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كلية العلوم

FACULTY OF SCIENCE

المؤتمر الدولي السادس للعلوم الأساسية وتطبيقاتها

6th International Conference of Basic Sciences and Their Applications

6th ICBSA

2nd December 2023

El–Beida – Libya

Email science.conference2023@omu.edu.ly

- المؤتمر الدولي السادس للعلوم الأساسية وتطبيقاتها هو حدث علمي مميز تستضيفه مدينة البيضاء في رحاب كلية العلوم بجامعة عمر المختار.
- ويهدف هذا المؤتمر لتبادل الخبرات العلمية واقتراح الحلول الممكنة لمختلف المشاكل التي تواجه بلادنا في مجالات العلوم الأساسية. ويعتبر المؤتمر فرصة ممتازة للإطلاع على أخر الأبحاث العلمية في مختلف العلوم الأساسية وتطبيقاتها.
- ويعتبر هذا المؤتمر هو السادس في سلسلة المؤتمرات التي نظمتها كلية العلوم بعد النجاح الذي حققهما المؤتمرات الخمس السابقة.

- Sixth International Conference of Basic Sciences and Their Applications (6th ICBSTA) is an event hosted by Elbeida City in Faculty of science - Omar Al-Mukhtar University.
- This conference aims to exchange scientific experiences and suggestions to solve various problems facing our country in the fields of basic sciences, The conference is an excellent opportunity to learn about the latest scientific research in various basic sciences and applications.
- This conference is the sixth in a series of conferences organized by the Faculty of Science after the success achieved by the previous five conferences.

تاريخ انعقاد المؤتمر

- تم انعقاد المؤتمر الدولي السادس للعلوم الأساسية وتطبيقاتها في 2 ديسمبر 2023.

Conference date

- The Sixth International Conference on Basic Sciences and Their Applications will be held on December 2, 2023.

Conference E-mail and Site أيميل وموقع المؤتمر

science.conference2023@omu.edu.ly
https://conf.researchr.org/home/icbsta-2023

Conference ICBSTA Themes محاور المؤتمر

علم طبقات الأرض	علم الكيمياء	علم الحاسوب	علم النبات
Geology Science	*Chemistry Science*	*Computer Science*	*Botany Science*
علم الحيوان	علم الأحياء الدقيقة	علوم الرياضيات	علم الفيزياء
Zoology Science	*Microbiology Science*	*Mathematics Sciences*	*Physics Science*
العلوم البيئية	العلوم الطبية الأساسية	علوم البحار	علم الإحصاء
Environmental Sciences	*Basic Medicine Science*	*Marine Sciences*	*Statistics Science*

العلوم الصيدلانية *Basic Pharmaceutical Sciences*

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6th International Conference of

Basic Sciences and Their Applications

6th ICBS

2 December / 2023

El-Beida - Libya

Abstract Book

THE SIXTH INTERNATIONAL CONFERENCE OF BASIC SCIENCES AND THEIR APPLICATIONS

2 DECEMBER / 2023

Under Auspices of
Omar Al-MukhtarUniversity, El-Beida - Libya

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Conference Message

It gives us immense pleasure as the host of the conference to extend a cordial welcome to all participants that expressed keen interest in attending and actively participating in the conference proceedings. Starting from the date of its announcement, the conference has received an overwhelming response from researchers belong to various faculties from several countries. The participation of such a huge number of researchers of different nationalities and backgrounds highlights the importance of presenting and discussing their research findings with their peers of mutual interest and sharing them with the scientific community all over the world. The Faculty of Science at our Omar Al-MukhtarUniversity takes pride in bringing these professionals togeather to participate in the conference.

It is also gratifying to note that the conference covers a wide range of very interesting topics relating to basic science and its applications. We cordially invite all those with an interest and/or participatory role in scientific or applied research in the related fields of basic sciences and its applications, management and sustainable utilization to share their knowledge and expertise by taking an active part in the conference.

In addition, apart from the facilities arranged for the conference, the guests are provided with an opportunity to visit some historical sites such as Cyrene old city in Al Gabal Al-Akhder region of Libya.

We look forward to seeing you at the conference.

