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المؤتمر الدولي الأول للعلوم والتنمية

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تقديم

انطلاقاً من حرص كلية العلوم بالجامعة الإسلامية على مواكبة التطورات المتلاحقة في قضايا البحث العلمي والتنمية، وتحديد ومعالجة الإشكاليات التي تواجهها، عقدت الكلية المؤتمر الدولي الأول للعلوم والتنمية.

وإن وجود عدد كبير من الباحثين من الأساتذة المختصين في كل مجالات العلوم من مختلف الجامعات والمؤسسات البحثية المحلية والعربية والدولية، ليشير المزيد من الاهتمام بقضايا البحث العلمي والتنمية لديهم، وليوجد سجل تبادل ونقل الخبرات العلمية، كذلك لفتح آفاق وسبل جديدة أمام الباحثين الفلسطينيين.

الأحياء

Biology

Prophylactic Efficacy of crushed garlic Lobes, Black seed or olive oils on cholinesterase activity in central nervous system parts and serum Lead intoxicated Rabbits

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Abstract

The effect of lead on cholinesterase activity in various central nervous system (CNS) parts and in serum, and the potential of crushed fresh garlic lobes, black seed and olive oils to combat lead poisoning in rabbits were assessed. Control and sodium acetate groups of animals exhibited blood lead level (BLL) not exceeding 10μ /dl. Oral administration of lead acetate elevated BLL to a value of 54.8 ± 3.2 10μ /dl at the end of the experiment i.e. after 20 days. This increase was a function of the experimental time. Treatment of animals with crushed fresh garlic lobes, black seed or olive oils lowered BLL to values of 32.5 ± 2.4 , 42.4 ± 2.5 and 43.6 ± 2.8 10μ /dl, respectively. Lead caused progressive decrease in the activity of acetylcholinesterase in different brain regions and spinal cord over the experimental periods examined. The enzyme inhibition is generally reached its significance ($p<0.05$) after 10 and 20 days of lead acetate intake. Such alteration in cholinergic transmission suggests that lead is able to reach the CNS and exerts its neurotoxic effect. Serum acetylcholinesterase and butyrylcholinesterase were also inhibited. Treatment of animal with crushed fresh garlic lobes, black seed or olive oils improved the enzyme activity in the central nervous system and serum. However, garlic was the most efficient. The ability of garlic to reduce lead toxicity may rely in its antioxidant / chelating action. One can say that the prophylactic efficacy of these natural products is in the order

of, crushed garlic lobes>>black seed oil>olive oil. Supplementation of diets with garlic is recommended to improve the body burden of lead and hence to protect the organ function against lead toxicity.

Biological effects of certain plant extracts against the immature stages of *Galleria mellonella* (Lepidoptera: Galleriidae)

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Abstract

Injection of *Galleria mellonella* larvae by the extracts of dry and green (fresh) leaves lead to significantly increasing of their mortalities. The tested plants were arranged according to their effects as follow: *Melia azedarach* (Meliacege), *Venca rosea* (Apocynaceae), *Allium sativa* (Liliaceous) and lastly *Caucasian antiqurum* (Tracheae). These extracts cause significantly increasing in the durations of larval and pupal stages than that of control group. There was no significant effect between the green and dry leaf extracts were significantly more effective than those of green one on the increasing of percentage of larval mortality. Green leaf extracts were more effective than dry one only on the reduction of the pupal weight. All these biological effects increased significantly by increasing of concentrations of extracts (0.5, 1.0, 1.5 and 2 ug/ larva). Generally, these plant extracts has significant effects on this insect and consequently, it can be consider as an applied safety compounds for control this economic insect which is a serious pest for honey bee industry. Use of it is more desirable for an environmental perspective than other chemical insecticides.

دراسة التأثير البيولوجي للمستخلص الكحولي لبعض النباتات المستوطنة في

منطقة الجبل الأخضر

صالح ابعيو

فخري العبار

كلية العلوم جامعة قاربيونس

بنغازي ليبيا

درست بعض النباتات اللبية المتوطنة في منطقة الجبل الأخضر من ناحية التأثير المايكروبيولوجي، وهذه النباتات هي : *Origanum cyrenaicum*, *Teucrium barbeyanum*, *Anthemis cyrenaica*. *Cirerbita Ballota andereu =iana haimanniana*, *Cynara cyrenaica*, *Echiops cyrenaicus*. *Theligionum cynocrambe* *Arbultus paarii*, *Arum cyrenicum* حيث تم استخلاص 100g من النبات ، في كحول الميثانول وتركيز المستخلص لكمية 50 ml من الكحول النتائج المايكروبيولوجي فتم زرع بكتريا : *Staphylococcus Escherichia col. Klebsiella pneumoniae*, *B-hemolytic streptococcus* *Proteus sp.* *Enterobacter sp*, *Albus*، على أطباق بترى وعرضت نتائج فعالية المستخلصات عليها. وتم دراسة تأثير المذيب الميثانول على أنواع البكتريا المستخدمة.

□

Risk factors of stroke among hypertensive men and women in Gaza Strip

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Background

Hypertensive patients are more likely to suffer a stroke than those patients with normal blood pressure. Despite hypertension other factors such as smoking, overweight, poor diet and lack of compliance with the therapeutic regimen (e.g. medication) may increase the risk of stroke. As hypertension is a major risk factor for stroke. Antihypertensive medication, weight control, diet, physical activity, regular medical follow-up and psychological factors such as low stress each may contribute to a normal blood pressure in hypertensive patients.

Objectives

To identify risk factors which contribute to the development of stroke.

Methods

A pair matched case-control study among 112 patients, who had been hospitalized for acute stroke and history of hypertension, and 224 controls with history of hypertension matched by age, sex starting of therapeutic regimen and enrolment location, was carried out. A structured interview on compliance with medication, diet, weight reduction, exercise, follow-up health care and smoking was used for data collection. Conditional logistic regression models were used for data analysis.

Results

The results indicate that non-compliance to the therapeutic regimen is a substantial risk factor for the development of stroke in Gaza (medication taking as prescribed, OR. 6.07, CI 1.5-24.07 High salt diet, OR. 4.4, CI 2.05-9.9, High fat diet, OR. 4.6, CI 2.09-10.4, physical exercise, OR. 0.26, CI 0.12-0.57, smoking , OR. 2.12, CI 0.82-5.5, high level of stress, OR. 2.77, CI 1.4-5.3).

Conclusions

Further studies are needed to explain the knowledge and misconceptions of patients with hypertension in Gaza.

Gastrointestinal Parasitic Infections in Bottle –Fed And Breast – Fed Children In Benin City, Nigeria

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Abstract

Feeding children (artificial milk and cereal meals) with the aid of plastic or glass bottles carrying plastic teats is a common practice especially among working mothers. A study was undertaken to determine the prevalence of protozoan and helminth gastrointestinal parasites in bottle-fed children, in Benin City, Nigeria. Stool samples (n=1840) were collected from children aged 0 – 2 years for a period of 12 months. Out of this number, 500 and 340 were from symptomatic newly admitted bottle-fed and breast-fed children respectively, in the

University of Benin Teaching Hospital (UBTH) and the central Hospital, the two largest hospitals in Benin city , 500 stool samples were also collected from bottle-fed children and 500 from breast-fed children of volunteer mothers outside the hospital. The stools were examined by conventional methods and parasites, where present, were identified. The investigation revealed five parasites – *Ascaris lumbricoides* (21.3%), *Trichuris trichura* (10.1%), *Strongyloides sp* (5.2%) *Entamoeba histolytica* (3.7%) and *Guardia intestinalis* (1.7%) Bottle-fed children had significantly higher prevalence of all the parasites- 21.3% in admitted children, 16.3% in children of volunteer mothers as against 3.1% and 1.3% respectively, in breast-fed children. The adoption of the baby – friendly practice (sole breast feeding for up to two years) recommended by the World Health Organization should be embraced so as to reduce the prevalence of gastrointestinal parasitic infections, a serious health problem in children, globally. A survey of other diseases in these two groups of children is recommended.

Key-words : Gastrointestinal parasites, bottle – feeding breast-feeding, children , Nigeria.

Within host asexual parasite-gametocyte behaviour during uncomplicated *Plasmodium falciparum* malaria

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Abstract:

The asexual parasite –gametocyte behaviour in vivo was studied in 142 children with acute symptomatic uncomplicated malaria. At presentation, the clinical features of malaria in the host were similar in those who had both asexual forms and gametocytes or asexual forms alone however a significantly higher proportion of those carrying gametocyte at presentation or during treatment with chloroquine (CQ) were males, aged ≤ 5 years, had significantly lower presenting asexual parasitaemia and less proportion of children with fever. The therapeutic responses to CQ significantly differ in those who had or did not have gametocyte at presentation. The prevalence of resistant infection at day 14 was higher in those who had gametocytes after treatment with CQ the area under the parasite density-time curve (AUC_{pd}) was significantly lower ($p=0.00001$) and fractional reduction of area under the parasite density – curve at 24h (FrAUC_{pd24h}) and at CQ ($P=0.00001, 0.000$ respectively) in these children, the half-life of parasitaemia ($t_{1/2pd}$) significantly correlates with FrAUC_{pd24h} ($r^2=0.14, P=0.01$). Thus, parasite adaptability modulates for male gender selection, low incidence of fever. Low parasitaemia in children bid for gametocyte carriage and increased potential for the clearance of asexual forms of the parasite within 24 hours of commencement of treatment,

promoting gametocyte survival in the host. These findings provide further evidence of risk factors for gametocyte carriage and within host transmission potential of the interaction of both asexual and the sexual forms of malaria parasite.

Keywords: host, asexual parasite, gametocyte, plasmodium falciparum, uncomplicated malaria.

MYCORRHIZA IN THE PERENNIAL GRASSES OF CHOLISTAN DESERT, PAKISTAN

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Abstract

About 480 Km long and 32 to 192 Km wide Cholistan desert (Akbar, et al , 1996) is located between Latitudes 27° 42' and 29° north and 69° 57' 30" and 72° 52' 30" East Longitudes (Akram, et al, 1993). Its climate is sub-tropical continental desert type characterized by low and sporadic rainfall (100-200 mm per annum, Akram et al, 1993) high temperatures, low relative humidity, high rate of evaporation and strong summer winds (Akram, et al , 1986). The principal adaptation is, however, governed by the availability of moisture and soil chemical composition (Chaudhry and Khan, 2002)

High aridity and brackish subsoil water collectively constraint the usual agricultural practices, therefore, the present land use in Cholistan desert is as natural grazing grounds. The local inhabitants are pastoral nomads and rear large herds of livestock. Since the grazing is open without any control therefore, grasses being the most palatable are the first to suffer

from overgrazing leading to habitat deterioration especially during the drought years.

Information about the potential significance of mycorrhizae for the restoration of derelict habitats in Pakistan and particularly from Cholistan desert is lacking. Arbuscular mycorrhizal fungi (AMF) are ubiquitous and abundant soil mycoflora and constitute an important functional component of the rhizospheres of 80-90% land plants in natural, agricultural, and forest ecosystems (Brundrett 2002). They form a fundamental link between biotic and abiotic components of the soil system (O'Neil et al., 1991). Studies over the past few years have demonstrated that arbuscular mycorrhizas (AM) influence several aspects of plant community structure and function by influencing various parameters such as plant diversity, species composition, and successional dynamics (Harnett and Wilson 2002). Plant species diversity may be positively (van der Heijden et al. 1998) or negatively (O'Connor et al. 2001) correlated with AMF populations. AMF may also alter plant species composition with no net effect on species richness (Smilauer and Smilauerova 2000), or may alter rates of succession (Smith et al. 1998). AM status of plants and their succession can vary depending on the moisture and nutrient conditions of the soil (Allen and Allen 1990).

In view of the fact, perennial grasses consist major portion of the Cholistan desert xeric vegetation and play a fundamental role in livestock rearing, the arbuscular mycorrhizal status of eleven perennial grasses of Cholistan desert with high fodder value have been studied. Such mycorrhization studies may be important for the restoration of disturbed habitats and range management programs.

For the collection of roots and rhizosphere soil samples seven sites were selected within the Cholistan desert. These sites were selected on the bases of grass species dominance or co-dominance at a particular location and the sampling was carried

out during August-September 2002, right after rainy season, when the plants were green and fine roots were present in all the grass species under study.

Soil samples were collected to the depth of approximately 30cm from the root zones of each grass species and stored at 4°C until analyzed. Three soil samples were taken for each grass species at each study site, thoroughly mixed and divided into three sub samples of 100g each. Spores were extracted from the soil samples by wet sieving and decanting technique (Gerdeman and Nicolson, 1963). Healthy spores of each distinctive morphotype were directly counted under a dissecting microscope and recorded as mean spores per 100g..

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plant community. In: Smith SE (ed) Diversity and integration in mycorrhizas. Proc. 3rd International conf. On Mycorrhizas.

O'Neil EG, O'Neil RV, Norby RJ (1991). Hierarchy theory as a guide to mycorrhizal research on large scale problems. Environ Pollut 73: 271-284. Hartnett DC, Wilson GWT (2002). The role of mycorrhizas in plant community structure and dynamics: lessons from grassland. Plant and Soil 244: 319-331. The fine feeder roots from 10 individual grass species at each site were collected. Washed. Fixed in FAA (formaldehyde: acetic acid: alcohol – 5:5:90, V/V) and stained as per Phillips and Hayman (1970). The data for the extent of infection per 100cm roots and percentages for presence of arbuscules, coils. Vesicles and brown infection per 50cm roots was collected from each slide. Percentages for the root infection were obtained by gridline intersect method (Giovanetti and Mosse, 1980). Heavily pigmented roots were cleared with H₂O₂ prior to staining.

Results showed that *Sporobolus iocladius* roots had highest (36.8cm per 100 cm) extent of AMF infection while maximum percentage of infection (92% per 50 roots) was recorded in the roots of *Panicum antidotale*. Coiling/cutting of AMF hyphae was not observed in the roots of *Panicum antidotale*, *Lasiurus scindicus* and *Cyperus* species.

From the rest of grass species, 43% coiling/cutting was recorded as highest in the roots of *Cenchrus ciliaris* compared to 8.2% as lowest in the roots of *Ochthocloa compressa*. 27.27% grass species showed arbuscular infections on the other hand 100% studied grasses were found with vesicular infection in their roots. Except *Cenchrus biflorus*, the brown infection was the constant feature along with AMF infect in all the other grass species under study.

Key words: AMF infection, Grass species, Roots, grass species, Cholistan desert

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Preliminary Survey of Terrestrial Vertebrate Fauna and People's Awareness Towards Wildlife in the Northern Governorate of the Gaza Strip

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Abstract

This study deals with the terrestrial vertebrate fauna in the Northern Governorate of the Gaza Strip. The ecological awareness of people (n=75) towards wildlife was investigated using a questionnaire specially designed for this purpose. A total number of 121 terrestrial wild vertebrate species (14 mammals, 86 birds and 21 herpatofauna) in addition to many extinct mammalian species was recorded. Many wildlife species are in the way of extinction where many anthropogenic factors, including overpopulation and residential creeping, lack or weakness of awareness and environmental education, destruction of ecological habitats. Over-use of pesticides, poor implementation of environmental laws and legislations, and the various Israeli military operations imposed by the Israeli occupation and settlements, were found to threaten wildlife resources in the area. Although population studies were not conducted in this survey, the populations of many have diminished as well. The hazards imposed by wildlife on both people's health and properties were also stated More than three-quarters of the interviewed people 57 (76.0%) believed in

the role of the wastewater treatment facility and its effluent pond in attracting biodiversity species. The majority of respondents 65 (86.7%) ensuring the importance of implementation of environmental laws and legislation to conserve nature and hence wildlife. Finally, the cooperation of different parties to enhance awareness and wildlife protection is highly recommended.

