



Republic of Iraq  
Ministry of Higher Education and Scientific Research  
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Biotechnology Research Center



**3<sup>rd</sup> International Scientific Conference of Biotechnology  
(3<sup>rd</sup> ISCB-2024)**

Under the Slogan

**Biotechnology**

**A Present Sciences and a Prosperous Future**

# 3<sup>rd</sup> International Scientific Conference of Biotechnology (3<sup>rd</sup> ISCB-2024)

## Medical and Molecular Sessions

### Persistence respiratory symptoms post coronavirus infection

Batool Mutar Mahdi, Zainab Muthanna Akbar, Dima Ali Mohammed,  
Rafal Qassim Amer, Aya Haider Fareed

#### Abstract

Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) is one of the viruses that was first identified in Wuhan city, Hubei province, China, and is responsible for this pandemic. World Health Organization (WHO) declared Health emergency all over the world in January 30, and a pandemic on March 11, 2020. To determine the frequency of persistent respiratory symptoms after COVID-19 infection. A cross-sectional study was conducted from December 2022 to April 2023 to assess frequency of respiratory symptoms post COVID-19 infection among the Medical and non- medical students who infected with COVID-19 whether vaccinated or not. The study included 382 medical students at Al-Kindy College of Medicine- University of Baghdad that participated in this study. The majority of them were females (72%) and the rest were males (28%). Most of the students were vaccinated (95.3%) with Pfizer/BioNTech COVID-19 vaccines (71.7%) with two doses (71.2%). The students were infected with COVID-19 and some of them were infected before vaccination (62.6%) and the rest (21.7%) after vaccination. After their recovery from Covid-19 whether vaccinated or not, they had respiratory symptoms and other clinical manifestations. Regarding respiratory symptoms, intermittent (47.4%) dry (46.6%) cough (40.6%) was the most common respiratory symptoms that persist for sixty days. Other symptoms were headache was the most common one (39.5%) followed by fever (22.5%). The most common respiratory symptoms were intermittent, dry, cough was the most common respiratory symptoms that persist for sixty days.

**Key words:** Covid-19, respiratory, symptoms

### A study of some Immunological and Physiological indicators for patients with Osteoporosis in Anbar Province

Thikra Majid Muhammed, Hiba Muwafaq Saleem, Hala Mahdi Hamad,

Muthanna M. Awad, Hussein Riyadh Abdul Kareem

#### Abstract

The most prevalent chronic metabolic bone disease is osteoporosis, which is characterized by reduced bone mass and microarchitectural deterioration of bone tissue. This study aimed to determine some levels of Immunological parameters ( IL-17, IL-1, IL-15, IL-6 ), Hematological parameters ( Hb and WBC) and some biochemical ( Vit D3) in patients with osteoporosis and compare their parameters levels with control group. The total number of blood samples were 80 samples which are included 50 samples for patients with osteoporosis with ages ranging from 16 to 50 years and 30 samples for healthy individuals as a control group who attended to Ramadi Teaching Hospital in Ramadi city, from the 1st of November 2022 to the 1st of January 2023. The results of the present study showed that have significant difference in all parameters with p-value ( $<0.05$ ) when the means levels of IL-1, IL-17, IL-15, IL-6 and Vit D3 respectively were : (8.467pg/ml), (89.32pg/ml), (83.84pg/ml), (60.34pg/ml), (4.667pg/ml); As well as the concentration of Hb, and mean number of WBC were: Hb (9.16g/dl) \ WBC (14.19X 10<sup>3</sup> c/ mm<sup>3</sup>) respectively, we conclude, patients with osteoporosis showed a considerable rise in IL-1, IL-17, IL-15, and IL-6. as well as a noteworthy drop in Vit-D3 and Hb in osteoporosis sufferers when compared to healthy individuals. Additionally, patients with osteoporosis had significantly higher WBC.

**Key words:** Osteoporosis, IL-17, IL-1, IL-15, IL-6, VIT D3

## The effects of statin therapy on mean platelet volume in patients with cardiovascular diseases

Alaa Abduljabbar Abdulrazzaq, Rowshen Hani, Aya Raad Saleh

### Abstract

Statins are the excellent therapy for decreasing the lipid and described in about all patients with cardiovascular diseases. It has a strong role in decreasing the morbidity and mortality present with cardiovascular diseases. In recent study, it has been conducted that its major effects is far more than lowering the lipid but also it has a great role in cardiac diseases as the thrombocytopenia and platelet dysregulation also associated in decreasing the cardiac disease effects. This study explained the statin role on the efficiency of the markers and its effect in patients with cardiovascular disease. The platelet counts were examined by the flow cytometry, the samples of blood were collected from patients before and after treatment. The results showed the express of CD62P and CD63 were decrease in patients had the therapy compared to the patients without it. The study concluded that the statin therapy decrease the mean of platelet volume (MPV) in the patients suffer from this diseases.

**Key words:** Mean platelets volume (MPV), statin, flow cytometry, cardiovascular disease

## Evaluation the effect of propofol drug on heart rate during surgery and some biochemical variables before and after surgery

Abdullah Abdulsattar Raef, Hend Ahmed Abass, Baida Hussein Ayada,  
Mohammad Mahamoud Al-Halbosi, Thamir Ismail

### Abstract

Several studies have shown that propofol drug affects intraoperative heart rate and some post and pre-operative chemical variables that affect the endocrine system. A descriptive quantitative design was conducted on adult people which started from 15 January 2023 through 15 March 2023. A sample of 100 adult people who are made for them a different type of surgery; and divided into two groups (Before and after surgery) which attended Al Ramadi teaching hospital. Clinical examinations were carried out using Cobas C111 and Cobas e411 for biochemistry variables (Sodium, Potassium, Chloride, Cortisol and ACTH). In addition to measuring the rate of heart pulse during the surgery. The frequency and percentage of age periods showed that the highest age group subject to the study was (10-20 years) and the lowest age group was (41-50 years). The frequency distribution for gender was about female participants in the study is higher than the number of males by percentage (60,40%) respectively. The body mass index (BMI) result for patients who underwent surgery was the highest percent for normal BMI (40%), while obesity and overweight were (30%). The results of the study showed high significant differences for (cortisol, ACTH and potassium) between two groups with (p value <0.05) and with decreasing potassium concentrations and increasing (ACTH and Cortisol) concentrations. In contrast, the concentration of chloride doesn't show any significant differences (p value > 0.05). The result of mean pulse showed decreasing in pulse number three (after 45 minutes from receiving propofol drug). The results of the study showed that the persons who were receiving propofol had shown a change in the levels of (Sodium, Potassium, ACTH, and Cortisol), while there was no change in the levels of (Chloride) before and after the surgery. In addition, by measuring the pulse, a significant decrease was observed in the third pulse level (after 45 minutes), which confirms that the drug propofol influences the level of the heart rate.

**Key words:** Propofol, Anesthetic drug, ACTH; Cortisol, Heart rate.

## Clinical importance of Inflammation and Renal function biomarkers in Type I Diabetes

Joumana Ali sharad, Hind M. Mousa

### Abstract

Type1 diabetes is an autoimmune condition that involves complex interactions between immune and physiological processes that lead to diabetic nephropathy. This study designed to predict the role of Tumor Necrosis Factor Receptor 2 TNFR2, urea, and creatinine in the development and management of type 1 diabetes and early detection of diabetic nephropathy. Sixty individuals were included in this study, 30 of them were patients with type 1. In-addition to 30 individuals were apparently healthy as a control. Enzymatic and colorimetric methods were used to measure biochemical parameters, ELISA technique was used to estimate the TNF-R2. The current finding indicated that TNF-R2 was significantly increased in patients than in control with high diagnostic accuracy 0.96. Also, the results showed that both urea, and creatinine were increased in the patient group compared to the healthy. It is concluded that elevated TNFR2 levels can reflect persistent inflammation in type 1 diabetes, and have excellent diagnostic efficiency. Moreover, urea and creatinine may serve as prognostic markers for the development of diabetic nephropathy in uncontrollable type 1 diabetes.

**Key words:** TNFR2, renal functions, Type I DM

## Exploiting role of peripheral miR-30a as a diagnostic biomarker for gastric cancer patients

Bashir Ayed Ahmed, Nuha J. Kandala

### Abstract

Gastric cancer (GC) is generated as a result of the interaction of many risk factors (environmental factors and genetic factors). Peripheral blood samples are considered one of the easiest methods that can be exploited due to the ease of drawing and analyzing them. MicroRNA is a short non-coding RNA with 18–24 nucleotides that is highly efficient in controlling the expression of genes and the growth of different types of cancer. The relationship between miR-30a gene expression was studied in 100 Iraqi participants (patients and controls), sixty patients had various gastric diseases and forty of the participants (control) were almost healthy. The models were analyzed by exploiting qRT-PCR technology. In patients with gastrointestinal disorders, the relative expression of miR-30a was considerably lower than in healthy controls. The minimum expression of miR-30a in patients was 0.01000, which was considerably lower than the minimum value observed in healthy controls (0.8300). Also, the maximum relative expression in patients (3.560) was lower than that in healthy controls (7.380). The 95% confidence intervals for the mean the difference in miR-30a expression between patients and controls were 0.8145 - 1.205 and 1.954 - 2.739, respectively, a statistically significant difference was seen between the two groups. The relative expression of miR-30a was also assessed in healthy controls and patients with various gastric diseases (gastric ulcers, gastritis, gastric cancer, and duodenal ulcers. The median relative expression of miR-30a was significantly lower in patients with gastric ulcers (median: 0.7400, IQR: 0.2200 - 1.560), gastritis (median: 0.7900, IQR: 0.2100 - 1.610), and gastric cancer (median: 0.9450, IQR: 0.4350 - 1.633) compared to healthy controls (median: 2.055, IQR: 1.528 - 2.830) (all  $p < 0.001$ , Mann-Whitney U test). Nonetheless, there was no discernible difference in the relative expression of miR-30a between patients with duodenal ulcers and healthy controls ( $p > 0.05$ , Mann-Whitney U test; median: 1.100, IQR: 0.6475 - 1.758). The minimum relative expression of miR-30a was lowest in the gastritis group (0.01000), followed by gastric ulcers (0.2100), gastric cancer (0.2500), and duodenal ulcers (0.4000), all of which were lower than the minimum value observed in healthy controls (0.8300). The maximum relative expression of miR-30a was highest in healthy controls (7.380), followed by gastritis (3.560), duodenal ulcers (2.230), gastric cancer (2.180), and gastric ulcers (1.880). These findings suggest that the downregulation of miR-30a is associated with the development of gastric diseases, and its relative expression could potentially serve as a biomarker to differentiate between those healthy individuals and those with stomach disorders. Therefore, microRNA can be exploited as a biomarker for early detection of the disease and it can be easily treated.

**Key words:** Gastric cancer, Peripheral blood, MicroRNA, Gene expression.

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## An Insilco study to reveal the effect of pollutants resulting from private generators on the P53 protein, which affects cancer

Hasan kadhim Nimr, Maitham A. Sultan, Najah K. Nimr

### Abstract

Pollutants which products from electricity generator are cause series effects on human health, especially when interact with crucial human proteins such as P53 which acts as a tumor suppressor, which means that it regulates cell division by keeping cells from growing and dividing (proliferating) too fast or in an uncontrolled way. In this study number of pollutants which included Volatile organic compounds (VOCs) such as toluene, benzene, naphtha and gases such as O<sub>3</sub>, CO<sub>2</sub>, NO<sub>2</sub>, H<sub>2</sub>S, SO<sub>2</sub> were docking as a ligand with p53 protein using software including PyRx python prescription 0.8., Discovery Studio Visualizer V21.1.0 and Ramachandran tool software. Aripiprazole drug which uses in treatment P53 protein was used as positive control. Positive control affinity was -6,7 which represent high affinity interaction with P53 protein which described with Specific Interaction the results showed moderate interaction between electricity generator pollutants and p53 protein as receptor. Toluene was more affinity and required low binding energy almost -4 then Ozon with -3.7 then Benzene and Naphtha with -3.5 then NO<sub>2</sub> with -3.2, then H<sub>2</sub>S with -2.9, then SO<sub>2</sub> -2.5, and CO<sub>2</sub> -2.5. Ramachandran plot showed high interaction in region of p53 confined between -185 of phi angle and 185 of psi angle in which beta sheet of secondary structure was available more than alpha helix. The study found the possibility of the influence of pollutants from electrical generators on the P53 protein, which protects cells from mutations and, consequently, cancer.

**Key words:** Pollutants, P53, PYRX, Discovery Studio Visualizer, Binding affinity

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## Microfluidic Technologies: Unraveling the Mysteries of Complex Parasite Interactions

Zainab Qassim Mohammed Hilo, Aswan Mahmood Hashem, Hawraa majid Hassan

### Abstract

This comprehensive review aims to highlight the pivotal role of microfluidics in unraveling the intricate interactions between parasites and their biological environments. The review explores recent advancements in this field, from fundamental microfluidic principles to diverse applications in studying parasite behaviors such as motility, adhesion, and invasion. The methodology employed in this review was comprehensive, encompassing an extensive survey of specialized scientific databases, a critical analysis of previous studies, and consultations with field experts. The findings reveal that microfluidic technologies have revolutionized our understanding of parasitic interactions, enabling high-precision monitoring of these interactions in miniaturized environments that mimic real physiological conditions. Moreover, this review emphasizes the significance of this technology in developing novel diagnostic tools and treatments for parasitic diseases. In conclusion, this review underscores that microfluidics is an indispensable tool in future research related to parasites, and it will significantly contribute to the development of new strategies to combat parasitic diseases.

**Key words:** microfluidics, Parasites, Parasitic diseases, Host-parasite.

## Circulating Tumor Cells: An Effective Predictor of Treatment Effectiveness in Patients with Breast Cancer

Ali A. Majeed, Lina A. Hassan

### Abstract

In the majority of solid tumors, the prognosis is determined by distant metastases rather than the main tumor. Remote metastases are formed by circulating tumor cells (CTCs) that actively penetrate the bloodstream, attach to the target organ's endothelium, invade the surrounding parenchyma, and create new tumors. CTCs, in addition to a variety of other skills such as migration or immune evasion, require tumor-forming capacity and are thus called stem cell-like cells. Our study is performance to assessment the levels of circulating stem – like cells in Iraqi patients with breast cancer. Between September 2023 and January 2024, we prospectively enrolled 36 patients with breast cancer that are divided in to three groups: (A) patients with baseline treatment, (B) patients with less 15 doses of first- line chemotherapy and finally (C) patients between 15 and 25 doses of first - line chemotherapy. The isolation and identification the gene expression of cell surface markers of Circulating Tumor Cells (CTCs) are CD44, CD 24, CD29 and CD133. Our results show the different levels of CTCs depend on the type of chemotherapy and period with chemotherapy treatment.

