve the goals of country, and to invest in these assess by cooperation in developing the society as a whole in order to create health citizens. The community health and public health share many features in common efforts like protection, promotion, and preservation of public health. In Palestine, the community health programs experience weaknesses and inefficiency due to several factors like politic, socio-economic and resources insufficiency, shortage of experts, health system fragmentation, absence of community health culture, uncooperative society, uncoordinated health providers services, and other factors in this domain. As a result, the importance of this study rises from the knowledge scarcity and shortage of research that deal with this topic. Therefore, the study aims at recognizing the nature of Palestinian community health programs and identifying the challenges and factors affecting those programs. Then, the study will set a national strategy for community health work in light of the absence of regulated policy that will lead to institutionalized it properly.

**Method:** the study design is retrospective through using qualitative methods. It will use six in-depth interviews with health experts (participants) from different relevant sectors and two focus groups with community health professionals and field workers who work in government, non-government, and community-based organizations in Palestine to have clear overview and obvious insight about this topic to establish effective community health programs activities.

**Results:** through thematic analysis and concepts categorization revealed that there are several obstacles and factors that hindering the community health programs development and strengthening in the health sector in the Gaza strip mainly managerial, environmental and cultural aspects. The community health approach and practice is not cultured-oriented and not institutionalized properly in the health system and it needs great efforts from all relevant players to promote it effectively and efficiently. There are no specific measures and documented protocols organizing the community works, in addition to duplication of services and weak coordination among health providers. Generally, the community health programs in the Palestinian health care system are definitely fragile.

**Implications:** This study facilitated to identify the holes that face the community health programs within the health system at governmental and Non-governmental sectors to develop effective programs that meet the community needs and priorities. As well, helped to find best findings and recommendations translated as policies in enhancing and reinforcing the community health programs in order to manage and coordinate the communication and cooperation measures between health providers.

Keywords: Institutionalizing      Community health programs      Health system  
Gaza Strip.

## **Quality of Life of Children Receiving Permanent Renal Dialysis in Gaza Strip**

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### **Abstract**

This study aims to evaluate the quality of Life in children (ages between 3- 16 years) receiving permanent renal dialysis in Gaza strip. The design of this study is case-control. All cases in Gaza strip were included in the study (15cases) and compared with the control group (45 individuals without the disease) that were selected accordance to the cases sex, age, living places, monthly income and the relationship between parents. The study sample was interviewed by the researchers and completed the developed questionnaire, which focused on quality of life and included five domains, these domains are Physical health, Psychological health, Social relationships, Environment health and Personal safety. Validity and reliability of the instrument were tested and the total instrument reliability test (Cronbach's Alpha) was 0.74, while by Split half methods was 0.94. The study revealed statistically significant difference (<0.001) between cases and control in all study domains except the environmental health domain. The educational achievement deteriorated significantly as a result of impairment of physical health, psychological health and social relationships. Also, the study revealed that the altered levels of serum electrolytes secondary to renal failure and dialysis are responsible for signs and symptoms that the patients experience. The study domains did not show statistically significant difference when compared by sex, age, living places, monthly income and the relationship between parents. The study also revealed that there was a bad need to pay more attention when caring and dealing with dialyzed patients. Special food supplementation should be available in order to improve their physical health, more psychological support from their families and the society. In addition, there is a need to provide safe environment and to enhance personal safety of these children.

**Key words:** Renal dialysis, Quality of life, Gaza strip.

## **Hand washing technique as an effective method for intestinal parasites control among school children in Gaza city**

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### **Abstract**

**Introduction:** Hand washing is the single most important procedure for preventing health care associated infection. Hand washing, which obviously requires clean water, is extremely important in reducing the risk of transfer of pathogenic material

#### **Objectives:**

To examine the impact of hand washing technique on the prevalence of intestinal parasites among school children in Gaza.

**Methods:** In the present study, the total sample was 508 school children, who ages ranged from 9 to 12 years. From 827 classes, it was selected 17 classes based on systematic random selection technique. Each child was advised to give one stool sample in a clean container in the early morning in the first exam. Each child was given a questionnaire to fill in the home. Infected school children with intestinal parasites were divided into two groups: case (45 child) and control (5 child) groups. Students were selected in both groups based on match criteria include: (age, sex, standard of living and place of residence). Hand washing technique: A single visit weekly for each school was made, each meeting was 25-30 minutes. The case group was given advanced hand washing technique training and how to wash their hands properly. Learning children about health education. Focus group for children's mothers: Follow up study: Those children were

monitored weekly to be sure for their commitment for application of hand washing. Designed questionnaire (appendix 6) was filled for each child in addition to the checklist. Observation of children about applying hand washing technique. Monitoring weekly for hand washing technique was taken place for two months.

**Results:**

The prevalence of intestinal parasitic infection was reduced after hand washing intervention that has statistically significant from 20.1% to 14.0%. The results showed that the prevalence of intestinal parasitic infection among males (14.2%) was higher than females (9.1%) with statistical significance (  $p=0.004$ ). The most intestinal parasite was *Entamoeba histolytica/dipar* and *Giardia lamblia*.

**Conclusions and recommendations:** It is concluded that hand washing has a significant role in reducing intestinal parasitic infection among school children. It is recommended that hand washing should be delivered to all school children in Gaza strip.

**Key words:** Parasites, Control, Prevalence, Children, Gaza

## **The Assessment of Apolipoprotein C- III Among Type 2 Diabetes Male in Gaza Strip as A predictor of Cardiovascular Diseases**

*Atef A Masad and Ferial S. Awad*

### **Abstract**

**Background:** Diabetes mellitus is one of the most important risk factors for cardiovascular diseases. Apolipoprotein C-III (apo C-III) is a multifunctional protein that not only regulates the metabolism of triacylglycerols but also an important regulator of endothelial function. In the presence of hyperlipidema, apo C-III exerts proinflammatory effects on both monocytes and endothelial cells that are important for transendothelial

migration of monocytes into the vessels' intima and development of atherosclerosis.