Mutagenic effects induced by the estrogenic mycotoxin Zearalenone In White albino rats

Dr. Mayson Louzon

Chromosomal aberration of the mycotoxin Zearalenone was evaluated on female albino rats. The investigation was assessed using chromosome aberration in bone marrow in the mothers and their embryos and the frequency of polychromatic erythrocytes with micronucleus test. Zearalenone was administered to pregnant female rats at the day (6-15) of gestation with 2 doses level, 15mg/kg, and 30mg/kg. All the dams were sacrificed on the morning of day 20 of gestation. Metaphase chromosomes were prepared from bone marrow cells of mothers and from all tissue of the embryos. The experimental evidence obtained from this work showed that Zearalenone induced severe chromosomal damage in mothers and their derived embryos. In bone marrow cells of mothers, Zearalenone induced 53% and 75% of aberrant cells in Pregnant rats received 15mg/kg and / or 30mg/kg Zearalenone respectively, versus 4% in the control group. And CA % in embryos derived from mothers treated with 15 and 30

mg/kg Zearalenone respectively was found to be 76% and 96% versus to 6% in control group.

Also micronucleus test showed that the frequency of polychromatic erythrocytes with micronucleus in the control samples was found to be 4.1(+1.197). Zearalenone treatment induced a very highly significant increase of micro nucleated polychromatic erythrocytes in bone marrow cells of pregnant rats. This increase was found to be dose related as 15mg/kg produced 13.1 (+3.07) whereas, 30mg/kg induced positive micronuclei in an average of 18.5 (+ 4.45).

In general CA% in the fetal cells of control and treated groups was higher than that recorded in their maternal bone marrow cells it is well known that the principal target for the induction of chromosomal aberration is DNA. So, the high level of chromosomal abnormalities reflects the damaging effects caused by Zearalenone on DNA constituent.

MEMATOLOGY AND HISTOCHEMISTRY OF LIVER AND KIDNEY OF RABBIT DURING PESTICIDE TREATMENT AND RECOVERY

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Abstract

The present work is aimed to show the induced toxic effects, after treatment with daily oral administration with vertemic 1/10 LD50. The possibility of recovery and attaining near to normal condition after vertemic insecticide withdrawal was also investigated.

The following parameters were estimated, Hematological parameters including complete CBC, Hb, RBC, MCV, MCH, MCHC, WBC, and platelet.

Biochemical parameters including Sugar, Cholesterol, Triglyceride Protein, Albumin, Urea, Creatinine, ALT, AST, Alkaline phosphate and Bilirubin.

Histological structure of kidney and liver were also studied.

Although the daily oral administration of vertemic insecticide caused obvious decrease in the body weight at all time intervals studied administration of vertemic insecticide provoked a general increase in white blood cell count.

Vertemic showed obvious decrease in red blood cell count (RBC). The effect of vertemic insecticide on hemoglobin content (Hb) was parallel to their action on RBC count. Hematocrit value showed a general decrease in response to the treated vertemic insecticide.

Blood platelets count (PLT) showed general increase in response to vertemic insecticide.

Oral administration of vertemic insecticide caused an increase in mean corpuscular volume (MCV), and mean corpuscular hemoglobin (MCH) at all time interval investigated and decrease in mean corpuscular hemoglobin concentration (MCHC). In recovering conditions the previous hematological parameters begin to improve.

A general increase in AST, ALT, bilirubin and alkaline phosphatase activities were noticed in vertemic treatment rabbits. However, these increments were regressed to near to normal levels in recovering conditions.

The daily oral administration of vertemic insecticide for 8 weeks caused a general increase of urea, uric acid and creatinine concentration in rabbit's blood serum compared to the control level.

Both serum total protein and serum albumin were decreased compared to the control group.

However the declines in serum total protein and serum albumin were backed near to the normal levels in recovering rabbits.

Glucose content of rabbit's blood serum showed general increase in response to vertemic insecticide administration. In general, results indicated a general increase in serum cholesterol and triglyceride level at the different time intervals studied.

However these increment in sugar, cholesterol, triglyceride, urea, creatinine and uric acid were backed near to the normal levels in recovering rabbits.

The main histopathological change in the liver and kidney organs were as follows:

The liver of treated rabbit showed excessive hepato cellular damage, as degenerative and necrotic changes; vacuolated nuclei; periportal coagulation necrosis as well as distributed inflammatory cells throughout the liver and the kidney.

The renal tubules suffered from hyaline degeneration, infiltration of inflammatory cells in between the degenerated renal tubules with hemorrhage.

However, these result returned to near to normal cases in recovering conditions.

It is concluded from the results of the presents study that administration of vertemic insecticide caused alteration that are directly proportional to dose applied and experimental duration.

Key words; vertemic – hematological parameters – sugar – cholesterol – histopathology – liver – kidney – triglycerides – protein – albumin – uera – uric acid – creatinine – ALT – AST alkaline phosphatase – bilirbin – rabbit.

Biodiversity, Indigenous Knowledge, Intellectual Property Rights, National Agricultural Research System And Roles of Scientists: A Case From India

Anadkumar, S¹, Vijayaragavan, K², Anita Jhamatani² and Premalita Singh²

Biological diversity, the incredibly vital in-thing of our environment, is now immensely valued world over. Of late, biodiversity is becoming a highly-sought-after resource by outsiders due to its use and economic values. But outsiders knew relatively less about uses of biodiversity. Instead, since time immemorial, the indigenous and local people were depending on the biological diversity for livelihood. Biodiversity nurtured local people. Local people nurtured biodiversity. Eventually, indigenous people have developed and patronized knowledge about biodiversity and its uses. This indigenous knowledge of biodiversity is an intellectual property. The indigenous and local communities are innovators, custodians, partons and owners of this intellectual property. But, multifarious factors like piracy influence extinction of indigenous intellectual properties. Obligated by such concerns the public funded National Agricultural Research Systems inevitably responds. Ordained by such obligations of local importance and global significance, a study was conducted in Indian Agricultural Research Institute, New Delhi, India, since it is the premier research and educational institute in the country. The study revealed 29 roles for protection of biodiversity related indigenous intellectual properties and rights. It was found that all the roles were held with consensus among the scientific community. The roles are listed below.

A. Respect and Recognition Roles

1. Identifying innovations and biodiversity related knowledge of indigenous and local communities.

2. obtaining bioresources and related knowledge in accordance with the customary laws of the concerned community.
3. Identifying scientific principles underlying the knowledge innovation (how they work & why the work) of indigenous and local communities.
4. Characterizing the innovations/knowledge of indigenous and local communities.
5. Having close face to face dialogue with indigenous and local communities in order to identify their needs, perceptions, importance of field conditions and their preferences.

B. Preservation and Maintenance Roles

1. Helping to set up a system of registration of innovations/knowledge of local people.
2. Contributing to database about innovations/knowledge of indigenous and local people.

C. Support and Promotion Roles

1. Identify the scope of value addition of innovation/knowledge of indigenous and local communities.
2. Exploring possibilities of adapting knowledge/innovation of one region for another.
3. Encouraging postgraduate students to take up thesis problems on specific aspects of innovations of indigenous and local communities.
4. Citation of contributions made by local inventors, communities and groups.
5. Carrying out all communications in local language with indigenous local communities.
6. Writing and speaking in local language about the knowledge systems obtained from the indigenous and local communities.
7. Sensitizing indigenous and local communities on the possibilities of community intellectual rights.

8. Helping the community to develop institutional capacity to appraise and enter into agreements on sharing bioresources.

D. Involvement and Encouragement Roles

1. Take-up on-farm research on the innovations/knowledge of indigenous and local communities related to biodiversity.
2. Conduct joint inquiry with farmers about their innovations and knowledge.
3. To experiment with indigenous and local communities in their capacities to innovate and invent.

E. Prior Informed consent, Mutual Agreement and Approval Seeking Roles

1. Seeking recommendations from regulatory authority vested with the responsibility of ensuring the provisions of the Government's executive order for access to bioresources and related knowledge.
2. Getting approval from institutions of indigenous and local communities.
3. Notifying the community at large by some means like public meetings.
4. Searching bioresources and related knowledge within the ancestral lands and demarcations of indigenous and local communities only after prior informed consent.
5. Submitting a copy of the research proposal based on indigenous bioresources & knowledge (regarding prospecting and /or of bioresources and related knowledge) to the recognized head of the local or indigenous communities.

F. Equitable Sharing Role

1. Granting access to collected specimens and relevant data to all citizens of the nation and the national government entities whenever these specimens and related knowledge are deposited in depositories.

2. Informing the local and indigenous communities (and the regulatory authority) of all the discoveries made from the research, collection, exploitation, use of bioresources and related knowledge.
3. Sharing the findings at different stages with the providers of bioresources and related knowledge.
4. Informing the local and indigenous communities (and the regulatory authority) of all the commercial products made from the research collection, exploitation and use of bioresources and related knowledge.
5. Developing insights and mechanisms and hence contribute to scope, extent and form of compensation to be rendered to the local communities when their knowledge or bioresources are obtained for any use.
6. Paying royalty to indigenous and local communities for commercial use of the bioresources and related knowledge acquired from indigenous and local communities.

These protection roles were standardized through rigorous psychometric process, survived a test of consensus among scientific community and accordingly have proven statistical validity. Hence, the roles are recommended for similar National Agricultural Research Systems to conserve and sustainably use indigenous knowledge of biological diversity consistent with the spirit the International Convention of Biological Diversity for humane science and sustainable development.

الفيزياء

Physics

Floquet scattering through a time-periodic potential for a position-dependent electron effective mass Structures Z.I.

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Abstract

Analytical results for the transmission probability of an electron traversing a quantum barrier subject to a harmonically driven potential is presented. We consider the quantum barrier consisting of two static regions *I* & *III* and a central driven quantum barrier region *II* with position-dependent electron effective mass. The aim of this work is to explore the effect of space dependence of the electron effective mass on the transmission coefficient.

The Floquet scattering theory is developed to investigate the electron transmission subject to the harmonic driving force $V_1 \cos(\omega t)$. the Floquet states will be used to construct the Floquet S matrix then the transmission probabilities of our system will be studied.

Globalization issues and the declining trend in basic science education

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Abstract

Globalization is irreversible issue. Technological improvements are the requirement of a developing society. Entrepreneurs need technocrats and no basic science graduated. How the technology alone can improve if no more advancements in basic science is permitted? The paper address all such issues giving emphasis to physics education in Indian Universities..

Radiation Measurements in Soil of Magazi in Middle Region of Gaza Strip Using Gamma Detector

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Abstract

Natural radiation is part of earth's environment exist in atmosphere, in the earth, and in our own bodies. An average person receives a radiation dose of about 300 millirem per year from natural sources compared to a dose of about 50 millirem from produced artifitial sources of radioactive material such as medical x-ray Natural radioactive material in Rock and soil account for about 28 millirem or 8% of the radiation dose a person receives in a year from all sources. The earth's crust contains small amount of Uranium, thorium and radium as well as radioactive isotopes of several elements Co, Cs, Cr, I, ... , including potassium. The radiation dose comes from rock, soil, and some building material (such as bricks and concrete). Natural radioactive material are one of most important source of radiation exposure to humans. Although these material contain low-level radioactivity (LLR),the accumulated dose can be high. Radiation contents of soil samples were tested using Gamma detector (WALLAC 1470 Wizard), samples were collected from middle region of Gaza-Strip in Magazi. The samples placed in the Gamma detector to search for radionunclides, ^{134}CS , ^{57}Co , ^{51}Cr , ^{125}I , ^{129}I in the soil samples using standard calibration normalization. The results were positive radioactivity for the previous radionuclides.

The two dimensional polaron under the effect of an external magnetic field

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Abstract

Using the strong coupling theory, the problem of a two dimensional polaron is studied under the effect of an external magnetic field. A modified coherent phonon state operator is used to take into account the fractional admixture of whether the lattice deformation tends to cover the entire Landau orbit or the mean electron position. The theory is observed to reproduce the desirable asymptotic limits attained by the reproduce the desirable asymptotic limits attained by the perturbation or the adiabatic theories.

ضبط الجودة وحساب الجرعة الإشعاعية لجهاز الطبقي المحوري

إعداد : ياسر حسين الشاويش

□ رئيس قسم الوقاية الإشعاعية - دائرة الطاقة النووية والوقاية الإشعاعية

نظراً لمحدودية تقنية التصوير الإشعاعي باستخدام أشعة التقليدية وبقائها عاجزة عن التصوير التشريحي لمقاطع جسم الإنسان، فقد تم تطوير تقنية حديثة عام 1972 في المملكة المتحدة هي التصوير الطبقي المحوري (Computed "CT" Tomography) والتي كانت انطلاقة إلى عالم جديد في مجال التشخيص الإشعاعي التقليدية تمكنا من رؤية وإظهار المقاطع التشريحية للجسم البشري خالية من ظل الأنسجة، ومع إثبات وجود آثار سلبية للأشعة كان من الضروري وضع مستويات إرشادية للمرضى وكذلك ضبط جودة الأجهزة ووضع قواعد الوقاية وأمثلة العمل بهدف تقليل الضرر الذي قد يسببه الإشعاع لكل من العاملين في تلك المجالات وعموم الناس بالإضافة إلى زيادة العمر الافتراضي للجهاز المستثمر.

The Effect of High power Transmission Line on Radon and Daughters Concentration in Dwellings Located Under its Effectiveness

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*(2) Researcher in Atomic Energy Commission of Syria (AECS)
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Abstract

In fact, we distributed about 150 dosimeter, each one contains one plastic track detector CR-39 in dwellings located under and next to high power transmission lines in AL HAGAR AL ASWAD, south Damascus. Were used to measure alpha-emission from the Radon and its daughter. That high power transmission lines which consists of three circuits (230Kv AND 230Kv) every one consists of three phases.

Noticed that increasing to Radon and Radon daughter concentration in dwelling located under high power transmission line compared with those on both sides of high power transmission lines, and that is due to the effective of EMF (Electromagnetic Field) on Radon and Radon daughter concentration.

Renewable Energy and Sustainable Development in Palestine

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Abstract

This paper summarizes the present status of the energy sector in Palestine, concerning to consumption, amount of energy availability and the obstacles facing development of this sector. Also, it shows the expected energy demand level throughout the upcoming ten years and the potential of renewable energy resources and its utilization in order to overwhelm the rapidly deficit in energy resources availability. The national and political motivations behind the development and establishment of small renewable energy projects pointed.

Path Integral Quantization Of Charged Particle Moving in Constant Magnetic Field

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Abstract

A canonical path integral quantization of a charged particle moving under the influence of magnetic field is done. The Hamilton –Jacobi formalism is used to obtain the equations of motion. The integrability conditions lead us to obtain the canonical reduced phase-space coordinates without using any gauge fixing condition.

A TREATMENT OF A HIGHER-ORDER SINGULAR LAGRANGIAN AS FIELD SYSTEM

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Abstract

The higher-order singular Lagrangian system is treated as field system. Euler-Lagrange equations are solved with some constraints. An example is studied and a comparison with Hamiltonian formulation is done.

Origin and escalation of mass-energy equation $\Delta E = \Delta mc^2$

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PACS : 03.30 + p,01.70 + w,01.65 + g,01.55. + b

Abstract

$E = \Delta mc^2$ existed before Einstein's derivation in Sep. 1905. Isaac Newton, S. Tolver Preston, Poincare, DE Pretto and F. Hasenohrl are the philosophers and physicists who have given idea of $E = \Delta mc^2$. Einstein derived existing $E = \Delta mc^2$ starting with result of relativistic variation of light energy, but finally obtained $E = \Delta mc^2$ under applying classical conditions ($v \ll c$). After Einstein, Max Plank also derived the same independently. Max box Born has expressed surprise over non-inclusion of previous references by Einstein in the derivation of $E = \Delta mc^2$.

Electronic Transmission Through Quantum Wire with Periodic Potentials

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abstract

By means of mode-matching and transfer matrix methods, we calculate the transmission of an electron passing through quantum wire consisting of several barrier potential. We take into account the space – dependent electron effective mass and the coupling between components of the motion of an electron in directions parallel and perpendicular to the interfaces of barriers. Our results show that the coupling effect leads to significant changes on the transmission spectra. In addition , the variation of the geometrical dimensions is also investigated.

