دليل رسائل الماجستير
الكليات العلمية

جامعة الأزهر – غزة
فلسطين
Faculty of Pharmacy

1. Master’s Program in Pharmacy
**In Depth Phytochemical Analysis in the Miracles of Pumpkin**

Reham Al-Shami

Discussion: 09/04/2013

Supervisor/s

- **Dr. Mazen A. El-Sakka** Main supervisor.

**Thesis Abstract:**

**Introduction:** Traditional Arabic and Islamic Medicine therapies have shown remarkable success in healing acute as well as chronic diseases and have been utilized by people in most countries of the Mediterranean who have faith in spiritual healers. The Holly Quran tells us many miracle healing stories, one of these stories is the story of Prophet Yunus (pbuh). Phytochemicals usually exert unusual, unique and specific active physiological effects responsible for their therapeutic and pharmacological functions. The family **Cucurbitaceae** includes a large group of plants which are medicinally valuable. It is a family of about 130 genera and about 800 species distributed over the world. A **pumpkin** is a gourd-like squash of the genus **Cucurbita** and the family Cucurbitaceae. **Objectives:** to improve the knowledge and research on scientific signs in Qur’an and Sunnah to prevent from the diseases, and to detect, in depth, the chemical content and the active ingredient(s) of pumpkin cultivated in Gaza Strip. **Methodology:** A cross sectional descriptive study was conducted on the pumpkin, a gourd-like squash of the genus **Cucurbita** cultivated in the South governorate in the Gaza Strip. The leaves are collected each month from March to July 2011. Collected leaves put for drying at shade and reduced to fine powder. The leaf powder is prepared for qualitative, quantitative, separation and characterization of compounds by GC/MS. **Results** Qualitative analysis in non Saponifiable extract showed the presence of sterols, volatile oils, cardenolides and saponins. In Saponifiable fraction showed the presence of flavonoids aglycons, fatty acids, cardenolides, and saponins. Ethanolic extract present alkaloids salts, catechol,
flavonoids glycosides, and saponins. By GC/MS our sample showed more than 6000 compounds, of which 31 were identical with their controls. **Conclusion:** This study describes the step-by-step the miracle event with our prophet Yunus (peace be upon him) from the chemical and the pharmaceutical, where we match 34 chemical compounds were not mentioned before in previous studies of more than 6000 compounds needs to separate by other advanced methods. **Recommendation:** Advanced studies on leaves and other parts of the drug, respectively advance analysis such as IR and NMR for all parts of the drug are necessary. Clinical studies are recommended to elucidate the correlation between chemical ingredients and their pharmacological properties, and to confirm the data of traditional medicine.

**Key words:** Pumkin, non Saponifable extract, Saponifable extract, GC/MS
Development and Validation of Spectrophotometric Method for Determination of Cefixime and Glimepiride by Ternary Complex Formation

Mohammed K. Al-Laham

Discussion: 26/05/2013

Supervisor/s

- Dr. Thab M. Almasri

Main supervisor.

Thesis Abstract:
A simple, accurate and sensitive UV-Visible spectrophotometric method have been developed and validated for the quantitative determination of cefixime and glimepiride in either pure form or in their dosage forms. The method is based on the formation of a ternary complex with copper(II) and eosin. The method does not involve solvent extraction.

Appropriate conditions were examined for the reaction to obtain maximum absorptivity and sensitivity. Under the optimum reaction conditions, linear relationships with good correlation coefficients (0.9997) were found between the concentrations and the absorbance of the formed complexes of the two drugs studied.

The color of the produced complex is measured at 550 and 544 nm with apparent molar absorptivities of $1.49 \times 10^4$ Lmol$^{-1}$cm$^{-1}$ and $1.657 \times 10^3$ Lmol$^{-1}$cm$^{-1}$ and Sandell's sensitivities of $3.1 \times 10^{-2}$ and $2.9 \times 10^{-2}$ µg/cm² for cefixime and glimepiride, respectively. The method is applicable over concentration range of 4-28 and 5-50 µg/mL for cefixime and glimepiride, respectively. The effect of excipients on the method was tested with very good recovery percentage. The results of analysis have been validated statistically, and recovery studies confirmed the accuracy of the proposed methods which was carried out by following the ICH guidelines. Furthermore, the developed methods hold their accuracy and precision well when applied to the determination of cefixime and glimepiride in their dosage forms.
Development of Spectrophotometric Methods for Aliskiren Determination in Pharmaceutical Dosage Form

Mohammed Baraka Abu Iriban  Discussion: 09/06/2013

Supervisor/s

- Dr. Mai A. Ramadan  Main supervisor.

Thesis Abstract

Two simple, accurate and precise spectrophotometric methods for the determination of Aliskiren (ALS) in pharmaceutical products were developed. The first method was based on the reaction of ALS with 1,2-naphthoquinone-4-sulfonate (NQS) in alkaline medium producing an orange-red colored product, which absorbs maximally at 500 nm. The second method was based on the reaction of ALS with ninhydrin (NIN) mixed with ascorbic acid as reducing agent in phosphate buffer pH 6.0 producing blue-violet colored product, which absorbs maximally at 569 nm. The experimental parameters for both methods were studied and optimized. The optimum conditions were 1 ml 0.5% NQS solution, 1 ml 0.01 M NaOH solution, water as diluting solvent and 10 min reaction time maintained at room temperature for NQS method. While for NIN method, 1 ml 1.2% NIN mixed with 0.1% ascorbic acid dissolved in 0.2 M phosphate buffer pH 6.0, water as diluting solvent and 20 min reaction time maintained at 90±3°C. Furthermore, order of addition, stability of products chromogen and the stoichiometry of reactions were studied. The stability of products chromogen were 2 and 1.5 hr, respectively. The ratio between ALS; NQS and ALS; NIN was 1:2. Beer's law was obeyed in the concentration range of 20-300 and 10-170 µg/ml with R² of 0.991 and 0.992 for NQS and NIN methods, respectively. The validity of the methods was assessed according to International Conference on Harmonization (ICH) guidelines. Regarding accuracy, recovery values for NQS and NIN methods were 99.17–100.65 ± 0.28–1.7% and 99.63–101.2 ± 0.25–1.27%, respectively. The RSD for intra- and
inter-assay precisions for NQS and NIN methods did not exceed 0.62 and 1.7% as well as 1.6% and 1.46%, respectively. Interferences liabilities were carried out to explore the effects of reagents and inactive ingredients. The average recovery values for 50 and 100 mg of ALS were 99.95 ± 1.8% and 100.86 ± 1% as well as 99.13 ± 0.76% and 100.3 ± 0.82% for NQS and NIN methods, respectively. The influence of small variation in the methods variables did not significantly affect the procedures; recovery values for NQS and NIN methods were 98.2–102.78 ± 0.14–1.6% and 98.6–101.1 ± 0.31–1.12%, respectively. The pharmaceutical dosage form was subjected for analysis of ALS content by developed methods and a reference one. The results were compared by statistical analysis with respect to accuracy and precision and no significant differences were found. The developed methods are easy to use, accurate and highly cost-effective for routine analysis of ALS in quality control laboratories relative to HPLC and other techniques.