**Objectives:** To investigate the prognostic value of plasma apo C-III concentrations for cardiovascular complication among T2DM patients in Gaza strip. **Materials and methods:** This study is a case-control study; a total of 89 male of T2DM were evaluated and classified into two groups according to heart disease [52 of T2DM patients without heart disease and 37 with heart disease] and equal number of normal subjects were run in parallel with each group as a control. Apo C-III and apoA1 were measured using immunoturbidimetric methods, glucose, CK, CK-MB, AST, LDH, cholesterol, triacylglycerols and, HDL-C were measured using colorimetric and kinetic method and LDL-C was calculated using the empirical relationship of Friedewald.

**Results:** The concentration of apo C-III, glucose, LDL, cholesterol, triacylglycerols, apoA1, LDH, AST, CK and, CK-MB were significantly increased among T2DM patients ( $P<0.05$ ). There was positive correlation between apo C-III and plasma triacylglycerols in T2DM patients compared with control ( $r=0.755$ ,  $p<0.001$  and  $r=0.426$ ,  $p=0.001$ ). Also, there were positive correlation between apo C-III and glucose, cholesterols, AST and apoA1 among T2DM patients ( $r=0.238$ ,  $p=0.012$ ,  $r=0.340$ ,  $p=0.001$ ,  $r=0.237$ ,  $p=0.013$ ,  $r=0.242$ ,  $p=0.011$ ) respectively. There was statistically significant difference between apo C-III ( $p<0.05$ ) in the two cases groups of T2DM (with/without heart disease) and between the obese and non-obese T2DM patients. There was significant difference between apo C-III and insulin treatment ( $p<0.05$ ), while no significant difference was found between lipid-lowering drug and apo C-III.

**Conclusion:** A high apo C-III and low apoA1 concentration in plasma, independently of fasting triacylglycerols and other traditional risk factors, predicts cardiovascular mortality among T2DM patients.

**Keywords:** apolipoprotein C-III, cardiovascular disease, Diabetes mellitus type 2, triacylglycerol-rich lipoproteins, dyslipoproteinemia.

**Predominance and emergence of a rare clone of community-acquired methicillin-resistant *Staphylococcus aureus* harboring TSST-1 in hospitals from Gaza, Palestine**

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## Abstract

**Background:** *Staphylococcus aureus* is an important pathogen causing significant disease in both hospital and community settings. Current knowledge regarding the epidemiology of *S. aureus* in Gaza is based on a single community-based carriage study. Here we describe a cross-sectional analysis of 230 clinical isolates collected from two hospitals in 2008 and 2012. **Methods:** Molecular characterization included *spa* typing, SCC*mec* typing, PFGE, MLST, and PCR detection of toxins including PVL (*lukF*), TSST-1 (*tst*), *mupA* and ACME. Antibiotic susceptibility testing was performed using VITEK2 and MicroScan. **Results:** Of the 230 isolates, 126 were collected in 2008, vs. 104 in 2012. The majority of the isolates were from skin (40.4%), surgical site (34.8%), urogenital (14.3%), and bloodstream (7.8%) infections. MRSA, defined phenotypically and genotypically by the presence of *mecA*, represented 57.8% of all tested *S. aureus* strains (54.8% in 2008, vs. 61.5% in 2012). Molecular typing revealed 13 clonal backgrounds, 7 of which were associated with MRSA (CC5, 8, 22, 30, 80, 239, 291). CC22, CC30 and CC80 accounted for 34.4%, 19.6% and 16.5% of all isolates, respectively, similar to a previous carriage study which showed predominance of CC22. SCC*mec* types I (2.3%), III (6.8%), IV (81.2%), V (6.8%) and VI (3%) were identified among MRSA isolates. PVL was detected in 41.3% of all isolates (43.6% MRSA, vs. 38.1% MSSA). TSST-1 was detected in 27.8% of all isolates, with higher prevalence among MRSA (39.8%) than MSSA (11.3%), and surprisingly high prevalence within CC22 (69.6%). Both PVL and TSST-1 were found in 5 isolates and *mupA* and ACME were not detected in our collection. Resistance was observed to erythromycin (25.7%), tetracycline (20.4%), fusidic acid (19.8%), clindamycin (18.3%), levofloxacin (13.0%), ciprofloxacin (11.5%), gentamicin (11.3%), TMP-SMX (10.4%), moxifloxacin (5.7%) and rifampin (3.5%). There was no resistance detected to tigecycline, teicoplanin, fosfomicin, nitrofurantoin, mupirocin, linezolid, synergid and vancomycin. **Conclusions:** Molecular typing of clinical isolates from Gaza revealed unusually high prevalence of TSST-1 among

CC22 *S. aureus* strains, which is of potential concern given a recent report of high carriage rates of CC22 within the community.

**Keywords:** *S. aureus*, molecular epidemiology, Gaza, TSST

### **Infant mortality rates in Gaza Strip from 1990 to 2012. A comparative study with regional and developed countries**

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#### **Abstract**

**Objective:** To present data of infant mortality rate (IMR) from 1990 to 2012 and analyze its trend and compare it with regional and developed countries. **Study design:** National retrospective descriptive study of two decades. **Method:** A retrospective collection of infant deaths and live births was conducted from the Palestinian Health Information Centre from 1990 to 2012 to calculate IMR, Neonatal Mortality Rate (NMR) and Postneonatal Mortality Rate (PNMR). **Analysis:** IMR, NMR and PNMR were analyzed through regression and Pearson correlation. **Results:** IMR fell significantly from 30 in 1990 to 17.8 in 2012, decline in PNMR from 14.7 in 1990 to 5.9 in 2012, slight decline of NMR from 15.3 in 1990 to 11.8 in 2012, the Neonatal Deaths constituted approximately half of the Infant Deaths till 1999, and then it constituted about 70% of Infant Deaths since 2000, about 23% of early neonatal deaths occurs at the first 24 hours. About 92% of change in IMR is attributed to the NMR& PNMR ( $F=121.2$ ,  $P=0.000$ ), about 34% of change in IMR is attributed to NMR ( $F=10.8$ ,  $P=0.003$ ), finally about 61% of changes in IMR is attributed to PNMR ( $F=34.7$ ,  $P=0.000$ ). IMR is positive correlated to PNMR ( $r=0.789$ ,  $P=0.000$ ), NMR ( $r=0.583$ ,  $P=0.003$ ) and early NMR ( $r=0.715$ ,  $P=0.000$ ). **Conclusion:** This study provides important information about IMR in Gaza Strip from 1990 to 2012. A range of different rates were identified as possible contributors in Gaza Strip progress toward reducing IMR as an important health indicator. The IMR was congruent with the rate of the neighboring countries, which was 17 in Jordan, 18 in Saudi Arabia and 20 in Turkey. While it was higher than developed countries as: 6 in USA, 3 in Qatar and

4 in Israel. **Recommendations:** the authors recommend MOH to invest more in developing the health care services at the first week -especially at the first 24 hours- of baby's life, and to assure quality of obstetric services in compliance with protocols and guidelines which will improve health indexes at GAZA STRIP.