Path Integral Quantization Of Relativistic Spinless Particle in an External Electromagnetic Field

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Abstract

The Hamilton-Jacobi formalism of constrained systems is discussed. The equations of motion for a singular systems are obtained as total differential equations in many variables. The integrability conditions for the system lead us to obtain the canonical reduced phase-space coordinates without using any gauge fixing condition. The path integral quantization of relativistic spinless particle in an external electromagnetic field is also discussed.

ON THE LAGRANGIAN FORMALISM OF QED

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Abstract

The QED theory is treated as a constrained system using the Euler-Lagrange equation for field system. It is shown that a singular Lagrangian as a field system for QED is in agreement with the general Lagrangian approach and the canonical Hamiltonian approach of constrained systems.

Keywords: Lagrangian and Hamiltonian approach, Field theory.

PACS Nos: 11.10Ef, 11.10, 03.65w

Finite Difference Time Domain Method Over Hexagonal Tessellation in Rectangular Waveguide Structure

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abstract

Rectangular waveguide structure containing dielectric medium is analyzed and investigated by using Finite Difference Time Domain method over Hexagonal Tessellation. In this communication, a simple explicit Finite Difference Time Domain method is developed through the Taylor series expansion of the two-dimensional wave equation. We study the stability condition and the convergency in the proposed structure.

Stability of Non linear Te surface Waves on nonlinear Dielectric Cladding

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ABSTRACT

The stability characteristics of non-linear surface waves propagating at a lateral antiferromagnetic non magnetic superlattices (LAN substrate and a non-linear dielectric cover have been simulated numerically by using the perturbation method. LANS which are linear frequency-dependent gyromagnetic media, described with an effective-medium theory [1]. The growth rate of perturbation [5] is computed by solving the dispersion equation of perturbation. We found that the nonlinear surface waves are always unstable because their growth rate of perturbation δ is always real with the existence of the magnetic matter of permeability tensor μ_e . This means that the stability of nonlinear surface waves is magnetic fraction dependent. The variation of the nonlinear surface waves energy flow [2,3] along the propagation axis as a function of the effective index n_x for different values of the saturation parameter μ_p has been studied . It illustrates that the

energy of the non-linear surface waves increases with increases with increasing μ_p . The spatial evolution [4] of the steady state field amplitude is determined by using computer simulation method [5]. The calculation shows that with increasing the n_x at fixed μ_p the field distribution is sharpened and concentrated in the non linear mediu.

Radiant cooling or heating:

Role of a metallic layer deposited on glass

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Abstract

A terrestrial-based blackbody absorber (emitter) exposed directly to solar radiation, when atmospheric effects are taken in to consideration, acquires a reference temperature of about 365 K. The effect of a window placed above the absorber is either an increase of a decrease of the reference

temperature, depending of the optical properties of the window. A radiant transfer model composed of a blackbody absorber placed under a self-supported horizontal window is presented. There is no contact between the absorber and the window, and only heat transfer by radiation is considered. For this initial study, convective and conductive transfers are neglected. The window may have multilayered coatings to change its radiative properties of absorptance, reflectance, and transmittance.

First, the energy balances for the absorber and window are reported. The emission of the two faces of the window is assumed to take place according to the Lambert law. From the energy balances, the computed value of the absorber temperature for a normal solar ray of incidence and a glass window of 3mm thick is about 422 K; this value is greater than the ambient temperature assumed to be 316 K. The increase of the absorber temperature is due to the absorptance of the glass in the infrared range corresponding to the emission of the blackbody. A metallic coating a few microns thick modifies the window radiative properties in the infrared and visible wavelength regions; its effect is an increase or a decrease of the absorber temperature depending on coating thickness and composition and whether or not the coating faces the absorber or faces the exterior. The absorber and window temperatures are given for different thicknesses and composition of the coating. Distinguishing the two cases when the coating faces the absorber or the sun, the increase or decrease of the absorber temperature is demonstrated from the radiative properties of the window and from the total transmitted, absorbed, and reflected energy by its two faces of the window. This model is applied to the temperature control in a real room.

**The Origin of Generalised Mass-Energy Equation
 $\Delta E = A c^2 \Delta M$: and its applications in General physics
and cosmology.**

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Einstein's 27 Sep 1905 paper available at
http://www.foumilab.ch/etexts/Einstein/E_mc2/www/

Abstract

Einstein's (Sep. 1905) derivation theorizes that when light energy (L) is emanated by luminous body then its mass diminishes as $\Delta m = L/c^2$ and this equation is speculative origin (without proof) of $\Delta E = c^2 \Delta m$. The same derivation predicts that mass of luminous body inherently INCREASES ($\Delta m = -0.03490 L/cv = L/c^2$) when it emits light energy in some cases, mass of body also remains same ($\Delta m = 0$).

Alternate equation $\Delta E = A c^2 \Delta M$ has been suggested, which implies that energy emitted on annihilation of mass (or vice versa) can be equal, less and more than predicted by $\Delta E = c^2 \Delta m$. The total Kinetic energy of fission fragments of U^{235} or Pu^{239} is found experimentally 20-60 Me V less than Q-value predicted by $\Delta m c^2$, it is explainable with $\Delta E = A c^2 \Delta M$ with value of A less than

one. $\Delta E = c^2 \Delta m$ is yet unconfirmed in chemical reaction. Energy emitted by Gamma Ray Bursts (most energetic event after Big Bang) in duration 0.1100s, is 10^{45} J which can not be explained by $\Delta E = \Delta mc^2$, similar is the case of Quasars. It can be explained with high value of A i.e. 2.57×10^{18} . The mass of particle Ds (2317) discovered at SLAC, have mass lower than current estimates; it can be explained with value of a more than one. $\Delta E = Ac^2 \Delta M$, explains that mass of universe 10^{18} kg was created from dwindling amount of energy (10^{-444} J or less) and A is 20568×10^{-471} J or less; and in the end may reduce to small energy. It gives explanation for big bang, annihilation of antimatter in hadron epoch < black holes and for dark matter etc. For origin of inherent gravitational energy it implies that it is another form of madd like other energies, hence gravitation and mass are inseparable.

Electrical and Structural Properties of Anatase Titanium Dioxide Nano-Structured Materials For Photovoltaics

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Abstract

This is a preliminary attempt to produce low cost technique for solar cell application based on inorganic metal-oxide). Titanium dioxide (TiO_2) thin films are prepared by sol-gel dip-coating technique, in order to study DC electrical and structure of TiO_2 nanoparticle. Films are deposited on conducting (ITO coated) glass substrates under ambient temperature in air in clean room. Electrical properties (DC) were studied through a digital Keithley 6571A electrometer, as a result I (V) characteristics of the device structure of Al/ TiO_2 /Al show exponential behaviour, temperature dependence, voltage) mechanism. The activation energy (E_a) of TiO_2 gave two values depending on temperature regimes. The conductivity (σ) increases with the voltage and the film was conductor. X-ray diffraction (XRD) results show the films to be polycrystalline, single phase anatase (A) type with crystals oriented mostly in A (101) plane. Atomic force microscope (AFM) image shows nanocrystalline structure of the films

with particles of uniform size and circular shape. Scanning electron microscope (SEM) images illustrate the films under strain, with shrinkage of cluster particles. Energy dispersion spectrometry (EDS) spectra identified the elements of TiO₂ thin films on particle and on area, provide that film and substrate were rich in Ti and Si.

Nonlinear TE surface waves in an a Layered of antiferromagnet-superconductor structure

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Abstract

This paper describes the theoretical characteristics of nonlinear transverse electric surface waves TE propagating at microwave frequencies in a layered structure of superconductor film bounded by an antiferromagnet substrate and linear ferrite cover. The effects of the operating angular frequency and temperature of superconductor on the dispersion characteristics have been examined. The power flow has also been studied as a function of the reduced phase and attenuation constants.

Absence of Ferromagnetic I Ising model on Directed Barabasi-Albert network

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Abstract

With up to 5 million spins, the existence on spontaneous magnetization of Ising spins on Directed Barabasi – Albert networks is investigated by Monte Carlo simulations. We confirm our earlier result that the systems magnetization for different temperatures T decays after a characteristic time τ (T), which is extrapolated to diverge at zero temperature by amodified Arrhenius law or perhaps apower law.

Measurement of Radon Concentration in Soil at North Gaza, Palestine

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2 Physics Department. Islamic University-Gaza

Abstract

Solid state nuclear track detectors (CR-39) are used to measure radon concentration in soil at north Gaza, Palestine. One hundred sixty (160) CR-39 dosimeters were distributed in five different locations on north Gaza) East Biet Hanoun, West Biet Hanoun, Al SHaaf, East JAbalia and Biet Lahia).

Result obtained shows that radon 222 levels very between 23.5 Bq/m³ and 584.1 Bq/m³ The average radon concentration in soil air at north Gaza was 207.24 Bq/m³

Electrical Conduction of Iodine Doped Poly (9-vinylcarbazole) Films

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Abstract

DC electrical conduction of iodine doped Poly (9-vinylcarbazole) (PVK) films was studied at various dopant concentrations and film thicknesses. The current-electric field dependence indicated that the electrical conduction is governed by Schottky mechanism. The conduction in these films increases as the temperature increases with a thermal activation energy α of the DC conductivity typical of electronic conduction (~ 0.47 eV).

PACS numbers: 73.61.-r, 73.61.PH

الكيمياء

Chemistry



Dye Sensitized Solar Cells

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Abstract

The demand for energy has increased exponentially in the recent years as a reasonable outcome of increased population and industrial expansion. Almost all technological processes are totally dependent on stable energy resources and effects of a decrease in energy are just unpredictable. Scientists have been actively involved in research projects aimed at developing low energy consuming technologies as well as looking for new resources. The first step was to identify alternative forms of energy which do not possess such finite limits; and have a low risk. Of course, nuclear energy was considered but dangerous accidents, like the Chernobyl in 1986, will not encourage those in favor of this energy source to exclude looking for alternatives.

As the demands of the world continue to grow, it is almost accepted for granted that renewable resources will definitely be the solution for providing adequate energy. Chemists are anticipated to perform a major breakthrough in this regard. The definition of the phrase "Renewable Energy" was put as energy flows which are replenished at rates comparable to which they are used. Undoubtedly solar energy is a major energy source that freely transmits its energy to the earth all days all over the years. Capturing solar energy for direct use and storage is thus a promise of a renewable source of energy. The field of solar energy is rather diverse starting with use of semiconductor

properties to versions which use nanotechnology in its highly expanding concept.

In this presentation, the Chemistry/Physics interface of the solar cell will be emphasized. Subsequently, problems related to light harvesting and charge injection will be addressed.

The Molecular Surface Electrostatic Potential as a Tool of Studying Chemistry

Presented by:

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Abstract

Molecular Surface Electrostatic Potential (MSEP) is rigorously defined in terms of the electron density, and has very interesting topological characteristics since it explicitly reflects opposing contributions from the nuclei and the electrons. Over the past 25 years, MSEP has become firmly established as an effective guide to chemical reactivity and molecular interactions. Currently, MSEP is being applied to a variety of important chemical and biological systems.

In this lecture, a general survey of MSEP Relationships to several intrinsic molecular properties is presented and discussed.

□

تقدير الطاقة والمواد الغذائية المنتجة لها لطلبة التمريض في قطاع غزة

بكر محمود الزعبوط * ومحمود إسماعيل الحبيبي **

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** أستاذ الكيمياء الحيوية والتغذية المساعد، كلية فلسطين للتمريض، وزارة الصحة، غزة.

ملخص البحث //

خلال هذه الدراسة تم تقدير كمية الطاقة والمواد المنتجة لها لعينتين من الطلبة، إحداهما من كلية التمريض بالجامعة الإسلامية- غزة والأخرى من كلية فلسطين للتمريض التابعة لوزارة الصحة- خان يونس. شارك في هذه الدراسة 93 من طلبة التمريض بالجامعة و 61 من طلبة فلسطين للتمريض. تتراوح أعمار هؤلاء الطلبة المتطوعين لهذه الدراسة بين 18-22 عا. قام كل طالب م طلبة العينتين بتعبئة سجل تكرار غذائي خاص به حول كمية ونوعية طعامه اليومي المعتاد لمدة ثلاثة أيام تم تحليلها في نفس السجل من ناحية محتوياتها من الطاقة والمواد الغذائية المنتجة لها فقط وذلك باستخدام جداول التحليل الكيميائي للأطعمة العربية. بعد تسليم السجلات تم جمع وتنظيم وتحليل البيانات وتقدير المواد المطلوبة ومقارنة النتائج بالكميات القياسية المطلوبة حسب منظمة الصحة العالمية لنفس الفئة من الشباب وحسب متوسط الوزن.

تظهر نتائج هذه الدراسة أ، مقدار تناول طلاب كلية التمريض بغزة من الطاقة أقل من الكمية القياسية المطلوبة بنسبة 14.3% بينما طالبات هذه الكلية يتناولن أقل من المطلوب من الطاقة بنسبة ضئيلة تصل إلى 1.7%. يتراوح متوسط وزن طلبة التمريض بغزة 70.6 كجم للطلاب و 58.9 كجم للطالبات،

وعند حساب الطاقة المطلوبة بناءً على متوسط الوزن (40 سعر حراري/ كيلوجرام) لوحظ أن مقدار تناول هؤلاء الطلبة يزداد عن الكمية المطلوبة بمقدار 60% للطلاب و 43.3% للطالبات.

في المقابل تظهر النتائج أن مقدار تناول طلاب كلية التمريض بخان يونس من الطاقة أقل من مقدار الطاقة القياسية المطلوبة بنسبة 16.8% بينما طالبات هذه الكلية يتناولن أقل من المطلوب بنسبة تصل إلى 12.9%. يتراوح متوسط وزن طلاب وطالبات التمريض بخان يونس 68.5 كجم و 58.0 كجم على التوالي، وعند حساب الطاقة والبروتين بناءً على متوسط وزن هؤلاء الطلبة، تبين أن مقدار تناول الطلاب من الطاقة يقل عن المطلوب بنسبة 19.2% ويزداد البروتين عندهم بنسبة 58.4%، وأما عند الطالبات فنقل الطاقة بنسبة 34.2% ويزداد البروتين بنسبة 41.2%.

ومن ناحية أخرى تم حساب كميات البروتين والكربوهيدرات والدهون التي يتناولها طلبة التمريض بغزة، فتبين أن نسبة الطاقة التي يحصل عليها طلاب كلية التمريض بغزة من هذه المواد الثلاثة هي 15.8% و 56.4% و 27.8% على التوالي، بينما للطالبات هي 15.6% و 53.6% و 30.7% على التوالي وفي المقابل أيضاً، تم حساب مدى مشاركة المواد الغذائية المنتجة للطاقة في الطاقة اليومية لطلبة كلية التمريض بخان يونس تبين أن نسبة الطاقة التي يتناولها طلاب هذه الكلية من البروتين والكربوهيدرات والدهون هي 15.7% و 59% و 25.4% على التوالي وللطالبات هي 17.1% و 57.1% و 25.7% على التوالي، أي أن هناك زيادة في نسبة الطاقة التي يحصل عليها طلبة خان يونس من البروتين والكربوهيدرات على حساب النقص في نسبة تناول الدهون.

RING TRANSFORMATION AND COMPLEX FORMATION OF 3-ACETYL-4,5- DIHYDRO-1,2,4-TRIAZOLE OXIMES

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*

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Abstract

Oximic 1,2,4-triazole ligands **2** were prepared from the reaction of 3-acetyl-4,5-dihydro-1H-1,2,4-triazoles **1** with hydroxylamine at room temperature.

At higher temperatures, the reaction with hydroxylamine afforded, however, the novel ring transformation product 4-amino-2-(4-chlorophenyl)-5-methyl-1,2,3,6-oxatriazine **3**. The reaction of the ligands **2** with nickel(II) and palladium(II) acetates in ethanol at room temperature yielded the respective square planar complexes **5,7**. Apparently, via the intermediates **4,6**, respectively. X-ray structure determination of one of the complexes(**5**) was performed. The new compounds were also characterized by elemental analysis, IR ¹H NMR, ¹³C NMR and HRMS. The respective hydrazones gave however the complexes **7**.