**Keywords:** Aliskiren, NQS, ninhydrin, spectrophotometric, validation.
The effect of P-glycoprotein on Propranolol absorption using in situ Single-Pass Intestinal Perfusion technique on rats

Ahmed F. Al Qedra

Discussion: 10/6/2013

Supervisor/s

- Dr. Mai Ramadan
  Main supervisor.

- Dr. Issam Abu Shammala
  2nd supervisor.

Thesis Abstract:


Background: Propranolol HCL (PLH) is a synthetic beta-adrenergic receptor blocking agent. Regarding its pharmacokinetics behavior, PLH is almost complete and rapid absorption from gastrointestinal tract, however the oral bioavailability is only 30% after oral administration and greatly different between individuals. PLH can be a substrate for P-glycoprotein distributed along intestinal, which secret actively into the intestine.

Aim: To find out the role of P-glycoprotein that may be effect on absorption of the anti-hypertensive agent PLH.

Methodology: In Situ Single-Pass Intestinal Perfusion SPIP technique was applied on rats (weighting 250-300 g and 7-9 week aged) to study the absorption phase. Rats were divided into three groups. The first group was perfused with PLH only (50 µg/ml). The second and third groups were perfused PLH in combination with verapamil HCL of different concentration (400 µg/ml and 2000 µg/ml, respectively). The intestinal luminal fluid was collected and analyzed by a validated spectroscopic method. SPSS was used to analyze the obtained data.

Results: The spectroscopic analysis of PLH in intestinal fluid was validated, it was linear in the range 10-50 µg/ml. The regression line equation is Y = 0.003 X + 0.15, \( R^2 = 0.999 \). The method was
accurate (% Recovery: 100% to 102.2%) and precise (within day % RSD: 1.55% to 2.0%, between days % RSD: 1.77% to 1.98%). PLH was stable in intestinal fluid at room temperature up to 8 hours. The limit of detection (LOD) was 1 µg/ml and the limit of quantification (LOQ) was 5 µg/ml. No interferences were found from intestinal fluid compound or verapamil HCL at the absorption maximal 319 nm. The method was applied sufficiently in the analysis with the advantage of avoiding expensive instrumentation. The inter-individual variation within a group was statistically not significant (P > 0.05). The absorption rate constant ka in first rat group was 0.18 ± 0.042 h⁻¹. The absorption rate constant ka in second and third group were 0.43 ± 0.05h⁻¹ and 0.42 ±0.042 h⁻¹, respectively. A five-fold increase in verapamil HCL concentration (400 to 2000 µg/ml) has not influenced ka of PLH (no statistically difference was found between the second and third group, P= 0.065). The increase of ka value by factor 2.4 of PLH when co-perfused with P-glycoprotein inhibitor (verapamil HCL) was statistically established (P=0.00).

**Conclusion:** Verapamil HCL (P-glycoprotein inhibitor) had increased ka of PLH by a factor of 2.4, indicating that P-glycoprotein plays a role in the absorption of PLH. P-glycoprotein role can explain the low a bioavailability of PLH after oral administration.

**Keyword:** Propranolol HCL, P-glycoprotein, Single-Pass Intestinal Perfusion technique, Verapamil.
The Effect of Vitamin C Alone or in Combination with Vitamin E on Fasting Blood Sugar, Glycosylated Hemoglobin and Lipid Profile among Type 2 Diabetic Patients (Gaza Strip)

Sherin M. Al Zinati

Discussion: 25/06/2013

Supervisor/s

- Dr. Amin Hamed  
  Main supervisor.

- Dr. Ashraf Al Swirky  
  2nd supervisor.

Thesis Abstract

Persistent hyperglycemia causes increases in the production of free radicals especially reactive oxygen species (ROS) which promote the development of many complications of diabetes mellitus.

The purpose of this study was to evaluate the effect of vitamin C alone or in combination with vitamin E as adjunctive therapy in reducing the serum level of glucose, glycosylated hemoglobin and lipid profile in type 2 diabetic patients in Gaza strip. To achieve this purpose sixty type 2 diabetic patients were selected from Palestine Medical Relief Society and some UNRWA health centers in Gaza Strip. All patients were treated with metformin and divided into three groups, but two patients withdrawn due to incompliance. The first group (n=20) continued on metformin therapy only (control group). The second group (n=19) was treated with vitamin C along with metformin, whereas the third group (n=19) was treated with vitamins C and E combination together with metformin. All patients were followed up for three months. A number of biochemical tests were carried out for each patient on the start and at the end of the experimental protocol; including fasting blood sugar (FBS), glycosylated hemoglobin (HbA1c) and lipid profile (TG, TC, LDL, HDL).
The results showed significant reduction in FBS, HbA1c and lipid profile among patients who used vitamin C (G2) and combinations of vitamin C and E (G3) compared to the control group after three months of treatment. The reductions in FBS, HbA1c and TG were more significant in G3 than G2, while the reduction in total cholesterol (TC) was similar in both groups. The reduction in LDL was more significant in G2 than G3.

Intake of vitamin C alone or vitamins C and E combination caused a small increases in HDL-cholesterol; however, these increases were not significant.

Conclusion: The study revealed that the use of antioxidants like vitamin C alone or the combination of vitamin C and E can provide a good glycemic control and reduce TG, TC, and LDL-cholesterol levels significantly and improve HDL-cholesterol level.

**Key words:** Reactive Oxygen Species (ROS); Vitamin C; Vitamin E; Fasting Blood Sugar (FBS); Glycosylated hemoglobin (HbA1c); Triglyceride (TG); Total cholesterol (TC); Low Density Lipoprotein (LDL); High Density Lipoprotein (HDL)
Faculty of Pharmacy

2. Master's Program in Clinical Nutrition
The Role of Helicobacter Pylori Infection, Malnutrition and Insulin Resistance among Type 2 Diabetic Medical Services Patients in the Gaza Strip: A Cross-Sectional Study

Ektemal M. Abu Jabal

Discussion: 23/10/2012

Supervisor/s

- Dr. Mazen A. El-Sakka
- Dr. Luay M. Nasser

Main supervisor.
2nd supervisor.