Dr IDRIS A. MASOUD ABDULHAMID

Chairman of the Conference


Foreword

The Sixth international conference of Basic Sciences and Their Applications (ICBS -2023) is now established as an event. The sixth conference is being attended this year by about 100 experts from different Universities and has the objective of demonstrating recent progress in basic and applied sciences.

Nearly a fifty-nine research papers have been submitted to the conference to share the latest knowledge in the form of oral presentations and posters. A quarter of the attendees were research students. Majority of these papers have been accepted after considering the valuable feedback from expert reviewers. The scientific program involved the presentation or poster and discussion of 49 papers. The revised and accepted research papers of the conference will be published in a special Issue of the Journal of Faculty of Science - Omar Al-MukhtarUniversity journal (Libyan Journal of Basic Sciences – LJBS).

We would like to thank all the participants, referees, reviewers and editorial board for their efforts and input during the preparation and conductance of the conference.

The conference committee

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Index of Abstract book

Abbreviation	*Identification*
BOTA	Botany Science
CHEM	Chemistry
ENV. S.	Environmental Science
MATH	Mathematics
MICRO	Microbiology
PHYS	Physics
ZOOL	Zoology

Contents

Paper code	*Title*	*Author(s)*
Section 1 Botany		
BOTA101	Checklist of Plants of Ibrak Nouta, Soussa, Al-Jabal Al-Akhdar, Libya	Adam S. Adam *et al.*
Section 2 Chemistry		
CHEM 201	Accumulation of Heavy Metals in Agricultural Soils from the Use of Pesticides (Study in The Green Mountain)	Mona A. M. Alghamq and Fathallah S. Altieb
CHEM 202	Removal of Toxic Lead Ions from Their Aqueous Solutions Using Fava Beans Phytoadsorption Technique	Salaheddin A. Sharif *et al.*
CHEM 203	Evaluation of Paraphenylenediamine in Kohl and Black Lipstick Samples Collected from Libyan Local Markets Using High-Performance Liquid Chromatography	Galal M. Elmanfe *et al.*
CHEM 204	Chemical and Microbiological Analysis of Groundwater after Major Flood Incident in Derna City	Nuri M. Abduali and Nawal A. Rajab
CHEM 205	Phytochemical screening, total phenolic content and antibacterial activity of fruits, peels and seeds of some watermelon and muskmelon cultivars from Al-Marj region	Salem A. Mahmoud *et al.*
CHEM 206	Assessment of Mineral and Heavy Metal Content in Spices: Comparative Analysis and Health Implications	Kareima A. Abdelghani *et al.*
CHEM 207	Assessment of Heavy Metals in the Water of Karaçomak River (Kastamonu), Turkey	Tariq A. M.Tyeb *et al.*
CHEM 208	Analysis the Main Chemical Components of the Resting Marble Sculptures at the Cyrene Museum, Libya	Saleh M. Bufarw *et al.*
CHEM 209	Mineral Analysis and Some Chemical Composition Estimation for the Barest Milk	Hana S. Mohammed *et al.*
CHEM 210	Using Sulfuric Acid to Produce Bioethanol from Fruit Waste: Banana Peels	Dalal M. Ibrahim *et al.*
CHEM 211	Determination of some Heavy Metals content in Chicken Shawarma samples from a restaurant in El-Beida city, Libya	Abdulrraziq S. Radad *et al.*
CHEM 212	Correlation between Diameter and Quality Control Parameters of Folic Acid Tablets from Different Brands Available on the Libyan Market	Azah M. Ali *et al.*
CHEM 213	Accurate and Rapid Methods for Determinate Anti-Oxidant and Total Phenol Contents in Two Different Types of Pomegranate Peels	Jibreel A. A. Aldaeh and Hamad M. A. Hasan
Section 3 Environmental Science		
ENV. S. 301	*Juniperus turbinata* Dieback in Al-JabalAl-Akhdar Mountain, Northeast Libya: Insights from Dendrochronological Analysis	Ahmed A. Al-Shaikhy *et al.*
ENV. S. 302	Distribution of *Thapsia garganica* in Al-JabalAl-Akhdar (The Green Mountain) Area at Libya	Muoftah A. Bataw