PREPARATION OF IMMOBILIZED-POLYSILOXANE IMINO(2- AMINOETHYLACETAMIDE) AND ITS APPLICATION

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KEY WORDS: Metal uptake. propylamine. ethylchloroacetate ligand. ethylenediamine. Polysiloxanes. Immobilized-polysiloxane ligands systems.

Abstract.

A porous solid polysiloxane ligand system of the general formula $P-(CH_2)_3-NH-CH_2COONHCH_2CH_2NH_2$. (where P represents $[Si-O]_n$ siloxane network) has been prepared by modification of immobilized 3-aminopropylpolysiloxane $P-(CH_2)_3NH_2$ with ethylchloroacetate followed by ethylenediamine. The new modified polysiloxane system exhibits good potential for the uptake of metal ions (Co^{2+} , Ni^{2+} , Cu^{2+} , Zn^{2+} and Hg^{2+}). This ligand system gives more stable complexes with metal ions than its parent 3-aminopropylpolysiloxane precursor.

Thermodynamic analysis of the binding of glutathione and S-methyl glutathione to glutathione S-transferase over a range of temperatures

Zeyad Yassin, Emilia Ortiz-Salmerón, F. Javier Las Heras-Vazquez, Carmen Barón and Luis García-Fuentes

Abstract

The glutathione transferases (EC 2.5.1.18) (GSTs) are a family of enzymes involved in the mechanism of cellular detoxification. They catalyze the nucleophilic attack of glutathione on the electrophilic centre of a number of toxic compounds. The cytosolic enzymes have two active sites per dimer which behave independently of one another. The homodimeric (26 kDa per subunit) glutathione S-transferase from *Schistosoma japonicum* (Sj GST) is a member of one of the most important supergene families of enzymes involved in the phase II metabolism of electrophilic compounds. The glutathione-conjugates have greater solubility in water, facilitating their export from the cell, where they are metabolized via the mercapturate pathway and eventually excreted. It has been confirmed that each subunit in homodimeric SjGST contains two structural domains, an N-terminal and a C-terminal domain. The dimeric structure is required for the formation of two functional active sites (one per subunit).

The binding properties of a glutathione S-transferase (EC 2.5.1.18) from *Schistosoma japonicum* to substrate glutathione (GSH) has been investigated by intrinsic fluorescence and isothermal titration calorimetry (ITC) at pH 6.5 over a temperature range of 15-30 °C. Calorimetric

measurements in various buffer systems with different ionization heats suggest that protons are released during the binding of GSH at pH 6.5.

The effect of pH on the thermodynamics of GSH-GST interaction was studied. The binding isotherms were made at each pH in the presence of two different buffers and the number of protons at each pH was calculated. It is found that, the protons are taken up at pH 5 and 8.5, and are practically zero at pH 8, whereas they are released between pH 5.5 and 8. The behaviour shown at different pHs indicates that at least three groups must participate in the exchange of protons.

Fluorimetric and calorimetric measurements indicate that GSH binds to two sites in the dimer of 26 kDa glutathione S-transferase from *Schistosoma japonicum* (Sj GST). On the other hand, noncooperativity for substrate binding to SjGST was detected over a temperature range of 15-30 °C. Among thermodynamic parameters, whereas ΔG° remains practically invariant as a function of temperature, ΔH and ΔS° are both decrease with an increase in temperature. While the binding is enthalpically favorable at all temperatures studied, at temperatures below 25 °C, ΔG° is also favoured by entropic contributions. As the temperature increases, the entropic contributions progressively decrease, attaining a value of zero at 24.3 °C, and then becoming unfavorable. During this transition, the enthalpic contributions become progressively favorable, resulting in an enthalpy-entropy compensation. The temperature dependence of the enthalpy change yields the heat capacity change (ΔC_p°) of $-0.238 \pm 0.04 \text{ kcal mol}^{-1} \text{ K}^{-1}$.

Moreover, the thermodynamic parameters, ΔH , ΔS° , and ΔG° , for the competitive inhibitor S-methyl glutathione (SMG) have been investigated by ITC at pH 6.5 over a

temperature range of 15-30 °C. Calorimetric measurements in various buffer systems with different ionization enthalpies were performed and suggested that no protons were exchanged during the binding of SMG. The results revealed that this binding is both enthalpic and entropically favorable at all checked temperatures, resulting in an enthalpy-entropy compensation. The temperature dependence of the enthalpy change yields the heat capacity change of $-0.158 \pm 0.001 \text{ kcal mol}^{-1} \text{ K}^{-1}$.

ELIMINATION OF REMAZOLE BLUE-B BY ADVANCED OXIDATION METHODS

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Abstract

Different methods have been used to reduce or eliminate organic pollutants from wastewater and groundwater. Advanced oxidation methods means the cold combustion of organic impurities in the aqueous media by means of chemical oxidation methods. Or what is called mineralization of organic pollutants. Remazol blue B. was taken as the model pollutant. (Ozone Hydrogen peroxide/Ultraviolet light). Were used to eliminate the pollutant from wastewater. Which means the fast oxidation to produce CO₂. H₂O. NO₃⁻. SO₄²⁻ etc. The effect of

pH. The initial concentration of hydrogen peroxide. The rate of ozonation. Dose of UV and the influence of temperature were studied to find the optimum conditions for oxidation of this organic pollutant. Experimentally. A special system was constructed to follow the oxidation reaction of ozone with impurities. Experimental results indicated that the oxidation of Remazol blue B was faster at higher pH than at lower pH. Using suitable analytical methods such as visible spectrometry techniques. Chemical Oxygen Demand (COD). Detailed kinetics and reaction mechanisms have been estimated. Recommendations. Including advantages. Disadvantages. Optimum conditions. Applicability and the economical side of similar purification/ recycling projects for used industrial water. Are introduced.

Keywords: advanced oxidation technology (AOT)- mineralization of organic pollutants- hardly oxidized impurities- Remazol blue B- (COD)-ozone-Ultraviolet radiation – H₂O₂.

SYNTHESIS OF DIFFERENTLY SUBSTITUTED 1,2,4-TRIZOLES

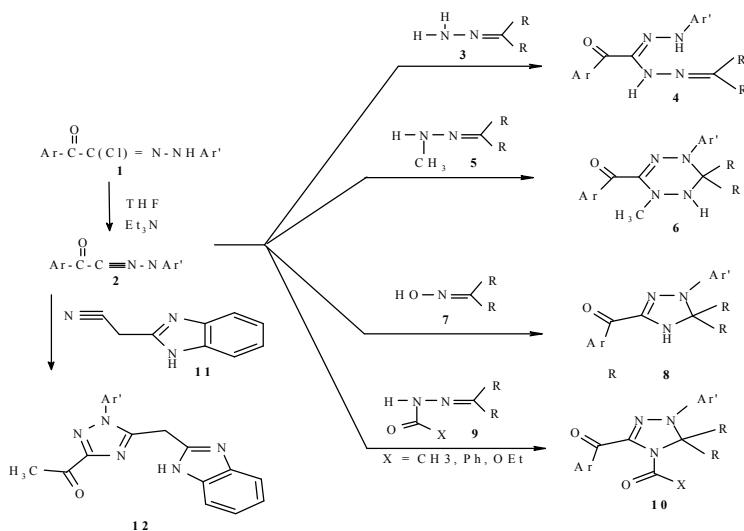
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Abstract

1,2,4-Triazoles represent an important class of heterocycles that find many practical applications in industry and medicine. The synthesis of different 1,2,4-triazole derivatives is presented in this paper. These derivatives were prepared from the reaction of nitrilimines with oximes, hydrazones and nitriles. The reactions pathways will be compared to those of nitrile oxides with oximes and hydrazones which react in a different way and give different heterocycles containing oxygen.



Heterocyclic Synthesis Using Nitrilimines: Synthesis of New 1,2,4-triazin-6-one and 1,2,4,5-tetrazine Derivatives

H.M. Dalloul, A.R. Ferwanah, A.M. Awadallah and E. Elsawi

The reactive 1,3-dipole nitrilimines are known to react with different nucleophilic substrates incorporating subtly located electrophilic centers to provide various heterocyclic products. The reaction with α -amino esters give 4,5-dihydro-1,2,4-triazin-6-ones, their reaction with 1-substituted-1-methylhydrazine (aza analogues of amino esters) give tetrahydro-1,2,4,5-tetrazines. Dihydro- and tetrahydro-1,2,4,5-tetrazines are obtained from the reaction of nitrilimines with aliphatic keto hydrazones and methyl and C-2-naphthoyl-N-arylnitrilimines with some α -amino esters, 1-substituted-1-methyl hydrazines and with different hydrazones and methyl hydrazones of aliphatic ketones.

**Synthesis and X-Ray Crystal Structure Analysis of
Substituted -2,3-Dihydro-1,3,4-Oxadiazoles via Reaction of
Acetone- and Cycloalkanone Benzoylhydrazones with
phenylisocyanate**

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Abstract

Acetone and cycloalkanones benzoylhydrazones (1a-f) react readily with phenyl isocyanate 2 at room temperature to give the corresponding dimethyl- and spiro-substituted 2,3-dihydro-1,3,4-oxadiazoles (3a-f), respectively. Structure elucidation of these compounds was based on spectral data and confirmed by X-ray crystal structure analysis for compound 3d. Treatment of 3 with trifluoroacetic anhydride resulted in the formation of the acyclic adduct 2,5-dioxo-1,5diphenyl-1,3,4 triazaapentane 5 via elimination of the respective alkene in moderate yields.

التحاليل الطبية

Medical

The Origin of Generalised Mass-Energy Equation $\Delta E = Ac^2 \Delta M$: and its applications in General physics and cosmology.

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PACS 03.30.+ p, 04.20.-q, 24.10.Jv, 98.54.Aj

Einstein's 27 Sep 1905 paper available at
http://www.foumilab.ch/etexts/Einstein/E_mc2/www/

Abstract

Einstein's (Sep. 1905) derivation theorizes that when light energy (L) is emanated by luminous body then its mass diminishes as $\Delta m = L/c^2$ and this equation is speculative origin (without proof) of $\Delta E = c^2 \Delta m$. The same derivation predicts that mass of luminous body inherently INCREASES ($\Delta m = -0.03490 L/cv = L/c^2$) when it emits light energy in some cases, mass of body also remains same ($\Delta m = 0$).

Alternate equation $\Delta E = Ac^2 \Delta M$ has been suggested, which implies that energy emitted on annihilation of mass (or vice versa) can be equal, less and more than predicted by $\Delta E = c^2 \Delta m$. The total Kinetic energy of fission fragments of U^{235} or Pu^{239} is found experimentally 20-60 Me V less than Q-value predicted by Δmc^2 , it is explainable with $\Delta E = Ac^2 \Delta M$ with value of A less than one. $\Delta E = c^2 \Delta m$ is yet unconfirmed in chemical reaction. Energy emitted by Gamma Ray Bursts (most energetic event after Big Bang) in duration 0.1100s, is 10^{45} J which can not be explained by $\Delta E = \Delta mc^2$, similar is the case of

Quasars. It can be explained with high value of A i.e. 2.57×10^{18} . The mass of particle Ds (2317) discovered at SLAC, have mass lower than current estimates; it can be explained with value of a more than one. $\Delta E = A c^2 \Delta M$, explains that mass of universe 10^{18} kg was created from dwindling amount of energy (10^{-444} J or less) and A is 20568×10^{-471} J or less; and in the end may reduce to small energy. It gives explanation for big bang, annihilation of antimatter in hadron epoch < black holes and for dark matter etc. For origin of inherent gravitational energy it implies that it is another form of madd like other energies, hence gravitation and mass are inseparable.

Biological Effects of certain plant extracts against the immature stages of *Galleria mellonella* L. (Lepidoptera: Galleriidae)

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Abstract

Injection of *Galleria mellonella* larvae by the extracts of dry and green (fresh) leaves lead to significantly increasing of their mortalities. The tested plants were arranged according to their effects as follow: *Melia azedarach* (melliaceae), *Venca rosea* (Apocynaceae), *Allium sativa* (Liliaceous) and lastly *Caucasian antiquorum* (Tracheae). These extracts cause significantly increasing in the durations of larval and pupal stages than that of control group. There was no significant effect between the green and dry leaves extracts on on the durations of larval and pupal stages. The dry leaf extracts were significantly more effective than those of green one on the increasing of percentage of larval mortality. Green leaf extracts were more effective of the pupal weight. All these biological effects increased significantly by increasing of concentrations of extracts (0.5, 1.0, 1.5 and 2 ug / larva). Generally, these plant extracts has significant effects on this insect and consequently, it can be consider as an applied safety compounds for control this

economic insect which is a serious pest for honey bee industry. Use of it is more desirable for an environmental perspective than other chemical insecticides.

Morphological and molecular study for Enterobius sp. In Gaza Strip

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AMSTRACT

Enterobius sp. is one of the most prevalent round worms still present in Gaza strip especially among school children. The estimated prevalence reaches 47.2%. Opinions have differed on the matter of existence of two species of Enterobius. Hugot (1983) classified human Enterobius into two species, *E. vermicularis* and *E. gregorii* based on the difference in the spicule length.

A morphological study of Enterobius sp. showed that there were two types, long spicule type (LST) and short spicule type (SST). Molecular investigation showed PCR products of the same size for LST and SST and the few differences in sequence did not correspond with the spicule type. This supports the possibility that *E. gregorii* is a developmental stage or morphological form of *E. vermicularis*. In conclusion no sequence differentiation between LST and SST was found.

Entamoeba histolytica or Entamoeba dispar among children in Gaza, Gaza Strip?

Dr. ADNAN Al- Hindi

Abstract

Most physicians in Gaza prescribe medicaments for patients suffering from *Entamoeba histolytica*/dispar without evidence of the causative agent is *E. histolytica*. Additionally, stool analysis, performed by routine methods usually report the species as *E. histolytica* without further confirmation. In this study 92 stool specimens were collected and analyzed by wet mount, iron haematoxylin staining, antigen detection of *E. histolytica* and polymerase chain reaction. The total number of *E. histolytica* identified by PCR was 64 (69.6%) while that of *E. dispar* was 21 (22.8%). Mixed infection with both *E. histolytica* and *E. histolytica*. was evident in 7 specimens (7.6%) in the light of these results approximately 30% of suspected clinical amoebiasis cases were negative for *E. histolytica*. Consequently, we recommend the use of PCR for diagnosis of stool specimens from patients with *E. histolytica*/dispar and that treatment should be prescribed for only those symptomatic patients who prove positive for *E. histolytica*.

Listeria monocytogenes in fresh poultry products in Gaza Strip

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Public*

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Listeria monocytogenes is gaining worldwide interest because it causes food borne illnesses. The present study was conducted with aim of assessing the prevalence of this pathogen in fresh poultry products in Gaza Strip. We tested 375 fresh poultry samples collected from different poultry meat sales centers and slaughterhouses in Gaza Strip. Results showed that Listeria species could be isolated from both internal and external parts of poultry samples with an incidence rate of 14.1% Five Listeria species were isolated and identified by API system. Isolation of these species was higher in external parts than internal parts of poultry suggesting contamination from external sources. These findings may suggest implementing more strict measures to reduce contamination during processing.

Study on the stats of prevalence of strongyloides *Strecrolis* infection among children in agricultural regions in Beit Lahia, Gaza , Strip

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This study was conducted in the city of Beit Lahia in order to find the rate of prevalence of *Strongyloides stercoralis* parasite. The study revealed that the rate of prevalence of *Strongyloides stercoralis* parasite was extremely high compared to the previous studies conducted in the same regions.

Beit Lahia is located on the west of Mediterranean Sea and bordered from the north by Israeli colonization, Jabalia camp from the south, and Beit Hanoun city from the east. The population of the city is nearly 55,000.