**Key words:** Iraqi patients, Breast cancer, Chemotherapy, CD44, Circulating Tumor Stem Cells

## Gene expression and immunology of TGF- $\beta$ and its relationship with Th17 in influencing recurrent miscarriages RM in women with AITD

Nadia Mohamed Nageeb

### Abstract

TGF- $\beta$  is the main regulator of immune responses and plays an important role in the development of autoimmune diseases in humans and is strongly implicated in autoimmune thyroid diseases with TPOAb positive. RM is the loss of more than two consecutive pregnancies before the fetus reaches the 20th week of pregnancy. This study aims to evaluate the genetic and immunological expression of TGF- $\beta$  and GAPDH and their relationship to recurrent miscarriages. Samples Blood samples were taken from 90 women, 70 of whom had AITD with positive anti-TPOAb. They were divided into 35 pregnant women with AITD and 35 with recurrent miscarriages with AITD. They were compared with 20 healthy women. 5 ml of blood was withdrawn 4 ml was divided for immunological tests and 250  $\mu$ l was added to 750  $\mu$ l Trizol to perform gene expression. We found highly significant differences in gene expression of TGF- $\beta$  at  $p \leq 0.001$  between women with AITD and healthy. The mean was respectively  $1.739 \pm 0.214$  &  $1.208 \pm 0.347$ , We found highly significant differences in the immunological TGF- $\beta$  levels at the  $p \leq 0.001$  between pregnant women and women with RM, and the mean respectively:  $1.7511 \pm 0.4955$ ,  $1.0145 \pm 0.1960$ . We also found significant differences in the level of TH17 at  $p \leq 0.001$  between pregnant women and those with RM and the mean was respectively:  $1.0111 \pm 0.2284$ ,  $1.5298 \pm 0.2922$ . Our study shows that there is a relationship between increased levels of Th17 in patients with AITD as it affected them by increasing

the rate of miscarriage, as well as increased levels of TGF- $\beta$  in pregnant women with AITD, but the increase in the TGF- $\beta$  led to maintaining pregnancy and immune regulation.

**Key words:** TGF- $\beta$ , Th17, Autoimmune thyroid disease (AITD)

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## Evaluation of APE1 Gene Methylation in Iraqi Patients Suffering from Breast Cancer

Muataz Mohammed Al-Tae, Mahmood Al-Mualm

### Abstract

*APE1* is an apurine/apyrimidine endonuclease that breaks DNA to create the AP site, which is used by enzymes in the BER pathway to recognize it. *APE1* is also involved in cellular processes such as apoptosis, proliferation, differentiation, and cell fate determination. This study recruited 50 healthy people and 50 breast cancer patients from Iraq. The One-Step qMethyl™ Kit is used to detect region-specific DNA methylation by selectively amplifying methylated cytosines in the presence of CpG dinucleotides. The findings of the *APE1* gene methylation were estimated once the RT-PCR run was completed. The results indicated that patients with breast cancer had lower levels of methylation than control participants, indicating that those with low levels of *APE1* gene methylation had a higher chance of getting breast cancer.

**Key words:** APE1, breast cancer, DNA methylation

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## Molecular Modeling Study of Darobactin with Antibiotic Resistant Bacteria

Ragheed Hussam Yousif, Mustafa K. Al-Bayat, Merriam Ghadhanfar Alwan, Khulood Waheeb Al-Sammarrae

### Abstract

Antibiotic resistance is one of the major issues in modern public health. Multidrug resistant bacteria cause this risk. These types of bacteria make traditional antibiotics ineffective for use in routine therapy. Darobactin is one of the novel antibiotics capable of binding to this species of bacteria. Several experimental studies were reported regarding the effectiveness of darobactin. However, a molecule modeling investigation is needed to elucidate how darobactin could bind to the drug-resistant gram-negative bacteria. Molecular docking and molecular dynamics simulations were carried out between darobactin and the protein receptor 6QGX. The current results revealed how darobactin interact with the protein receptor in 2D and 3D perspective. The MMPBSA Binding energy for the 50 ns molecular dynamics simulation was -44.808 kJ/mol. Moreover, the hydrogen bond occupancy calculation showed the contribution of the important residues of BamA in forming hydrogen bonds with darobactin. The current results present darobactin as a promising medication for antibiotic resistant bacteria. This study encourages more darobactin modeling studies on different receptors.

**Key words:** (Darobactin, molecular docking, molecular dynamics simulation, antibiotic resistant bacteria)

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## Synergistic impact of combined doxorubicin and 5-fluorouracil on metastatic prostate cancer cells PC3

Ali Haider Alhammer, Shahad Ali Mudhafar

### Abstract

Prostate cancer (PCa) is the foremost cause of cancer-related death worldwide and the second most prevalent disease in males. Androgen deprivation is the gold standard therapy, however, castrate-resistance is developed and associated with metastasis. Novel treatments for hormone-refractory PCa are urgently required. Although Doxorubicin (Doxo) has exhibited some efficacy in this context, its toxicities restrict its usage. The current standard therapeutic strategy in cancer therapy involves combining drugs to achieve increased overall effectiveness with reduced doses and toxicity. Hence, the goal of this *in vitro* study was to evaluate whether the co-treatment of 5-fluorouracil (5-FU), a commonly used chemotherapy for various malignancies and Doxo might counteract the resistance and enhance the efficacy of PCa cells to Doxo-based treatment. The cytotoxicity of the aggressive, androgen-independent PCa cell line PC3 was evaluated via the MTT test. To assess synergism, the combination index (CI) was calculated using CalcuSyn software. Although morphological alterations were analyzed with an inverted microscope, the induction of apoptosis was assessed using fluorescence microscopy following dual staining with acridine orange and ethidium bromide (AO/EB). Both 5-FU and Doxo, when used alone, exhibited an antiproliferative effect characterized by changes in morphology and the initiation of early apoptosis. Interestingly, the combination of these compounds results in a synergistic cytotoxic effect (CI<1). Remarkably, reduced dosages of combination medications (20-fold less for 5-FU and 3.6-fold less for Doxo) were adequate to elicit cytotoxic effects compared to monotherapies. In addition, synergism is accompanied by further alterations in the morphology of PC3 cells. The results indicated that the incorporation of 5-FU enhanced the effectiveness

of Doxo at lower doses compared to their individual usage, demonstrating a synergistic effect. This *in vitro* study indicates the necessity for more *in vivo* and clinical research by permitting the application of reduced therapeutic doses.

**Key words:** Doxorubicin, 5-Fluorouracil, Combination, PC3, Androgen Receptor Negative, Metastatic Prostate Cancer.

## Investigating metabolite-based biomarker for early diagnosis of breast cancer and its Prognostic significance in both benign and malignant tumors

Raghdaa Adnan Syabakhash, Samar Muayad Alfadheil, Russul Reidh Al-Hamaoy

### Abstract

In recent years breast cancer has become more prevalent among Iraqi women. Monitoring proteins in human bodily fluids is the best approach for early detection and prognosis. This is a crucial first step toward effective therapy, delaying the cancer spread, and reducing mortality rates. The current study aimed to assess the diagnostic and prognostic importance of proline as a marker in breast cancer patients, as well as the correlations of proline and the recognized biomarker CA 15-3 and clinicopathological features. This study included 30 recently diagnosed female breast cancer patients before surgery and their levels one month later, as well as 28 female control participants with noncancerous breast tumors. CA15-3 and proline levels were determined using ELISA and HPLC techniques, respectively. The average proline levels varied significantly between the study participants' categories; the benign group had the greatest level, followed by the post-operative category, and lastly the newly diagnosed category. Furthermore, significant changes were seen in the average CA-15-3 levels, with the newly diagnosed category having the highest level, followed by the post-operative category, and finally the benign category. In both the malignant and benign groups, proline concentrations correlated significantly positively with CA15-3. Proline and CA-15-3 were both significant predictors, with ROC values of 100% and 90% for Proline and 93% and 93% for CA-15-3, respectively.

**Key words:** Breast cancer, Proline, CA 15-3, Tumor.

## Vibrio Cholera 22.... Isolation and Molecular Detection of Cholera Toxin (CTX) in some Iraqi Governerrates

Atheer Abdulrazzaq, Alyaa M. Zyara , Farah T. Samawi, Shaimaa Y. Abdulfattah, Aans Nori, Kifah Ahmed

### Abstract

*Vibrio cholerae* is a major etiology of diarrhea in humans worldwide. In this study, we isolated and identified *V. cholerae* from the human stool of suspected cases admitted in different hospitals of Iraqi governorate. A total of (180) suspected patient stool samples infected with *Vibrio cholera* (*V. cholera*), 110 samples were positive and showed growth of yellow colored colonies when cultured on Thiosulfate citrate bile salt agar (TCBS). The isolates were Gram-negative, curved shaped, and motile. Biochemically, they were found positive for indole and Methyl Red tests and negative for Voges-Proskauer test when we used API 20 test. Ninety of the isolates were O<sub>1</sub> when made serotyping test. Antibiotic sensitivity test revealed these isolates as highly sensitive to chloramphenicol, tetracycline, and Ampicillin, and Erythromycin while resistant to TR, and oxacillin. Following the standard protocol for isolating and identifying *V. cholerae* isolates from samples, PCR was executed to perform molecular detection of *V. cholerae* isolates using the *ompW* and *16S* ribosomal RNA genes. The detection of toxicity was conducted using CTX toxin genes. Out of the 110 positive samples, only 50 isolates were positive for CTX gene, using genus-specific primers.

**Key words:** *Vibrio cholerae*, CTX toxin genes.

## Genetic Detection of Amoebic Meningoencephalitis Causing by *Naegleria fowleri* in Iraq: A Case Report

Noor Nihad Baqer, Ahmed Salih Mohammed, Bassad A. Al-Aboudy, Abdullah Musaid Ismail

### Abstract

We diagnosed a case report of amoebic meningoencephalitis by *Naegleria fowleri*. This case represented the first recording in Iraq where it was not recorded previously. This case was diagnosed after the death of an 18-year-old girl patient who lived in a rural area of Mosul in Iraq. Genetic detection of *N. fowleri* showed PCR product was 183bp for *18S rRNA* gene. It was registered as the first recording of Iraqi isolate *N. fowleri* in GenBank with accession number OP380864.1. It is necessary to examine microscopically the cerebral spinal fluid (CSF) to observe the amoeba stages and

exclude the bacterial causative. Rapid diagnosis may help in the treatment of amoebic meningoencephalitis. In addition, genetic identification can diagnose amoeba. Avoiding swimming or using freshwater contributes to prevent amoebic meningoencephalitis infection.

**Key words:** Meningoencephalitis, *Naegleria Fowleri*

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### **Detection of the molecular changes in *Ocimum basilicum* treated with cold plasma in treatment of aflatoxin B1 in water**

Shaimaa Fakhri Jasim, Labeeb Ahmed Al-Zubaidi, Nemat J. Abdulbaq

#### **Abstract**

The phenylpropanoids are small phenolic molecules, which are the important component in many herbs. *Ocimum basilicum* L. plant sweet basil is one of the famous genera for its medical features and aromatic oils, which are important economic. The current study was conducted for study to evaluate the atmospheric nonthermal plasma dielectric barrier discharge (DBD) technique on four genes expression were cinnamate 4-hydroxylase (C4H), 4-coumarate CoA ligase (4CL), chavicol O-methyl transferase (CVOMT), and eugenol O-methyl transferase (EOMT), that participate in the biosynthesis of the phenylpropanoid pathway in aerial parts of *Ocimum basilicum* L., and in another hand study the effectiveness for essential oil encapsulation technique of sweet basil to treat water contaminated with aflatoxin B1. The experiment was designed by dividing the seeds into three groups as follows control group without treatment, group2 (treated with cold plasma for 3 minutes, and after 7days treated for 3 minutes), and group 3 )treated with plasma for 5 minutes after 7 days treated for 3 minutes.( After that, the seeds for each group were planted in the greenhouse of the Botanical Garden/College of the Science/ University of Baghdad. The results appeared that cold plasma increased the germination seeds of treated groups 2and group 3 were faster than the control group and the height average of the mature plants of groups 2and 3 was between (50 to73), (50 to 100) cm respectively comparing to control group .

**Key words:** *Ocimum basilicum*, cold plasma

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### **Gene Expression Analysis of Kcs Genes in Sunflower and Exploration of Their Role in Drought Stress Tolerance**

Mahmood-ur-Rahman, Parwsha Zaib

#### **Abstract**

Drought stress is considered as the main abiotic factor which badly affects growth of sunflower plant. Several studies have been carried out to understand the mechanism of drought stress tolerance in plants. KCS genes are responsible for wax biosynthesis and reported to be involved in drought stress tolerance. In this study, comparative genomics and expression profiling of KCS genes was done to understand their role in stress mechanism. Phylogenetic analysis revealed that KCS genes were divided into six distinct clades which was further confirmed by Synteny analysis and concluded that KCS genes in both species share the same evolutionary origin. Further, they were amplified in sunflower by using gene specific primers .Five genes, i.e. KCS2, KCS4, KCS5, KCS10 and KCS18 were successfully amplified in sunflower. Then, sunflower plants were subjected to drought stress and expression profiling of amplified KCS genes was carried out by Real Time PCR. All the five genes were up-regulated under drought showing their role in stress conditions; however, the expression level of each gene was varied. Maximum relative expression was found for KCS4 gene in T1, i.e. 19 fold as compared to control. Total chlorophyll contents were decreased under drought stress while antioxidants like catalase, peroxidase, superoxide dismutase and proline were increased.This study concluded that KCS genes have role in drought stress tolerance and their expression is significantly up-regulated under stress conditions.

**Key words:** Sunflower, wax biosynthesis, drought, gene expression profiling, KCS genes

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## Incidence of Microsatellite Instability at D17S250, BAT25 and BAT26 loci in Malignant and Benign Breast Tumors Iraqi patients

Basman F. Abbas, Nidhal A. Mohammad, Alaa D. Kadhim, Hind T. Muhi

### Abstract

Microsatellite are repetitive short motif sequences of one to six nucleotide bases. Microsatellite instability (MSI) is the nucleotides gain or loss from repetitive deoxyribonucleic acid (DNA) tracts. This study was designed to identify MSI in benign breast tumor (fibroadenoma) and breast cancer (ductal carcinoma) and by using BAT25, BAT26 and D17S250 as markers. Samples were taken from formalin fixed paraffin embedded (FFPE) of 21 cases with benign tumor and 23 cases with malignant breast tumor. The age of patients was range from 16-72 year. The 25mg of FFPE tissue were used to extract normal DNA and corresponding tumor DNA by using DNA extraction kit. High resolution agarose and conventional PCR was used to detect MSI. The results show that MSI in malignant and benign cases was (21%) and (19%) in D17S250 which is higher than BAT25 and BAT26 loci. No significant ( $P > 0.05$ ) correlation was found between age and MSI. As a conclusion, D17S250 marker can be used to detect MSI in malignant and benign breast tumor.