**Key words:** Infant Mortality Rate, Neonatal Mortality Rate, Post Neonatal Mortality Rate, early NMR, MOH, Gaza Strip.

### **Childhood cancer in Gaza Strip, 2000 - 2010: challenges and hopes**

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#### **Abstract**

**Background:** Childhood cancer remains the leading cause of death by disease among children in many countries. There is insufficient research into the state of paediatric oncology in Gaza strip. **Objectives:** The purpose of this study was to analyse the state of paediatric oncology between 2000 and 2010 in Gaza Strip. **Methods:** This retrospective descriptive study analysed all patients under the age of 15 who were diagnosed with cancer in Gaza Strip and registered in the National Cancer Registry at the Palestinian Health Information Center - Ministry of Health (MOH) over a period of 11 years (January 2000 - December 2010). **Results:** The total number of registered children cancer cases was 651 cases which represents 8.7 % of total number of all cancer cases in Gaza Strip during the period from 2000 to 2010. Leukaemia was the most common malignancy (37.4%), followed by lymphoma (14.5%) and brain cancer (7.7%). The average incidence rate per 100,000 populations is 8.7. Detailed information about morphology and stage of cancer in most cases were failed. **Conclusions:** Cancer in children in Gaza Strip was dominated by leukemia. More epidemiological studies and survival rate analysis are now required to illustrate the patterns of paediatric cancer and related risk factors. Researchers should focus their research on this area and collaboration between the research institutions and

cancer centers in the hospitals of Gaza Strip should be increased to improving the management of children with cancer.

**Key words:** Paediatric Oncology, Childhood cancer, Gaza Strip

### **A model Predictors of Acute Diarrhea among Hospitalized Children in Gaza Governorates: Case Control Study**

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#### **Abstract**

This study aims to determine the predictors of diarrhea among hospitalized children in the Gaza governorates. The case-control design included 140 children (70 cases and 70 controls) in a stratified cluster sample from Naser Medical Complex and Alnasser Pediatric Hospital. An interview questionnaire was used, and face and content validation were performed. Multiple logistic regression by binary logistic regression was used for the multivariate analysis of risk factors of diarrhea in children aged less than five years. Results showed a significant association between diarrhea and family income, residence, complementary feeding, and age of weaning ( $p < 0.05$ ). Children living in villages have lower odds of having diarrhea by 53.2% than children living in cities. Children of families with incomes between 485 USD and 620 USD have lower odds of having diarrhea by 80.8% than children of families with incomes less than 485 USD. Moreover, children who did not receive complementary feeding have lower odds of having diarrhea by 59.0%. Children with one month increase in weaning age have a decrease 1.058 times the odds to have diarrhea. This study concludes that the residence, family income, complementary feeding, and age of weaning are risk factors for diarrhea among Gaza Strip children less than five years old. The results of the study imply the need for increased attention on children of low income families and those who were not naturally breast fed.

**Key words:** Predictors, Diarrhea, Hospitalized Children

## **Effects of noise on rabbit's blood**

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### **Abstract**

experiments are described in which domestic rabbits were deliberately subjected to a daily 3-4 hours noise regime ( dB) for 18,28,40,50 days, to determine its effects on the blood.

Exposure to noise caused increase in white blood cell counts, mean corpuscular volume , meancorpuscular hemoglobin and mean corpuscular hemoglobin concentration ,while red blood cells count, hemoglobin content , hematocrit value and platelets count showed significant decrease . Noise exposure to rabbits caused a general increase in its biochemical parameters such as urea, uric acid, creatinine, cholesterol, triglycerides and sodium, while glucose level decreased significantly.

our results indicate a general decrease of total protein, albumin and globulin levels. Domestic rabbits liver function enzymes such as alanine -amino transferase, aspartae amino transferase and alkaine phosphatase' were increased as well under the influence of noise exposure.

signs of improvements in the previous hematological and biochemical parameters were noticed in the recovery group of animals.

**key words:** noise- recovery- domestic rabbits

## **Depression And Life Events As Influential Factors For Insomnia**

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### **Abstract**

Sleep is a biological and behavioural phenomenon to rest the mind and body. Insomnia is one of the most common sleep disorders in the general population. The objective of the present study was to identify the prevalence of insomnia and the influential factors for insomnia. The scope of this study was to determine depression and life events as possible influential factors for insomnia. The participants were 500 working adults aged 20-60 years in Georgetown, Penang (Malaysia) who were relatively healthy. The results revealed that 27% of the respondents reported insomnia. Depression was significantly correlated with insomnia. Females reported more insomnia than males and the youngest age group (20-29) experienced more insomnia compared to the older age groups. Life events such as work and finance were significant risk factors for insomnia. As a conclusion, depression interferes with sleep pattern while life events such as finance and work play important role as risk factors for insomnia.

*Keywords: (Depression, life events and insomnia)*

### **Potential Analysis Of Cottonwood Parasite (Dendrophloe Pentandra) Stem Extract In Decreasing Of Mutant P53 Protein Expression On Cervical Cancer Cell (Hela Cells) In Vitro**

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### **Abstract**

Cervical cancer is the second most common type of cancer in women and the most common cause of mortality related cancer in developing countries. In 2005, cervical cancer leads to over 250,000 deaths in the world. Treatment in cancer are including surgery, chemotherapy and radiotherapy.