To conduct the study, random cases were selected from 10 unique agricultural regions in Beit Lahia.

The prevalence of *Strongyloides stercoralis* and other intestinal parasites were assessed in a suburban community of Beit Lahia city through the examination of stool specimen from each of the random selected 1600 individuals ranging from age 3 to 18 years old using direct faecal smear and formalin- ether concentration techniques.

The overall parasitic infection rate was 74.6% and 17.8% of the cases had multiple and triple infections. The infection rate of *Strongyloides* cases was 7.5% and most of those infected children were passing adult worms. Moreover, 61.3% of the children living near the sewage water pool were affected with *Ascaris lumbricoides*.

Amongst the protoza infection *Entamoeba histolytica* was observed most frequently 7.3% and *Giardia lamblia* was 4.6%. The high rate of parasitic and multiple infection reflects the low socio-economic status of the community studied.

Bookstrapping all possible regression

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This research tests the effect of bootstrapping resample method to all possible regression, here we want to test all possible regression which has maximum R^2 and discuss the effect of bootstrap resample to subset selection variable and discuss the effecting of bootstrap number.

Role of C.T. Myelography in the spinal Imaging

Dr. S.I. AL-AGHA

*MBBCH DMRD, FRCR, FFRRCSI
Consultant Radiologist*

Myelography and C.T Myelography have declined with advent of MRI due to non invasive technique and lack of radiation. However in modern life, spinal injuries are seen more frequently. The Neurosurgeons and, or Orthopedic Surgeons are anxious to know the extent of spinal column as well as spinal cord injuries in the victims of these accidents.

The detection of bony fractures by C.T. is much better than MRI. In addition the presence of ferromagnetic structures in support of these injured patients may hinder MRI examination. The long MRI examination time and non availability of MRI machines add to favour of myelo C.T. rather than MRI examinations in these patients.

On the other hand, lack of MRI availability in some areas including ours, put a pressure on us to use C.T. myelogram for investigation of other spinal cord pathologies like neoplasm and failed back surgery after discectomies and laminectomies.

البصريات الطبية

Optometry

Age related macular degeneration (AMD)

Abstract

*BY: Dr. Mohammed A.A.Etarshawi-M.D ophthalmology
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Introduction:

AMD is considered the leading cause of central vision loss among individuals 65 years of age and older in developed countries.

Despite the profound clinical impact of this disorder and the extensive research regarding its prevention and treatment, the cause remains unclear.

Treatment of AMD still largely unsatisfactory and prevention is usually not possible.

10 Materials and methods:

We have consulted many books of results of retina about old aged patients of both sexes to detect the senile changes in their maculae using direct and indirect ophthalmoscope and slit lamp biomicroscopu with Volkis lens.

Fluorescein angiography for diagnosis of subretinal membranes and laser photocoagulation for treatment were used in management of AMD cases.

The study with indocyanin green angiography is an important exploration to localize occult subretinal membranes.

Two types of ADM were diagnosed namely dry AMD and wet AMD with the marked impairment of visual activity.

Cataract the most common surgery in Gaza strip governorates

*By Dr. Mohamed A.A.Etarshawi
Faculty of science-Department of optometry – IUG*

Abstract

Objectives: To show that cataract extraction surgery is the most common operation done in the Naser hospital for eye diseases in Gaza and to prove that cataract is widespread in population above sixty in both sexes.

Rigid Gas Permeable Lenses for Keratoconus

*Dr. Jomia Mohammed El Jazzar
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Abstract

Aims:

Keratoconus is a spontaneous non inflammatory distortion of the symmetrical curvature of the cornea with thinning and protrusion of the central or paracentral area. The incidence is between 50 and 230 cases per 100.000 of the population. This causes severe distortion and diminution of vision. The optical correction depends the severity of the condition. In early cases glasses or soft contact lenses can be of benefit. Surgical intervention in the form of penetrating Keratoplasty is needed for advanced cases with corneal scarring. The use of rigid contact lenses is the mainstay of managing Keratoconus . This study is done to assess the use of rigid contact lenses for managing keratoconus in Gaza Strip.

Methods:

Between June 1997 and June 1999 thirty one patients with 42 eye suffering from keratoconus were fitted with RGP contact lenses. Thirteen were males and eighteen were females. Age was between 14 and 55 years. Twenty of them gave history of itching. Out of 42 eyes ; 3 were mild cases , 21 were moderate cases, 15 were advanced cases and 3 wee severe cases. All eyes had vision 6/60 or less before fitting which did not improve with glasses or soft contact lenses. All cases were fitted and followed by me . Success was classified depending upon visual improvement and tolerance to lens.

Results:

The vision of 18 eyes improved to 6/6 – 6/9 , 15 eyes improved to 6/12- 6/24, 25 eyes improved to a lesser extent and 4 eyes did not tolerate the lens and had to stop them. The causes are allergic kerato - conjunctivitis and severe degree of KC.

Conclusion:

RGP contact lenses play a major role in the management of keratoconus.

Laser & eye, clinical applications & Literature overview

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Abstract

The presentation will concentrate on Laser as the modality of science that changed many ideas in the treatments of eye problems, so the understanding of its basics & clinical uses is of utmost importance to have the best results from all its wavelengths and to avoid its hazards, needs and encourages to find the principles of physics that explain the action of all wavelengths that have a relation to the eye and its diseases.

الرياضيات

Mathematics

CONNECTEDNESS IN ISOTONIC SPACES

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Abstract

An isotonic space (X, cl) is a set X with isotonic operator $cl : \wp(X) \rightarrow \wp(X)$ which satisfies $cl(\emptyset) = \emptyset$ and $cl(A) \subseteq cl(B)$ where $A \subseteq B \subseteq X$. Many properties which hold in topological spaces hold in isotonic spaces as well.

The notion of connectedness that is familiar from topological spaces generalize to isotonic spaces. We further extend the notions of Z - connectedness and strong connectedness to isotonic spaces, and we indicate the intimate relationship between these notions.

Explicit Formulas to Determine the Efficiency of OLS in the Presence of first Order Disturbances in Regression Models

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Abstract

It is well known that the ordinary least squares (OLS) estimates in the regression model are efficient when the disturbances have mean zero, constant variance and are uncorrelated. In problems concerning time series, it is often the case that the disturbances are, in fact, correlated. It is known that OLS may not be optimal in this context, we have proved that the relative efficiency of the variance of the generalized least squares (GLS) to that of OLS is invariant to scaling and shifting of the design vectors. We have derived explicit formulas for the relative efficiencies of the GLS estimator to that of OLS estimator in some important special cases. We consider both linear and quadratic design vectors in the presence of First Order, AR (1) disturbances with and without an intercept term included in the design and use these formulas to show some asymptotic properties of the estimators.

Linear Codes over the Ring Z_4

*Samia S. El-azab*¹
*Mohammed S. EL-Atrash*²
*Amany J. ElMassry*³

Abstract

In this paper we prove that for any standard basis B_1 of the module Z_4 , there is a basis B_2 for which the greedy code generated using the B-ordering is linear with respect to B_2 , where B_2 is derived from B_1 by a lower triangular matrix P ; $B_2 = PB_1$. In Addition we prove a similar result for self-orthogonal greedy codes.

ON ARTINIAN T_0 – ALEXANDROFF SPACES.

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Abstract

In this paper, we study the topology τ_α of all α - open sets on Artinian T_0 - Alexandroff space $(X, \tau(\leq))$. We show that τ_α is Artinian T_0 – Alexandroff space. Then we describe the induced partial order \leq_α to get some results and some common properties relating the original topology $\tau(\leq)$ and τ such as:

- (1) A subset A is α – open in $(X, \tau(\leq))$ if it is an up set with respect to the partial order \leq_α .
- (2) A is dense with respect to τ if and only if it is dense with respect to $\tau(\leq)$.
- (3) $(X, \tau(\leq))$ is hyperconnected if and only if (X, τ) is hyperconnected.
- (4) The class of all semi-open sets in $(X, \tau(\leq))$ is the same as the class of all semi-open sets in (X, τ)
- (5) The set of maximal elements in $(X, \tau(\leq))$ is the same as the set of maximal elements in (X, τ) . Moreover the maximal elements greater than or equal any element x in $(X, \tau(\leq))$ is the same set of maximal elements greater than or equal any element x in (X, τ) .
- (6) If A is semi-open, then D is dense in A in τ if and only if D is dense in A in τ_α .

Ⓜ - Compact Topology

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Abstract

Let X be locally convex space, using the definition of "Ⓜ - compact set", I will define a new topology on X called "Ⓜ - topology". Also I will study some properties of the new topology.

ON T_0 – ALEXANDROFF SPACES

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Abstract

In this paper, we study and describe some topological concepts on special class of topological spaces called T_0 – Alexandroff spaces. We characterize the closure, the interior, and the cluster points of a subset. We identify some of generalized open sets as preopen, semi-open a-open and some of relate properties. We focus on special important type of T_0 – Alexandroff spaces which is satisfying the ACC, we call such spaces Artinian T_0 - Alexandroff spaces. We get strong results on this class such as characterization of extremely disconnected.

A METHOD OF COMPUTING THE NORM GIVEN BY PARTITIONS AND WEIGHTS

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Abstract

Norms given by partitions and weights were introduced in the paper "Subspaces of L_p , $P > 2$ determined by partitions and weights" by D. Alspach and S. Tong, *Studia Mathematica* 159 (2) 2003. Later it was proved by the same authors that every subspace of L_p , $p > 2$, with unconditional basis has an equivalent partition and weight norm. In this paper, by introducing an equivalent form of Rosenthal's inequality with norm given by partitions and weights, we will explain a method of obtaining the norm given by partitions and weights. Some open questions related to the equivalent norm will be listed.

On non_archimedean $\Lambda(\alpha)$ – Compactoid Set

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Abstract

For a non-archimedean locally convex spaces, the $\Lambda(\alpha)$ -compactoid sets and operators are introduced and studies. We show that the finite product of $\Lambda(\alpha)$ – compactoid sets is $\Lambda(\alpha)$ – compactoid, and we also show for $\Lambda(\alpha)$ - compactoid operators that the operator $T : E_1 \times E_2 \rightarrow F_1 \times F_2$ is $\Lambda(\alpha)$ -

compactoid if and only if the operators $T_{i,j} : E_j \rightarrow F_i, i, j=1, 2, i \in \Lambda(\alpha)$ - compactoid.

Bäcklund transformations for fifth-order Painlevé equations

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Abstract

In this article we study Bäcklund transformations of the following fifth-order Painlevé equations

$$v^{(5)} = 15vv''' + \frac{75}{2} v'v'' - 45v^2v' + zv' + 2v$$

$$v^{(5)} = 30vv''' + 30v'v'' - 180v^2v' + zv' + 2v$$

$$v^{(5)} = 18vv''' + 36v'v'' - 720v^2v' + 3v' + \frac{1}{2} \lambda z(5v''' - 36vv') - \frac{1}{2} \lambda^2 z(2zv' + v) +$$

$$\frac{1}{z} [v^{(4)} - 18vv'' - 9(v')^2 - 3\lambda v' + 24v^3 + \kappa]$$

We derive Bäcklund transformations between these equations and new fifth-order Painlevé equations. The method of derivation is based on the idea of seeking transformations that preserve the Painlevé property. Moreover we study some properties of the new equations.

MacDonald codes over the ring $F_2 + uF_2$

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Abstract

In this paper. we construct MacDonald codes of type α and β over the ring $F_2 + uF_2$ and we study Gray image properties, torsion code, weight distribution. Finally we obtain linear binary codes by Gray map. These codes are extensions of MacDonald codes over the ring Z_4 which are studied in [7].

A Method for Determination of the Eigenvalues Bounds for an Infinite Family of Interval Matrices: A Computational Approach

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Abstract

Given a matrix $A \in \mathbb{R}^{n \times n}$ with entries $a_{ij} \in [a_{ijL}, a_{ijH}] \subset \mathbb{R}$ for $i, j = 1 \dots n$. The uncertain parameters generate an infinite family of $n \times n$ matrices. From the above matrix let's generate all of the vertex matrices, by allowing each uncertain entry of A to vary over the entire interval. From these vertex matrices, we need to calculate the vertex characteristic polynomials, then the eigenvalues of a matrix $A \in \mathbb{R}^{n \times n}$ are the n roots of its characteristic polynomial $p(z) = \det(zI - A)$. The set of these roots is called the spectrum and is denoted by $\sigma(A)$. If $\sigma(A) = \{\lambda_1, \dots, \lambda_n\}$, then it follows that $\det(A) = \lambda_1 \lambda_2 \dots \lambda_n$. The problem is to estimate bounds for the location of the Eigenvalues corresponding to all matrices in the family. In this paper an algorithm was developed to obtain all possible vertex matrices for any size of given interval matrix and a computational approach is proposed for computing an eigenvalue bounds for a family of interval matrices. The problem treated in this paper of considerable practical significance. This problem usually is referred to as robust stability.

Illustrative examples are given to validate the proposed method.

Natural weak automorphism of P_2 -lattices

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Abstract

Natural weak automorphisms of Boolean and Post algebras were examined by T.Traczyk.

Weak automorphisms of finite P_2 – lattices extending a given Weak automorphism of its center were described by K. Tabash. The aim of this paper is to describe the natural weak automorphisms of a finite P_2 -lattices with a distinguished chain base.

ON SOME INTEGRAL INEQUALITIES OF GRONWALL TYPE

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Abstract

Inequalities play an important role in almost all branches of mathematics. The integral inequalities involving functions of one and more than one independent variables play a fundamental role in the study of differential explicit bounds on

the unknown functions. In this paper. Some integral inequalities are presented.

Our aim is to give explicit bounds on some new integral inequalities of Gronwall-like type. Applications are presented also.

العلاقة بين أساس الفضاء الجزئي F المكمل في E وأساس الفضاء E

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ملخص البحث:

سنقدم بعض النتائج المتعلقة بمخمنة بيساجا في فضاءات كوذا النووية، لقد برهنا مخمنة بيساجا في فضاء كوذا النووي تحت شروط خاصة على هذا الفضاء وبرهنا بعض العلاقات التي تربط بين أساس الفضاء F المكمل في الفضاء E وبين أساس الفضاء E .

Background Subtraction

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Abstract

Estimation of the density of random variables has been a classical statistical problem. There were various estimation methods, one of the best methods in the nonparametric estimation is the kernel density estimation. We apply the result to a particular problem such as the camera surveillance used for motion detection. In automated surveillance systems, cameras and other sensors are typically used to monitor activities at site with the goal of automatically understanding events happening at the site. Automatic event understanding would enable functionalities such as detection of suspicious activities and site security. Higher level understanding of events requires certain lower level computer vision tasks to be performed such as detection of unusual motion, tracking targets, labeling body parts, and understanding the interactions between people. For many of these tasks, it is necessary to build representations of the appearance of objects in the scene. For example, the detection of unusual motions can be achieved by building a representation of the scene background and comparing new frames with this representation. This process is called "background subtraction" .

An Analytical Model for Evaluating Interrupt-Driven System Performance of Gigabit Ethernet Hosts with Finite Buffer

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Abstract

An analytical model based on Markov processes is developed to study the impact of interrupt overhead on operating system performance of network hosts such as PC-based routers, servers, and end hosts when subjected to Gigabit network traffic. Under heavy network traffic, the system performance will be negatively affected due to interrupt overhead caused by incoming traffic. In particular, excessive latency and significant degradation in system throughput can be experienced. Also, user applications may livelock as the CPU power is mostly consumed by interrupt handling and protocol processing. In this paper, we present an analytical model to evaluate system performance. The system performance is studied in terms of

throughput. Latency, stability condition, CPU utilizations of interrupt handling and protocol processing, and CPU availability for user applications. The analysis yields insight into understanding and predicting the impact of system and network choices on the performance of interrupt-driven systems when subjected to light and heavy network loads. At an early stage, our analysis work can be valuable for engineering and designing certain system parameters. And at a later stage, the analysis can be used to aid in system calibration and diagnosis.