**Key words:** Breast cancer, microsatellite instability, PCR, high resolution agarose.

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## Identification of Eye Retina by using Deep Learning NN Techniques for Security

Abdullah Mohammed Hamad, Oğuz Ata

### Abstract

With the development of artificial intelligence technology in recent years, machines have started to take on the human workload. These systems try to apply the learning ability of the human brain; It has been used in many areas of image processing, eg. Big data analysis, industry, clustering, pattern recognition, etc. Depending on the technological development, the data volume used in various fields has reached a very high level. As a result, it became difficult to analyze large amounts of human data. In this study, a new method will be developed using artificial intelligence. The method to be developed will be validated on the newly created eye images data set. The purpose of the developed data set will be to identify people using eye images. Then, the proposed CNN structure presented 99.32% accuracy that is remarkable when compared with previous studies. Moreover, the proposed structure validated with cassia dataset.

**Key words:** CNN, Biometric systems, deep learning, Eyes images.

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## Cytotoxic effects of gliotoxin extracted from *Candida albicans* Isolated from patients with Urinary Tract Infection

Yaser Qais Hatem, Batol Omran Dheeb

### Abstract

The findings of the toxicity test demonstrated the toxicity of exposure to the gliotoxin produced by *candida albicans*. Elevated medication levels were associated with an increased risk of blood deterioration. At a concentration of 200 µg/ml, the rate of degradation was 2.21%, and at a value of 100 µg/ml, it was 1.97%. The toxicity increased with prolonged contact with the fungus. And the Samples of gliotoxin were also tested on human lymphocytes to determine their cytotoxic effects. Using the methylthiazol tetrazolium (MTT) bioassay, the cells were subjected to four different doses of gliotoxin (100, 50, 25, and 12.5µg/ml). Cell growth was shown to be concentration-dependent, with the sample exhibiting growth inhibition percentages at the corresponding concentrations of 33.82%, 10.16%, 5.7%, 0.0%, and 0.0%. Furthermore, the potential DNA damage caused by gliotoxin, DNA was extracted from the lymphocytes and subjected to electrophoresis on a 1% agarose gel. The results indicated that gliotoxin had the ability to degrade or damage DNA. Additionally, the study revealed a linear relationship between the concentration of gliotoxin, the inhibition of cell growth, and the extent of DNA damage in human lymphocytes. The study investigated the genotoxic effects of gliotoxin (GT) on human lymphocytes, using single cell electrophoresis and a comet assay. Results showed significant DNA damage in these cells, highlighting GT's genotoxic impact. The comet assay revealed no significant differences in comet length between the control and sample 1, but significant changes in head diameter, head, tail, and tail content. These findings highlight GT's adverse impact on DNA integrity.

**Key words:** Cytotoxicity assay, comet assay, FTIR, Genotoxicity assay, HPLC, Toxicity test.

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# 3<sup>rd</sup> International Scientific Conference of Biotechnology (3<sup>rd</sup> ISCB-2024)

## Plant Biotechnology Sessions

### Production of protein isolate and enzymatic protein hydro-lysates from local pumpkin seeds and studying their functional properties

Aswan Hamdullah Bayar, Israa Obaid al-karaquly

#### Abstract

Protein isolate was achieved from local peeled non soaked pumpkins seeds by using petroleum ether with protein percentage 53.15%. Enzymatic protein hydro-lysate were produced from this isolate, pepsin was used at pH=3, trypsin was used at pH=8 individually at different times. Essential and non-essential amino acids were determined which distinguished with glutamic acid and arginine; mixed enzymes were used Ma (pepsin+ trypsin) and Mb (trypsin+ pepsin) and essential and non-essential amino acids were determined which distinguished with high percentage for isoleucine, lysine, methionine, valine and serine. Functional properties for protein isolate and protein hydro-lysates were studied, just like solubility in different pH, it is found that the best solubility for protein isolate was at pH=5, the enzymatic hydro-lysates were at pH=4. At measuring emulsifying capacity, the enzymatic hydro-lysate by using pepsin was the higher capacity while the protein isolate dissolved in pH=8 had higher emulsifying stability. The enzymatic hydro-lysate by using pepsin showed the highest foaming capacity and mixed enzymes Ma (pepsin+ trypsin) showed higher foaming capacity and stability.

**Key words:** pumpkin seeds, protein isolate, protein hydro-lysate, pepsin, trypsin, emulsifying capacity, foaming capacity.

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### GC-MAS Analysis for Stinging Nettle (*Urtica dioica* L.) Extract

Faiz Fadhil Ibrahim, Sama Mohammed Abd-Allah

#### Abstract

We can obtain many antioxidant compounds from fruits and vegetables such as phenolics, Flavonoids, anthocyanins, carotenoids. about 20% of known plants were present in pharmaceutical studies, lead to impact positive ways to the healthcare system such as treating cancer and harmful or/and chronic diseases. this Plants have ability to produce a high number from bioactive compounds. The purpose of this study was to make Water - alcoholic extract for *Stinging Nettle* (*Urtica dioica* L.) and determine the bioactive compound by GC-MS analysis. The results shown the GC-MS analysis of *Urtica dioica*.L showed a highly complex profile containing approximately 39 components. The current study concluded that 50 % ethanol / 50 % water concenter as good solvent and have ability to extract such good amount of phytochemical compound from *Stinging nettle*. The chosen temperature also concede good temperature because it doesn't cause denaturation to this compound. Generally, *Stinging nettle* concenter as plant riche with phytochemical compound that clarify its medical important in traditional medicine.

**Key words:** *Urtica dioica* L., GC-MAS

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## Optimum Green Synthesis, Characterization, and Antibacterial Activity of Silver Nanoparticles Prepared from an Extract of Nettle (*Urtica dioica* L)

Faiz Fadhil Ibrahim, Sama Mohammed Abd-Allah

### Abstract

Materials within nanoscale (1 - 100 nm) have distinguished properties compared to the same material in their normal /molecular scale . These differences include both of the physical and structural level for this molecules due to the surface to volume ratio. silver nanoparticles (AgNPs) concenter as one of leading interest at the promising approaches within the area of nanoscience . it can be synthesized by the biomolecules from many plant components and microbes species which shown high potential for the synthesis of silver nanoparticles (AgNPs). The purpose of this study was to synthesis silver nanoparticles using *Stinging Nettle* (*Urtica dioica* L.) extract as a reducing and stabilizing capping and test this silver Nano particles by SEM to identify their Nano size and UV to identify that they are silver nanoparticle and EDS to identify that metallic feature of silver nano particles and this purity and finally tests their antimicrobial activity by testing them on *Burkholderia cepacia* . The results shown successful green synthesis of silver nano particles with size ranging from 1-50 nm with high purity and 100% antimicrobial activity at 25mM concentration . The current study concluded that silver nano particles concenter as antimicrobial agent and *Stinging Nettle* extract has high reducing ability for silver Nano particles.

**Key words:** silver nano particles, *Stinging Nettle*, Green Synthesis

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## Study the effect of phenolic compounds extracted from some wild Iraqi plants as anti-leishmaniasis *in vitro*

Zainab Yaseen Mohammed Hasan, Mohammad Mahmoud Al-Halbosiy , Esraa Hasoon, Baraa Abdulhadi

### Abstract

As the natural compounds especially from plants are conducted as a rich source for being of therapeutic importance, thus researchers had reported the benefits of using such products in treatments for diseases affecting humans and other organisms for many years. The study included the extraction of phenolic compounds from four genera of plants of the Compositae family growing wild in, western Iraq, including: *Achellia fragrantissima*, *Herba-alb Artemisia* (wormwood), *Lactuca serriola* (Wild lettuce ), and *Silypum marianum* . Hydro-alcoholic extraction was employed by cold maceration method with 75% Ethanol. A general chemical detection of the secondary metabolites of the crude ethanolic extract was carried out for each of the four plants separately. Thin layer chromatography (TLC), qualitative estimation for the types of phenolic compounds were detected and the total phenols for each extracted residue had been proceeded as quantitative estimation for phenolic compounds using a colorimetric method with the standard curve plotting for the phenol standard (Gallic acid). HPLC technique was also applied to detect types and concentrations of the phenolic compounds extracted in each plant residue. The effect of total phenolic extracted from each plant on cultures of the *Leishmania* parasite was also studied during an exposure period of 24 hours *in vitro* experiments, by treating several different concentrations of each plants extracts separately in three replicates for each concentration, then comparing them with a control model. The violet color was then read at the wavelength (620 nm) using an Elisa Reader device to obtain the inhibition rates, as the intensity of the color is an expression of the number of those living cells. The results showed that the plants contain phenols, flavonoids, tannins, glycosides, saponins, and alkaloids, but the wormwood extract gave a negative result for alkaloids. The results of thin layer chromatography analysis showed that the phenolic extract of the four plants contained qualitatively Pyrogallol, Cinnamic acid, Gallic acid, and Hydroquinone in varying proportions. The extract also contained some types of flavonoids. Results for HPLC showed that the four plants are rich in these phenolic compounds. For quantitative total phenolic compound results; *Artemisia*, the wormwood plant contained the highest percentage 1464.72 mg % dry plant powder, while the lowest percentage was in the *Silypum* plant 223.86 mg% dry plant powder. The activity against *Leishmania* growth inhibition rate showed that each plant extract exhibited different mode in inhibiting the parasite cultures, along with the standard Galic acid, that was varying depending on the type of plant, its concentration, for the period of 24 h. exposure. The four plants genera of the Compositae family growing wild in western Iraq, including: *Achellia fragrantissima*, *Herba-alb Artemisia* (wormwood), *Lactuca serriola* (Wild lettuce ), and *Silypum marianum* are rich with phenolic compounds which may help in parasite diminution from human body

**Key words:** *Achellia*, *Artemisia*, gallic acid, *Lactuca*, and *Silypum*.

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## Modern technologies to detect fungi that cause diseases to agricultural crops in Iraq a review

Teeba Hashim Mohammad, Zahraa R.Taha, Zahraa Abbas Abed

### Abstract

Fungal species that parasitize crops cause significant losses annually as they affect the quality and quantity of crops. Infected crops are considered a poor product that negatively affects the local and international agricultural sector. Therefore, rapid and accurate early detection of the pathogen is an important measure to control the crop and avoid losses. In the beginning, a basic database must be available from the field area registration to know the number of samples and the number of repeaters to be taken, determine the appropriate place to store samples, ophthalmic and microscopic examination, planting samples taken with suitable culture media, isolation and purification of fungal cultures and preservation of pure fungal cultures for the purpose of applying modern techniques. A loop-mediated isothermal amplification (LAMP) assay is used to detect about 100 pg fragments of DNA genes per reaction, which accurately detects fungal infections. This assay is used after isothermal amplification to detect genes without the use of PCR. As well as the use of Analysis of whole GENome (AGE), a global method for determining microgenes, this includes experimental practice analysis and bioinformatics testing. Recent tests to detect pathogenic fungi include post- and isothermal amplification analysis, polymer chain reaction techniques (PCR), overlapping, biomagnetic and quantum biometry. One of the modern methods is the method of following bioinformatics, which is based on comparing the entire gene for the purpose of determining the distinctive and special areas of the fungus and designing polymer interaction tests for the species and genus to be diagnosed. The current study aims to uncover accurate and rapid methods for the diagnosis of fungi that infect local agricultural crops to control and find solutions and avoid crop damage.

**Key words:** agricultural crops, pathogenic fungi, LAMP, GENome, bioinformatics.

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## Synergistic Effects of Nano-Silicon and IQ Combi on Yield Traits of Wheat under Saline Irrigation

Raghad Sabbar Abbas, Ayyad W. Al-Shahwany, Leila Zarandi-Miandoab , Nader Chaparzadeh

### Abstract

Salinization is a severe abiotic stress that negatively affects plant growth and development, removing up to 1.5 million hectares of farmland from production annually. To address this issue, two factorial plot experiments were conducted to evaluate the individual and combined effects of nano-silicon (S) and IQ Combi (Q) on the yield traits of wheat *Triticum aestivum* L. "cultivar IPA 99" under saline conditions (M). The plot experiments followed a randomized complete block design with three replications during the growth seasons in autumn 2022 and 2023. The plants were irrigated every 18 days from planting with three NaCl irrigation levels: 0 (distilled water), 50, and 75 mM. A foliar application of nano fertilizer was sprayed after the third leaf appeared, and the spraying process was repeated every 15 days, three times in total. The results showed that salinity significantly decreased the yield component, biological yield, and harvest index by 15.36%, 7.91%, and 9.29%, respectively. In contrast, the maximum synergistic effects of (S), (Q), and (M) increased these traits by 64.00%, 20.71%, and 22.62%, respectively. Additionally, the most significant effects of the synergistic nano-fertilizer on catalase, peroxidase, and Proline under salinity were 48.41%, 73%, and 82%, respectively. In conclusion, increasing salinity concentration negatively affected all studied traits. The addition of nano fertilizer, especially at high concentrations, had a positive role in reducing the harmful effects of salinity.

**Key words:** Nano-fertilizer, wheat, salt stress.

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## Comprehensive analysis of the phytochemical composition and Gas Chromatography-Mass Spectrometry (GC-MS) Technique of selected

Ashwaq Talib Hameed, Hadeel Radawi Al-Newani, Wijdan Hameed Abd Al Razaq , Eman Naji Saleh

### Abstract

Brassicaceae, a family of economically and nutritionally significant species, contains glucosinolates, flavonoids, and phenolic compounds. The purpose of this research is to examine the phytochemical profiles of selected species in this family, contributing to the understanding of their potential health benefits and applications in the food and pharmaceutical industries. The study involved a comprehensive analysis of the phytochemical constituents in various parts of the plants, including leaves, stems, and seeds. Using advanced chromatographic techniques, such as High-Performance Liquid Chromatography (HPLC) and Gas Chromatography-Mass Spectrometry (GC-MS), the research identified and quantified the study conducted a thorough analysis of phytochemical constituents in different plant parts—leaves, stems, and seeds—utilizing advanced chromatographic techniques like High-Performance Liquid Chromatography (HPLC) and Gas Chromatography-Mass Spectrometry (GC-MS) for identification and quantification. The presence of key

phytochemicals. The glucosinolate profiles were particularly emphasized due to their known anticarcinogenic properties and role in plant defense mechanisms. Additionally, the study investigated the antioxidant capacities of the extracts using assays like DPPH radical scavenging activity and Ferric Reducing Antioxidant Power (FRAP). The results demonstrated significant antioxidant activity, correlating with the high levels of phenolic compounds and flavonoids present in the species examined. The findings of this research underscore the importance of the Brassicaceae family as a source of bioactive compounds with potential health-promoting properties. The detailed phytochemical profiles provided in this study can inform the selection of specific species for targeted applications in developing functional foods and nutraceuticals. Moreover, the antioxidant properties observed suggest that these species could play a crucial role in mitigating oxidative stress-related diseases. Future research should focus on the bioavailability and metabolic pathways of these phytochemicals in human systems to fully exploit their therapeutic potential. This research highlights the importance of the Brassicaceae family as a source of bioactive compounds with potential health benefits. The remarkable antioxidant properties of these species suggest that they may be vital in combating diseases associated with oxidative stress.