Surgery can not be done for the metastasized cancer, while chemotherapy and radiotherapy treatment can cause various side effects. Cottonwood Parasite (*Dendrophthoe pentandra*) stem contains quercetin 39.8 mg/g. Quercetin acts as an anticancer on cell cycle regulation, interacts with estrogen receptor type II, inhibits tyrosine kinase enzymes, and suppresses the expression of mutant p53 protein. This research aims to know the effect of Cottonwood Parasite stem extract against mutant p53 expression on HeLa cell (cervical cancer). Cottonwood parasite stem is obtained from extraction and followed by evaporation with ethanol 70%. HeLa cells were divided into 4 groups: HeLa cells without treatment(A), HeLa cells treated with 25µg/ml extract concentration(B), 50µg/ml(C), 100µg/ml(D). Immunocytochemistry method was performed using monoclonal antibody to mutant p53 to measure the expression of mutant p53 level as an indicator of apoptosis on HeLa cells, by examining the appearance of brown colour under light microscope. This results showed that cottonwoods Parasite stem extract was decrease mutant p53 protein expression in HeLa cells culture. Based on these facts, quersetin which are found mainly in the cottonwood parasite is likely to be developed as an anticancer drug that is promising in the future, either as agent chemoprevention or co-chemotherapy.

*Keywords: Cottonwood Parasite, cervical cancer, p53 mutant*

**Awareness And Willingnes To Health Policy : An Empirical Study  
With Reference To Malang Indonesia**

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**Abstract**

In Indonesia there is a lot of health porblem, such as deficiencies in health resourches and health financing, morbidity and mortality in communicable diseases, and others. This problem is correlate with poor of political commitment in health policy. In other hand, poor awareness about the magnitude of the problem, lack of orientation, competence and capacity of health manpower, poor advocacy efforts and lack of active community participation have added to poor political commitment for health prevention of the Indonesia. The present study is an effort in the area of Public health policy awareness to examine the level of awareness about health policy and

identifies the determinants of health awareness and the different factors affecting them. The study was conducted in Malang, Indonesia, and 866 questionnaires were got filled from randomly proportionate sub-district. The results shown low level of awareness and willingness to health policy, even people prefer traffic jam policy rather than health policy. Overall, there is no correlation respondents characteristic (Gender; age; ethnic group; religion; education; occupation; income of respondents) and awareness and willingness to health policy in Malang city. In contrast, age ( $p < 0,001$ ) and education ( $p < 0,01$ ) has correlation to the awareness and willingness to health policy in area around resident of respondents. Radio access has relation to the awareness and willingness to health policy in Malang and in their subdistrict with  $p=0,012$ ,  $p=0,097$ , respectively. In other hand, television access has relation with awareness and willingness to health policy only in their subdistrict with  $p=0,001$ . Enhancing health awareness among citizen in Malang ia a challenging task. We conclude that a greater understanding of which aspects of every character and background are important in a health policy awareness and willingness in Indonesia to inherent sociotechnical for enhancing health policy awareness and willingness in Indonesia.

**Keywords:** Awareness, willingness, health, policy,

### **Staff Developed Infection Prevention Program Increases Antimicrobial Stewardship and Decreases Hospital Acquired Infection Rates**

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#### **Abstract**

The burden of Hospital Associated Infections (HAIs) to intensive care units is extremely high and cannot be overemphasized, with more than one third of all HAIs being acquired in intensive care units. This study aimed to explore causes of HAIs and activities used in order to improve the quality of health care in the intensive care unit at Ranteesy Pediatric Hospital (RPH). The study design is experimental (pre and posttest), all the staff who worked in the intensive care unit were involved in this study. The researchers used many quality assessment tools to help identifying, collecting, displaying, monitoring and improving the quality of health care. These tools are Brainstorming, self-administered questionnaire, check list, flow charts, fish

bone analysis, Pareto chart, trend chart and run chart. Result revealed that lack of knowledge; supervision and experience were represented 76% of the causes of infection in the intensive care unit. Post intervention test showed significant improvement and changes in the rate of HAIs in comparison to the pre-test, as average of positive cultures (blood, sputum, urine, wounds or CSF) dropped from 76% to 42%, used antibiotics vials per week decreased from 130 to 92 vials, and the average of hospital stay days from (8-10) to (5-8). The study finding supports the need for health educational programs about infection control and prevention, and following up with staff performance at Ranteesy Pediatric Hospital (RPH) and specifically in the ICU to reduce the incidence of HAIs and minimize the cost.

**KEYWORDS:** hospital associated infections prevention, infection prevention in pediatric ICU, infection control pediatric ICU, quality improvement pediatric ICU, prevention of HAIs.

### **Effects of chromium on some haemato-biochemical parameters in domestic rabbits**

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#### **Abstract**

[[The objective of this study is to assess the effect of chromium (3.4 mg/kgm daily for 90 days) on some blood indices of adult rabbits weighting 1000-1300g. Administration of chromium for this period decreased total protein, total albumin, total globulin and cholinesterase values. The decrements were 41.18%, 49.36%, 33.16% and 3.80% respectively, compared to control level. On the other hand, it increased levels of kidney function indices as sodium and calcium were 42.62% and 90% respectively. The effect of chromium was studied on the activities of alkaline phosphatase (ALP), alanine amino transferase (ALT) and serum aspartate amino transferase (AST) with increment value 13.15%, 14.32% and 4.15% respectively. The hematological parameters were shown obvious

changes in the increment of white blood cells (WBC), lymphocyte and MCHC values and the decrement of red blood cells (RBC), hematocrit , hemoglobin (Hb), MCV, MCH and platelets count in response to administration of chromium .

**Key words:** Chromium , rabbits , blood indices , Gaza Palestine .

### **A Comparative Study of Coronary Risk Factors Among Urban and Rural Diabetics in Gaza Strip**

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**Background:** Diabetes mellitus (DM) is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. Coronary heart disease (CHD) is more prevalent among DM patients than other population. Actually, Higher risk of CHD is seen in DM patients who are smokers and have lipid abnormalities, obese, and hypertension.

**Objective:** The aim of this study is to compared the lipid profiles levels and other CHD risk factors among DM patients in Gaza governorate (the urban region) and the eastern region of Khan Younis governorate (the rural region). Gaza strip, Palestine.