Centraloid Operators

By

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Abstract

In this paper we study centraloid operators, some of its properties and its relation with its adjoint, its Hilbert adjoint, isometric and normal operators. Also we show that the set of all centraloid operators need not be a Banach algebra.

البيئة وعلوم الأرض

Environment and Earthsciences

Hydrogeochemistry and carbonate saturation model of groundwater, Khanyounis Governorate—Gaza Strip, Palestine

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Abstract

Groundwater is a critical resource in Khanyounis city as it is the main source of water. The aquifer has deteriorated to a high degree, during the last two to three decades, in quality and quantity. More than 90% of the population get their drinking water from brackish water desalination plants. Fifteen domestic wells were sampled in 2002 to probe the hydrogeochemical components that influence the water quality. Na, K, Ca, Mg, Cl, SO₄, NO₃, and HCO₃ were analyzed. The data were statistically treated and plotted on the Piper diagram. A hydrogeochemical numerical model for carbonate minerals was constructed using the PHREEQ package. The results show that the groundwater is polluted with Cl, from seawater, and NO₃, sourced from fertilizers and sewage. The regression analysis shows that there are three groups of elements that are significantly and positively correlated. Na–Cl signature and plot show that seawater intrusion is advancing into the aquifer. The main hydrochemical facies of the aquifer (Na+K–Cl+SO₄), represents 60% of the total wells. Whereas 32.3% of the wells are located in the ‘no pair up’ and ‘no pair down’ fields on the Piper diagram. Calcite, dolomite, and aragonite solubility were

assessed in terms of the saturation index where they show positive values indicating supersaturation. The hydrogeochemical behavior is rather complicated and is affected by anthropogenic and natural parameters.

Keywords Gaza Strip - Khanyounis - Groundwater – Hydrogeochemistry

تجربة سلطة جودة البيئة في مجال مكافحة حشرة البعوض

إعداد / الأستاذ محمد كامل شبير

مدير دائرة الصحة العامة بسلطة البيئة الفلسطينية

يمثل البعوض وضعاً متميزاً بين الأعداء الطبيعية للإنسان، انطلاقاً من مضايقته وإزعاجه للإنسان، ودوره الغير عادي كناقل لأخطر الأمراض التي تصيب الإنسان، وتتمثل خطورته في استنزاف العوائل في مدى عريض يؤدي إلى أمراض دائمة وربما الوفاة، مثل أنثى بعوض الأنوفيليس الناقل للملاريا والتي لم يتم تشخيصها ضمن أنواع البعوض الموجود في بلادنا فلسطيني.

لا زالت مشكلة الحشرات والقوارض خاصة البعوض والذباب والحشرات التي تسبب أمراضاً خطيرة وتشكل مشكلة بيئية كبيرة، كما أن مشكلة القوارض في فلسطين أيضاً ما زالت تسبب رعباً للناس، لذلك تعتبر مكافحة الحشرات والقوارض من أهم الأنشطة التي ستأخذها على عاقتها دائرة جودة البيئة والصحة العامة في مجال المكافحة كما ستعمل جاهدة على مراقبة المبيدات الحشرية المستخدمة في مجال المكافحة وفي مجال الزراعة وذلك من أجل منع استخدام أي مبيدات حشرية مؤثرة على صحة الإنسان والبيئة.

تعمل سلطة جودة البيئة دائما لمواكبة أحدث التطورات العلمية في مجال مكافحة الأفات ضمن برنامج مكافحة المتكاملة تمشيا مع الأهداف العالمية المتمثلة في ضرورة الحد من تلوث البيئة بأقصى درجة ممكنة بإتباع الأساليب والوسائل المتطورة في هذا المضمار .

وللوقاية من العديد من الأمراض والأوبئة التي تنتقل عن طريق الحشرات بوضع استراتيجية واضحة ومدروسة بجانب وضع الخطط لتنفيذها وتحديد الأهداف المرجوة من العمل والطرق الكفيلة للوصول إلى هذه الأهداف ومراحل تنفيذ كل خطة وتكلفة تنفيذها ودراسة المعوقات المحتمل ظهورها أثناء التنفيذ والحلول المقترحة للتغلب عليها وإزالة المعوقات.

Modeling of Lead Emissions From Petrol Vehicles in Palestine: A case study for the city center of Gaza

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Abstract

The Transport sector in Palestine is expected to face a growing demand for mobility in the near future linked to population growth, expected increase in the standards of living, and the anticipated increase in the rate of urbanization in excess of population growth. This is due to the fact that the per capita demand for mobility is not only dependent on the socioeconomic factors, but also on population density and geography. Consequently, a growing demand on fuel is expected to increase sharply in the Palestinian Territories, which makes the transport sector a target field for energy and environmental research.

A good transport network contributes to the aims of protecting and improving the environment ensuring that development and growth are environmentally sustainable. Gaza city, as a case study, is a unique area for environmental research since it is the main city in the Gaza Strip and one of the largest metropolitan areas of the Palestinian Territories. Gaza city alone holds 51% of the total road traffic and 56% of petrol vehicles in the Gaza Strip. Traffic volumes in the city center of Gaza reach as high as 1500 Passenger Car Units per Hour (PCU/H) per direction of flow. Additionally, major roads have very high traffic volumes exceeding 2000 PCU/H. The increasing number of vehicles coupled with the unorganized traffic management cause traffic congestion which in return increases air pollution. Lead pollution potential from petrol vehicles in Gaza city might arise from the fact that many of the vehicles are in poor condition using mostly leaded petrol, while very few vehicles use unleaded petrol. Approximately, 98% of petrol consumed in the Gaza strip in 1995 was leaded with different octane numbers. This in return will increase the chances the environmental lead pollution.

أثر الفقه الإسلامي في الحفاظ على البيئة

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الحمد لله والصلاة والسلام على رسول الله صلى الله عليه وسلم

لم تقتصر أحكام الفقه في الشريعة الإسلامية على الإنسان فحسب بل تناولت فيما تناولته الأحكام المتعلقة بالكون والحياة وذلك للترابط الوثيق بينها، لأن أي خلل في الكون يؤدي إلى خلل في التوازن الحياتي والبيئي والإنساني، ومن هذا المنطلق يظهر أثر الفقه الإسلامي جنباً في الحفاظ على البيئة قبل ما يزيد عن ألف وأربعمائة سنة وقبل أن تنتبه حكومات العالم وتدعو بل وتضع القوانين الموجبة لضرورة الحفاظ على جميع عناصر البيئة : الإنسان وكل ما يتعلق به والكائنات الأخرى والأرض والماء والهواء.

والفقه الإسلامي يستمد أحكامه في الحفاظ على البيئة من مصادر الإسلام الرئيسية منها وهي القرآن الكريم والسنة النبوية المطهرة والقياس والإجماع، والمصادر التبعية أي الفرعية وهي كثيرة وأهمها المصالح المرسله والعرف وسد الذرائع ... وغيرها، ومن هذه المصادر تظهر القواعد الفقهية المنظمة للبيئة، وأهم ما يمكن أن يستنبط من الشريعة الإسلامية في موضوع الحفاظ على البيئة قاعدة (التوازن البيئي) وأي خلل في أي عنصر من عناصر البيئة فإن ذلك ينعكس سلباً على البيئة بسبب فقدان التوازن البيئي وهو ما سيثبت من خلال البحث.

هذا وحيث أن أحكام الفقه الإسلامي تتضمن المبادئ التي بموجبها الحفاظ على البيئة فقد رأيت لزاماً للكشف عن الجوانب التطبيقية لهذه الأحكام في عصور الإسلام الزاهرة وذلك من خلال الحديث عن ولاية الحسبة هذه الولاية التي هي

إحدى النظم الإدارية في شريعة الإسلام والتي هي جزء من النظام القضائي الإسلامي والتي من خصائصها الحفاظ على البيئة كنموذج قضائي ميداني.

Crustal structure of the Dead Sea Rift from Gravity Data : 3-dimensional Modelling

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The unique geological setting of the Dead Sea rift, where the inception of plate boundaries within the continental rift is clearly observed, makes the region the main focus of interest for geoscientific researchers. The nature of the crust underlying the eastern and western shoulders of the rift as well the Dead Sea depression (Jordan Rift Valley) have been controversial among researchers for the past five decades. The Dead Sea Rift forms a part of the largest Tertiary-Quaternary rift system which extends from Gulf of Aqaba in the south to Syria and Turkey in the north. The rift, like the rest of the East African Rift system, has undergone a very complicated geological evolution and tectonic history.

In the present work, an attempt is made to prepare a high-resolution 3-dimensional gravity model of the southern part of the Jordan Dead Sea Transform. The results of the recent seismic reflection/refraction experiments in Wadi Araba, which cross the eastern and western Jordan Rift Plateaus have been used to constrain the initial 3-dimensional gravity model of the graben. The gravity data were mainly collected by the Natural Resources Authority (NRA) OF Jordan and the Geophysical Institute of Israel (GII). The present study incorporates additional gravity data measured by joint collaboration between several geophysical institutes: Germany (FU Berlin); Jordan

(NRA); and Palestine (Earth Science and Seismic Engineering Centre (ESSEC) at An-Najah National University.

The general geological information of the study area have been incorporated both in the qualitative and quantitative interpretation stage of the observed Bouguer gravity anomaly.

A three-dimensional interpretation of the newly compiled Bouguer anomaly map is part of the DESERT 2000 Transect. Which is a multi-disciplinary and multinational project studying for the first time the Dead Sea Transform (DST) fault system from Gaza at the Mediterranean Sea to Saudi Arabia across the international border in the NW-SE direction.

The negative Bouguer anomalies (with magnitude reached -130 mGal), located into transform valley, are caused by the internal sedimentary basins filled by the light density young sediments (≥ 10 Km). A high-resolution 3-D model constrained with the seismic results reveals a possible crustal thickness and density distribution beneath the DST valley. The inferred zone of intrusion coincides with the maximum gravity anomaly over the eastern flank of the DST. The intrusion is displaced at different sectors along the NW-SE direction.

The zone of the maximum crustal thinning (≤ 30 Km) is attained in the western sector at the Mediterranean. The south-eastern the largest crustal thickness in the region (38 -42 Km). Linked to the left lateral movement of ~ 105 Km at the boundary between the African and Arabian plate, and constrained with the DESERT 2000 seismic data, a small asymmetric topography of the Moho beneath the DST was modeled. The thickness and density of the crust suggest that a continental crust underlies the DST. The deep basins, the relatively large nature of the intrusion and the asymmetric topography of the Moho lead to the conclusion that a small-scale asthenospheric upwelling(?) might be responsible for the thinning of the crust.

Water Decontamination of ONP, 24-DNP, AND Dinoterb by Activated Carbon, and Trace Analysis by Carbon Past Electrode with solid Incorporated

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The contamination of drinking water and the wastewater problems are highly critical environmental problems. The nitro-phenols compounds are classified as hazardous compounds. Their existence even in low concentrations is considered to be a source of contamination, which can cause harmful health effects. Thus, the water decontamination becomes an ultimate goal for many scientific researchers.

The activated carbon has grand capacity of contaminants adsorption and its efficiency for water decontamination has been studied over many compounds. The electrochemical detection method is very well known by its efficiency and sensibility of detection.

Herein, a decontamination study for adsorption of O-Nitrophenol, 2,4-Dinitrophenol and Dinoterb in water samples by activated carbon, the isotherms of adsorption assure the high capacity of activated carbon to treat these compounds. The carbon past electrodes with activated carbon as solid incorporated used and give good and reproductive results for the determination of the above-mentioned compounds and it facilitate the trace analysis due to its precision and low cost.

FRACTAL PATTERNS IN SPECIES DISTRIBUTIONS OF SOME BRITISH SCARCE PLANTS

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abstract

The spatial distribution and fractal structure of two British scarce plants, Lobelia urens (heath lobelia) and Phyteuma orbiculare (round-headed rampion), have been examined at several different scales. The two species have similar degrees of local patchiness at scale coarser than 50 Km and have contrasting coarse-scale between 50Km and 1Km scales, but differed consistently in the slopes of their scale-occupancy curves distributions at scale finer than 1Km.

The slope of the log-log plot of L. urens is not constant, but varies systematically with spatial scale, and from habitat to habitat at the same spatial scale. Abundance estimates suggest that the species P. orbiculare is found to be clumped at all scales, whereas L. urens is dispersed at intermediate scale. Fractal dimension analysis suggests that this changes through scale. The distribution varied in their pattern from highly clumped to randomly dispersed. Fairly predictions of L. urens can be made from 50 m and 200 m. Some issues affecting management of species abundance, as well as underlying mechanisms and conservation schemes have been highlighted.

**Statistical Analysis of Drinking Water Quality:
Evaluation of Chloride and Nitrate Concentrations
of Wells' Supplies Gaza Governorates (1999-2002)-
Palestine.**

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- (b) *Head, Information of Health Survey Division, Palestinian Health Information center, Ministry of Health, Palestine, e-mail: tayserm@hotmail.com*

Poster Abstract

Background: Gaza Strip is one of the most highly populated areas in the world with limited water resources (groundwater), which created a real water problem.

Objectives: To evaluate the Quality of drinking water wells' supplies residence of Gaza strip for Chloride and Nitrate (Cl^- & NO_3^-) concentrations during the period from 1990-2002 and to match (Cl^- & NO_3^-) with world Health Organization (WHO) guidelines. Seasonal variations for (Cl^- & NO_3^-) and variations among Governorates were evaluated.

Methods: Data about Cl^- & NO_3^- for 73 drinking wells, distributed all over Gaza Governorates during the period from 1990 to 2002 were collected from public

health laboratory-Palestinian Ministry of Health. Means and standard deviations were calculated and matched with WHO guidelines for Cl^- & NO_3^- concentrations by using one sample t-test. Paired t-test was applied for the testing of seasonal variations of concentration. ANOVA test were used for evaluating Cl^- & NO_3^- concentrations among Governorates. All wells that have not met the inclusion criteria (\geq five-years available data) were not considered for t-tests.

Results: During the period from 1990-2002 for all Gaza Governorates, the mean of Cl^- concentration (397.1 mg/l) and of NO_3^- concentration (126.2 mg/l) were found statistically higher than WHO-recommended guidelines (250 mg/l and 50 mg/l) for Cl^- and NO_3^- respectively (P-value <0.001). 50.8% and 77% of analyzed wells were significantly higher than WHO guidelines n Cl^- & NO_3^- respectively. Mean of both Cl^- & NO_3^- concentrations in Khan Younis (777.8 mg/l, Cl^- ; 190.0 mg/l, NO_3^-) were found significantly the highest among all Governorates. Seasonal variations shows that mean of both Cl^- & NO_3^- Concentrations were significantly higher in autumn (392.7 mg/l, Cl^- ; 126 mg/l NO_3^-) than spring (382.6 mg/l, Cl^- ; 122.1 mg/l, NO_3^-) (P-value <0.01).

Conclusions: Real problem of drinking water quality in respect to Cl^- an NO_3^- is concluded among all Governorates especially KhanYounis. Both Cl^- and NO_3^- concentrations have been decreased in spring season.

Medical Waste Management in Gaza Governorate: Alarm for Actions

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Medical waste treatment and disposal is an increasingly imposing public health crisis, The main objective of this poster is to highlight the present status of medical waste management in Gaza Governorate (El-Shifa hospital as a case study) as well as to identify the risk factors associated with generation, collection, on-site handling, storage, processing, transportation and disposal of medical waste. The study showed there were no common standards for source separation, collection bins, collection equipment for the disposal of medical waste. The medical waste is transported manually in thin plastic transparent bags to be stored in the open air near the incinerator. There is no preparation for the material to be incinerated. The incinerator located inside the hospital and not working properly. The workers have no protective equipment such as. Work clothes, thick gloves, boots or safety glasses, and there are no washing facilities. Wastes can pose a risk to health care workers, patients and local communities. While there is much concern about the possible spread of disease especially from contact with sharps such as needles, the treatment of those wastes, through incineration inside the hospital, can release an array of hazardous pollutants into environment. Management of

medical waste is very much dictated by the prevailing legislation as well as public perception. Economic, environmental, and occupational safety issues also play a key role in the management of medical waste.