**Key words:** Brassicaceae, Phytochemical analysis, (GC-MS), Bioactive compounds

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### **Production and purification of cellulose – degrading enzyme from *Bacillus subtilis* and using rice husks as a carbon source for bacterial growth and enzyme production**

Soad Abd Ali Atiya, Hassena Wadhah Muaibed, Shaymaa Rajab Farhan

#### **Abstract**

This research was aimed to rice straw biodegradation and cellulase enzyme production and purification by *Bacillus subtilis* growth on medium contain rice straw as carbone source. Bacterial isolate *Bacillus subtilis* was tested for cellulolytic activity by using CMC medium, the result was shown it has cellulolytic activity. Bacterial isolate *Bacillus subtilis* was grown on the liquid medium contains rice straw for cellulose enzyme production. The results of enzyme purification by using centrifugation then concentrated by PEG 6000 and gel filtration chromatography by using sephadex G- 100 and concentrated by PEG 6000. In the final step of cellulase purification, the specific activity, purification fold and yield were 45.714 U/mg, 4.636 and 89.72%, respectively.

**Key words:** cellulase enzyme, purification, *Bacillus subtilis*.

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### **Comparison of herbicides with some of their mixtures and their effect on rice and accompanying weeds**

Saddam Hatem Abdulraheem, R.M. M. Al-Fetlawy

#### **Abstract**

A field experiment was carried out in a farmer's field in Al-Najaf Governorate, 10 km south of the rice research station in Al-Mishkhab, in the summer agricultural season 2019, with the aim of comparing the effect of mixtures of herbicides with some other herbicides on the yield of rice (*Oryza sativa* cv. Yasamin) and its components. The experiment was applied according to a RCBD with four replications. The mixture [Propanil + (Fenoxaprop + Azimsulfuron)] gave the lowest mean in weed density and dry weight of 7.50 plants m<sup>-2</sup> and 37.25 g m<sup>-2</sup>, respectively, which was reflected in a significant increase in the characteristics of number of panicles, number of panicle grains and grain yield. As it reached 634 panicle m<sup>-2</sup> and 97.00 grain panicle<sup>-1</sup> and 6.30 tons h<sup>-1</sup> respectively, compared to the weedy treatment that gave the highest density and dry weight of the weeds, it reached 82.25 plant m<sup>-2</sup> and 370.72 g m<sup>-2</sup> respectively and the lowest value. For the characteristics of the number of panicles, the number of panicle grains, and the grain yield, which amounted to 425 panicle m<sup>-2</sup>, 77.68 panicle<sup>-1</sup> and 6.30 tons h<sup>-1</sup>, respectively. It is concluded that the treatment (Stam – F34 + flag) is the best treatment by giving the highest averages of the yield characteristics and its components, through the effect of this treatment on reducing the density and dry weight of the weeds.

**key words:** herbicides, Propanil, Fenoxaprop, Azimsulfuron

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## Immunomodulation effects of alcoholic extracts for both *Achellia*, *Artemisia* wild plants at Iraqi desert in *Vitro*

Zainab Yaseen Mohammed Hasan, Raghda Saad Makia, Eman Mohammed Kadhim, Silvana Tariq Shaban, Baraa Abdulhadi Abdulhameed

### Abstract

*Artemisia hera-alba*, *Achillea fragrantissima*, are plants naturally grown as a wild herbs in western regions of Iraq specially Anbar lands belongs to family. *Artemisia* is one of the larger genera in the family Asteraceae, and mostly used in medicine against anthelmintic and antimalarial beside its tradition use as antibacterial, antifungal as well as hypoglycemic effect. In The current study aimed to hightiten the important effects for the phenolic compounds as these plants were rich with. An extracting methods for *Artemisia hera-alba*(AR), and *Achillea fragrantissima* (A), aerial parts had been proceeded with cold maceration methods. Both plants extract residue were subjected to phytochemical general investigations qualitative and quantitative estimation besides antioxidant assay to explain their biological activities as immune boosting and modulations. Results indicated that both plant extract rich phenolic compound as; Pyrogallol, Hydroquinone, and Cinnamic acid. Beside the following flavonoids were present in both extract; Rutin, Quercetin, Apigenin, Kaempferol and Luteolin. The immune modulation effects indicated that both plant extract showed a proliferative effects for normal human lymphocytes in higher doses while a cytotoxic effects had been appeared in low doses. The toxic effects for all used concentrations of both plants affected the normal natural killer cells viability which indicated that the dose might be adjusted to avoid any toxic effect appeared on these plant extracts in different medication state.

**Key words:** *Artemisia hera-alba*, *Achillea fragrantissima*, Immunomodulation, phenolic compounds

## Using silver nanoparticles to increase the accumulation of active compounds in cultured callus of *Withania somnifera* L.

Ashwaq S. Abed, Alaa J. Taha

### Abstract

This study focuses on the differences in the content of withanolide compounds in *Withania somnifera* L. plants under different culture systems. Additionally, it assesses the effects of treatments with silver nanoparticles (Ag-NPs) on the biomass and withanolide content in callus cultures. The leaves of the field plant (*in vivo* cultures) showed a rise in content of 27-OH-withanolide, withaferine-A, and withastramonolide. Conversely, the leaves and roots in the *in vitro* cultures demonstrated a high content of withanolide-B and withanone. The high content of withanolide-A was mainly observed in callus cultures. Moreover, the findings showed a considerable reduction in callus biomass across different concentrations of Ag-NPs (0, 1, 2, and 3 g/L). Conversely, there was a noteworthy rise in the production of withanolides. Specifically, withastramonolide and withanolide-A exhibited significant increases at 2 mg/L Ag-NPs, showing 121% and 15% increases, respectively, compared to the control. Additionally, several other withanolide compounds, including 27-OH-withanolide, withaferin-A, withanone, and withanolide-B, accumulated significantly at 3 mg/L Ag-NPs, with percentage increases ranging from 67% to 277%. Additionally, the study evaluated DPPH scavenging activity in Ag-NPs-treated samples, showing a substantial 64.4% increase at 3 mg/L, suggesting elevated active components or improved antioxidants in this treatment. In conclusion, the findings provide insights into the variations in withanolide content under different culture systems and demonstrate the potential of Ag-NPs treatment to enhance withanolide yield and antioxidant activity in *Withania* plant cultures.

**Key words:** Withanolide compounds, Ag-NPs, callus cultures, DPPH

## Activity of Crude Phenols Extract to Reduce Side Effect of Paclitaxel Drag on Chromosomal Aberrations, Sperm Parameters and Sperm DNA Fragmentation

Hayder Haqi Ismail, Majid Shaii Hamdalla, Hazim Ismail Al-Ahmed

### Abstract

Phenols are used to make detergents, a number of prescription medications, herbicides, and other industrial manufactured products. Because they are antioxidants, consuming a collection of phenolic ingredients contained in food lowers the risk of health problems. Paclitaxel is frequently employed in the management of various cancers. High doses of paclitaxel have been demonstrated to be more effective against several forms of cancer. But it has harmful effects on the reproductive system of male. One method of reducing paclitaxel side effects is to administer the medication along with an

antioxidant. eighteen albino male rats were divided in to 3 groups. Each group contains 6 rats: Group one: Negative control with normal saline injected intraperitoneal. Group tow: Positive control Paclitaxel (4 doses at 7mg/kg in 28 days) without plants extract treated. Group three: Animals were treated with Paclitaxel and crude phenols extract of fenugreek at 10 mg/Kg administration orally then samples are collected after 28 days. this result showed that phenols extract reduced chromosomal aberrations and DNA fragmentation, while increased sperm parameters . in this work, we investigate the potential benefits of phenols extract from fenugreek to combat side effects of the chemotherapeutic agent paclitaxel.

**Key words:** phenols, paclitaxel, chromosomal aberrations, sperm parameters, sperm DNA fragmentation.

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## Effectiveness of *Scenedesmus obliquus* Algae in the Biodegradation of Polycyclic Hydrocarbons in Contaminated Water

Assim H. Flayyih, Buthena A. AL Magdamy

### Abstract

He experiment included knowing the efficiency of *Scenedesmus obliquus* in the treatment of anthracene, one of the aromatic hydrocarbon compounds used in the manufacture of pesticides and paints; and its use as a source of carbon in the culture medium BG-11 under constant laboratory conditions. The algae exposure to anthracene concentrations (100, 200, 300) mg/L and studied the effect of different concentrations on algae growth by light intensity measurement and studied the ability of algae to analyze and consume the pollutant as a source of carbon after (0, 3, 6, 9, 12) days and measured the remaining concentrations using the High Performance Liquid Chromatograph (HPLC).The results showed that the highest value of light density was obtained during the tenth day for all concentrations, meaning that the growth of algae increased in the presence of anthracene. The algae used also has high efficiency on the removal of the anthracene compound, because it was recorded at the highest rate of removal during the third day (76.4, 84.5) ppm within two concentrations (200, 300) ppm respectively. While the highest rate of removal during the ninth day (30.6 ppm) within the concentration of (100 ppm) and at the end of the experiment was the remaining pollutant of all concentrations equal to (UDL, 18.1, 50.9) ppm respectively; and the experiment showed the efficiency of green algae in consuming anthracene and removing the pollutant within the high concentration of it.

**Key words:** Green algae, *Scenedesmus obliquus*, petroleum hydrocarbon, Anthracene.

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## Endeavors of Modified 5-EnoylPyruvylShikimate-3-Phosphate Synthase Engineering in Genetically Modified Plants to Combat Weeds

Duha Mysire Majeed, Hameed M. Jasim, Allah Bakhsh, Ayyad W. Al-Shahwany

### Abstract

The enzyme 5-EnoylPyruvyl-Shikimate-3-Phosphate Synthase (EPSPS) is crucial within the shikimate pathway, where it holds significance in the synthesis of various aromatic amino acids and secondary metabolites in plants. Its implication in the plant metabolism process has led to extensive research exploring its potential for Genetically Modified (GM) crops especially in potato crop. In this review article, we discuss the expression of EPSPS in transgenic plants, its implications for herbicide-resistance (glyphosate resistance), crop yield improvement, and environmental impact. Shikimate pathway have the central role EPSPS enzymatic cascade and fill a knowledge gap by investigating the potential yield advantages of EPSPS overproduction in plants. Recent studies primarily focus on the manipulated EPSPS gene expression for glyphosate resistance and exploring the effects of EPSPS overexpression on plant growth, competitiveness, and yield.

**Keywords:** EPSPS, Transgenic plants, gene expression, GM crops, herbicide resistance, glyphosate

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3rd ISCB\_2024

# 3<sup>rd</sup> International Scientific Conference of Biotechnology (3<sup>rd</sup> ISCB-2024)

## Environmental Biotechnology Sessions

### Evaluation of some biochemical parameters in serum Iraqi patients with *helicobacter pylori* infection

Mohanad Salam Majeed

#### Abstract

Multiflagellate, gram-negative, helical-shaped *H. pylori* bacteria are frequently found in the stomach. They are microaerophilic. This infection might result in severe mucosal inflammation as well as damage, which could result in stomach ulcers. External organ systems to the gastrointestinal tract may be impacted. In patients with *H. pylori*, we are assessing as well as comparing insulin resistance, lipid profile, kidney function, and iron profile for assessing cardiovascular disorders and analyze cardiovascular risk factors. Data in this paper show that patients who have *H. pylori* had higher levels of triglycerides (TG), total cholesterol (TC), insulin, very low density lipoprotein (VLDL), low density lipoprotein (LDL), homeostasis model assessment insulin resistance (HOMA-IR), creatinine, transferrin, and urea when put to comparison with the control group, with a significance level of  $P \leq 0.050$ . High density lipoprotein (HDL-C), iron, and ferritin in the *H. pylori* group are less significant ( $P \leq 0.050$ ) when compared to it in the control group.

**Key words:** *H. pylori*, lipid profile, kidney function, iron profile and insulin resistance.

### Study the Effect of *Alchemilla vulgaris* on Biofilm Production by *Staphylococcus aureus* That Isolated from Wounds and Respiratory Tract of Patients

Rawaa Adnan Khalaf , Salah Mehdi.Al-Chalabi, Abdul Ameer Jwad Zayer, Nawaf Khalid Mohammed, Hazim Ismail Al-Ahmed, Rawya Mahmood Jassim, Sura S. Talib, Haider Abdulzahra, Mustafa Qahtan

#### Abstract

*Alchemilla vulgaris*, an aggregate species, commonly called lion's foot or Lady's mantle, is a perennial herbaceous plant from Rosaceae family. It ranges between 30 to 50 cm long half-rosette herbaceous plant with corrugated and lobed kidney-shaped to semicircular leaves and the green to yellow flowers form clusters. The plant blooms from June to September, can be found on roadsides, grasslands bank, and mountain slopes. Lady's mantle is commonly used in traditional medicine internationally. The upper parts of the plant were reported to treat diabetes, anemia, multiple sclerosis, hernias, ulcers, abdominal and gynecological disorders, inflammations, rashes, and wounds. In Southeast Europe and the Balkans, *Alchemilla* species are used to treat respiratory infections; gynecological, menstrual, and menopausal complaints; diabetes; diarrhea; weight loss; kidney and liver disorders; different inflammatory diseases; and skin disorders. Clinical specimens were cultured including wound swabs, sputum and throat swabs and six isolates were identified as *Staphylococcus aureus* by colony morphology, Gram stain, cultivation on mannitol salt agar, coagulase test and a set of biochemical tests, three isolates from wound swabs and three from respiratory tract (sputum and throat swabs). *Alchemilla vulgaris*(L.) seeds ethanol extract was extracted by 70% ethanol and aqueous extract was extracted by sexhulate then dried by lyophilizer. Phytochemical investigation was performed using petroleum ether, ethyl acetate and 70% ethanol; Preliminary phytochemical examination showed the presence of alkaloids, flavonoids, phenols, glycosides, tannins, and saponins in both alcoholic and aqueous extracts of *Alchemilla vulgaris*, with more concentration in alcoholic extract than aqueous extract. Antimicrobial sensitivity test was done by disk diffusion method using six antibiotics and most isolates were multidrug resistant for oxacillin and gentamicin while ciprofloxacin and levofloxacin show high activity. Methanol extract show more activity than aqueous extract and *Staph. aureus* from wound source were more susceptible than isolated from the respiratory tract. Inhibition zone ranged from 20- 11 mm in diameter for methanol extract and 16- 8 mm in diameter for aqueous extract. MIC was 100 mg/ mL. Biofilm was detected by two methods, Congo red agar and microtiter plate assay reveal strong biofilm formation for all isolates. Antibiofilm activity was examined and both ethanol and aqueous extracts decreased the bacterial biofilm formation.