**Materials and Methods:** This study was a cross sectional started in July, 2013 and finished in September, 2013. A total of 200 DM patients, aged 10-65 years, whose diabetes was identified from 2 years at least, and from Gaza governorate and the eastern region of Khan Younis. Demographic & socio-economic data, clinical data, and physical activity (PA) situation of the study population were taken by interview questionnaire. Anthropometric and biochemical evaluation were carried out. collected data and biochemical analysis were analyzed using SPSS version 18.

**Results:** According to Chi-Square Test and T-Test analysis, Coronary risk factors for the urban and rural diabetic group of study population were as follows; Hypertension was seen in 49.0% of urban group and 41.0% of rural group. Smoking prevalence was seen in 11.0% of the patients belonging to the urban group and 16.0% of rural group. Sedentary PA was seen in 60.0% of urban group and 37.0% of rural group. Obesity was found in 66.0% of urban group and 63.0% of rural group. Moreover, High levels of serum total cholesterol (TC) ( $\geq 240$ mg/dl) were seen in 39.0% of urban group and 23.0% of rural group. Low levels of high-density lipoprotein cholesterol (HDL-c)

( $\leq 40\text{mg/dl}$ ) were seen in 24.0% of urban group and 45.0% of the rural group. High low-density lipoprotein cholesterol (LDL-c) levels ( $\geq 160\text{mg/dl}$ ) were observed in 15.0% of urban group and 8.0% of rural group. High triglycerides (TGs) levels ( $\geq 200\text{mg/dl}$ ) were seen in 38.0% of urban group and 79.0% of rural group.

**Conclusions:** Urban group patients were more progressing towards the coronary risk factors as compared with rural group patients, because they were having higher of TC, LDL-C, TGs, more obese, more physical inactivity and also hypertensives.

**Keywords:** Diabetes mellitus, Lipid profiles, Coronary heart disease, Gaza Strip.

### كيف أثر الاحتلال الصهيوني على منزلة التنوع الحيوي في قطاع غزة منذ 1967 How did the Zionist Occupation impact the status of biodiversity in the Gaza Strip since 1967?

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**الملخص:** تتعم فلسطين التاريخية المباركة (27,000 كم<sup>2</sup>) بتنوع حيوي (Biodiversity) لا يوجد له نظير في المنطقة المحيطة، إذ ساعد في ذلك موقعها الجغرافي الاستراتيجي بين قارات ثلاث الذي هيء سبل النقاء نباتات و حيوانات تلك القارات في تلك البقعة المباركة من الأرض. يضاف إلى ذلك تداخل المناطق الجغرافية النباتية (Phytogeographical Zones) فيها ممثلة بالمناطق المتوسطية و الإيرانية الطورانية و الصحراوية العربية و التغلغل السوداني فضلا عن التداخلات المناخية و الأنواع المتعددة للتربة. تضم البيئة الفلسطينية أكثر من 2700 نوعا نباتيا، 120 نوعا من الثدييات البرية، 540 نوعا من الطيور البرية، 120 نوعا من الزواحف و البرمائيات، بالإضافة إلى حوالي 400 نوعا من أسماك البيئات المالحة و العذبة. لقد أدى الاحتلال الصهيوني للأراضي الفلسطينية منذ عقود خلت إلى تدمير مجمل مناحي البيئة الفلسطينية و تدهور طويل المدى لتنوعها الحيوي و مصادرها الطبيعية و يظهر ذلك جليا في قطاع غزة الذي يمثل محور هذه الدراسة العلمية التي تهدف إلى تبيان أثر الاحتلال الصهيوني على منزلة التنوع الحيوي في قطاع غزة. اعتمد الباحث في تحقيق هدف الدراسة الحالية على الخبرة الذاتية في مجال العلوم البيئية و اللقاءات

المتعددة في المحافل العلمية المختلفة و الزيارات الميدانية المتكررة و المناقشات العلمية مع المهتمين و نوي الشأن فضلا عن المراجع الأدبية و المصادر الإعلامية المتوفرة.

بينت الدراسة أن قطاع غزة الذي يضم أكثر من 1.8 مليون نسمة يعيشون في مساحة لا تزيد عن 365 كم<sup>2</sup> يعاني من مشكلات بيئية جمة تهدد واقعه و سبل تنميته بشكل مستدام. يعتبر تدهور و فقد التنوع الحيوي أحد أهم المشكلات البيئية التي تعصف ببيئة قطاع غزة الطبيعية جراء الاحتلال الصهيوني له منذ عام 1967 حيث عملت و عمدت السياسات و العمليات و الحروب الصهيونية المدروسة على النيل من ذلك التنوع الحيوي بشكل يدق ناقوس الخطر حيث تمثل ذلك النيل في العديد من الصور نذكر منها:

1. بناء السياج الأمني المحيط بقطاع غزة مما تسبب في منع التدفق الطبيعي لأشكال الحياة البرية (Wildlife) و لاسيما الثدييات البرية من فلسطين المحتلة إلى قطاع غزة.
2. بناء السدود و أنظمة التصريف في المجرى الأعلى لودي غزة منذ بداية سبعينيات القرن الـ 20 مما تسبب في منع المياه السطحية (Surface Waters) القادمة من جبال الخليل و النقب و حوض التجميع المائي (Watershed) من الوصول إلى المجرى الأدنى للودي في قطاع غزة الذي أضحي جافا و نجم عن ذلك تغير في التركيب النباتي و الحيواني له فضلا عن عدم تغذيته للخزان الجوفي في قطاع غزة الذي يعاني شحا في المياه و تلوثا و سوء إدارة.
3. تدمير الملامح التضاريسية و الطبيعية (Landscape) في قطاع غزة جراء تجريف و سرقة الكثبان الرملية (Sand Dunes) التي تقدم خدمات جائلة للبيئة الفلسطينية و المجتمع الفلسطيني على حد سواء.
4. تشييد و بناء محطات معالجة المياه العادمة (Wastewater Treatment Plants) في مناطق تتمتع بكثبانها الرملية كنظم بيئية استراتيجية للبيئة الفلسطينية مما ساهم في ابتلاعها التدريجي و تدمير مكنونها البيولوجي و فقد قدرتها الترشحية للخزان الجوفي و زيادة قدرتها التلويثية له بملوثات شتى يقف على رأسها تلوث الخزان الجوفي بالنترات و الميكروبات المرضية، و ما محطة معالجة المياه العادمة في بيت لاهيا - شمال قطاع غزة عن المجتمع الفلسطيني ببعيدة.
5. تدمير البيئات الطبيعية و مساحات الأعراس و الغابات و الحقول الزراعية و الكثبان الرملية نظرا لتضييق الخناق على سكان قطاع غزة اللذين يتزايدون بشكل مضطرد و يحتاجون إلى أماكن سكنية بشكل متواصل لمجابهة التزايد السكاني.
6. التدمير المتعمد للمحاصيل الاستراتيجية في قطاع غزة من خلال تشجيع اقتلاع بساتين الحمضيات و الفاكهة و استبدالها بمحاصيل مائية تصديرية تستنزف مياه الخزان الجوفي مثل مزروعات الفراولة و الورد و غيرها.
7. إنشاء ما يسمى بالحزام الحدودي الأمني (Security Border Belt) على طول الحدود المصطنعة مع قطاع غزة بهدف كشف المناطق الحدودية و تأمين انتشار القوات الصهيونية في تلك المناطق مما يساهم في فقد التنوع الحيوي و تقليل الخدمات البيئية و الاقتصادية و الاستجمامية و الثقافية التي تقدمها الأعراس و الأشجار و البساتين المقتلعة و ما تنعم به من أشكال الحياة البرية الأخرى.

8. التدريبات و العمليات التي تقوم بها الآلة العسكرية الصهيونية و ما يصاحب ذلك من اقتلاع للأشجار و المزروعات و تشريد أشكال الحياة البرية خوفا من الموت أو الضجيج.
9. الحروب الصهيونية في قطاع غزة و ما نجم عنها من استخدام مدروس لأنواع متقدمة من الأسلحة الفتاكة المحرمة دوليا مثل اليورانيوم المخضب ( Depleted Uranium = DU) و الفوسفور الأبيض (White Phosphorus) و معدات الحرب الثقيلة و التي بمجملها أحدثت خرابا و دمارا و اسعا في البيئة الفلسطينية و التنوع الحيوي يصعب الاستشفاء منه في الأمد القريب و ربما تمتد آثاره إلى آمام بعيدة نظرا للخاصية التراكمية الحيوية (Biomagnification) التي تتمتع به بعض ملوثات الحرب الصهيونية و انتقالها عبر السلاسل و الشبكات الغذائية.
10. تدمير التربة الفلسطينية التي تعتبر الأساس الفيزيائي و الكيميائي و البيولوجي للنظم البيئية الطبيعية و الزراعية في قطاع غزة جراء استخدام المعدات الثقيلة في الحروب و الاجتياحات فضلا عن مخاطر القصف الجوي بالفذائف مختلفة الحجم و الأشكال و الآثار و التي تلوث و تدمر التربة و من ثم تدمر ما تدعمه التربة من حياة نباتية و حيوانية.
11. تراكم النفايات الانشائية (Construction Wastes) الناجمة من عمليات القصف لفترات طويلة و لاسيما في المناطق الهامشية و السكانية مما يتسبب في انتشار الآفات البيئية (Environmental Pests) كالعثابين و القوارض التعايشية (Commensal Rodents) و العقارب و الحشرات الضارة و التي بطبيعتها تسبب ازعاجا و تشكل خطرا على صحة للمواطنين و ممتلكاتهم.
12. إنشاء الأنفاق الأرضية (Earth Tunnels) التي تصل بين الأراضي المصرية و قطاع غزة جراء الحصار الصهيوني الظالم على قطاع غزة حيث تعتبر تلك الأنفاق شريان حياة يزود الفلسطينيين في قطاع غزة بحاجياتهم الاستراتيجة و غير الاستراتيجة و ربما ينسلل من الأنفاق كائنات حية غريبة (Exotic Species) عن البيئة الفلسطينية تتسبب في نشر الأمراض و تؤثر على التنوع الحيوي الزراعي و ما سوسة النخيل الحمراء (Red Palm Weevil, *Rhynchophorus ferrugineus*) إلا مثلا صارخا تهدد أشجار نخيل البلح (Date Palms) في قطاع غزة.
13. قطع الأشجار و الشجيرات (Trees and Shrubs) للحصول على الوقود و الأخشاب جراء الحصار الصهيوني الظالم على قطاع غزة الذي قلص أو منع أمدادات الوقود من الوصول إلى قطاع غزة، حيث يتسبب قطع الأشجار في تدمير التنوع النباتي و فقدان ما تدعمه من أشكال الحياة البرية الأخرى.
14. المساهمة في ضعف البنية التحتية لقطاع و مشروعات المياه العادمة في قطاع غزة مما يتسبب في تدني كفاءة محطات المعالجة و قذف كميات هائلة من المياه العادمة الخام أو المعالجة جزئيا في البيئة البحرية (Marine Environment) و التي غالبا ما تتسبب في تلويثها و حدوث اضطرابات في النظم البيئية البحرية (Marine Ecosystems). تعتبر ظاهرة اضطراب النمو البيولوجي (Eutrophication) من أهم المخاطر التي تفرضها المياه العادمة على صحة البيئات البحرية و الساحلية و تنوعها الحيوي فضلا عن تأثيراتها المتعددة على صحة الإنسان.
15. تقليص المساحات البحرية المخصصة للصيد السمكي (Fishing) في قطاع غزة تبعاً للأوضاع الأمنية و السياسية التي يفرضها الكيان الصهيوني على المجتمع الفلسطيني حيث

يترتب على ذلك قتل و ملاحقة لصيادي الأسماك و زيادة في جهد الصيد السمكي (Fishing Effort) باستخدام طرق صيد غير آمنة و غير مستدامة تسبب هلاكاً و فقراً للتنوع الحيوي في البيئة البحرية و بالتالي تسبب قلة في الانتاج السمكي و ضعفاً في سد احتياجات المجتمع الفلسطيني من البروتين السمكي الذي تفوق فوائده البروتين الحيواني.