Section 4 Mathematics		
MATH 401	A New Study of Stable Symmetric Families of Exponential Distribution	Naeima N. Abd elati *et al.*
MATH 402	Addressing the Missing Data Challenge in Time Series Analysis: Strategies and Implications	Suaad O. Ben-Farag and Intesar N. El-Saeiti
MATH 403	The Connection between Regular Relation and Subcanonical Hypergroup of Canonical Hypergroup	Yasser A. AbouElwan and Maher A. Alderawe
Section 5 Microbiology		
MICRO 501	Evaluation of the Activity of Alcoholic Extract from the Leaves of *Salvia officinalis* and *Mentha longifolia* Against Some Fungi Isolated forms Soil	Fatma B. Abuaziza and Ibtisam M. Ahamdi
MICRO 502	*Staphylococcus xylosus* Isolated from Surface Plants in the El-Beida Medical Center Garden and its antibiotics sensitivity	Alzubair A. R. Alhasni and Nagah S. A. Abubaker
MICRO 503	Investigate the Prevalence of Pathogenic Bacteria on Randomly Selected Surfaces and Preventive Practices among Working Staff in the Neonate Care Unit in Benghazi Medical Center	Salah A. Hamad Gadalla *et al.*
MICRO 504	Study of Bacterial Species that Cause Urinary Tract Diseases and Their Resistance to Some Antibiotics in Laboratories of Al-Marj city	Asma Y. A Alorfy and Rafaa H. Bogreen
MICRO 505	Effect of Aqueous and Alcoholic Extracts of Frankincense Plant on the Growth of Bacteria	Dareen M. Bukhairallah and Aliyah J. Allythi
MICRO 506	A Study of Gram Positive Bacterial Profile on Computer Keyboards and Mice in Benghazi University Offices, and the Efficiency of Disinfectants.	Amal. M. Aspaq and Salha F. Benjewerif
MICRO 507	Antibacterial Activity of *Ulva lactuca* Extracts from the Coast of Sousa City (Libya)	Wafa E. Ali
MICRO 508	Molecular Characterization of Multidrug-resistant *Klebsiella pneumoniae* Isolated from Teaching Hospitals in Benghazi, Libya	Asma A. Elramli
Section 6 Physics		
PHYS 601	Effect of Flame Retardants and 1% Stabilizer on Melting and Dripping of Thermoplastic Polymers Duedue to the Furnace Test, Part 1: Furnace Modulated and Calibrated	Mastura A. A. Efhema
PHYS 602	The Prospective Use of Locally Produced Borate Glass as Windows and Shields in Imaging Photon and Neutron Environments	Salima A. Abdelrahman *et al.*
PHYS 603	Physical Properties of Bi_2O_3–PbO–P_2O_5 Glasses	Abo-alqasem S. Mater *et al.*