**Key words:** *Alchemilla vulgaris*, Biofilm, *Staphylococcus aureus*, Antimicrobial, Wound infection



## Antibiofilm activity of pyocin against local isolates of *P.aeruginosa*

Zainab Zamel Khalaf, Laith Ali Hussein

### Abstract

Pyocins are narrow-spectrum bacteriocin that kill bacteria closely related to the producing strain and play a key role in colonization and competition in bacterial communities. Twenty bacterial isolates of *P.aeruginosa* were isolated from wounds and burns, the bacteriocin producing isolates was detected by cup assay method. Then, the bacteriocin was extracted from highly producing one and this bacteriocin tested against bacterial isolates other than producing one in both planktonic and biofilm form. The ability to forming biofilm was tested by microtiter plate method in order to achieve the isolates that forming strong biofilm. The antibiofilm activity of bacteriocin also done in this study by the same procedure that used for testing biofilm. The results showed that all bacterial isolates have the ability for producing bacteriocin against each other but not on its own because each one of isolate contain immunity gene against its own bacteriocin. The results of biofilm showed that 6 isolates has the ability for producing strong biofilm but others produced moderate biofilm. Other findings showed that bacteriocin gave highly activity against biofilm that formed by strong isolates and percentage of inhibition ranged from (48 to 67 %). In conclusions, the bacteriocin can be used to inhibit the biofilm producing isolates of the same species so we can use it as alternative antimicrobial agent instead of antibiotics.

**Key words:** Bacteriocin , pyocin, biofilm , *Pseudomonas aeruginosa*

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## Detection some antibiotics gene correlated with antibiotic resistance in *Klebsiella pneumoniae* isolated From UTI

Zahraa Hashim Mohammed, Estabraq Ali Maklef, Raya Ezat Maroof

### Abstract

Urinary tract infection (UTI) is the second most common type of bacterial infection worldwide. The second most common cause of infection is *Klebsiella pneumoniae*. The aim of this study was to demonstrate the relationship between antibiotic susceptibility and antibiotic resistance genes in *Klebsiella pneumoniae*. A total of 260 urine samples were collected, of which 100 people (62 females and 38 males) were diagnosed with *Klebsiella pneumoniae*. Urine samples were collected from patients who visited AL-Zahraa Teaching Hospital, Al-Kut Hospital, Fayrouz General Hospital, and Al-Karama Teaching Hospital in Wasit Governorate, Iraq between November 2022 and January 2023. Bacterial isolates were identified by biochemical assays and Vitek2 compact system, while antibiotic susceptibility was determined using Kirby Bauer method. The results showed that females in the age group of 19-28 years were more likely to be affected than males, and the difference was highly statistically significant. Our study found a correlation between age and gender in patients with *Klebsiella pneumoniae* UTI. On the other hand, *blaVIM* gene was found positive in 2 of 40 isolates, *blaNDM1* gene was found in 15 of 40 isolates, *blaOXA51* gene was found in 4 of 40 isolates, and *blaIMP* gene was found in 1 of 40 isolates by PCR technique. The bacteria were 90% and 85% sensitive to subenem and meropenem, respectively, while the resistance to ceftriaxone and gentamicin was 81% and 46%, respectively. These genes are associated with antibiotic resistance in *Klebsiella pneumoniae*, a common bacterium that causes urinary tract infections. (UTIs).

**Key words:** *Klebsiella pneumoniae*, UTI

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## Assessment the Antibiotic Sensitivity of the *Escherichia coli* Isolated from Different Clinical Samples

Lina Abdul Ridha Hassan Alsalami, Taghreed Abdul Kareem AlMakhzoomy

### Abstract

Antimicrobial resistance (AMR) presents a substantial worldwide challenge in the effective management of infectious diseases. AMR results in heightened morbidity and mortality rates, disproportionately affecting low and middle-income nations. In the laboratory, antimicrobial susceptibility testing (AST) is a crucial tool for assessing AMR in bacteria. This test is essential for identifying the most suitable treatment for individual patients and predicting treatment outcomes. However, the presence of bacterial resistant to a wide range of medications significantly jeopardizes infection control. Unfortunately, the situation has deteriorated due to the limited development of new antibiotics and the absence of new effective treatment strategies. *Escherichia coli*, a common bacterium, is closely associated with the issue of AMR. So this study aimed to compare and evaluate the results of drug sensitivity testing for *E. coli* strains obtained from various clinical cases, such as wounds, urinary tract infections (UTIs), and high vaginal swabs, that were collected from patients attending Al-Sadder Medical City Hospital, Iraq between November and December 2023. After being placed in a transport medium, the specimens were brought to a lab for identification and culture. In this research, ten antibiotic resistance levels were analyzed in a total of 108 *E. coli* isolates. The susceptibility of the isolates to antimicrobial drugs was determined using AST techniques. Utilizing established breakpoint values, the isolates were

categorized as resistant or intermediate. The study's participants comprised 85.1% female and 14.8% male subjects. The *E. coli*-infected patients were classified into five groups, based on age ranges. Patients in the 20–35 age group had the highest frequency (40.7%), followed by those in the 4–19 age group (25.9%), 52–67 age group (14.8%), 68 ≤ age group (11.1%), and the 36–51 age group (7.4%), in that order. Furthermore, out of the *E. coli* isolates that underwent the Antibiotic Sensitivity Test (AST), the majority of the bacterial isolates exhibited high resistance to Amoxicillin + Clavulanic Acid (AMC), Trimethoprim (TMP), and Ceftriaxone (CRO), with percentages of 77.7%, 62.9%, and 55.5%, respectively. The bacterial isolates showed varying degrees of resistance to Amikacin (AK) (18.5%), Ciprofloxacin (CIP) (44.4%), Levofloxacin (48.1%), Norfloxacin (48.1%), Piperacillin (PRL) (51.8%), and Imipenem (IPM) (3.7%). However, *E. coli* did not exhibit resistance to Meropenem (MEM), has been the most encouraging antimicrobial agent for treating *E. coli* infections according to our research.

**Key words:** *E. coli*, AMR, Meropenem, urinary tract infections (UTIs).

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### Identification and detection of virulence genes as markers in *Enterococcus faecium* isolated from several pathogenic sources by molecular methods in Hillah City, Iraq

Shireen Sabah kamil, Ali H. Al-Marzoqi

#### Abstract

In the current investigation, 184 clinical samples were collected from four distinct cases: dialysis samples, UTI samples, and burns with degrees of combustion ranging from 3% to 80%. There have been three distributions of it: eleven, 144, and 29. The samples came from Margan Hospital, lobby burns, Hillah General Teaching Hospital, and time between Octobers to December / 2019. The primary aim of our efforts was to isolate, identification, and study virulence factors of *Enterococcus faecium*. The results of isolation and diagnosis showed that *Enterococcus faecium* 18 (3.72%). Using polymerase chain reaction (PCR), molecular approaches were used to identify *E. faecium* virulence factors. *E. faecium* genes (*ESP*, *gel E*, *asaI* and *hyl*). The results of the genetic diagnosis showed that 16 positive for virulence genes.

**Key words:** *Enterococcus faecium*, Virulence factors, PCR, *ESP*, *gel E*.

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### *fimH* adhesin-related gene and biofilm formation in Uropathogenic *Escherichia coli* isolates from AL-Hillah/ Iraq

Zeena Hadi Obaid, Dina Hassan Abed Abood

#### Abstract

Uropathogenic *Escherichia coli* (UPEC) is the main causative agent of UTIs and their ability to build biofilms leads to increases its severity and makes its removal difficult. The main objective is to evaluate molecular technique to identify *E. coli* species based on species- specific gene (*uidA* encoding β-D-glucuronidase and *yiaO* encoding outer membrane protein along with 16SrRNA) and to investigate the possible relationship between the prevalence and variations of *fimH* gene sequence and the intensity of biofilm formation. Primers have been designed based on the sequence data available for *E. coli* in the database of NCBI for *uidA*, *yaiO* and 16SrRNA genes. *fimH* virulence genes were detected in fifty *E. coli* isolates of UTI patients by using PCR assay followed by sequence analysis of *fimH* among isolates with different degree of biofilm strength. Gel electrophoresis result presented bands for *uidA*, *yaiO*, and 16SrRNA genes in all *E. coli* isolates. However, no bands were detected among isolates of *Shigella* and *Klebsiella* species. DNA sequence analysis for *fimH* gene revealed three positions of variations were repeatedly detected among strong biofilm former isolates which led to change in their amino acid types. The *uidA*, *yaiO*, and 16SrRNA genes represented an ideal target for the identification of *E. coli* since all primers achieved exclusively related fragments. Variations of amino acid types among three biofilm phenotypic categories might be responsible for structural and functional heterogeneity of type 1 fimbria D-mannose specific adhesion protein.

**Key words:** Uropathogenic *E. coli*, *uidA*, *yaiO* and *fimH*.

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## Comparison of microbial content between dust storm samples in Baghdad and dust hot spots in Samawah desert

Baraa Qassim Hadi, Mohammad Abdul Wahab Al-Aadhami,  
Noor Nihad Baqer, Nadia Abdul Ridha Hameed

### Abstract:

Dust storms are usually caused by strong winds that blow large amounts of dust into the atmosphere from dry, bare ground. Airborne dust contains a variety of microorganisms and chemicals such as bacteria, fungi, and viruses, some of which are pathogenic. The purpose of this study is to detect the biological content in some samples of dust storms. The results showed that the Eight samples of air which were collected from different place of Baghdad in non-dusty days were included *Staphylococcus lentus*, *Sphingomonas paucimobilis*, *Bacillus sp*, *Aspergillus sp.*, *Pencillum sp*. While the eight samples taken from the sands of the Samawa desert and the eight samples taken from Baghdad air on dusty days showed almost the same results, which included *Staphylococcus lentus*, *Sphingomonas paucimobilis*, *Bacillus sp.*, *Actinomyces sp*, *Rhizobium radiobacter*, *Aspergillus sp.*, *Pencillum sp.*, *Alternaria sp.*, *Fusarium sp.*, *Candida sp.* and *Yeast sp*. The similarity in the results between aerosolized and settled dust means that dust particles carry the microbial content from a place to another.

**Key words:** Dust storm, Microbiological content, desert soils

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## Characterization of Antibiotic Resistance and histological examination *lactobacillus* isolated from traditional Dairy products: In centers and districts of Dhi Qar Governorate

Adeeb Abdulally Abdulhussien, Zaynab Mohmmmed farhan

### Abstract

As probiotics or starting cultures, *lactobacilli* are frequently utilized in yoghurt, cheese, pickles, wine, beer, and preserved foods. They are also employed in silage. They are regarded as safe by most people (GRAS). Recent research, however, has revealed that some strains of lactic acid bacteria (LAB) are both resistant to antibiotics and have genes that confer such resistance. Some of them may even use horizontal gene transfer to spread their inherent genes for antibiotic resistance to other LAB or pathogens, endangering human health.

*This study aimed* This work aims to produce some lactic acid bacteria (LAB) and prospective probiotics by isolating and characterizing their enzymes. Among all the isolates.

**Key words:** histology study, *lactobacillus*, powder milk, bacterial strains, antibiotic

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## Study of the waste water effect of the biodiversity plant sample in Al-Hammar Marsh water in Al-Fhood city / Thi-Qar governorate

Hadeel Razzaq Wahab, Shrooq Saad Shams Aldeen, Ahmed Ghalib Ibraheem

### Abstract

The southern marshes of Iraq are a variety of aquatic environments; these include deep and shallow perennial, seasonal, fresh, and salt marshes, most of which are open water and dense aquatic vegetation. The study was conducted on the Hammer Marsh in the Al-fhood sub-district in Dhi-Qar governorate. It is a group of marshes located south of Al-Shatrah, one of the permanent marshes; the length is about 50 km, and the study 9 station. The study showed the dominance of (*Phragmites australis*) and (*Typha domegensis*) plants in wetlands, it was found in all study stations. The clear waters in the deeper areas of the marsh have provided support for the submerged and diverse aquatic plant groups, including (*Ceratophyllum Demersum*) that appeared in four stations (F1, F2, F3, F5b) other scattered plant groups, and several existing swamp weeds appeared, including the (*Myriophyllum vulgar*) and (*Potamogeton pectiatus*). As for the phosphate values, they were higher than the permissible limits in most of the stations recorded (0.752) in station F5b, and the nitrate values were recorded at high values in marsh water, higher than the internationally permissible limits (WHO,2011)that it recorded (27.6)in station F2. The growth of aquatic plants appears densely in the Hammer marsh in the Al-fhood such as (*Phragmites australis*), (*Typha domegensis*), (*Ceratophyllum Demersum*), (*Myriophyllum vulgar*) and (*Potamogeton pectiatus*) where it grew in the stations (F1, F2, F3, F5b). The phytonutrients provide phosphate and Nitrogen, and the ones coming from human waste, mainly in the areas surrounding the marsh, stimulate the growth of aquatic plants which later decompose to produce unacceptable odors and add (BOD) into the water.