Thesis Abstract:

Background: Diabetes mellitus means the increase in blood glucose above the normal range. With T2DM, the more common type, and the body does not make or use insulin well. In patients with DM, chronic infections are frequent and severe, due to the impairment of their immune status, helicobacter pylori are one of the most common infections worldwide. Available data on the possible association between H. pylori infection and DM are contradictory. There are only a few studies in the Middle East, and the present study is the pioneer study, first conducted in the Medical services Clinics in the Gaza Strip. Objectives: This study was conducted to reveal the prevalence of H. Pylori infection, malnutrition, and insulin resistance among T2DM patients, to describe the dietary requirements of T2DM patients, to highlight the need for better education in clinical nutrition of medical staff in Clinics, finally to evaluate the current information about diet, and lifestyle in the prevention of H. Pylori, and malnutrition. Methodology: Across-sectional study was conducted in the Medical Services Clinics in the Gaza Strip, were 129 patients included in this study. Data was collected through direct methods that included hematological information and indirect methods through a structured interview questionnaire. Results: The results of this study showed a highly significant percentage of H. Pylori (70.5%) among the diabetic patients including in the study, But not indicate any
significant association between gender and \textit{H. Pylori} status. \textbf{Conclusion:} The study contributes in highlighting the relationship between DM patients, malnutrition and \textit{H. Pylori}. Patients should update their sugar level values in the record, and should get exercise and diet plan for every meal. \textbf{Recommendation:} Encourage patient's education as it imparts knowledge and thus modify dietary habits and quality of food consumed, and provides possible intervention strategies to diabetic patients, that could improve the understanding of DM\& \textit{H. Pylori} etiology in our country, especially in the new discover cases of T2DM. And further research are needed in consederation the impact of \textit{H. Pylori} upon patients with chronic diseases. \textbf{Key words:} Type2 diabetes mellitus, \textit{Helicobacter Pylori}, Insulin Resistance, Malnutrition.
Lifestyle, Serum Leptin and Lipid Profiles of Obese Adolescents in Secondary Schools in Gaza Strip

Samaher J. Younis

Discussion: 02/12/2012

Supervisor/s

-Dr. Mahmoud Taleb Main supervisor.
-Dr. Baker M. Zabut 2nd supervisor.

Thesis Abstract:

Introduction:
Malnutrition is a status of nutrition in which deficiency or excess or imbalance of energy, protein, and other nutrients causes measurable adverse effects on tissue/body function (shape, size, composition and function) with clinical outcome. Vulnerable groups to malnutrition include children, pregnant and lactating women, adolescents and elderly people. The present study was carried out among adolescents aged 15-19 years old in all Gaza governorates.

Objectives:
Assessment of the nutritional status and its determinants among adolescents aged 15-19 years.

Methodology:
The study sample was consisted of 442 cases aged 15-19 years old. Data were collected through face to face interviews with the adolescents to fill a questionnaire and through blood analysis for determination of hemoglobin concentration, lipid profiles and serum Leptin hermon was taken from obese and normal control adolescents according to BMI. Anthropometric measures of weight, height, west circumference and triceps skinfold were determined for the entire study sample to assess the nutritional status among of them. Data was analyzed using ANOVA, t-test, correlations and other statistical analysis.
Results
Regarding obesity, it was found that there were significant relationships with gender and mother occupation from other socio-demographic variables.

About 38.4 % of the adolescents in Gaza Strip don’t have physical activities at all; even normal BMI objects (19.9 %). It was found a statistical relationship between exercise and female gender (p=0.00).

Regarding Leptin hormone, no differences were observed between cases of high BMI and controls of normal BMI (t-test 0.18, p=0.85).

It was found that there a very strong correlations between Leptin and lipid profiles. Also there were strong correlations between Leptin and central obesity in males and females. Also there was a strong correlation between Leptin and peripheral obesity in males, not females.

Conclusion and recommendations:
Findings of the study indicated that malnutrition is a multifactorial problem among adolescents aged 15-19 years old in Gaza Strip. The present study also provided base line information regarding malnutrition among adolescents in Gaza Strip. Interventions to improve socioeconomic situation and behavioral factors among adolescents are also recommended. Policy makers should have an important role in development of strategic plan to overcome malnutrition in Palestinian community.

Key words: Anthropometric measures, nutritional status, adolescents, Obesity, Leptin, Lipid profile.
Evaluation of Calcium and Magnesium among Newly Diagnosed Women with Pregnancy Induced Hypertension in El-Shifa Hospital: A Case Control Study

Adeeb M. Abu Khater

Discussion: 04/12/2012

Supervisor/s

- Dr. Mazen A. El-Sakka, Main supervisor.
- Dr. Jehad El-Hissi, 2nd supervisor.

Thesis Abstract:

Pregnancy induced hypertension (PIH) is the most common medical complication during pregnancy, which can be developed to serious complications for mother and fetus.

Objectives: To compare serum calcium, magnesium in women with pregnancy induced hypertension and healthy pregnant women, to identify the relationship between lifestyle and PIH, to identify the relationship between socioeconomic statuses, age, body mass index and education level and the occurrence of pregnancy induced hypertension; and to provide suggestions and recommendations that would decrease in the incidence of pregnancy induced hypertension among Palestinian women.

Subjects and methods: A hospital based case control study was carried out at the larger governmental hospital, El-Shifa Hospital. 50 newly diagnosed women with PIH and 50 healthy pregnant women were included in the study. Data was collected through direct methods that included structured interview questionnaire and biochemical information.

Results: The results of this study have indicated that the levels of serum calcium and serum magnesium were so closed among the study population in the two groups of pregnant women. Moreover, past antenatal hemorrhage, present history of vaginal bleeding, anemia and
multiple gestations, clinical signs and symptoms (headache, blurred vision, edema and epigastric pain), lifestyle (physical activity), anthropometric measurements (pre-pregnancy weight, BMI), type of water drinking were significantly related to PIH.

**Conclusion:** The study contributes in highlighting the relationships between calcium and magnesium and PIH, and provides suggestions and recommendations that decrease the risk of PIH.

**Recommendations:** This study has recommended to establish a policy and strategy by a decision maker in order to standardize the diagnoses criteria of PIH, improve nutritional measuring assessment as weight, height, body mass index, weight gain and biochemical test for pregnant women in all healthcare centers, and to improve pregnant women nutritional status, further studies are needed to study independently the relationship between calcium and magnesium among pre-eclampatic and eclampatic women.
Impact of Dietary Behavior, Lifestyle & Socioeconomic Status on Patients Infected with H. pylori and Subjected to Upper GIT Endoscopy: A Case – Control Study

Hanan El-Modallal

Discussion: 21/03/2013

Supervisor/s

- Dr. Jehad H. El-Hissi
  Main supervisor.

- Dr. Mazen A. El-Sakka
  2nd supervisor.