Section 7 Zoology		
ZOOL 701	The Prevalence and Morphology of Toxoplasmosis in Domestic and Semi-domestic Cat in El-Beida City, Libya	Ahmed M. Ekhnefer *et al.*
ZOOL 702	Chromium (VI) Induced Oxidative Stress and Biochemical Perturbations in Rabbits	Ahlam M. Amharib
ZOOL 703	Effects of Ginger and Garlic on Semen Quality in Male Rabbits	Amani M. M. Salem
ZOOL 704	Comparative Study between Vitamin E and Graviola on Hematological Parameters in Male Rabbits	Hanaa J. Abdelmola
ZOOL 705	A Study of the Association between Blood Pressure and Study Stress, Gender and ABO in a Random Sample of Students from Al-Mahara Institute at El-Beida City, Libya	Hajir S. Saloumah and Najah A. Hasan
ZOOL 706	The Influence of *Moringa oleifera* on Liver Enzyme and Glucose in Male Rabbits	Fayrouz A. Khaled and Amani A. Mohammed
ZOOL 707	Comparison of the Role of Garlic and Folic Acid on Hematological Parameters of Male Rabbits	Fayrouz A. khaled and Hind A. Abraheem
ZOOL 708	Role of Vitamin E in Ameliorating the Chloropyrfios Induced Changes in Body and Organs Weight in Male Rabbits	Aisha A. Ali *et al.*
ZOOL 709	The Toxic Effect of Some Environmental Polution (Phathalate and Aluminum) on Oxidative Stress in Rabbits	Basma A. Ibridan
ZOOL 710	Effects of Chromium(VI) on Body Weight and Organ Weights in Male Rabbits: The Protective Role of the *Moringa oleifera* Leaf	Fayrouz A. Khaled and Marwa M. Ali
ZOOL 711	Curcumin Attenuated Inflammation on Hepatic Induced by Tramadol in Male Rabbits	Fayrouz A. khaled *et al.*
ZOOL 712	Effects of Sodium Benzoate and *Ephedra alata* on Body weight and Weight of Some Organs Weight in Male Rats	Fathy M. A. Awad *et al.*
ZOOL 713	Epidemiology of Cattle Gastrointestinal Helminthes in Almarj District, Libya	Abdelhakim A. Eljaki *et al.*
ZOOL 714	Histopathological Changes Induced by Heavy Metals (Lead and Cadmium) in *Siganus rivulatus* fish Collected from the Benghazi Sea Port	Hussein B. B. Jenjan *et al.*
ZOOL 715	Effect of hibernation on DNA of Testis in Uromastyx acanthinra (BELL, 1825)	Yousef K. A. Abdalhafid and Mona M. Almansory
ZOOL 716	Effect of Caffeine on Brain during Chick Embryonic Development	Kawakeb A. O. Saad and Rema F. M. Emabrouk
ZOOL 717	The Protective Role of Melatonin against the Toxic Effect of Sodium Arsenite on Hematological Parameters in Rabbits	Fayrouz A. Khaled and Ameenah S. Husayn
ZOOL 718	The Potential Protective Effect of Sidr Honey on Some Hematological Changes Caused by Exposure to Cigarette Smoke on Male Albino Rats	Nura I. Al-Zail *et al.*
ZOOL 719	Some Biological and Fisheries Indicators of the Golden Gray Mullet, *Liza aurata* (Mugilidae) in the Southern Mediterranean Coast (Libya)	Alia Salem Elshakh *et al.*

Section 1
Botany

Code: BOTA 101

Checklist of Medicinal Plants of Ibrak Nouta, Soussa, Al-Jabal Al-Akhdar, Libya

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Abstract:

Al-Akhdar area in Libya has high plant diversity. The purpose of this study was to produce an inventory of all medicinal plants of Ibrak Nouta, Soussa – Al-Jabal Al-Akhdar, Libya. This study was carried out for four seasons during the years 2021/2022, medicinal plants in the study area were identified and classified. The results indicated the presence of a total of 97 medicinal plants. These taxa belong to 43 families. Two families of Gymnosperms are represented by 3 species, 3 genera, and the remaining 41 families are belonging to Angiosperms. Dicotyledons are represented by 81 species and 66 genera, and 32 families Monocotyledons are represented by 18 species, 17 genera, and 9 families. Two families were Parasite represented by 7 species 2 on the stems *Cuscuta epithymum subsp. Epithymum*, *Cuscuta planiflora Ten*, and the remaining 5 on the roots *Orobanche amethystea* Thuill. *Orobanche amethystea* Thuill. *subsp. amethystea Orobanche cyrenaica* Beck ex E.A.Durand & Barratte. *Orobanche pubescens* d'Urv. *Phelipanche mutelii* (F.W.Schultz) Pomel. Furthermore, the findings revealed that the most represented life forms of medicinal plants in Ibrak Nouta were Therophytes (Th ,36%) 34 species, Chamaephytes (Ch,16%), 17 species, 15 species, followed by Geophytes (G ,15%) 15 species, Nano-Phanerophytes (N.Ph ,12%) 12 species, Hemicryptophytes (H,7%) 7 species, Parasite (Pa ,7%) 7 species, Phanerophytes (Ph ,5%) 5 species and Lianas (Li ,2%) represented by 2 species. Also on the list is an endemic medicinal plant represented by the species *Onopordum cyrenaicum*, *Teucrium* apollinis.