**Key words:** marsh plants, heavy metals, marsh, biological pollutants

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## Isolation and identification of fungal species from foodstuffs in local Najaf market and molecular detection of *Aspergillus niger* and *Aspergillus flavus* fungi

Hawraa F. Wali, Suaad W. Kadium, Nawfal H. Aldujaili

### Abstract

This study was conducted to isolate and diagnose fungi from food sources, namely nuts, legumes, dried fruits, pasta, ma'ounah, pasta, and cornflakes randomly from local markets in the Najaf and Kufa governorates, three samples of each food item weighing 250 grams. A sample was transferred to the Fungi Laboratory / College of Science / University of Kufa for diagnosis and study. The results showed the presence of 117 isolates of fungal genera and species from different food sources, which were isolated and identified as follows: *Aspergillus flavus*, *Aspergillus niger*, *Penicillium sp.*, *Aspergillus terreus*, *Rhizopus Sp.*, *Culveriar sp.*, Alter aria Alternative, Fusarium. oxysporium, dipole is S. they are (17, 17, 20, 18, 10, 9, 14, 8, 4) isolates, respectively. The presence of *A. niger* ranges from 60% in Cortney flex and Sunflower hub to (50.3)%A. The incidence of flavus ranges from 45% in gelatin to 65.6% in sunflower center. Alternate repetitions of the song range from white center (49%) to 45.3% cedar , For the purpose of molecular diagnosis, DNA was extracted from *A.niger* and *A.flavus* using a Favorprep Fungi/Yeast kit, and the purity and concentration of the DNA was determined using a spectrophotometer, PCR technology was used with a specific primer, and the result showed a specific band (500 pb) for 17 isolates of *A.flavus* and a specific band (310bp) for 17 isolates of *A. niger*.

**Key word:** Fungi, PCR, *Aspergillus* , spectrophotometer

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## Design of a multi-stage System with Baffles to Treat Rivers water from Microbial Pollutants

Abdulsalam Tawfeeq Dawood, Rawaa Adnan Khalaf, Wael Adil Obaid, Hazim Ismail Al-Ahmed, Khalid Abbas Rasheed, Nawaf Khalid Mohammed, Hayder Haqi Ismail, Zahraa Abbas Abed, Sara Jawad Kadhem

### Abstract

Waterborne diseases were and still are a health burden for society through many reasons, such as agricultural waste, livestock waste, sewage, organic materials, heavy metals, pathogens, and other things, and through the process of irrigation and surface runoff, all of these reasons lead to the deterioration of the quality of river water. Surface runoff depends on the density of rainfall and its topographical environment, which is the reason for these pollutants entering water bodies. This study presents a multi-stage system whose purpose is to remove microbial pollutants from the water taken from the irrigation canal located at the University of Baghdad, whose water source is the Tigris River. The samples were subjected to microbiological tests before the treatment process to identify and isolate pathogens using traditional and conventional methods, where it was found that there were a number of pathogens and bacteria such as (Salmonella, Vibrio, cholera, Clostridium, Staphylococcus, Streptococcus). After treating this water in this system, the water coming out of it was examined using the same methods mentioned in the microbial examination process above. It was found that the water was completely free of pathogens and bacteria, which indicates the efficiency of this system in removing these microbes.

**Key words:** microbial pollutants, Waterborne diseases, pathogens, water bodies, a multi-stage system

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## Investigation of the effect of *Plantago major* on *Enterococcus faecalis* isolated from teeth infection

Mawj Numan Modher, Sara Muhanad Yaseen, Ahmed Fahdel Nema, Sarmed Mohammed Hussein

### Abstract

Antiviral, and anti-inflammatory activities. The study's objectives were to look into the biofilm formation and investigation of the root canal-derived *Enterococcus faecalis* antibiotic susceptibility. It also collected and presented information about the effects of main plant extracts from *Plantago* that have antibacterial qualities on *E. faecalis*. In order to test the efficacy of the extracts against bacteria of extracts in planktonic forms, the disc diffusion method was applied, *P. major* leaf extract inhibits the growth of *E. faecalis* isolates in zones of inhibition that range in size from 9 to 22 mm. The micro-titer plate 96-well technique was employed to assess minimum inhibitory concentration (MIC) of *P. major* extract against *E. faecalis* , the results indicated that *P. major* extract was more effective against *E. faecalis*, with a MIC of (128 to 256 µg/mL). A variety of commercial disks were used for the antibiotic control experiments. The inhibitory zone diameters were measured in millimeters and normalized. The results showed that 60 of the samples contained *E. faecalis*. Although sensitive to Imipenem, most of the isolates were resistant to erythromycin, clindamycin, trimethoprim, and tetracycline. Of the most antibiotic-resistant isolates, 29.5% had strong biofilm formation. The anti-biofilm effects were evaluated using the microtiter plate technique, the result showed 11(60%) samples had weak biofilm production and 7 (40%) samples were moderate. As this research showed, *plantago major* extracts have potential as antibacterial and Anti-biofilm agents against *E. faecalis*.

**Key words:** *Plantago major*, *Enterococcus faecalis*, Biofilm, Antimicrobial activities, Microtiter Plate.

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## A Study on phytochemical constituents, antimicrobial and antioxidant activity of *Equisetum ramosissimum* Desf. methanolic extract

Aya J.M, Ismail A.M

### Abstract

This study aims to determine whether the *Enterococcus faecalis* presence in teeth root canals is one of the common reasons for endodontic therapy failure. It is crucial to understand *E.faecalis* behavior to implement effective treatment. Numerous doctors and researchers have been using different herbs as medicine since ancient times. Drugs of the conventional type are not without adverse effects, and bacteria are growing resistant to them. Under these circumstances, researching historic uses for medicinal plants is a sensible and efficient way to discover new medicinal products. Perennial *Plantago major* belongs to the family Plantaginaceae and may be found all over the world. Many illnesses have been treated with medicine using the *Plantago major* plant. Research has demonstrated that *Plantago's* major plant extracts exhibit wound-healing qualities in addition to antibacterial. In the present study the phytochemicals composition, antioxidant and antimicrobial activity of methanol extract of aerial parts of *Equisetum ramosissimum* were studied. Qualitative analysis of fern methanol extract was revealed the presence of many bioactive compounds (flavonoids, saponins, tannins and alkaloids). The flavonoids was purified from fern methanolic extract and analyzed by using High Performance Liquid Chromatography (HPLC), The total flavonoids concentration records 485.8 µg/ ml. In present study are using different concentrations of flavonoids (12.5, 25, 50, 100 and 200 µg/ml) to assay the antioxidant activity which compared with standard antioxidant (ascorbic acid) , the scavenging percentage of the extract was  $33.4 \pm 8.7$  at a concentration of 12.5 µg/ml. Antimicrobial activity was determined, against 16 microorganisms, including 12 strains of bacteria and 4 species of yeasts. Antibacterial activity was determined using microdilution method and measured minimum inhibitory concentration (MIC) at concentrations 25-200 µg /ml. was used agar well diffusion method measuring inhibition zone for yeasts , the extract showed inhibitory effectiveness against all types of studied bacteria with MIC 25 µg /ml except for *pantoea* where MIC 50 µg /ml . As for yeast, the extract showed highest inhibitory effectiveness against a *Candida ciferrii* has inhibition diameter (10mm) at a concentration 100 µg /ml .

**Key words:** Flavonoids, *Equisetum ramosissimum* , antioxidant activity, antimicrobial activity

## Studying the antibiotic susceptibility and antibacterial activity of probiotic bacteria against pathogenic bacteria isolated from skin infections

Arwa M. Salih, Mayaada S. Mahdi

### Abstract

Probiotics refer to live microorganisms that promote the organism well-being when consumed in sufficient quantities. *Lactobacillus acidophilus*, a well-established probiotic, is often suggested for its positive impact on health. To investigate the spread of antibiotic resistance and the antibacterial effectiveness of probiotic bacteria against pathogenic bacteria obtained from skin infections. A total of 40 samples were collected from patients in two Baghdad hospitals between August and October 2017. The samples originated from patients of various ages and genders. Following standard morphological and biochemical characterization, 69 isolates were identified *Enterobacter cloacae* (n=12, 17.4%), *Klebsiella pneumoniae* (n=1, 1.4%), *Proteus mirabilis* (n=1, 1.4%), *Pseudomonas aeruginosa* (n=15, 21.7%), and *Staphylococcus aureus* (n=21, 30.4%). Eleven isolates (15.9%) belonged to *Staphylococcus epidermidis*, with the remaining isolates distributed across *Bacillus spp.* (n=6, 8.6%), *Pseudomonas stutzeri* (n=1, 1.4%), and *Enterobacter aerogenes* (n=1, 1.4%). Antibiotic susceptibility testing using nine antibiotics identified 18 isolates resistant to Gentamicin, Cefotaxime, Amikacin, Ceftriaxone, Tobramycin, and Amoxicillin-clavulanic acid. *Lactobacillus acidophilus*, a potential probiotic, was cultured and evaluated for its inhibitory activity against the isolated skin infection bacteria. The results upon evaluating the inhibitory effect of the probiotic *Lactobacillus acidophilus* against bacteria causing skin infections, the results demonstrated a broad-spectrum inhibitory effect at all tested concentrations against the isolated skin infection pathogens. In concluded *Lactobacillus acidophilus*, a probiotic bacterium, demonstrated inhibitory activity against skin infection-causing bacteria.

**Key words:** bacterial skin infections, multidrug resistant, probiotic bacteria

## Silencing of *Pseudomonas aeruginosa* Integron class I gene by Short Interference RNA

Albab Fawwaz Ibrahim

### Abstract

The elevation of global resistance of *Pseudomonas aeruginosa* to various antibiotic agents represents a public health threat. In the field of bacterial cellular engineering, gene silencing emerges as an important technology capable of reducing the expression of antibiotic resistance genes. Specifically, short interference RNA (siRNA) technology holds promise in addressing bacterial infections linked to antibiotic resistance. This study focuses on the application of siRNA to target the Integron Class I (intI) gene in *P. aeruginosa* as a potential strategy to attenuate antibiotic resistance issues. The primary objectives of this research involved the identification of the intI gene in *P. aeruginosa* clinical isolates, the design and introduction of constructed siRNA to induce gene silencing, and the assessment of alterations in gene expression using RT-PCR. The study aims to clarify the efficacy of siRNA-mediated silencing in downregulating the expression of the intI gene associated with antibiotic resistance. A total of 30 clinical isolates of *P. aeruginosa* were included in the study. DNA extraction was performed to identify the intI gene, and a custom siRNA sequence was designed against intI. The siRNA constructs were introduced into *P. aeruginosa* isolates via Gold Nanoparticles (AuNPs). Gene expression changes were quantified using RT-PCR. The study found that the intI gene was present in all (100%) *P. aeruginosa* isolates. Importantly, the results demonstrated a significant reduction in the expression level of the intI gene when targeted with siRNA, indicating the efficacy of siRNA in downregulating the gene associated with antibiotic resistance. In conclusion, the widespread presence of the intI gene in *P. aeruginosa* is closely linked to antibiotic resistance. The study highlights the substantial capability of siRNA to downregulate intI gene expression, presenting a promising avenue to inhibit antibiotic resistance in vitro. This research underscores the potential of siRNA technology as a targeted approach to combat antibiotic resistance in *P. aeruginosa*.

**Key words:** Gene expression, integron, *P. aeruginosa*, silencing, siRNA

## Phenotypic and molecular identification and antibacterial activity of *Streptomyces* species isolated from soils of Ninevah governorate, Iraq

Intsar hazim hamid, Jassim Fathi Ali

### Abstract

42 samples of different soils were collected randomly from different areas of Nineveh Governorate, and after conducting laboratory examination and using selective media (International *Streptomyces* project medium) for *Streptomyces* bacteria, 18 isolates of *Streptomyces* bacteria were obtained, as the isolates showed differentiation in the color and shape of colonies, air and vegetative mycelium, and the production of pigments, and upon microscopic examination of the isolates, special characteristics of these bacteria were shown from filamentous forms and variation in the forms of spores, and the isolates varied in the results of the tests. Biochemical diagnostic and the production of many enzymes decomposing carbohydrates, proteins, amino acids and secondary metabolic substances, which are important substances produced to compete with other bacterial species on the nutritional requirements found in laboratory environments and the ability of isolates to produce antibacterial materials for humans pathogens, which is one of the important features of these bacteria, as these metabolites are antibiotics that can be used in the medical fields to resist many diseases and search for new antibiotics Produced by these bacteria, and the diagnosis of bacterial isolates was confirmed by the use of a special amplification chain reaction (PCR) of a special piece of the 16SrRNA gene and after the electrophoreses of the amplified DNA pieces was carried out and when examined with ultraviolet light, all bands traveled the same distance on the agarose gel, which confirms the positive result of having all isolates of the same size 1000 bp for primers special to the genus *Streptomyces*.

**Key words:** *Streptomyces*, Natural products, Antibiotics, Antimicrobial effect

## Promising Bio-Economy Green Renewable Energy Sources

Aya Yasser El-Said Mohamed, Islam Mamdouh Elhadad

### Abstract

Depletion of natural sources, global warming, and the worldwide economic crises are the key roles in searching for alternatives for conventional petroleum wells. Renewable energy sources are gaining more interest in diverse fields, especially in petroleum oil industries and applications as is the most widely used power source and other applications such as lubrication. Providing another renewable, clean, and cost-effective alternative is a must. Some strongly rising raw materials for renewable alternatives are edible oils, non-edible oils, or animal fat sources. So the challenge is to take the good sides from both sides, as crude oil has great properties but a negative impact on the other hand renewable oils have poor properties but a more environment-friendly impact. Rely on the transesterification reaction between the active components in the oil - fatty acids - and alcohols to improve the oil properties and develop for diverse applications. Employing the principles of green chemistry in choosing the raw materials, catalysts, and methods scientists could produce a promising green alternative for petrol as fuel and mineral oil as lubricant. The improved biofuels and biolubricants are renewable, biodegradable, eco-friendly, and remarkably cost-effective giving the advantage in using them as blends or the mselves to take benefits and profits on an industry scale.

**Key words:** Bio-Economy, Energy Sources

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## Isolation of Fungi and Yeast from soil samples

Rawaa Adnan khalaf, Hazim Ismail Al-Ahmed, Salah Mehdi Al-Chalabi, Sara Jawad Kadhem, Nawar rushdi jabber, Mariam Fouad Kadhem, Nawaf Khalid Mohammed

### Abstract

A series of comparative studies was made of soil yeasts in a yellow-brown earth originally under forest but now under pasture. of six solid acid media used for primary isolations, an agar medium containing 4 % (w/v) glucose and 1 % (w/v) peptone gave the highest yeast counts. Two soil-extract agars and a modified Czapek-Dox agar gave slightly lower counts, a third soil-extract agar inhibited all but one yeast species and gave a much decreased count. The addition of a surface active agent to glucose peptone agar did not increase the count. Acid broth enrichment cultures gave a distorted picture of the species pattern shown by primary cultures on solid media. Prolonged mechanical shaking of soil dilutions before culturing, and the addition of a surface active agent to the diluent did not affect the yeast pattern seen, quantitatively or qualitatively.