Thesis Abstract:

*Background:* Gastrointestinal problems are a common cause for attendance at primary health care units as well as referrals to tertiary care centers in developed countries. *Helicobacter pylori*, classified as curved rod shaped bacterium, has been consistently associated with patients suffering from peptic ulcer disease, more in ulcer disease than in non-ulcer disease. One of the major consequences of *H. pylori* infection is its effect on acid production in the stomach.

*Goal:* To demonstrate the impact of patient's dietary behavior, socioeconomic factors, and lifestyle on patient's infectivity status by *H. pylori*.

*Objectives:* To reveal the effect of dietary behavior on *H. pylori* infected patients, to clarify the effect of antiacids on patient’s infectivity status, to identify the effect of socioeconomic status on *H. pylori* infected patient and to explore the effect of patient's lifestyle and the infected patient.

*Methodology:* Case – Control study was conducted on patients with upper digestive tract problems in endoscopic clinics in Gaza in order to determine the impact of patient's dietary behavior, socioeconomic factor and lifestyle on *H. pylori* infecting status. Cases are defined as patients who tested positive for *H. Pylori* IgG antibody in blood. Controls are patients who tested negative for *H. Pylori* IgG antibody in blood. Different endoscopic centers in Gaza as Shifa hospital, Public Aid Hospital,
Results: The results were male 43.5% gave positive IgG but 53.7% gave negative IgG, while female gave 56.5% positive IgG and 46.3% gave negative IgG. Most IgG positive was in Gaza city. The low socioeconomic status plays a role in the prevalence of infection in study sample. The results showed that the smoking increase the risk of H. pylori infection. Intake of all antacids and antibiotics showed an increase of positive H. pylori infection. Eating outside (restaurants and fast food) once per week increases the risk of H. pylori infection. The results showed most participants who are intake less spicy food gave negative IgG and are more protective than whom are intake high spicy foods. Yogurt from dairy products and take cup of yogurt per day give statistically significant results and decrease the risk of H. pylori infection. The weight loss is statistically significant with H. pylori infection which are patients IgG positive had less weight than patients IgG negative this due to the patients had symptoms as loss of appetite and vomiting. The impact of Hemoglobin (Hb) level on the IgG positive patients is highly significant result.

Conclusion: H. Pylori infection is a phenomenon in Gaza Strip, and dietary behavior, socioeconomic status and lifestyle play an important role on patient’s infection.

Recommendation: New strategies, awareness, regarding lifestyle, drugs intake, herbal, yogurt & vegetable eating behavior, should be encouraged through different awareness aspects and programs.

Key words: H. pylori, Infection, lifestyle, GIT, Dietary behavior.
Effect of Maternal Obesity on Pregnancy Outcome
In Gaza Governorate

Suha R. Baloushah

Discussion: 12/03/2013

Supervisor/s

- Dr. Jehad H. Elhissi
  Main supervisor.
- Dr. Usama Abu Mohsen
  2nd supervisor.

Thesis Abstract:

Introduction: Maternal obesity has adversely affect on pregnancy outcome. This study focus on this outcome. Goal: to reveal the effect of maternal obesity on pregnancy outcome. Objectives: To investigate the effect of maternal obesity on risk of gestational diabetes, to explore the effect of maternal obesity on risk of gestational hypertension and preeclampsia, to reveal the effect of maternal obesity on risk of macrosomic baby.

Subject and methods: This study is based on cohort prospective design. A systemized random sample for 200 mothers whose BMI was ≥ 30 kg/m² at registration and their newborn from UNRWA clinics in Gaza City.

Results: The study found some factors that are associated with adverse maternal outcome. Increasing in obesity degree will risk of hypertensive disorder, gestational diabetes; and having macrosomic new born.

Conclusion: The study contributes in highlighting the relationship between maternal obesity and pregnancy outcome and provides possible intervention strategies that could contribute to reduce effect of maternal obesity on pregnancy outcome.

Recommendation: It is recommended for women planning to be pregnant to keep their body weight within its normal limits; hiring nutritionist in each maternity unit. If the MAC is > 33 cm, a large cuff should be used for BP measurements.

Key words: Maternal obesity; hypertensive disorder in pregnancy; gestational diabetes; macrosomic baby.
Impact of Hemodialysis on Nutritional Status in Patients with End-Stage Renal Disease Aged 19-59 Years at Al-Shifa Hospital, Gaza-Palestine

Abed Al Hameed Hassan El Belbeisi

Discussion: 03/06/2013

Supervisor/s

- Dr. Amin T. Hamed

Main supervisor.

Thesis Abstract:

**Background:** Malnutrition is highly prevalent worldwide among hemodialysis patients and is one of the strongest predictors of morbidity and mortality; even though it has not been assessed among hemodialysis patients living in Gaza Strip, Palestine.

**Objectives:** To determine the prevalence of malnutrition among hemodialysis patients, to determine the impact of demographic socioeconomic factors on malnutrition indicators, to determine the prevalence of chronic kidney disease complications, to evaluate the diet & fluid compliance among hemodialysis patients, and to clarify the correlation between dietary intake and malnutrition among hemodialysis patients.

**Methodology:** To achieve this purpose, sixty patients with end stage renal disease, from both gender, aged 19-59 years on regular hemodialysis for at least six months were assessed using anthropometric indices including height & dry weight (the postdialysis body weight used as the dry weight); physical examination (blood pressure measurement); biochemical tests including (hemoglobin, serum iron, fasting blood sugar, serum albumin, total iron binding capacity, creatinine, cholesterol, phosphorous, alkaline phosphatase, parathyroid hormone, total calcium, sodium, and potassium), demographic socioeconomic & medical history questionnaire, and estimation of dietary pattern & intake using food frequency questionnaire.
Results: Approximately two thirds of hemodialysis patients showed biochemical malnutrition indicators. These include hypoalbuminemia (66.7%), low predialysis serum creatinine level (65%), low serum cholesterol (61.7%), and low BMI, where 46.7% of the patients had BMI less than the recommended BMI (23.8 kg/m²) for hemodialysis patients. There was a marked increase in the prevalence of chronic kidney disease complications (anemia 100%, hypertension 75%, high turnover bone disease 58.3%, hyperkalemia 50%, diabetes mellitus 43.3%). On the other hand, a significant inverse proportion was found between number of visits to emergency room (ER) and number of admission days to the hospitals over a year (2012) with serum albumin, and BMI. The data suggests that the patients were at high risk of morbidity and mortality. Moreover there was a significant direct proportion between demographic socioeconomic factors (age, marital status and monthly income) and BMI. Furthermore, a significant direct proportion was found between dietary protein, phosphorous, potassium intake and serum albumin, serum phosphorous, serum potassium respectively. The majority (78.3%) of hemodialysis patients didn’t have any diet regimen and about (61.7%) of patients deviated from their fluid restrictions.