على الرغم مما تسبب به الاحتلال الصهيوني من مشكلات بيئية و تدهور للتنوع الحيوي في قطاع غزة منذ احتلاله في عام 1967، إلا أن رحمة الله هي أقرب لنا من كل ما سواه و أن ضرر الصهاينة لنا ما هو إلا أذى يجب ألا يتبيننا عن مواصلة مشروعنا النضالي في سبيل تحرير أرضنا الفلسطينية المباركة لننعم بعدها بالبيئة النظيفة و التنوع الحيوي الغالي الذي بصونه نصون بينتنا و مواردنا على نحو مستدام.

## Homocysteine and hematological indices in hemodialysis patients at Al-Shifa hospital, Gaza Strip

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### Abstract

**Background:** Renal failure constitutes one of the ten leading causes of death in the Gaza strip with mortality rate of 2.8%. Although hyperhomocysteinemia has been strongly linked to end stage renal disease, biochemical test is restricted to monitoring kidney function. Therefore, introducing homocysteine as a biomarker of ESRD in Gaza hospitals is recommended.

**Objective:** To assess homocysteine and hematological indices in hemodialysis patients at Al-Shifa hospital, Gaza Strip.

**Material and methods:** This case-control study comprised 60 hemodialysis patients and 60 healthy controls. Questionnaire interview was applied. Serum homocysteine, urea and creatinine, white blood cell (WBC) count, red blood cell (RBC) count, hemoglobin, hematocrit, mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), mean corpuscular hemoglobin concentration (MCHC), platelet count, prothrombin time (PT),

activated partial thromboplastin time (APTT) and international normalized ratio (INR) were determined. Data were analyzed using SPSS version 18.0.

**Results:** End stage renal disease was more prevalent among lower educated and unemployed individuals, families with low income as well as among individuals with family history of the disease. Clinical data showed that hypertension and diabetes are the most common self-reported disorders among the hemodialysis patients. Serum homocysteine was significantly higher in cases compared to controls ( $50.8 \pm 9.7$  vs.  $13.1 \pm 3.7$   $\mu\text{mol/l}$ ,  $P=0.000$ ). Serum urea and creatinine were also found to be significantly higher in cases ( $169.6 \pm 42.4$  and  $9.96 \pm 2.40$   $\text{mg/dl}$ , respectively) compared to controls ( $27.4 \pm 7.1$  and  $0.77 \pm 0.14$   $\text{mg/dl}$ ) with  $P=0.000$ . White blood cell count, MCHC and platelet count were significantly increased in cases compared to controls ( $7.18 \pm 1.37 \times 10^3$   $\text{cell/l}$ ,  $33.8 \pm 1.2$   $\text{mg/dl}$  and  $266.3 \pm 104.2 \times 10^9$   $\text{L}$  vs  $5.95 \pm 1.37 \times 10^3$   $\text{cell/l}$ ,  $28.4 \pm 2.0$   $\text{mg/dl}$  and  $222.0 \pm 54.1 \times 10^9$   $\text{L}$ ) with  $P=0.017$ ,  $P=0.000$  and  $0.045$ , respectively. In contrast, RBC count, hemoglobin, hematocrit and MCH showed significant decreases in cases ( $3.12 \pm 0.54 \times 10^6$   $\text{cell/l}$ ,  $8.9 \pm 1.5$   $\text{gm/dl}$ ,  $26.3 \pm 4.6\%$  and  $28.6 \pm 2.9$   $\text{pg}$ ) compared to controls ( $4.03 \pm 0.37 \times 10^6$   $\text{cell/l}$ ,  $12.8 \pm 1.6$   $\text{gm/dl}$ ,  $45.0 \pm 4.6\%$  and  $31.9 \pm 4.4$   $\text{pg}$ ) with  $P < 0.01$ . Prothrombin time and INR were significantly higher in cases compared to controls ( $16.2 \pm 2.6$   $\text{sec}$  and  $1.23 \pm 0.17$  vs  $13.5 \pm 0.4$   $\text{sec}$  and  $0.97 \pm 0.07$ ,  $P=0.000$ ), whereas APTT was decreased in cases ( $25.3 \pm 5.3$  vs  $32.6 \pm 2.1$   $\text{sec}$ ,  $P=0.000$ ). Homocysteine levels were higher among lower educated and unemployed individuals, families with low income as well as among individuals with family history of ESRD ( $P < 0.01$ ). Homocysteine was positively correlated with urea ( $r=0.827$ ,  $P=0.000$ ), creatinine ( $r=0.842$ ,  $P=0.000$ ), WBC count ( $r=0.338$ ,  $P=0.008$ ), MCHC ( $r=0.789$ ,  $P=0.000$ ) and platelet count ( $r=0.369$ ,  $P=0.000$ ) whereas negative correlations were found between homocysteine and RBC count ( $r=-0.648$ ,  $P=0.000$ ), hemoglobin ( $r=-0.733$ ,  $P=0.000$ ), hematocrit ( $r=-0.836$ ,  $P=0.000$ ) and MCH values ( $r=-0.402$ ,  $P=0.001$ ). In addition, homocysteine showed positive correlations with PT ( $r=0.564$ ,  $P=0.000$ ) and INR ( $r=0.657$ ,  $P=0.000$ ) and negative correlation with APTT ( $r=-0.690$ ,  $P=0.000$ ).

**Conclusions:** Serum homocysteine was significantly higher in hemodialysis patients compared to controls. Homocysteine was positively correlated with urea, creatinine, WBC count, MCHC, platelet count, PT and INR, and negatively correlated with RBC count, hemoglobin, hematocrit, MCH and APTT.

**Keywords:** Homocysteine, hematological indices, hemodialysis, Gaza Strip.

### **The Antibacterial Effect of Some Medicinal Plant Extracts and their Synergistic Effect with Antibiotic and Non-antibiotic Drugs**

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#### **Abstract**

**Aim of the study:** Assess the antibacterial effect of some medicinal plant extracts and their synergistic antibiotic and non-antibiotic drugs against *Escherichia coli*, *Staphylococcus aureus* and *Pseudomonas aeruginosa*.