Keywords: Ibrak Nouta, Al-Jabal Al-Akhdar, Medicinal plants, Soussa.

Section 2

Chemistry

Code: CHEM 201

Accumulation of Heavy Metals in Agricultural Soils from the Use of Pesticides (Study in the Green Mountain)

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Abstract:

The continued growth of the world's population is a great challenge for ensuring food security, as the nutrients and fertility of the soil are limited and decrease over time. Therefore, agricultural productivity must be increased to meet the food needs of the growing population. The heavy reliance on chemical fertilizers as a means of increasing food production poses significant environmental problems, as the levels of oxidative environmental pollutants that harm the ecological balance and human health risk Heavy metals and pesticides are at the top of the list of environmental pollutants that threaten nature due to their toxicity and persistence in the environment. This paper focuses on the negative impact of heavy metals (cadmium, lead, copper, and zinc) and pesticides (insecticides, herbicides, and fungicides) on the agricultural ecosystem and human health. The samples which heavy metals were measured were taken from three locations. This unique collection of information enables a reliable overview of the concentration of heavy metals, also referred to as metalloids including, Cd (1.23, 0.09, 0.10 mg/ kg), Cu (24.00, 17.33, 20.21 mg/kg), Pb (3.05, 15.84, 15.14 mg/kg), and Zn (52.34, 28.56, 40.26 mg/ kg). In this article we propose that in some cases (e.g. Hg and Cd) the high concentrations of soil heavy metals attributed to human activity can be detected at a regional level.

Keywords: Heavy Metals, pesticides, environmental pollutants, human health.

Code: CHEM 202

Removal of Toxic Lead Ions from Their Aqueous Solutions Using Fava Beans Phytoadsorption Technique

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Abstract:

Toxic heavy metal contamination of soil and water ecosystems is a major concern worldwide and dangerous issues to be solved urgently. This pollution is mainly caused by human activities. Exposure to any level of these contaminating elements leads to enormous diseases and disorders to humans, animals, and marines. Cleaning up the environment from these pollutants requires the development of simple, green, and sustainable techniques. Biosorption is one of the most benign and inexpensive bioremediation processes for the removal of toxic heavy metals from the environment, such as lead, arsenic, and cadmium. We have developed a green and simple method for the removal of lead heavy metal from its aquatic system. The heavyHeavy metal phytoadsorption methodology using different amounts of fava beans-dead biomass (0.5, 1.0, and 2.0 g) was able to remove up to 83% of Pb^{2+} ions from their 100-mL aqueous solutions at room temperature and neutral pH. The results of these instrument-shaking experiments were compared with hand-shaking experiments and showed similar efficiency. It was observed that the fava beans (*Vicia faba* L.) can be used as a potential adsorbent for the removal of heavy metals from contaminated water.

Keywords: Biosorption, phytosorption, phytoadsorption, fava beans, lead ions, toxic heavy metals, pollution.

Code: CHEM 203

Evaluation of Paraphenylenediamine in Kohl and Black Lipstick Samples Collected from Libyan Local Markets Using High-Performance Liquid Chromatography

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Abstract:

Cosmetics are known to contain a long list of toxic chemicals. The aim of this study was to detect and determine the toxic substance para-phenylenediamine (PPD) in some cosmetics such as Kohl and black lipstick by reverse phase high pressure liquid chromatography (RP-HPLC). In this study, ten cosmetics samples were collected from some local markets in the Libyan city of El-Beida. A simple, rapid and reliable method was developed and validated for the determination of PPD in kohl and lipstick samples using a solution of methanol (50%) as the solvent. The method has been validated over a wide linear range of 5–25 µg/ml with correlation coefficients consistently greater than 0.997. The lowest level of PPD was observed in the Hashmi black Kohl sample (0.0058 % w/w), while the Flormar eyeliner powder sample showed the highest PPD content (0.0105 % w/w). RP-HPLC measurements indicated that the PPD content in the four samples under study (Hashmi (Kajal) Kohl, Kohl Homemade from Massa, Libya, Kohl Homemade from El-Beida, Libya and Pupa Pencil Eyeliner) was free of PPD (not detected). The PPD content in all samples analyzed in this study is well below the permitted limits set by the US Food and Drug Administration and documented values.