Conclusion & Recommendation: The prevalence of malnutrition and chronic kidney disease complications is high in hemodialysis patients. The nutritional status needs more attention, regular periodic nutrition assessment, and early nutritional interventions to decrease malnutrition and its consequences, which has a significant adverse impact on patients survival among Palestinian hemodialysis patients. Keywords: Hemodialysis, Nutritional Status, End Stage Renal Disease, Malnutrition, Body Mass Index.
Assessment of Dietary Habits on Risk Profiles and Complications among Type 2 Diabetic Patients at Al-Remal Clinic in Gaza Strip

Mohamed Emad Salem Kuhail  

Discussion: 16/06/2013

Supervisor/s

- Dr. Jehad H. Ahmed  Main supervisor.
- Dr. Luay M. Nasser  2nd supervisor.

Thesis Abstract:

Dietary habits are one of the most risk factor for development of chronic micro and macro-vascular complications among type 2 diabetes mellitus (T2DM). This study aimed to assessing the effect of dietary habits and socio-demography on glycemic control (HbA1c) and diabetes risk profiles; cholesterol, triglycerides, LDL-C, HDL-C, blood pressure and body mass index. In addition, it examining these risk factors on long term complications of T2DM. Descriptive analytic cross-sectional design was used in this study; carried out on 206 patients diagnosed with T2DM, both gender at the age of 30 years and above. A structured interviewed questionnaire was used to collect the data from participants with regard to the socio-demographic, long-term complications of T2DM, body mass index, biochemical investigation and dietary habits tool, as well as the dietary habits total score and food frequency (FFQ). The main result illustrated that T2DM was more prevalent among females, poor people, and low educated and unemployed ones. Uncontrolled hemoglobin A1c,
cholesterol, triglyceride, LDL-C levels, body mass index and blood pressure were associated with increasing of age and low educational level. Poor dietary habits were found positively correlated with overall glycemic control and diabetic risk profiles. Uncontrolled HbA1c was found to be positively and statistically associated with frequent intake of carbohydrates. Hypercholesterolemia and hypertriglyceridemia were also found to be positively and statistically associated with carbohydrates, milk and milk products and inversely with vegetables. LDL-C level was positively and statistically associated with carbohydrates and inversely associated with vegetable. HDL was inversely associated with carbohydrates and positively associated with vegetables. Regarding micro and macro-vascular complications of T2DM, retinopathy was positively and statistically associated with uncontrolled HbA1c, low HDL-C, and obesity. Nephropathy was positively associated with uncontrolled HbA1c, hypercholesterolemia, hypertriglyceridemia, low HDL-C and obesity. Neuropathy was a positively and statistically associated with uncontrolled HbA1c, hypercholesterolemia, hypertriglyceridemia and low HDL-C. Coronary heart disease was positively and statistically associated with uncontrolled HbA1c, hypercholesterolemia, hypertriglyceridemia, low HDL-C and high LDL. Hypertension was positively and statistically associated with uncontrolled HbA1c, hypercholesterolemia, hypertriglyceridemia, low HDL-C, high LDL and BMI. Cerebrovascular accident was positively and statistically associated only with uncontrolled HbA1c. In conclusion, this study indicated that dietary habits and socio-economic factors could play an important role in the alteration of glycemic control (HbA1c) and diabetic risk profiles among T2DM.

**KEY WORDS:** Type 2 Diabetes mellitus, Dietary Habits, Glycemic Control, Diabetic Risk Profiles, Complications
Faculty of Science

1. Master's Program in Mathematics
Study of the oscillations of nonlinear dynamic system subject to different excitations

Jihad Yusuf Abu Ful

Discussion: 06/09/2012

Supervisor/s

- Dr. Usama H. Hegazy

Main supervisor.

Thesis Abstract:

Many vibrating physical systems can be described mathematically by a system of nonlinear differential equations. These physical systems have many applications in many branches of engineering, physical sciences, etc. A dynamical system is considered as one of the important subjects that are modeled by various kinds of nonlinear differential equations.

This study is concerned with the nonlinear oscillations and dynamic behavior of electromechanical system. A two degree of freedom nonlinear system is modeled to investigate the nonlinear response of the electromechanical instrument.

The considered system is subjected to different types of forces:

(i) Harmonic excitation forces,
(ii) Parametric excitation forces,
(iii) Tuned excitation forces.

All forces are applied to both the mechanical and electrical parts of the electromechanical system. For each type of these forces, the study includes the analytical solutions applying the multiple time scales perturbation technique, determination of some of resonance cases. The effect of different parameters, under resonant condition, on the system behavior is investigated applying frequency response function method. They have been confirmed numerically.
Analytical predictions and numerical simulations of nonlinear differential equations

Helmi Fekry Alsultan

Discussion: 24/12/2012

Supervisor/s

- Dr. Usama. H. Hegazy

Main supervisor.

Thesis Abstract:

This study is concerned with the analytic and numerical solutions of nonlinear differential equations, which represent the motion of a dynamical system. The system describes the vibration of a beam that is subjected to parametric or tuned excitations. The multiple time scales perturbation technique has been applied to determine approximate solutions for the differential equations describing the system. The stability of the system is studied using the frequency response equations and the phase plane technique. The phase plane trajectories are used for investigate the presence of the chaotic behavior of the system. The Runge-Kutta fourth order (RK4) numerical method has been applied to extract all possible resonance cases.
A Study Of Some Unified Classes Of Analytic Functions Defined By Fractional Calculus

Mohammed Talab El Najjar

Discussion: 16/04/2013

Supervisor/s

- Prof. Tariq Omar Salim

Main supervisor.

Thesis Abstract:

Fractional calculus operators have recently found interesting application in the theory of analytic function. The classical definitions of fractional calculus and its other generalization have fruitfully been applied in obtaining the characterization properties, coefficient estimates, distortion inequalities, inclusion relations, integral preserving properties and subordination.

In this thesis, we investigate the following items:

1) By means of the class \( S \) which contains all functions of the form

\[
f(z) = z + \sum_{k=2}^{\infty} a_k z^k
\]

We define a new subclass \( (\alpha, \beta) - ST \) of analytic and univalent functions in the open unit disk \( U = \{ z \in \mathbb{C}, |z| < 1 \} \). This class contains interesting subclasses like starlike and convex functions. These classes have properties such as coefficient estimates, points, preserving integral operator and other results.