Keywords: Gaza medical waste, environment, legislation, occupational safety.

Nitrogen cycling model in wetland ecosystems

□

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The lecture deals specifically with my master thesis which concern mainly with the modeling of nitrogen cycling in the wetland. The model simulate the fate of nitrogen cycle and enhance the wetland functions and its role in wastewater treatment.

Treatment of municipal wastewater in Gaza strip in the presence of hydrogen peroxide

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and *Monther F. Salem*****

Abstract

For real municipal wastewater samples, taken from the central collection station in Gaza city, aerobic oxidation of wastewater have been studied in the presence of hydrogen peroxide. A simulation for the real treatment station have constructed in the laboratory to study the effect of different parameters under the same real treatment conditions. Optimum conditions have been arrived for the ratio of H_2O_2 : COD and temperature. Possibility of substitution of aeration with the addition of hydrogen peroxide have been tested. Physical, chemical, and microbiological properties of the treated wastewater have been followed through the course of treatment. The was not encouraging.

Key words: physical chemistry, kinetics, aerobic oxidation, wastewater treatment, hydrogen peroxide, COD, BOD, and TDS.

Pre-treatment of waste before dumping pays!
Simple technical Processes contribute to economic
Waste management

Meine Adresse lautet:

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Abstract

The Gaza Strip is a coastal area along the eastern Mediterranean Sea. By its location, Gaza Strip is the gateway on the crossroad between Asia, Africa and Europe. The area of Gaza Strip is 365 km² (40km long and 6 to 12km wide), 80 km² is occupied by the Jewish Settlements. The Gaza Strip is bounded by the Green Line which is the border with Israel from the north and east. Egypt bounds the Strip from the south, and the Mediterranean Sea is the western border Gaza City is the biggest city in Gaza Strip, its area 45km². Gaza Strip is located in a transitional zone between the arid desert of the Sinai and semi-humid Mediterranean climate along the coast .the weather is rather dry in summer season from April till October, and rainy in the winter season from November until March. The average daily mean temperature ranges from 25c° in summer to 13c° in winter. Mean Annual rainfall at Gaza is 400mm.

Gaza Strip is currently populated with 1.000.517 (PCBS) distributed in 5 Governorates, 24 cities, camps and villages. Half

of them are refugees, they were kicked out from their original villages in 1948 which now are under Israel's occupation.

The refugees are living in 8 refuges camps distributed among Gaza Strip. The rate of growth in Gaza Governorates is one of the highest rates in the world, which is 4.5% annually. The religion of the country is the Islam and the Arabic Language is the native language for all inhabitants. Gaza City is populated with about 400,000 inhabitants.

Israelis left Gaza with destroyed infrastructure and roads. Salah El Din Road is the Major Road in Gaza Strip, the road connects all Gaza Governorates from north to south. Networks of roads were developed later to serve all Gaza Cities and Villages.

Landfills are the ultimate place for non-usable waste. The generation of hazards from landfills is a well known phenomenon and-apart from hygienic effects-it involves liquid, gaseous and solid emissions. Conventional methods focus on sealing systems around the landfills., but they are expensive and the pollution potentials still remains.

Emphasis is spent to the substance "waste" itself. A properly pre-treated waste before dumping should be inert, immobile, and hygienic. This can be achieved perfectly by thermal treatment only, but other, low costive processes are available today. They consist of several process steps which may include mechanical and biological operations. The biological process reduces not only the amount of biodegradable materials, it also dries the waste and turns it into a mixture of compound that can be easily separated into burnable and recyclable materials without reduced risks.

In the first part of the paper, the authors characterize and analyze well-known as well as new processes of so-called „cold waste processing”. They concentrate on the „dome aeration process” which has an extremely simple design, is

cheap in operation and is a reliable process. The aeration bases on natural draft and provides an excellent supply of air. Built on the top of existing landfills, uncontrolled methane emissions can be minimized. All together, in the sense of the Kyoto Protocol, the process may help to reduce the global warming due to the avoidance of emissions. Thus, well designed economic models may draw advantage from the international trade of emission rights and help to finance the system by selling such rights. By now, it may sound like an academic consideration or a theory, but the idea could help to overcome economic problems of Waste Management in low-income regions.

Since agriculture and horticulture suffer from a loss of nutrients, composting is a favourable way to recycle nutrients and to maintain the structure of the soil. Unfortunately, the organic material is less suitable for composting because of its low porosity. A structural material like wooden chips must be added for higher void fraction that provide sufficient oxygen for the aerobic composting. Because of the shortage of wood, other solutions are required. It was found, that chips made of used car tyres, provide equivalent porosity and can be recycled perfectly. This extremely simple but highly effective solution will be introduced and discussed. It is not a way to get rid of the old tyres, but it makes advantage of their typical properties.

Subsurface Geology of Gaza Strip (south west of Palestine) Deduced from the Interpretation of Surface Geophysical Data

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ABSTRACT

Gaza Strip is located at the south western side of Palestine which extends by 45 km along the south eastern shore of the Mediterranean Sea with width varying from 5 to 15 km and a total area of about 365 km². General studies were outlined the subsurface geological and hydrogeological structures of the Gaza Strip but no detailed models have been carried out.

In order to investigate the area to propose detailed subsurface models, geophysical techniques have been conducted. A 60 V.E.S were carried out in different location in the study area, in addition to seismic refraction and reflection profiles. The geophysical data were interpreted quantitatively and qualitatively and integrated models for the subsurface geology of Gaza Strip were proposed. The proposed models coincide well with bore holes information in some locations that means the proposed geophysical models corresponds to geologic models, whilst in other locations this correlation does not show an acceptance degree of consistency, which maybe due to the limitation of the geophysical methods and to the interpretation ambiguity of the geophysical data.

استنباط الجيولوجيا تحت السطحية لقطاع غزة (جنوب غرب فلسطين) من

خلال تفسير المعلومات الجيوفيزيائية السطحية

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ملخص

يقع قطاع غزة في الناحية الجنوبية الغربية لفلسطين ، ويمتد بطول 45 كم على طول الساحل الجنوبي الشرقي للبحر الأبيض المتوسط ، ويتراوح عرض القطاع بين 5 إلى 15 كم ، وبمساحة إجمالية حوالي 365 كم² . لقد أجريت بعض الدراسات الجيولوجية العامة بهدف الحصول على معلومات حول التراكيب الجيولوجية والهيدروجيولوجية تحت السطحية ، لكن لم يتم تنفيذ دراسات تفصيلية حول هذا الموضوع.

لغرض الحصول على معلومات تفصيلية عن جيولوجية وهيدروجيولوجية المنطقة ، تم استخدام الطرق الجيوفيزيائية المختلفة ، حيث تم استخدام طريقة المقاومة الكهربائية وتنفيذ 60 محطة قياس للسبر الكهربائي العمودي (V.E.S) إضافة إلى تنفيذ عدة خطوط قياس سيزمية انعكاسية وانكسارية.

تم تفسير المعطيات الجيوفيزيائية بطريقة كمية وكيفية وبطريقة مترابطة وأمكن بذلك اقتراح أشكال ونماذج للجيولوجيا تحت السطحية لمنطقة الدراسة.

لقد أظهرت النماذج المقترحة من تفسير المعطيات الجيوفيزيائية توافقاً ممتازاً مع المعطيات الجيولوجية التي تم الحصول عليها من بعض الآبار المحفورة في بعض المناطق مما يشير إلى أن النماذج الجيوفيزيائية المقترحة هي أيضاً نماذج جيولوجية صحيحة ، في حين في مناطق أخرى لم يظهر مثل هذا التوافق ، قد

يرجع وذلك إلى محدودية بعض الطرق الجيوفيزيائية المستخدمة وإلى غموض في تفسير بعض الشواذ الجيوفيزيائية ، وإمكانية تفسيرها بأكثر من نموذج.

مدخل جديد لمعالجة المياه العادمة الناتجة عن الصناعات الغذائية إعداد

د. زاهر عدنان سالم

مستشار بيئي في سلطة جودة البيئة
غزة – فلسطين ، سبتمبر 2004

الملخص:

تتناول المحاضرة مسألة بيئية هندسية حيوية معاصرة وهامة للغاية، فالجميع يعلم أن الوطن العربي يعد من أفقر المناطق للموارد المائية في العالم، فمساحة الوطن العربي تمثل 10.2% من مساحة العالم، في حين موارده المائية لا تمثل سوى 0.5% من الموارد المائية المتجددة عالمياً. وبالنسبة للمياه العادمة فكما تشير إحصائيات عام 2000 فإن نتيجة ما ينتجه الوطن العربي من مياه عادمة سنويا يقارب الأحد عشر مليار متر مكعب، ومن هذه المياه يعالج فقط الثلث وثلثين تبقى دون معالجة أو إعادة استخدام. أما بالنسبة لما ينتجه الفلسطينيون من مياه عادمة في الضفة الغربية وقطاع غزة ، فإن التقديرات تتراوح ما بين ال 50 إلى 70 مليون متر مكعب سنويا، يجمع ويعالج منها أقل من النصف ، والباقي يقذف في البيئة. إذا لابد من جمع ومعالجة المياه العادمة لتفادي الأخطار الناتجة عنها ولاستغلالها كمصدر غير تقليدي للمياه يساهم في تعويض العجز المائي الحالي. تركز المحاضرة على عدد كبير من المصانع الغذائية المنتشرة عشوائيا في المدن والبلدات الفلسطينية والتي تقذف بمياهها العادمة دون أي معالجة إلى شبكة مياه الصرف الصحي أو إلى الطبيعة فتسبب في الضغط على محطة المعالجة

المركزية – إن وجدت – أو تلوث البيئة، كما أن المياه العادمة التي تنتجها تلك المصانع تقدر بكميات كبيرة نسبياً، تهدر ولا يستفاد منها. ومن هنا انبثقت فكرة ضرورة معالجة المياه العادمة لهذه المصانع بداخل المصنع نفسه، بحيث نتمكن من إعادة استخدامها للأغراض المناسبة، وبذلك نكون قد قدمنا خدمة رائعة للإنسان وللبيئة.

فالمحاضرة تسلط الضوء على المدخل العلمي والحل الهندسي لمعالجة المياه العادمة لبعض المصانع الغذائية الواقعة في مدينة غزة، حيث تم التعرف على الكم والمواصفات للمياه التي تنتجها مصانع تعبئة المياه الغازية والعصائر، كذلك بعض مذابح الدجاج والحبش، وتم أخذ العينات بالعدد الكافي وتم عمل التحاليل الكيميائية والميكروبيولوجية بهدف حصر أنواع الملوثات التي ترافق هذه المياه بعد قذفها من تلك المصانع، ثم تم تحليل النتائج.

بعد ذلك تمت تجربة كل من المعالجة البيولوجية والمعالجة الالكتروكيميائية بعد المعالجة الفيزيائية (يقصد بها التنقية من المواد الصلبة العالقة) لهذه المياه وتمت المقارنة بين الطريقتين.

دلت النتائج على أن المعالجة الالكتروكيميائية أكثر نجاعة وأكثر أمناً وسهولة، كما تمت متابعة عملية المعالجة الالكتروكيميائية وتكرار التجربة بالدرجة الكافية إلى حين التوصل إلى نظام التشغيل الأمثل لوحدة المعالجة، والذي أعطى نتائج ممتازة، حيث وصلت كفاءة إزالة الملوثات العضوية إلى 95%، هذا بالإضافة إلى التعقيم الكامل. تمت الاستعانة بالمنحنيات البيانية لمتابعة وتوضيح فعالية المعالجة أثناء فترة مكوث المياه العادمة في الوحدة. تم إضافة تعديلات هندسية وإضافات تقنية على وحدة المعالجة الالكتروكيميائية، كما تم إعداد مخطط هيكلي هندسي للوحدة لتصبح محطة صغيرة متكاملة تعالج المياه العادمة بكفاءة عالية جداً تم تعقمها كلياً، مما يسمح بإعادة الاستخدام.

تجدر الإشارة إلى أن المبدأ في المعالجة الالكتروكيميائية هو "تخليق" كميات من فوق أكسجين (H_2O_2) الذي يقوم بتكسير الملوثات العضوية وتعقيم المياه، كما تم فحص المياه العادمة المعالجة بأحدث الطرق (يقصد هنا باستخدام الأحياء الدقيقة) لإظهار عدم وجود السمية في المياه المعالجة. تم عمل البحث في جامعتين ومعهدا متخصصا للبحث العلمي في تكنولوجيا معالجة مياه الصرف الصحي في أوروبا.

إن البحث الذي ستوجزه المحاضرة، يعد ذو قيمة علمية كبيرة ويشكل مصباحا وحافزا جديا للباحثين والمختصين في هذا المجال.

Improve the Quality of Potable Water Used by the Elementary Schools in Gaza Strip (Palestine) Using Reverse Osmosis Filters

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Abstract

The recent laboratory tests conducted by the Palestinian Water Authority and the Palestinian Ministry of Health have shown that more than 70% of the water wells in Gaza Strip do not satisfy to the WHO and the Palestinian Standards for Drinking Water. This low water quality, polluted water constitutes a hazard threatening the health of the population in Palestine. Some researches pointed that elementary students are greatly affected by the bad quality of potable water in the schools. Over 50% of the student brings desalinated water from their homes to school; the others either drink the poor water at school or keep themselves dehydrated until they return home. The conferences and workshops conducted under Department of Environment & Earth sciences and Rural Research Center at the Islamic University of Gaza have drawn attention to the bad quality supplied to the local elementary schools.

In general, desalination becomes a strategic option in scarce water countries. In Palestine, desalination technique maybe is the unique solution for improvement the water quality at least

at the present conditions. Water resources in Gaza Strip suffer from deficit in water balance of about 30%.

Due to the low quality of water in Gaza Strip and the needs for purification, the Islamic University of Gaza- presented by the Environmental & Rural Research Center established a project to improve the quality of potable water used by the government elementary schools in the city of Gaza as well as increase and improve the environmental and health awareness. The project was funded by USAID and aims to installing 60 desalination units (RO system) with production capacity of 1500l/day for every RO station, in addition to 60 stainless steel tanks to hold this quantity of water for every school.

The aim of this paper is to describe the project activities and the effect of RO system in improving the water quality. Sixty water samples have been analyzed for the most important physical, chemical and biological elements.

Keywords: Gaza Strip, desalination, reverse osmosis, potable water.

Mobility of Organic Contaminant in Soil

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Abstract

This study estimated the mobility of organic contaminant (e.g, metolachlor, a herbicide) from bentonite based and emulsifiable concentrate (EC) formulations in soil columns and field plots by using bioassay and chemical techniques. A bentonite based formulation of metolachlor was made by adsorbing metolachlor to bentonite- benzyltrimethylammonium (BTMA) from aqueous solution. Bioassay and GC-techniques detected high metolachlor concentrations in the top soil layers (0-9cm) in soil columns and field plots treated with bentonite – BTMA-metolachlor complex. These results were also evident y severe growth inhibition restricted to the top soil layers (0-9 cm) and normal growth at deeper layers in soil columns and field plots. A wider range of metolachlor concentrations were detected in soil layers in columns treated with EC-formulation in both soil columns and field plots. Relatively higher metolachlor concentrations were detected in the soil layers in field plots than in soil columns. A bioassay technique was a more sensitive tool than chemical technique and detected diluted concentration of metolachlor at deeper layers. The different mobility of metolachlor applied as bentonite-BTMA complex is due to the adsorption capacity of bentonite-BTMA complex. Key words: metolachlor; bentonite-BTMA; mobility, soil columns, field plots.