**Key words:** Yeast, fungal, diagnosis, chemical test.

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## Isolation of bacteria from soil samples

Rawaa Adnan khalaf, Rabah Najah Algafari, Sura Saad Talib, Zahraa Abbas Abed, Sara Saeb Rasheed, Rawnaq Zuhair Fadhil

### Abstrac

Antibiotic is one of the most important commercially exploited secondary metabolites produced by bacteria and employed in a wide range. Most of the antibiotics used today are from the microbes. Bacteria are easy to isolate, culture, maintain and to improve their strain. Bacillus species being the predominant soil bacteria because of their resistant endospore formation and production of vital antibiotic like bacitracin etc. are always found inhibiting the growth of the other organisms. In the present research study, soil bacteria with the antibiotic activity was screened and isolated. The media used in this research was nutrient agar medium. 1g of the soil samples were dissolved in 10ml of sterile water to make soil suspensions. Portion of the suspensions were inoculated on the nutrient agar by streaking and were incubated at 37°C for 24 hours. After which colonies with a clear zone of inhibition were observed. The bacteria isolated were; Bacillus lentus, Micrococcus roseus, Bacillus alvei, Enterobcteraerogene and Bacillus pumillus. The inhibitory activities of the isolated microorganisms were checked against some of the important opportunistic microflora like Staphylococcus aureus and Pseudomonas species.

**Key words:** Bacterial isolation, morphological ,characteristic

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## The inhibitory effect of probiotic *Lactobacillus sp.* on *pseudomonas aeruginosa* isolated from wounds in Holy Najaf Province

Nadia Habeeb Sarhan, Gasak Reaihd Abdulreda, Zainab Abdullah Waheed, Nadhirah Najah Abbas

### Abstract:

This study was conducted to determine the inhibitory effect of *Lactobacillus sp* on *pseudomonas aeruginosa* isolated from wounds, All samples were cultured on blood agar and Mackonkey agar, incubated at 37C for 24h. the results showed that *P.aeruginosa* is the most common causative agent of wound infections isolate. Also found a high resistant to different types of antibiotic, 20 isolates (66 %) were resist to amoxiclav While 29 isolates (96 %) were resist to Ceftzidime and Cefataxime ,30(100 %) were resist to nalidixic acid ,24(80 %) were resist to Ciprofloxacin ,while 22(73%) were resist to norfloxacin. Antimicrobial effect of *Lactobacilli spp.* on *P. aeruginosa* using agar disc method showed that high inhibition zone 21 isolates (70%) were well inhibition zone around the disk that made from *L.acidophilus*

**Key words:** *Lactobacillus sp.*, *pseudomonas aeruginosa*





# 3<sup>rd</sup> International Scientific Conference of Biotechnology (3<sup>rd</sup> ISCB-2024)

## Physiology Sessions

### Effect of *Gingko biloba* and Milk thistle (Silymarin) extract on some physiological parameters in Alloxan-induced diabetic rats

Nawar R.jaber, Sura S.Talib, Zahrra A. Abed, Noor N., Hazim Ismail AL-ahmed

#### Abstract

Diabetes mellitus (DM) has been well-known as a global health issue for decades, due to its elevated occurrence and heightened rates of mortality and morbidity, for a very long time, the usage of herbal therapy has been documented for diabetes treatment and its complications throughout the world, the purpose of this study is to investigate the effect of *gingko biloba* ethanol and aqua milk thistle extracts on some physiological parameters in alloxan-induced diabetic rats, The study was conducted on 25 male albino rats, the rats were divided into five groups after 24 hours of alloxan injection; each group contained five rats., 1st group: control, non-diabetic, 2nd group: positive control; diabetic, 3rd group: received metformin orally, 4th group: received *gingko* extract 50 mg/kg orally, 5th group received milk thistle extract 60 mg/kg orally, the findings demonstrated a statistically significant increase in the total SOD, total WBC, LYM, MID and GRAN cells, a decrease in MDA and TNF- $\alpha$  in both treated groups and metformin group, a decrease in blood sugar levels in the *gingko biloba* and metformin treated groups, an increase in blood sugar levels in milk thistle treated group, CRP-latex test was negative for all groups.

**Key words:** Diabetes, GBE, MTE, Alloxan

### Study the correlation between lipid profile parameters and bacteremia cases in both patients with normal and abnormal lipid profile

Nabaà Adnan Muhammed, Rawaa Adnan, Rawan Ibrahim, Amna Faaz,  
Teba sabah, Malak Ali, Fatin Haqiy

#### Abstract

Bacteremia is blood borne infection which requires critical treatment, including the prescription of antimicrobics and early diagnosis using various biomarkers, such as leukocyte count, C-reactive protein (CRP), and procalcitonin (PCT), have been adopted into clinical settings for predicting bacteremia before completing a blood culture (BC). Using a biomarker which is a sensitive surrogate of bacterial infection as a supplement to clinical judgment may be considered as a promising approach in reducing, limiting, or rationing usage of antibiotics. High-density lipoprotein cholesterol (HDL-C) appears to have evolved as part of the innate immune system playing an essential role in the acute-phase (AP) response and sepsis. Inflammatory diseases lead to marked changes in HDL-C metabolism, decreasing plasma HDL-C levels and altering structure and conformation of HDL-C particles. The study aimed to introduce a diagnostic tool that would be specific and give good detection and sensitivity for bacteremia by evaluating the effect of bacteremia on serum lipid profile including cholesterol, particularly high-density lipoprotein cholesterol (HDL-C) and low-density lipoprotein cholesterol (LDL-C) concentrations and Triglyceride (TG) and to investigate to what extent alterations of the lipid profile at the time of a positive BC may indicate bacteremia with either patient with dysregulated lipid profile and normal patients without defect in lipid profile. A total of 28 patients with normal lipid profile and 21 patients with lipid profile who are outpatient attending Amyriah Teaching Hospital and Fallujah Teaching Hospital from 20<sup>th</sup> of August to 25<sup>th</sup> September 2022, who included according to the inclusion criteria that are registered in a Questionnaire, a blood samples were collected and used for blood culturing and another part separated in gel tube and the serum samples used for serological tests (PCT and CRP) and biochemical tests (Cholesterol, Triglyceride, HDL, LDL, VLDL). The study results showed that most of the patients with positive blood culture in the study older than 45 years in both normal and dysregulated lipid profile (66.6% and 72.7 %) respectively. Females with positive blood culture represent the highest percentage of patients in both normal and dysregulated lipid profile in our study (66.6 % and 81.8 %) sequentially. Moreover; the study results revealed presence a negative correlation between HDL and CRP and PCT in patients with both normal and abnormal lipid profile and a fluctuated correlation among other parameters with high sensitivity and specificity in the using of HDL as a biomarker for bacteremia along with CRP and PCT. The most common bacterial species that isolated form study groups is *Bacillus*

*cereus* followed by *Lactobacillus delbrueckii*. The study concluded ability to consider the reduced levels of HDL as a biomarker for bacteremia in patients with both normal and abnormal lipid profile. Inability to consider the lipid profile parameters other than HDL as a diagnostic or prognostic parameter for bacteremia due to instability. The antilipidemic drugs may have a suggested positive effect on enhancing the recovery from bacteremia.

**Key words:** lipid profile, HDL, various biomarkers

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### **Investigating of Hormonal Levels Biomarkers in the Diagnosis and Early Detection of Breast Cancer**

Halah Kamal Al-Qazzaz, Noor Kamal Al-Qazzaz, Iyden Kamil Mohammed

#### **Abstract**

Breast cancer is a major public health problem, with a high incidence among females worldwide, it increases with age and environmental conditions. Breast cancer is the most diagnosed type of cancer and at the same time the leading cause of cancer-related death. Hormonal biomarkers have garnered attention for their potential utility in early breast cancer detection. The study aimed to learn about the effects of different hormone levels used as biological markers, including prolactin, testosterone, cortisol, and human chorionic gonadotropin (HCG), in the diagnosis and detection of the risks of breast cancer. Blood and saliva samples were collected from all females (50 normal breasts (NB), 111 benign breasts (BB) and 20 malignant breasts (MB)) with histologically confirmed and age-matched to extract potential levels of diagnostic hormonal levels. All biomarkers were carried out once from saliva and serum samples in all subjects of the three study groups (NB, BB, and MB) to determine the different levels of hormones according to the AccuBind ELISA test system. The result shows that hormone levels, particularly prolactin, testosterone, and HCG, could serve as potential biomarkers for distinguishing MB from BB lesions in breast cancer diagnosis and detection.

**Key words:** Breast cancer, Cholesterol, HCG, Prolactin, Testosterone.

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### **A Study of Hematological Changes (RBCs abnormalities) and Their Impact on The Health Status of a Selected Sample of Workers in Private Generators**

Mohammad Abdul Wahab Shaker, Zinah Saad Madhloom, Farah Amer Abed

#### **Abstract**

Environmental contamination is a highly critical issue that demands immediate and practical attention. Environmental pollution, whether in the form of solid, liquid, or gaseous substances, is detrimental to human behavior and well-being, as well as causing significant harm to animal, bird, and plant life. Petrol is recognized as a dangerous substance that poses risks to human health and is linked to a range of health issues, including haematotoxicity and oxidative stress. Chronic exposure to gasoline can have negative impacts on health, specifically by causing damage to the hematological system, leading to bone marrow suppression, an elevated risk of aberrant blood cell shape, and an increased likelihood of getting cancer. This research uses the Blood Film technique to study the effect of air pollutants resulting from the smoke of private generators, the blood changes that occurred, and their impact on the health of private generator operators. 100 males in Baghdad city were divided into two groups: controls (20) were exposed to ambient air daily, and gasoline (80) workers were in private generators groups. The blood samples were collected for the examined peripheral blood films (RBCs). The results show that gasoline inhalation was associated with a significant increase ( $P < 0.05$ ) in red blood cell (RBC) abnormalities compared with the control group. As well as in this study, the reported RBC morphology was changed as the duration of work (years) increased. Long-term exposure in private generators affected RBC morphology, and a significant correlation was mentioned between the duration of exposure and RBC abnormality at the place of work.

**Key words:** Gasoline; Red blood cell; Private generators.

3rd ISCB\_2024

## The Negative Effects of Using Some Artificial Sweeteners on Some Physiological Parameters in Albino Rats

Sara Saeb Rasheed, Rawnaq Z. Fadhil, Noor Haidar Talib, Salah M.M. Al-chalabi,  
Sara Jwad Kadhim, Rawaa Adnan Khalaf

### Abstract

The artificial sweeteners are widely consumed as sugar substitutes in various food products, while they are promoted for their low calorie content helping in manage blood sugar levels and its ability in weight control. The current study investigates the negative effects of artificial sweeteners on some physiological parameters in albino rats. We used fifteen male albino rats weighting (180-200) gm. The animals were divided in five groups (control, sucrose, stevia, stevia leaves and saccharine) three rats for each, the duration of the experiment was 45 days, the sweeteners were dissolved individually in water, rats showed a preference for water consumption with sucrose, saccharine and less with stevia leaves, the blood were collected for (serum glucose, ALT, AST, Alk.pho, b. urea, s. creatinine, lipid profile and CRP) measure. Results showed there was significant increase in glucose mg/dl (176.1±17.1%, 119.2±10.76%, and 132.17±13.1%), b. urea mg/dl (33.6±3.2%, 28.1±2.9 % and 31.4±1.9%) s. creatinine mg/dl (0.85±0.2%, 0.53±0.12% and 0.98±0.11%), GPT U/L (45.8±4.42%, 33.7±3.71% and 41.6±3.1%) GOT U/L (128.67±11.5%, 70.8±9.17% and 129.3±12.08%) cholesterol mg/dl (196.8±20.7%, 162.1±12.0% and 209.3±18.9%) triglyceride mg/dl (178.5±17.7%, 119.403±11.5% and 187.2±16.1%), HDL mg/dl (25.5±2.49, 46.8±5.25% and 36.6±3.5%) and VLDL mg/dl (35.6±3.5%, 23.89±.3% and 22.21±1.7%) of (sucrose, stevia and saccharin) groups when we compared them with the control group. It was found that dietary supplementation with stevia leaves didn't affect blood glucose 107.1±15.4%, b.urea 24.4±5.2%, s.creatinine 0.44±0.04%, GOT 64.9±6.3%, cholesterol 153.1±15.6%, triglyceride 117.4± 2.4%, HDL 46.8±5 and VLDL 37.45±3.2%. Except GPT there was significant elevated 33.7±3.76%, when we compared with the control group. Also there were no significant changes in alkaline phosphatase levels in all five groups.

**Key words:** Artificial Sweeteners, albino rats

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## Clinical investigation of the impact of zinc and vitamin D3 deficiency on hair growth and quality in individuals experiencing hair loss

Ahmed Abdulraheem Ibrahim, Baraa Ahmed Saeed, Qabas A.T. Alraw, Ayat Jawad Ali,  
Estabraq Faris Fadhi, Anwer Jaber Faisal

### Abstract

Zinc's role in cell division, protein synthesis, enzyme activity, hormonal balancing, and wound healing makes it essential for hair tissue growth and repair. Due to its many biological functions that affect hair development and follicle health, vitamin D3 is essential for hair follicle growth. The study compares these important nutrients in men and women with hair loss to investigate if there are substantial differences that could guide gender-specific treatment techniques. The research also seeks to better understand how these micronutrients affect hair follicle health and hair growth, which could improve hair loss management and prevention. A total of 120 people were analysed for vitamin D3 and zinc levels; the subjects were split into two groups according to gender and whether or not they experienced hair loss. A close-system laboratory kit and the fully automated Cobas C411 instrument were used to measure the levels of vitamin D3. Zinc levels are measured with the cobas c311. The device was created by Roche and is used for clinical chemical analysis. Zinc and vitamin D3 levels were found to be significantly higher in men who were not suffering hair loss compared to those who were. In terms of zinc and vitamin D3 levels, the female who did not experience hair loss had a significantly higher level than the female who did. Men experiencing hair loss had much higher levels of zinc and vitamin D3 than women experiencing the same condition. These findings indicate that Zinc and Vitamin D3 deficits may cause hair loss and that genders may have different nutrient metabolisms and needs. Biological and physiological factors including hormonal changes may affect nutrition metabolism and use, as shown by the differences. A gender-specific strategy to assessing and treating hair loss is highlighted by this study. Supplementation and diet changes may help manage hair loss and improve scalp and hair health by addressing vitamin shortages.