2) By means of the class \( A(p) \) and using the Saigo type fractional derivative operator \( J_{\alpha,z}^{\lambda,\mu,\nu} \), we define the subclass \( T^\alpha(a, p, \lambda, \mu, \nu) \) and then get two subclasses \( S^\alpha(p, \lambda, \mu, \nu) \) and \( C^\alpha(p, q, \lambda, \mu, \nu) \) as special cases of the class \( T^\alpha(p, q, \lambda, \mu, \nu) \). We find it useful to recall Jack's lemma, which is needed to get the results on the class \( T^\alpha(p, q, \lambda, \mu, \nu) \).
3) Here we use the operator $J_{o,z}^{\lambda,\mu,\nu}$ of a function $f(z) \in A(p)$ to define a modification of fractional derivative operator $\Delta_{z,p}^{\lambda,\mu,\nu}$ which also maps $f(z)$ onto itself, then using the classes $S_{z,p}^{\lambda,\mu,\nu}, K_{z,p}^{\lambda,\mu,\nu}, C_{z,p}^{\lambda,\mu,\nu}$ and $QC_{z,p}^{\lambda,\mu,\nu}$ and some basic lemmas based on the definition of the subordination, we studied properties connected with inclusion relationships and integral-preserving properties.
On Topological Structures And Approximations Of Sets

Mohammed Suheil Shublaq

Discussion: 05/05/2013

Supervisor/s

- Prof. Dr. Mousa Said Marouf
  Main supervisor.

- Dr. Mohammed Jamal Iqelan
  2nd supervisor.

Thesis Abstract:

In this thesis, we shall use some classes of near open sets to get several results in topological spaces and Rough Set Theory.

New concepts on definability of sets will be introduced. Also, we introduce a model on reduction of attributes in information systems using topological concepts.
Divide-and-Conquer Algorithms for Computing Matrix Inverses

Shady Sayed El-Okur

Discussion: 06/05/2013

Supervisor/s

- Dr. Awni M. Abu-Saman

Main supervisor.

Thesis Abstract:

This thesis is devoted for computing the inverse of nxn matrices. Elimination methods and other numerical methods will be discussed as an important tool for solving systems of linear equations, and consequently for finding the inverse of square matrices. Divide and Conquer strategy solves a problem by breaking it into sub-problems that are themselves smaller instances of the same type of the problems. As an introductory example, we will see how this technique yields a numerical algorithm for computing the inverse of square matrices, this algorithm is called Divide and Conquer Algorithm (D&C algorithm). The LU and Cholesky factorizations will be used in the algorithm to convert the matrix into a product of a lower and upper triangular matrix. The algorithm will be implemented for non-singular and ill-conditioned matrices, it will be simulated as a user subroutine on the mathematical code MATLAB. The second is to discuss a quite unexpected feature of the modified algorithm computations, namely, that to approximate inverse of an extraordinary ill-conditioned systems. We will demonstrate this by inverting a matrix by increasing gradually the number of computational digits to minimize the round-off error, and to overcome the sensitivity of the system. Numerical examples will be given to show the efficiency of the algorithms. The algorithms will be simulated to invert dense, structural and sparse matrices. Computational results of the (D&C algorithm) will be compared with MATLAB inverses obtained using built-in functions and with available computations of different algorithms.
On Topological Structures and Fuzzy Sets

Nashaat Ahmed Saleem Rajab

Discussion: 19/06/2013

Supervisor/s

- Dr. Mohammed Jamal Iqelan

Main supervisor.

Thesis Abstract:

In this thesis, we shall use some classes of near open sets to get several results in topological spaces and Fuzzy Set Theory.

New concepts on fuzzy sets and fuzzy relations in product topological spaces will be introduced.
Faculty of Agriculture

1. Master's Program in Animal Production and Poultry
Some Nutritional Studies To Alleviate The Effect of Heat Stress on Broilers

Ramzi Abdel Aziz A. Bashir

Discussion: 10/09/2012

Supervisor/s

Prof. Hatem Ayesh El Shanti Main supervisor.
Prof. Adel Zaki Mohamed Soliman 2nd supervisor.
Dr. Ahmed Mohamed Abd El Khalek 3rd supervisor.

Thesis Abstract:

The growth trial of the present study was conducted at a private sector poultry farm at Deir al Balah, middle governorate, during the period of August to October 2010, while, slaughter test and blood plasma measurements were done at Faculty of Agriculture-Al-Azhar University, Gaza strip, Palestine.

The aim of this study was to assess the effects of dietary supplements of each of vitamin C, vitamin E, commercial enzyme mixture (thermo stable endo-1,4-beta-xylanase), rosemary (Rosmarinus Officinalis L.) and peppermint (Mentha piperita L.). Either alone or in combinations in broiler diets during hot summer season. Parameters measured were: growth performance, carcass traits, some blood plasma constituents and economics of production.

In this study, four hundred one-day-old unsexed Cobb chicks were randomly distributed among 10 experimental groups of 40 chicks each in four replicates, to assess the effects of each of the previous dietary supplements in broiler diets. The average initial live body weights of different groups were nearly similar.

The experimental diets were in the following order:

- **Treat. 1**: wheat-corn-soybean meal diet (control).
- **Treat. 2**: control + 200 mg Vit. C/kg diet.
- **Treat. 3**: control + 60 mg Vit. E/kg diet.
- **Treat. 4**: control + Enz. mixture (Econase 0.1 gm/kg diet).
Treat.5: control + 1% ground rosemary leaves
Treat.6: control + 1% ground mint leaves.
Treat.7: control + 200 mg vitamin C+ 60 mg vitamin E/kg diet.
Treat.8: control + 200 mg vitamin C+ 60 mg vitamin E+ 0.1 g Econase /kg diet.
Treat.9: control + 200 mg vitamin C+ 60 mg vitamin E+ 0.1 g Econase +10 g ground rosemary leaves/kg diet.
Treat.10: control + 200 mg vitamin C+ 60 mg vitamin E+ 0.1 g Econase +10 g ground rosemary leaves+ 10 g ground mint leaves/kg diet.
Deanship of Postgraduate Studies & Scientific Research

1. Master's Program in Water and Environmental Sciences
Hydrogeological Evaluation of the Aquifer in the Southern Part of the Gaza Strip, Palestine

Jehad S. Al-Dasht  
Discussion: 04/10/2012

Supervisor/s

- Dr. Usama F. Zaineldeen  
Main supervisor.

- Dr. Khalid A. Qahman  
2nd supervisor.

Thesis Abstract:

This study was carried out at the Southern part of the coastal aquifer in the Gaza Strip (KhanYounis and Rafah Governorates) considering its geological and hydrogeological characteristics, water quality and water balance. This study is an attempt to find out the natural and anthropogenic reasons impact on the deterioration of groundwater in this part. All needed data are collected from many of relevant Palestinian Ministries. For determination status of groundwater quantity and salinity (suitability) for domestic use, Cl concentration in the pumped water and water level maps have been drawn with their relationship with distribution of abstraction rates. Rainfall distribution maps and aquifer lithological cross sections have been drawn also to determine their roles on the groundwater situation.