Keywords: Kohl; Lipstick; PPD; Methanol; HPLC.

Code: CHEM 204

Chemical and Microbiological Analysis of Groundwater after Major Flood Incident in Derna City

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Abstract:

During and after flooding, human exposure to bacteria, microorganisms, and chemical pollutants through contaminated water causes epidemic disease outbreaks. Unprecedented torrential rains with high intensity and dam failure caused major floods, inundating the wells and allowing sewage-contaminated water to enter the wells. In this study, groundwater samples were collected immediately after the flood stage (September 2023) from seven different regions of the city of Derna to determine heavy metal concentration, microbiological and physicochemical properties. The results showed that the concentrations of the studied heavy metals ranged between (0.0010–0.070µg/g), (0.0001–0.0012µg/g), (0.002–0.09µg/g) and (0.003–0.012µg/g) for Pb, Cd, Fe, and Cu, respectively. Metal concentrations were well below the permitted limits defined by the WHO. Additionally, a chemical analysis of the samples revealed that the water varied from neutral to slightly alkaline (pH 7.3 – 7.8) and (EC) ranged between (926 –2056 µs/cm), which indicates little increase in the proportion of water salinity. The results also showed the values of parameters; most of them exceeded the maximum allowed limit in drinking water: TDS, TH, TA, and Cl^- ranged (463–1028) (250–760), (228.4–380.3), and (290-406), while other parameters were within the limits allowed: TOC, Ca^{2+}, Na^+, and NO_3^- ranged (12.9–15.8), (63–235), (21.38–42.19) and (1.04–2.86), parameters expressed in mg/L,. respectively. Regarding microbiological characteristics, the total bactria count was determined by microbiological examination to be (>100 cfu/100ml). Also, *Escherichia coli*, a dangerous bacteria pathogen, was found in some of the samples analyzed.

Keywords: Derna, Groundwater, Heavy metals, Chemical/Microbiological, Contamination.

Code: CHEM 205

Phytochemical screening, total phenolic content and antibacterial activity of fruits, peels and seeds of some watermelon and muskmelon cultivars from Al-Marj region

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Abstract

This study investigated the content of phytochemical screening extracted by aqueous and ethanol solvents, total phenol compounds and antibacterial effects by agar well diffusion method of muskmelon and watermelon fruits, peels and seeds from four locations around the city of Al-Marj (Al-Jabal Al-Akhder), namely Farzogha, Botraba, Sidi Arhoma and Al-Ewilia locations. The results revealed that the phytochemical screening of aqueous extracts revealed that flavonoids, carbohydrates glycosides, cardiac glycosides and saponins were present in all parts of muskmelon and watermelon, while the phytochemical screening for ethanol extracts of watermelon and parts of muskmelon showed that flavonoids, tannins, cardiac glycosides, and alkaloids were present in all parts for ethanol extracts of watermelon and muskmelon, carbohydrates glycosides, and saponins were absent in all parts of muskmelon and watermelon. A high percentage of total phenol was found in the seeds followed by fruits and finally peels from different locations. The results indicate that all aqueous extracts from different parts of the muskmelon and watermelon samples did not exhibit any inhibition zone against all microorganisms tested. On the other hand, few ethanol extracts exhibited different values of inhibition zones.

Keywords: frying, muskmelon, watermelon, Farzogha, Botraba, Sidi Arhoma, Al-Ewilia

Code: CHEM 206

Assessment of Mineral and Heavy Metal Content in Spices: Comparative Analysis and Health Implications

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Abstract

This study systematically investigated the mineral and heavy metal content in various spices, addressing both their nutritional benefits and potential health risks. Contamination often occurs during manufacturing and storage, which poses public health concerns, especially for heavy metals like lead, cadmium, and mercury. Key findings include Al-Anwar Company (Cn) sample that has the highest sodium level at 0.002 ppm and Attar agile (Cag) sample containing lead at 24.579 ppm, far exceeding the WHO limit of 0.02 ppm. The study was designed to guide consumer choices and inform regulatory actions to ensure public health safety.