**Key words:** Zinc Supplementation, Vitamin D3, Baldness, and Hair loss.

## Physiological and Biochemical Study of Renal Failure Patients in Salah al-Din

Ansam Hasan Alwan, Mustafa Ali Abd Al-Rahman, Marwan Q. Al-Samarraie

### Abstract

One condition brought on by renal malfunction is kidney failure. A robust, natural kidney serves as the body's primary filter, balancing bodily fluids, chemicals, and blood acidity. It also generates hormones that regulate the synthesis of red blood cells and the development of new bone. Kidney failure affects people of all ages, but it is more common in the elderly. It causes waste products to accumulate in different bodily parts, a higher heart rate was associated with a lower estimated glomerular filtration rate (GFR) and an increased likelihood of proteinuria. 10 to 13% of the world's population is affected by chronic kidney disease, and millions die each year due to the lack of inexpensive treatment choices. The incidence increases dramatically with age. CKD is associated with several undesirable outcomes, including an increased risk of cardiovascular events, acute kidney injury (AKI), and progression to end-stage kidney disease (ESKD), making its diagnosis essential. The initial and continuing risk factors for chronic kidney disease include genetic, ethnic, socioeconomic, and age variables. The study was conducted on patients with renal failure in Salah AL-Dean province, specifically in Ballad General Hospital and Tikrit Teaching Hospital. The collection of samples took place from November 1, 2023, to December 1, 2023. It involved collecting blood samples from each patient in the studied groups. The groups were divided into two categories within a specified age range of 20 to 65 years, as follows: Control group (30 individuals): They were healthy and free from any chronic diseases, confirmed through comparison with the patient group, patient group (60 individuals): They were diagnosed with the disease based on the conducted criteria. The variables studied were; B Urea, S Creatinine, S Uric acid, S Sodium, S Calcium and anti-oxidant Super oxide Dismutases (SOD), Malondialdehyde (MDA). The results showed an increase in the rate of urea, creatinine and uric acid, and there were significant differences at level  $P < 0.05$ . and there were significant differences in the concentration of MDA. The results showed an increase in the rate of urea, creatinine and uric acid, and there were significant differences at level  $P < 0.05$ . and there were significant differences in the concentration of MDA, and there were significant differences in the concentration of SOD among the study groups compared to the control at a significant level of  $P < 0.05$ , and shows that serum calcium levels in patients were significantly lower than in healthy controls at level ( $P \leq 0.05^*$ ), but there is no significant change in the sodium level in patients with kidney failure. The results of this study showed that patients with renal failure had a significant increase in the concentration of urea, creatinine, uric acid, and antioxidants, as well as a decrease in the percentage of calcium and blood in patients compared to the control group.

**Key words:** renal failure, B-Urea, S-Creatinine, S-Uric acid, S-Sodium

## Correlation Between Urinary Neutrophil Gelatinase Associated Lipocalin and Oxidative Stress Biomarkers in UTI Patients

Mayss Abdulrazaq Hamed, Osama Nadhom Nijris

### Abstract

Urinary tract infection (UTI) is most common universal infectious disease that affects organs concerned with the urinary system i.e. bladder, ureter, and urethra along with kidney (1). Neutrophil gelatinase-associated lipocalin (NGAL) is a protein expressed in neutrophils and several other human tissues (2). Malondialdehyde (MDA) is an indicator of lipid peroxidation in cell and tissues which increases in several diseases (3). The biological antioxidant glutathione (GSH) is present in virtually all mammalian tissues and participates in many essential aspects of cellular homeostasis (4). Estimation of urinary NGAL, serum MDA and GSH levels in UTI patients and find the correlation among these biomarkers. This study including the collection of 114 samples (blood and urine) from UTIs suspected patients (women and man) aged between 18 to 45 years and who visited Samarra general hospital and outpatient clinics in Samarra city during the duration from October 2022 to January 2023, patients personal information was recorded including name and age etc., the urine and blood samples were handled in Samarra general hospital, biochemistry and microbiology labs also in college of applied science, microbiology lab for preservation and estimation processes. of 104 urine samples, 60.58% were positive urine culture and 39.43% were negative urine culture, *E.coli* was the most predominant bacteria 31.75% follow by *S. aureus* 19.5%, *K. pneumonia* 17.46%, *S. epidermidis* 12.7%, *P. mirabilis* 6.35%, *P. vulgaris* 4.77%, *S. saprophyticus* 4.77% and *C. freundii* 3.18%. The urinary NGAL and serum MDA levels were significantly higher in UTI patient  $11.04 \pm 3.75$ ,  $152.2 \pm 42.8$  compared to control subject  $4.13 \pm 1.76$ ,  $28.29 \pm 8.71$  whereas serum GSH level was lower in UTI patients  $1.415 \pm 0.42$  compared to control subject  $7.27 \pm 2.74$ ,  $p \leq 0.0001$ , moreover the urinary NGAL and serum MDA levels were significantly higher in UTI patient with positive culture  $13.80 \pm 2.63$ ,  $191.4 \pm 10.9$  compared to negative culture  $6.4 \pm 2.43$ ,  $101.5 \pm 17.0$  whereas serum GSH level was higher in UTI patients with positive culture  $1.562 \pm 0.494$  compared to negative

culture 1.267-0.264,  $p \leq 0.0001$ . Also there was strong correlation among urinary NGAL and MDA, GSH biomarkers. there was strong relationship between UTI and oxidative stress and NGAL as his part in antibacterial immune processes.

**Key words:** UTI, NGAL, MDA, GSH

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## Effects of Green Tea Aqueous Extract Against Iron Dextran- Induced Cardiotoxicity in Wistar Rats

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### Abstract

Elevated iron levels in the body have long been recognized as a significant issue in chronic diseases. Iron is a vital metallic element that plays numerous roles in the human body, including oxygen transport, electron transfer, DNA binding, and various enzymatic reactions. Green tea, derived from the leaves and buds of the *Camellia sinensis* plant, is available in various forms such as white tea, yellow tea, green tea, and black tea, with differences primarily in processing methods. This study aimed to investigate the effects of green tea extract on reducing cardiovascular complications in patients with cardiomyopathy. A case-control study was conducted with 32 male rats, divided into four groups: a control group, a dextran iron group (10 mg/ml), a green tea extract group (100 mg/ml), and a combination group of dextran iron and green tea extract (each at 100 mg/ml). The treatments lasted for 4 weeks, after which blood samples were collected from all rats to measure levels of total cholesterol, triglycerides, various lipoproteins, glucose, iron, transferrin, urea, and creatinine. Additionally, the rats' hearts were removed, preserved according to standard laboratory protocols, and examined pathologically. The study findings indicated that green tea extract had a positive and reducing effect on serum blood factors compared to both the control group and the dextran iron group. These results demonstrate that green tea extract lowers blood factor levels. Furthermore, histopathological microscopic examinations revealed that tissues treated with green tea extract were normal and free of adverse effects or disorders, indicating improvement in cardiomyopathy conditions. Additionally, treatment with green tea increased the expression of genes related to Hcpidin and GAPDH proteins. The present study shows the positive and side-effect-free impact of green tea extract at the investigated dose in a rodent model. Continued research and evaluation of various doses could better elucidate the effects of green tea extract on reducing disorders and preventing elevated serum lipid levels.

**Key words:** Green tea extract, cardiomyopathy disorders, Wistar rats

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## Gliotoxin-Induced Changes in Mice Spleen&Brain: *In Vivo* Study

Safa M. Abdulateef, Sumayah Sami Hashim, Afrah Kadhim Ghannawi,  
Batol Imran Dheeb, Muhnnad Massadeh

### Abstract

Gliotoxin is a secondary metabolite produced by several fungal species with the consensus amino acid sequence cysteine-glycine and an unusual disulfide bridge. Gliotoxin (GT) is a significant cause of human diseases, particularly in immunosuppressed patients. GT is secreted in the culture media of *Aspergillus fumigatus* and has been implicated in the virulence of this major pathogen. This study was conducted to evaluate gliotoxin effectiveness on mice brains and spleens using careful light and electron microscopic methodologies to observe histopathological changes and explore the interaction between gliotoxin and metalloproteinases in mice spleen subjected to different acute toxic doses of gliotoxin. Mature male BALB/c mice were used in this study. Animals were provided by Biotechnology researches center of Al-Nahrain University. To study the histological changes and expression of MMP1 & MMP7 in mice, animals were injected intraperitoneally (i.p.) with acute doses as (125, 250, 500  $\mu\text{g}/\text{ml}$ ) and comparing with control group (received i.p. one dose of methanol 10%) and the mice of each group were sacrificed at day seven, each mouse was dissected and the organs were collected then sectioned. The expression of MMP1 and 7 in mice spleen were estimated using immunohistochemistry. It has diverse cellular effects in the spleen showed deposition of amyloid-like substance in congested red pulp, accumulation of phagocytic cells in the tissue due to tissue damage and inflammation and with apoptosis of lymphocytes in white pulp. Light microscope observed tissue vacuolation and atrophy of glial cells, necrosis of neuronal cells, and damage to Purkinje fibers effects by gliotoxin on the brains of treated mice. Immunohistochemistry (IHC) analysis showed the effectiveness of Gliotoxin on the expression of MMP1 and MMP7.

**Key words:** Gliotoxin, Matrix metalloproteinase, immunohistochemistry, LD50

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## The physiochemical characteristics of collagen derived from local egg shell membrane

Ayat Adnan Abbas, Rawya Mahmood Jassim

### Abstract

Collagen was extract from eggshell membranes (ESM). This research aimed to investigate the collagen extract from egg shell membrane and detection it . Acetic acid was added in a 1:10 ratio to membrane weight, the maximum collagen output was obtained , chemical composition estimation, viscosity ,HPLC, Yield and FTIR. The percentages of protein, moisture, ash, fat, and carbohydrates were 72.92, 15, 5.65, 6.1, and 0.66%. The yield of ESM was estimated as well based on dry weight. At 40°C, collagen dissolves thermally.

**Key word:** Egg shell membrane, collagen, hydroxyproline, HPLC, FTIR.

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## Iraqi and childhood cancer: the harsh truth

Harith Abdulrahman Ahmed, Mustafa Nuhad Jumaa Jamal,  
Gihan Hosny Abd Elsamie, Haitham Hassan Abd

### Abstract

The implementation of more advanced imaging and diagnostic procedures, as well as the development of specialized medications that selectively attack tumor cells, result in higher treatment costs and reduced fatality rates. Preventive programs play a crucial role in the endeavor to manage cancer since they can decrease both the occurrence of cancer and the number of deaths caused by it. The implementation of screening programs for colorectal, breast, and cervical cancer has effectively alleviated the impact of these prevalent malignancies. Anti-cancer vaccinations, including both preventive and therapeutic types, are a significant means of prevention. Despite certain advancements in these domains, a significant amount of work remains.

**Key words:** ICD-10, cancer, ASR, CR, Childhood

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## The Therapeutic Role of Citrus Peel Extraction on *Helicobacter Pylori* Bacteria

Sara Saeb Rasheed, Rawnaq Z. Fadhil, Hazim Ismail Al-Ahmed, Salah M.M. Al-chalabi

### Abstract

Antibiotic resistance is a growing global problem that affects people, animals, environment and the economy. Many bacteria have become resistant to antibiotics, and this fact is emerging as one of the major threats to public health. The lack of new antibiotic due to their time-consuming with costly development, and increased side effects of the treatment regimens, exacerbates the problem. Therefore, it is necessary to identify new antimicrobial agents to treat bacterial and fungal infections, thus a number of natural compounds have been tested as potential alternatives. Plant extracts, which are valuable sources of bioactive compounds that play an important role as a new strategy to combat pathogenic microorganisms. Furthermore, some bioactive show a synergistic effect when combined with antibiotics and antifungals, suggesting a promising alternative for therapeutic strategies against antibiotic resistance. However, Fruits like citrus are known to contain at least several hundred different types of bioactive compounds (polyphenols, flavonoids, essential oil, quercetin, vitamin C, carotenoids, folic acid, limonoids, narnginin and synephrines) with identified antioxidant, anti-inflammatory, anticancer and antimicrobial properties could help eradicate a number of infectious diseases. Polyphenols in citrus fruit considered natural products play important role by reach the large bowel and contribute to the gastrointestinal health, since these bioactive compounds can prevent the proliferation of *H. pylori*. Also, beneficially modulating the gut microbial ecosystem by increasing the number of *Bifidobacterium* spp., *Lactobacillus* spp., and *Enterococcus* spp. which are known for their anti-inflammatory, immunoregulatory and decrease oxidative stress, and thus, polyphenols improve the body's immune system. The microbiota impacts the biotransformation of polyphenols into low-molecular weight, allowing a high absorption, transport and delivery to the epithelium, ending in a correct distribution in the blood stream and tissues of the host. Thus, a stable synergy between the microbiota and polyphenols that is essential to maintain the balance of metabolism.

**Key words:** Citrus Peel, *Helicobacter Pylori*

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## The Relationships between apelin, vaspin and thyroid hormone levels in obese diabetic

Diyar Adel Lateef, Nesreen Ahmeed Nasser, Osama A. Mohsein, Rayah Sulaiman Baban

### Abstract:

Apelin and vaspin modulate thyroid function. Furthermore, they are connected to particular components of chemical elements. Increased apelin and vaspin in diabetic women can have a negative impact on their thyroid function. The aim of the study was to understand the relationship between thyroid hormones and adipokine as a way to find a solution to the problem of obesity or its complications. Between October 1, 2022, and February 2, 2023, the case-control study included a total of 150 women, 100 obese women as the case group (50 obese and diabetic, 50 obese without diabetic), and 50 healthy women as the control group. They visited Al-Habbobi and Al-Nasiriya teaching hospitals. Vaspin and apelin were measured using the enzyme-linked immunosorbent assay (ELISA), whereas C-Peptide was assessed using the electrochemiluminescence immunoassay (ECLIA) for thyroid hormone (FT3, FT4, and TSH). The measurement of fasting blood sugar (FBS) and haemoglobinA1C (HBA1C) was conducted using colorimetric and fluorescence immunoassay (FIA), respectively. In the results, in obese diabetics, vaspin is significantly lower than in controls. Although there is no significant difference in apelin levels between groups ( $0.34 \pm 0.08$  vs.  $0.32 \pm 0.11$ ,  $P = 0.09$ ), Vaspin and apelin tests show no significant difference between obese non-diabetics and controls. FT3 and TSH levels are significantly higher in obese diabetics and non-diabetics than in the control group. While FT4 dropped significantly between groups, in obese diabetics, FT3 and TSH levels are significantly higher than in obese non-diabetics. Obese diabetics had a significantly lower decrease in vaspin and apelin levels than obese non-diabetic patients. In conclusion, the decrease in FT4 across all groups and vaspin levels in obesity and diabetes suggest that vaspin is involved in hormone metabolism. Despite lower thyroid hormone levels, apelin levels were not statistically different. This suggests that the thyroid gland controls fat levels and metabolism.

**Key words:** adipocytokines, obesity, apelin, vaspin, biomarkers, type 2 diabetes Mellitus, hypothyroidism