The collected data are shows that; the total population rate has been increased during period 2000 to year 2010 with about 37.14% followed by rising water demand of both sectors domestic and agricultural in the study area. Study area is affected by climate change, where annual rainfall has a significant spatial and temporal variation; therefore, there are unpredicted fluctuations in number of rainy days accompanied by volatility and an unexpected drop in the amount of precipitation in this area. Infiltrated rainwater to the groundwater was affected by rainfall quantity decline. The average recharge water quantities don't adequate to cover water needs for irrigation purpose in this area. The average water quantities for
Irrigation purposes in the period (2000-2010) is 38.5Mm$^3$/yr. Regarding to domestic water use, number of municipal wells gradually increased from 25 wells in 2000 to 67 wells in 2010, 43% of them have high pumping rates arrived to 180 m$^3$/hr higher than of the average rate that recommended by PWA (70m$^3$/hr). Extracted quantity of groundwater for domestic use in 2000 is 14Mm$^3$, this quantity increased by 54.8% in 2010 to reach 22.3Mm$^3$.

The result shows that costal aquifer is dynamic system subjected to continuous change of inflows and outflows, where net water outflow exceed water inflow. Hence, net aquifer balance is negative. It found also, that the impact of water deficit evident in lowering water table during the study period is about 8m, this decline matching with presence of municipality wells that have high production rates. Cone of depression has declined more and more every year with drilling new wells, as well as to spread huge number of agricultural wells in the same depletion area. Hence, this deterioration reflects an increase of Cl concentration in the areas that suffer from low water level. Cl concentration value is varied in the drinking wells depends on depth and locations of these wells. Percentage of suitable wells that have Cl concentration matching with WHO standards (<250mg/l) is 27% from total wells that distributed in the study area.

Subsurface lithological structure has been drawn to determine the natural reasons behind the groundwater deterioration. Cross sections had shown the shortage of storage capacity of high quantities of fresh water in the coastal aquifer in the study area. Those sections show presence of clay that reduces the replenishment processes for the aquifer from the rainfall and returns flow from agricultural activities. So, lithological formation was evident as one of the natural causes which accelerate destroying process of the coastal aquifer, particularly with presence different clear in lithological structure within different places of the Gaza Strip comparing in the study area, which in turn provides the opportunity to the aquifer for increasing the storage capacity, as it clear in the North of Gaza Strip.

Severe deterioration of the quality and quantity in the groundwater resources had been happened in this part of the Gaza Strip as a result of overexploitation of the groundwater and unsound environmental management conditions. So, quick decisions must be taken to reduce at least this crisis and to begin in providing well management for this only and very important resource.
Batch and Column Experiments to Investigate the Ammonia Behavior During Groundwater Recharge in Gaza Strip

Mohammad Sobhi Al Khateb

Supervisor/s

- Dr. Thaer H. Abushbak

Main supervisor.

- Dr. Adnan M. Aish

2nd supervisor.

Thesis Abstract

Fresh water resources alone cannot meet the growing water demand and therefore wastewater is a growth may lead to excessive exploitation of groundwater to meet the demand. Reuse of treated wastewater through groundwater recharge has emerged as an integral part of water and wastewater management in arid and semi-arid regions of the world. In most of the reuse systems in practice, infiltration is carried out by subjecting conventional secondary treatment effluent to tertiary filtration prior to soil aquifer treatment (SAT).

Laboratory-scale batch and soil column studies were carried out to study the ammonia behavior during SAT with synthetic wastewater and secondary effluent. Secondary effluent were collected from Gaza wastewater treatment plant. Ammonia removal in soil batch tests fed with synthetic wastewater with natural soil was about 95.6% and about 26% in secondary effluent. The ammonia removal in batch reactors fed with synthetic wastewater was 2.26% under disinfected soil and 7.85% in batch reactors feed with secondary effluent. Likewise in case of soil column studies with synthetic wastewater ammonia removal was 95.7% in cycle 1 and 69% in cycle 2. Whereas ammonia removal was 95% and 18% in the column fed with secondary effluent.

It was observed the sandy soil with low cation exchange capacity and clay content did not provide sufficient attenuation and ammonia...
removal of effluent pollutants. Ammonia removal in sandy soil during SAT is predominantly biochemical reaction through nitrification process. Attributed to presence of more pore spaces that allowed more oxygen resulting in grater to allow decomposition of organic matter and higher nitrification capacity. Sandy soil have less charged site, which are beneficial for the effective treatment of wastewater during SAT system.
Effect of Irrigation with Reclaimed Wastewater on Soil Properties and Groundwater Quality in Zaiton area, Gaza, Palestine

Khayri Sabri Attaallah

Discussion: 16/12/2012

Supervisor/s

- Dr. Adnan M. Aish

Main supervisor.

Thesis Abstract

Monitoring study was conducted from March to December 2011 to investigate the short-term effect of irrigation with reclaimed wastewater RWW (from Gaza Wastewater Treatment Plant) on physiochemical properties of soil, groundwater and fruits. Two experimental plots planted with olive and citrus trees were used. The experimental sites were located in Zaiton area, south of Gaza city; the first experimental plot (A) was irrigated with fresh water (FW). The second experimental plot (B) was irrigated with RWW. Soil, irrigation water, fruits and olive oil samples were characterized according to standard methods. The electrical conductivity (EC), total dissolve solid (TDS), Nitrite (NO₂⁻), chloride (Cl⁻), alkalinity, potassium (K⁺), sodium (Na⁺), sodium absorption ratio (SAR), chemical oxygen demand (COD), total coliform and fecal coliform were significantly higher in RWW than FW. However, heavy metal in RWW and FW were found to be below standard limits. At the end of the experiment, soil results exhibited no significant variation in infiltration rate, bulk density, and porosity between the two plots (A) and (B). However, significant difference in EC, TDS, NO₃⁻, Cl⁻, Mg⁺², Ca⁺², Na⁺ and OM were reported, particular at top soil layer (0-30 cm) more than (30-60 cm) layer. Piper (Trilinear) diagram indicated that there is no significant changes in the hydro chemical facies of groundwater were observed during the study period. Which indicated that short term irrigation by RWW for citrus and olive trees does not affected clearly on the groundwater. Results also showed no microbial contamination in the olive and citrus fruits in both plots. Additionally, the levels of
the heavy metals were reported to be low. Olive oil quality parameters indicated no significant variation in refractive index, free acidity, peroxide value and acid value extracted from olive fruits from both plots. The main conclusion of the study is that land application of RWW can be designed and operated in a way such that there are minimum negative effects on the environment. To further prove this more completely, this research should be collected over a period of 10 years to truly evaluate long-term effects of RWW application.
Master's Program in Water and Environmental Sciences

**Physico-Chemical and Microbiological Characteristics of Seawater in Northern Part of Gaza Strip, Palestine**

Mohammed Y. M. Al Safady

Discussion: 11/02/2013

**Supervisor/s**

- Dr. Mohammed I. Abudaya  
  Main supervisor.