Relationship between Nitrate Contamination of Ground Water and Metbemoglobin Level among Infants in Jabalia, Gaza and Khanyounis

By: Naser¹ A, Ghbn²N, and Khoudary³ R,2003

Abstract

A cross-sectional study was carried out in Gaza Strip-Palestine in 2002. The aim of this study was to determine the relationship between nitrate concentration in drinking water wells and Met-Hb level of infants in Jabalia, Gaza and Khanyounis. The study was conducted at 12 governmental primary health care centers. Covering a study population consisted of 338 infants who were attending for vaccination. Data was collected through , a standardized questionnaire face to face with infants' mother at the centers blood samples for Met-Hb and CBC and samples from the drinking water wells obtained during the study period between June and November 2002.

The high Met-Hb level was strongly associated with nitrate concentration in drinking water wells. The highest average of Met-IIb level had been detected in Khanyounis, as a response to the highest average of the observed nitrate concentration, Met-Hb level exceed 5% in 53.2% of infants from Khanyounis, 51% of infants from Jabalia and 45.8% from Gaza. There is a positive relationship between infants from Gaza. There is a positive relationship between infants of age 3.1 to 6 months and high Met-Hb level, and negative relationship between exclusive breastfeeding and high level of Met-Hb. Moreover, it was noticed a significant positive relationship between the high Met-Hb level and supplementary feeding. A significant negative impact of high Met-Hb level on the Hb level, weight

gaining and growth of infants also had been noticed. The study also demonstrates clearly that drinking water resources is considered as main factor for high level of Met-Hb and the tap water, reservoir or private wells water rather than treated or filtered water, In addition, there was a positive correlation between high level of Met-Hb and the boiled water.

The study revealed that nitrate was more prevalent in khnyounis, Jabalia and Gaza which directly proportional with increased level of Met-Hb, Demonstrate that nitrate constitutes the main risk factor for increasing Met-Hb level amongst infants. The study findings indicate the importance of exclusive breast feeding for infants less than 6 months of age, and the choice a suitable source of water for these infant's use.

Analysis of the Relation between Hydrological Factors and Salinity Using ANN

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Abstract

Intensive exploitation of groundwater in the Gaza strip in the past four decades, has disturbed the natural equilibrium between fresh and saline water, and has resulted in increasing salinity. High salinity of groundwater has many impacts on public health as well as on the soil properties which may cause a reduction in the agricultural production. Solving this problem must be integrated with the whole water resource management. It is evident that water resources in the Gaza strip have to be managed in a sustainable manner in order to maintain water balance and fulfill the water demand for different uses.

Understanding spatial relation between hydrological factors and salinity of groundwater can be essential for developing a decision support system (DSS). The DSS is needed to support the manager of water resources in defining the extent of the groundwater salinity, and formulating and evaluating strategies for solving the problem of groundwater salinity. In this article, the relation between hydrological factors and salinity, represented by

chloride, of groundwater in the North Governorate in the Gaza strip in analyzed using Artificial Neural Network model (ANN). Time series of the hydrological factors: rainfall, groundwater level, discharge rate and salinity of 30 wells in the North Governorate in the Gaza strip are used in the analysis.

The weight of significance of each hydrological factor is measured by the error ratio which is computed using ANN model. For each hydrological factor, a contour map of error ratio is developed. Accordingly, the study area is classified into three zones: high, medium and low. These zones indicate the sensitivity level of the groundwater salinity against each hydrological factor in spatial domain. The zones can be used as criteria for developing an effective DSS for water resource management in the Gaza strip which is part of ongoing research.

Keywords: Groundwater, Salinity , Hydrological factors, Artificial Neural Network (ANN), Groundwater management.

Integrated Geophysical Investigation of Fervença Region (Cantenhede, Center of Portugal)

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Abstract

Geophysical methods are very important tools used to investigate and delineate the subsurface geology of an area. Integration the geophysical and geological data are commonly used to construct the subsurface model for the study area.

Fervença Basin is an area located near Cantenhede, Center of Portugal. The surface geology of the area shows a great variety of sediments and sedimentary rocks ranging from Jurassic to Holocene, but subsurface geology information are very limited. Geophysical survey has been conducted to the area to construct subsurface geology models of the area some 44 vertical electrical sounding (V.E.S) with Wenner configuration and six seismic refraction profiles were carried out. The geophysical data analyzed in terms of quantity and quality and integrated with the available geology data and subsurface geology models were proposed for the area. The proposed models coincide well with some boreholes information in some location that means the proposed geophysical models corresponding to geologic models, whilst in other location

inconsistency was clear. This maybe related to the limitation of the geophysical methods and/or to the ambiguity of the geophysical data interpretationl.

Entropy and Multi-objective Based Approach for a Groundwater Quality Monitoring Network Assessment and Redesign

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abstract

Nowadays long-term monitoring is a major tool in gathering information for tackling changing environmental issues and reducing the uncertainty in surface and groundwater management. In many parts of the world, monitoring network features, such as spatial distribution, temporal frequency and variables to be measured, are not assessed and designed according to the information gained from the network, rather monitoring practices are undertaken on the base of collecting data which might not be needed.

Selection of the number and location of groundwater quality monitoring wells may require the consideration of different aspects such as monitoring objectives, temporal frequency of monitoring, and cost of monitoring. These aspects (multi-objective criteria) were examined using observations of groundwater quality variables made twice a year in 124 wells in the northern part of the Gaza Strip, where ground water is of the best quality. Considering these multi-objective criteria, the groundwater quality monitoring network was assessed and redesigned using entropy theory.

The assessment and redesign procedures were based on expressing transinformation as a function of distance between

wells (Transformation Model). The transformation was computed using contingency tables. An exponential decay curve was fitted to the Model data. The high value of the coefficient of determination supports the fitting of this decay curve. It was found that the number and location of groundwater quality monitoring wells varied if the multi-objective criteria were embedded in the assessment and redesign procedures. Probably, the most important contribution of this study was to develop a methodology that made use of the entropy theory and to apply the procedure based on the theory to a complex real situation: the groundwater quality monitoring networks in the Gaza strip, Palestine (a developing region).

Key-words: groundwater quality monitoring; spatial variability; entropy; information; Gaza Strip.

Health Effect due to Poor Wastewater Treatments in Gaza Strip

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Abstract

In eastern Mediterranean countries including Palestine, the demand on water is growing rapidly due to rapid population growth, urbanization and socioeconomic development. Both the west Bank and Gaza Strip are facing a series of wastewater and sanitation-related problems, large-scale discharge of untreated wastewater , leaking of collected wastewater from sewer systems and cesspits, water treatment plants that do not function or function only badly and uncontrolled reuse of untreated wastewater by the irrigation sector.

In this paper I focus on the Gaza strip only. Currently, about 70%-80% of the domestic wastewater produced in Gaza is discharged into the environment without treatment, either directly at the source, after collection from cesspits or through the effluent of the sewerage system or overloaded treatment plants. Most of the wastewater flows into the sea, a small part infiltrates and contaminates the soil and the groundwater. Moreover, the discharge causes public health risks through direct exposure as well as through reuse of untreated wastewater on irrigated lands.

Diseases related to contaminated drinking water (poor water treatment) constitute a major burden on the health of people in Palestine and are among the leading causes of ill-health.

Sustainable health, especially for children, is not possible without an effective and adequate water supply and healthy water treatment.

This paper has three objectives:

- To demonstrate the link between wastewater and health and show the profound influence of water supply and quality on public health in Gaza.
- To highlight the environmental and health impact resulting from poor wastewater treatment in Palestine.
- To describe the basic classification of water-related disease in Palestine, mainly Gaza strip.
- To describe how improvement and proper management in water treatment will lead to improvements in health and a reduction in morbidity rates.

The paper also assesses the environmental and human health impacts associated with the current practices of wastewater management and sanitation in Gaza, especially:

- Soil and groundwater pollution resulting from discharge of untreated wastewater.
- Direct human health risks as a result of exposure to wastewater in open systems.
- Indirect human health risks as a result of consumption of polluted crops and fish.

ELIMINATION OF REMAZOLE BLUE-B BY ADVANCED OXIDATION METHODS

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Abstract

Different methods have been used to reduce or eliminate organic pollutants from wastewater and groundwater. Advanced oxidation methods means the cold combustion of organic impurities in the aqueous media by means of chemical oxidation methods, or what is called mineralization organic pollutants. Remazol blue B was taken as the model pollutant, (Ozone/Hydrogen peroxide/Ultraviolet light), were used to eliminate the pollutant from wastewater which means the fast oxidation to produce CO_2 , H_2O , NO_3^- , SO_4^{2-} etc. The effect of Ph, the initial concentration of hydrogen peroxide, the rate of ozonation, dose of UV and the influence of temperature were studied to find the optimum conditions for oxidation of this organic pollutant. Experimentally a special system was constructed to follow the oxidation reaction of ozone with impurities. Experimental results indicated that the oxidation of Remazol blue B was faster at higher Ph than at lower Ph. Using suitable analytical methods such as visible spectrometry techniques. Chemical Oxygen Demand (COD), detailed kinetics and reaction mechanisms have been estimated.

Recommendations, including advantages, disadvantages, optimum conditions, have been reported Applicability and the economical side of similar purification/ recycling projects for used industrial water, were introduced.

Keywords: Advanced oxidation technology (AOT)-mineralization of organic pollutants- hardly oxidized impurities-Remazol blue B- (COD)-ozone-Ultraviolet radiation-H2O2.

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Assessment of Groundwater Quality in Gaza City (South of Palestine) during the period (1994-2004)

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Abstract

Groundwater is the main source for public water supply in Gaza Strip. The surface water resources and other resources are very limited. It is a valuable source for drinking water. In eastern Mediterranean countries including Palestine, the demand on water is growing very rapidly due to the rapid population growth; urbanization and socio-economic development.

Gaza Strip located in the southwestern part of the Palestinian coastal plain in arid to semi arid area. The rainfall in the area ranges between 450 mm/y in the north to about 300 mm/y in Gaza City. Gaza Strip characterized by densely population (1.3 millions inhabitants) lives in small area (360 square kilometers), with the highest population density rate in the world (3198 inhabitants per square kilometers). As a result to

the population level; the increase of agriculture activities; the over pumping of the groundwater; the seawater intrusion and the limitation of the rainfall, quality and quantity of groundwater in Gaza Strip is deteriorated rapidly.

To detect the trend of changes in the chemical characteristics and the groundwater quality in the study area, some of 20 municipal wells samples were collected and analyzed during the last ten years (1994-2004). The samples were evaluated for domestic use by applying both The Palestinian Standards for Drinking Water as well as The WHO Standards. The comparison shows significant decreasing and fluctuation in water quality for the study area. This change in groundwater quality in Gaza City is attributed to the previous mentioned factors and to the fluctuation in the annual rainfall of the area.

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Computer

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ARABIC PHONOLOGY AND COMPUTER SCIENCE

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Abstract

The aim of this work is to design and implement an Arabic phoneme recognizer that uses as much as possible the Arabic phonology properties with the characteristics of the Arabic language. This is represented by the proposed two segmentation algorithms that are based on the rules of Arabic phonological system. and the standard Arabic phonemes duration [1]. It is represented by designing and implementing a set of neural networks that are based on the Kohonen Self-organizing Map and Learning Vector Quantization which are good for a language that has a certain logical relationship between the pronunciation and writing[1]

Probabilistic adaptive framework for dynamical systems

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Abstract

State- of the-art techniques for forecasting that combine excellent generalization properties and sparse representation utilizes the basic notions and mathematical models of statistical mechanics are combined into a paradigm model, which will ultimately represent and learn a dynamic state of knowledge.

This paradigm will represent what we know and will learn what will happen. It will be designed to account for the uncertainties implied. It utilizes the sparse Bayesian learning (SBL) concept for the objective of managing a fine-scale system. This framework will be able to diagnose abnormality in the system. Abnormality in this context is referred to outliers, false signals (e.g. as a result of sensor failure) and system behavior drift (i.e. concept drift, and novelty detection). The proposed versatile adaptive paradigm might be borrowed in any control processes of dynamical systems in which a quantitative characterization of uncertainty is manifested. Since, water scarcity and uncertainties in forecasting future water availabilities present serious problems for basin-scale water management. Thus, it is a must to design intelligent prediction models, which learn and adapt to their environment in order to provide water managers decision-relevant information related to the operation of river systems. Therefore

the framework plausibility will be demonstrated as decision tools to enhance real-time water management , a relevance vector machine (RVM). Which is a probabilistic model, has been used in an on-line fashion to provide confident forecasts practical applications, on- line algorithms should recognize changes in the input space and account for drift in system behavior. Support vectors machines (SVM_s) lend themselves particularly will to the detection of drift and thence to the initiation of adaptation in response to recognized shift in system structure. The resulting model will normally have a structure and parameterization that suits the information content of the available data.

Engineering Industry Controllers Using Neuroevolution

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Abstract

Neuroevolution or evolving neural networks with evolution algorithms such as genetic algorithms, is becoming one of the hottest areas in hybrid systems research. One of the areas that become under research using neuroevolutions, is the controllers. In this paper, We shall present two engineering controllers based on neuroevolutions techniques. One of the controllers is used to monitor the temperature and humidity in an industry. This controller is having a linear behavior. The second controller is concerned with scheduling parts in queues in an industry. The scheduling controller is having a non-linear behavior. The results obtained by the proposed controllers based on neuroevolution are compared with results obtained by traditional methods such as neural networks with backpropagation and ordinary simulation for the controller. The results show that the neuroevolution approaches outperform the results obtained by other methods.

Keywords: : Neuroevolution, Real time systems, Control systems

A Report on the “MathBroker” Project for Brokering Mathematical Web Services?

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Abstract

We report on the past achievements and on the current status of a project on the development of a software framework for brokering mathematical services in the Web. The World Wide Web is currently evolving from an infrastructure for delivering static Web pages coded in HTML to an infrastructure for providing dynamic *Web services* that use XML as the common format for object data and metadata. These services communicate with clients (and other services) using the SOAP protocol [6], their interfaces are described in the Web Service Description Language WSDL [9], their behavior is described by semantic Web technologies like OWL-S [4], interface/behavior descriptions are stored in Web registries such as the one developed by the ebXML initiative [5] that can be queried by clients for lookup of appropriate services. While most Web developers focus on the use of Web service technologies for business applications, projects like our “MathBroker” project or the European MONET project [7] aim to support the area of computer mathematics where services provide functionality related to e.g. computer algebra or automated theorem proving. The general idea is that a client (human or software) in need of advanced mathematical capabilities can

automatically discover and use corresponding services provided in the Web. The challenge of this particular application area is that it operates with semantically rich objects and provides complex functionality whose specification requires a precise formalism to be useful to potential clients.

Our work in the “MathBroker” project began in 2001 with the goal to use and adapt the then emerging Web service technologies for the purpose of computer mathematics. A starting point for this project was previous work by the OpenMath (OM) initiative [8] on describing mathematical objects for semanticspreserving communication e.g. between a mathematical service provider and service requester. OM has an XML representation that makes it suitable for communication in SOAP-based web service communication. Upon this foundation,

we have based the following achievements:

? Supported by the Austrian Science Foundation (FWF) project P15183.

Mathematical Service Framework We have elaborated the use of the AXIS software to implement for the first time mathematical demonstrator services based on Web service technologies (SOAP and WSDL) using the XML encoding of OM objects [2]. This work pushed existing Web service software to their limits and revealed several deficiencies at that time.

Mathematical Service Description Language We developed a “Mathematical Service Description Language” (MSDL) which in a highly structured way extended the interface description features of WSDL by semantic information such as the mathematical problem solved by particular service [3].

MSDL was later revised as an extension of the simultaneously developed description language of the MONET project.

Mathematical Registry Provider Having experimented with Sun’s JWSDP

registry, we developed on the basis of ebXML a Web registry for storing respectively retrieving MSDL descriptions by mathematical Web services respectively clients [1].

Mathematical Query Language Currently, we work on the development of a mathematical query language. On the basis of the ebXML registry of MSDL descriptions, a brokering service shall be developed to which clients can submit descriptions of their problems and retrieve those services that can solve the specified problems.

The current status of the project with sample services and software can be found at <http://www.risc.uni-linz.ac.at/projects/basic/mathbroker>.

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