Keywords: Spices, heavy metals, public health, regulatory guidelines.

Code: CHEM 207

Assessment of Heavy Metals in the Water of Karaçomak River (Kastamonu), Turkey

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Abstract:

In this study, eight stations of the Karaomak River were selected and water samples were taken to determine the seasonal accumulation of heavy metals. The Pb, Cr, Ni, Zn, Mn, and Cu concentrations were determined using an ICP-OES device. Sources of heavy metal contamination in the Karaomak River were determined as sewage, industrial effluent, fertilizers, herbicides and pesticides. The aim of our study was to investigate changes in metal concentrations in river water depending on the station and the variation of the sampling period. It was observed that the metal concentration means per annum were in the water Mn> Cu> Zn> Pb> Ni> Cr. The highest seasonal values of heavy metals were observed as follows; Pb (14.018 µg/L) and Ni (2.469 µg/L) in summer, Cr (2.079 µg/L), Zn (20.789 µg/L), Mn (58.296 µg/L) and Cu (19.072 µg/L) in winter. In general, the heavy metal values in the water recorded in this study did not exceed the allowed limits of international standards of drinking water according to the reference values except lead metal that exceeded the allowed limits. The findings of this study may be useful for further biomonitoring studies.

Keywords: Seasonal variation, Karaçomak Creek, heavy metal, water.

Code: CHEM 208

Analysis the Main Chemical Components of the Remains Marble Sculptures at the Cyrene Museum, Libya

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Abstract:

Fluorescence X-ray (XRF), atomic absorption (AAS), and flamephotometer were used to determine the percentages of broken samples that cannot be restored from sculptures in the city of Cyrene, Libya. The results showed fairly close ratios between the fluorescence and the atomic absorption of the samples. The proportions of calcium oxide and magnesium oxide showed that marble samples are made of coarse grains with dolomite composition, as they contain a magnesium carbonate component, likely to have a source from the Thassos quarry in Turkey.

Keywords: XRF, AAS, Flamephotometer, Dolomite Composition.

Code: CHEM 209

Mineral Analysis and Some Chemical Composition Estimation for the Barest Milk

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Abstract

This study aimed to measure the level of some elements and heavy metals and to measure the percentage of protein, fat, and lactose sugar in the breast milk of some women in the city of El-Beida. The sodium concentration in the samples ranged between (72.14-193 mg/ml), and the potassium concentration ranged between (180.80-2501.9 mg/ml). Copper and iron concentrations ranged between (3.236-12.726 mg/ml) and (2.050-3.053 mg/ml) respectively. The study also showed a discrepancy in the percentage of protein. The results showed the highest percentage in sample number S1 (3.95 mg/ml) and the lowest percentage in sample number S7 (2.91 mg/ml). The percentage of fat was measured, which ranged between (0.83-5.17 mg/ml), and the percentage of lactose, which ranged between (4.37-5.92mg/ml). Through the previous results, a difference was observed between the concentrations of these elements in the samples. We can say that it is due to what the mother takes in vitamins during the breastfeeding period and the diet followed by the mother during breastfeeding.

Keywords: Heavy Metals, Breast Milk, Sink Tester Ltd.

Code: CHEM 210

Using Sulfuric Acid to Produce Bioethanol from Fruit Waste: Banana Peels

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Abstract:

Agricultural waste made of lignocellulosic materials, such as banana peels, has the potential to yield bioethanol, a sustainable energy source. Important processes in bioethanol synthesis include pretreatment and hydrolysis of lignocellulosic biomass. Our investigation verified the effectiveness of the acidic pretreatment method as a pretreatment for bioethanol production. We used the same H_2SO_4 hydrolysis method for the pretreatment method. Our findings indicated that pre-restaurating banana peels with acid reduced the sugar content the most. The reducing sugars were fermented for three days using an active strain of S. cerevisiae to produce bioethanol. The maximum absorption spectrum for bioethanol was found at 280 nm using the potassium dichromate technique. The band in the FT-IR spectra confirmed the υ(OH) stretching vibration. The pretreatment stage is primarily responsible for the production of bioethanol. Banana peels are the waste that is easily available during all seasons and its waste is easily available and economically feasible.