- Dr. Abdallah H. Bashir  
  2nd supervisor.

**Thesis Abstract**

This study has been conducted to comprehensively investigate and determine the physico-chemical and microbiological characteristics of the seawater quality of northern Gaza Strip. The main objective of the study is to identify the characteristic of the near shore water quality and to determine the extent of compliance with the Palestinian local standards, WHO and other international standards.

The investigation was conducted through analysis of seawater samples from six sites along the coastal water of northern Gaza Strip. The total samples 168 (84 for physicochemical and 84 for microbiological) were analyzed during the winter season period (8/2011 to 12/2011).

Samples were collected from the study area of about 14 km along the seashore region from Wadi Gaza until Al-Forisa Club in the north. The study area was divided into six sites (1, 2, 3, 4, 5 and 6) according to several criteria such as the presence of pollution points of direct and indirect and the most crowded areas of swimmers and sea visitors.

The analysis of the results shows significant spatial and temporal variations in the physico-chemical parameters (turbidity, electrical conductivity, nitrates, and total dissolved solids) but no significant variations in pH and water temperature. On the other hand, the analysis of the results shows significant variations in the microbiological indicators (total coliform, fecal coliform, fecal streptococcus and pseudomonas aeruginosa) which is apparently due to raw sewage discharge.
Analysis of variance confirmed that sites close to the raw sewage discharge points had significantly higher levels of total coliform, fecal coliform, fecal streptococcus and pseudomonas aeruginosa than sites free from any sewage discharge. The data indicate high microbiological contamination of seawater above internationally accepted limits, especially at sites close to sewage outlets. Turbidity, electrical conductivity, nitrates, and total dissolved solids levels also varied significantly also under the influence of sewage discharge.

Based on the main findings of the current study, negative health impacts on Gaza Strip population especially seashore visitors, are expected. Several recommendations that may help in controlling and/or protecting the coastal area and the marine ecosystem in the study area have been suggested. They mainly include; the construction of new wastewater treatment plants and upgrading the existing ones, routine monitoring of the pollution level of the coastal area especially the recreational zones and development of a national program for the protection of the marine environment that can be enforced by setting the necessary rules and regulations. The study recommended finally; the need for further studies to assess the health impacts of the seawater pollution.

**Keywords:** Physico-chemical ; Microbiological characteristics ; Seawater quality ; Northern Gaza Strip ; Seashore region ; Wadi Gaza ; Marine environment ; Recreational ; Sewage; Pollution ; Health impacts.
Biochemical degradation of some pesticides in agricultural soil of Gaza Strip - Palestine

Ammar Fawzy Matar

Discussion: 25/03/2013

Supervisor/s

- Dr. Mazen S. Hamada
  Main supervisor.

- Dr. Abdallah H. Bashir
  2nd supervisor.

Thesis Abstract

This work deals with a biochemical degradation of three pesticides: diuron, carbaryl and glyphosate. Analysis was conducted of 6 soil samples collected from two agricultural places in the Gaza Strip (open fields and inside greenhouse) according to soil type map. The samples were treated, and 82 types of bacterial strains were isolated. 14 of them showed good ability of growth when using the tested pesticides as a sole source of nitrogen and carbon. The identified bacteria belong to the following genera; Bacillus, Corynebacterium, Pseudomonas, Morganella and Aeromonas. Three bacterial strains were used as representative bacteria in studying the biodegradation rate of diuron, carbaryl and glyphosate on solid and liquid media. The bacterial strains were identified through cultural and biochemical characterization as Bacillus coagulans, Morganella morganii and Corynebacterium kutseri. These were capable to degrade diuron, carbaryl and glyphosate. The three bacteria were inoculated with each of the three pesticides at a concentration of 150 ppm for 11 days. The biodegradation rate of the three pesticides on liquid media was determined using UV spectrophotometer. Also the remaining concentrations of the tested pesticides were chromatographically measured using TLC after optimization of solid phase extraction conditions. The results showed that the bacteria Bacillus coagulans had a high efficiency to degrade carbaryl with rate 98.71% and rate 71.96% with diuron and less efficiency for glyphosate with degradation rate 20.50%. Bacteria Morganella morganii showed moderate rate of degradation of the three pesticides.
mdiuron 45.54%, carbaryl 87.37% and 47.69% for glyphosate), while the bacteria *Corynebacterium kutseri* showed the best efficiency for glyphosate with rate 77.90%, and moderate efficiency for carbaryl with rate 47.59%, and the least for diuron with rate 27.25%.
Evaluation of Hydraulic Properties of the Gaza Coastal Aquifer, Palestine

Majed F. Hamada

Discussion: 02/06/2013

Supervisor/s
- Dr. Adnan M. Aish  Main supervisor.
- Dr. Khalid A. Qahman  2nd supervisor.

Thesis Abstract

There are many studies done on the coastal aquifer in the Gaza Strip, but did not any of these studies to analyze and evaluate the characteristics of hydraulic aquifer in the Gaza Strip, which is the only source of water in the Gaza Strip and this had to be conducting this study, which included these properties.

This study was conducted from March 2010 to February 2013 where study included several ways to assess and study and analyze the characteristics of hydraulic was the most important use of pumping pilot wells which included practical study of 20 wells agricultural was under rehabilitation at that time and was a researcher supervisor on the process of rehabilitation of these Where the results were identical to the wells previous collected information field.

As more information was collected from 25 wells spread over an area of the Gaza Strip from the Palestinian Water Authority and CMWU had been an examination of experimental pumping test, also included in this study work sectors Geological some wells (9) wells were dug through the rehabilitation project agricultural wells to see rock formations of the layer-bearing water, which was composed of granules rough to soft sand to gestures of sandstone and comparing these materials with previous studies in different places on the study results were approach and identical to the study, were also collected soil samples for wells that have been drilled and an examination of gradation in the laboratory and using Hezn formula been extract value (k), which was also identical to the results of the study, which showed
the value of \( k \) = 18 to 55 and the value of \( T \) = 150 to 2500 and the value of coefficient storage \( S \) = 10-4, and then been mapping GIS for these properties and distribution Results on all areas of the Gaza Strip.

This study also recommended to do more studies in this area and the use of more accurate methods that found also recommended the establishment of test wells to see the properties of the tank water carefully to learn the mechanics of maintaining the water tank and the mechanics of dealing with the only source in the Gaza Stri.