**Materials and methods:** The extract of medicinal plants were prepared using Soxhlet apparatus for alcoholic extract, and water reflux for aqueous extracts. The antibacterial activities of extracts were evaluated using the disk diffusion method as well as well diffusion method; the inhibitory zones were recorded in millimeters. The minimal inhibitory concentration (MIC) of the plant extracts against *E. coli*, *S. aureus* and *P. aeruginosa* were assessed using microdilution method. The synergistic effect between plants and extraction of antibiotics and / or Non-antibiotic drugs was assessed using disk diffusion method.

**Results:** The results of this study showed that ethanolic extracts used against *E. coli*, *S. aureus* and *P. aeruginosa* were showed antimicrobial and synergistic effect with most antibiotics better than methanolic and aquatic extracts. Water extracts were showed synergistic effect with the Paracetamol and Loperamide Hcl better than methanolic and ethanolic extracts against *E. coli* and *S. aureus*. Ethanolic extracts were showed synergistic effect with the Paracetamol and Loperamide Hcl

better than methanolic and aquatic extracts against *P. aeruginosa*. The results of this study showed that there is a decrease in MIC in case of methanolic extract of *E. camaldulensis* against *E. coli* (3.125 mg/ml), and the methanol and aquatic extract of *F. sycomorus* (leaves) against *S.aureus* varying from 6.25 to 3.125 mg/ml, and the ethanol extract of *E. camaldulensis* against *P. areuginosa* (6.25 mg/ml).

**Conclusion:** Thereby, our results indicate the possibility of using these extracts in the treatment of bacterial infections, and the results of this study was encouraging, despite the need for clinical studies to determine of the real effectiveness and potential toxic effects in vivo. These results was revealed the importance of plant extracts when associated with antibiotic and Non-antibiotic drugs in control of bacteria. This study suggests the use of Paracetamol and Loperamide Hcl to augment of some plant extracts and antibiotics activities against the most popular infectious bacteria such as *E. coli*, *P. aeruginosa* and *S. areuse*.

### **The Effect of Ramadan Fasting on Anthropometric Measurements and some Biochemical Parameters among Type2 Diabetic Patients in Gaza Governorate**

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#### **Abstract**

**Study Aims:** The aim of this study is to assess the effect of Ramadan fasting on anthropometric measures and some biochemical parameters among T2D Patients in Gaza Governorate.

**Research Methodology:** This study is a cross sectional study (2:1). The study was carried out in the last Ramadan (late of July to August, 2011) in Gaza Governorate. Anthropometric and biochemical evaluation were carried out one week before Ramadan (Visit-1) and one week before its end (Visit-2).

**Study Tool:** Data were collected through questionnaire interview and biochemical analysis were analyzed using SPSS version 14.

**Study Sample:** A total of 80 patients suffering from the diabetes type 2, aged 40 to 65 years, have no history of diabetic complication or other diseases were treated with the same of oral hypoglycemic drugs (OHD), and compared with 40 healthy individuals as controls.

**Conclusions:** In the t-test analysis, there was a statistically significant reduction in the mean of body weight and body mass index at the end of Ramadan month among both groups as compared to pre-Ramadan. Among T2D patients, This study found a statistically reduction in the means ( $\pm$  SD) of fasting blood glucose (FBG) and HDL-C, a statistically significant increase in the mean ( $\pm$  SD) of

serum triglycerides levels (TG), serum total cholesterol (TC) and LDL-C and no change in the mean ( $\pm$  SD) of serum creatinine and urea levels with fasting.

Among control groups, there is a statistically reduction in the means ( $\pm$  SD) of FBG, a statistically significant elevation in the means ( $\pm$  SD) of serum LDL-C, HDL-C and TC and no statistical differences in the mean ( $\pm$  SD) of serum TG, creatinine and urea levels at the end of Ramadan fasting month compared to pre-Ramadan means.

**Recommendations:** Ramadan fasting is relatively safe and devoid of any serious complication among controlled diabetic patients. Furthermore that patients should be properly educated about drug regimen adjustment, diet control, daily activities and possible complications that may suddenly occur and how to deal with them.

**Keywords:** Ramadan fasting, Biochemical parameters, Type 2 diabetes, Anthropometric measurement

### **The effect of *Azotobacter chroococcum* as nitrogen biofertilizer on the growth and yield of *Cucumis sativus***

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#### **Abstract**

Biofertilizer has been identified as an alternative to chemical fertilizer to increase soil fertility and crop production in sustainable farming. The use of biofertilizer is steadily increased in agriculture and offers an attractive way to replace chemical fertilizers, pesticides, and supplements. The main objective of this study is to evaluate the effect of *Azotobacter chroococcum* as nitrogen-biofertilizer on growth and yield of ***Cucumis sativus* (cucumber)** under greenhouse conditions. The study was done by planting 210 cucumber seeds distributed into seven treatments which were used in our study as follows: control (without treatment), biofertilizer only, organic fertilizer only, chemical fertilizer only, organic fertilizer + biofertilizer, 20% chemical fertilizer + biofertilizer, and biofertilizer, (two dose). After 3 months and through **cucumber** growth criteria, (shoot length, root length, shoot wet and dry weight, root wet and dry weight, number of leaves, number of branches), yield parameters, mineral content (N%) of **cucumber** were measured. In the green house experiment, growth parameters of **cucumber** showed that the productivity of cucumber increased. Seed inoculation with *A. chroococcum* increased yield about 6%, compared to

control. The increase of biofertilizer treated plants in dry root weight were 31%, 18% in wet root weight, 11% in dry whole plant weight, 13% in wet whole plant weight, 14% in whole plant length, 10% in number of branches, 27% in number of leaves over control. The increase in shoot nitrogen percentage was 15% in biofertilizer treated plants, where it was 40% in biofertilizer + 20% chemical over control. The increase in root nitrogen percentage was 18% in biofertilizer treated plants, where it was 22% in biofertilizer + 20% chemical over control. Our results provided a proof of the efficiency of *Azotobacter chroococcum* as an important biofertilizer in yield of ***Cucumis sativus* (cucumber)**.

**Key words:** *Azotobacter chroococcum*, non symbiotic nitrogen fixation, cucumber, biofertilizer, chemical fertilizer