Keywords: Bioethanol, Waste banana peels, UV and IR.

Code: CHEM 211

Determination of the Content of Some Heavy Metals in Chicken Shawarma Samples Collected from Some Restaurants in El-Beida City, Libya

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Abstract:

The purpose of this study was to identify and determine certain heavy metals in chicken shawarma samples from some fast-food restaurants in El-Beida city Libya using ultraviolet-visible spectrophotometry. The concentrations of the metals such as (pb, Cu, and Fe) were measured, and the contents were represented as ppm. The highest concentration of lead (0.7249 ppm) has been determined in chicken shawarma. On the contrary, the highest concentrations of copper (5.98 - 10.91 ppm) and iron (0.6973 - 1.6066 ppm) have been detected in other foods. Each sample that was analyzed had a heavy metal content that was above the limits of safety for human consumption established by various international public health organizations, such as the World Health Organization (WHO).

Keywords: Heavy Metals, UV-Visible spectrophotometry, Chicken Shawarma.

Code: CHEM 212

Correlation between Diameter and Quality Control Parameters of Folic Acid Tablets from Different Brands Available on the Libyan Market

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Abstract:

The aim of this study was to evaluate the quality control parameters of the folic acid tablets (5 mg) using diameter measurements. Eight different brands of folic acid tablets with varying diameters were purchased from different private pharmacies in El-Beida City, Libya. The quality control parameters of the tablets were tested according to the United States Pharmacopoeia (USP) guidelines using in-vitro tests. The tests included uniformity of weight, thickness, friability, hardness, disintegration time, and assay content using the high-performance liquid chromatography (HPLC) method. The diameter measurements were taken for all eight brands of folic acid tablets, and statistical analysis was performed using Graph Pad InStat, version 3.10. The results showed that all eight brands of folic acid tablets met the USP standards for quality in the prescribed in-vitro quality control tests. Furthermore, all brands also met the diameter specifications. The study found a strong correlation ($r = 0.9766$) between the diameter and weight of the folic acid tablets content. Furthermore, the diameter had weak to moderate correlations with other parameters, such as thickness, hardness, friability, disintegration time, and the state of the folic acid tablets content. This study shows that the diameter can be used to detect the weight of a tablet. An increase in tablet diameter was found to be an indication of a significant correlation ($p < 0.0001$) with increased weight.

Keywords: Quality control, Folic acid, Tablet, Hardness, Friability, Weight variation, Thickness, Diameter.

Code: CHEM 213

Accurate and Rapid Methods for Determinate Anti-Oxidant and Total Phenol Contents in Two Different Types of Pomegranate Peels

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Abstract

Two different peel samples were collated from two different sources including Libyan and Tunisian pomegranate pees. Sensitive, rapid, and accurate methods were used to estimate the contents of antioxidant capacity and total phenols in the samples studied. The contents were measured by spectrophotometric methods and the values were calculated from standard curves of Tannic acid as a reference material. The results showed that the content of anti-oxidant and total phenols were increased in pomegranate peels compared with the Tunisian ones.

Key words: Anti-oxidant, T. P., spectrophotometric methods.

Section 3

Environmental Science

Code: ENV. S. 301

Juniperus turbinata dieback in Al-Jabal Al-Akhdar Mountain, northeast Libya: insights from dendrochronological analysis

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Abstract:

Juniperus turbinata Guss. plays a vital role in the ecosystems of Al-JabalAl-Akhdar Mountain, comprising an essential component of its climax community. However, it is susceptible to significant deterioration due to various factors, including tree death. The current work aims to understand this phenomenon and examine its interaction with drought events by using dendrochronological analysis. The study was carried out at 14 study sites throughout the Al-JabalAl-Akhdar mountain, and trunk core samples from 4-6 trees were collected and investigated at each site. The trees examined have an age range of 79-269 years, and the region has experienced successive cycles of drought. A significant 85% of the study sites have encountered significant water stress caused by the ongoing drought cycle, which has exceeded expectations in terms of duration and impact. The effects of drought vary between different areas due to the characteristics of the local site and various anthropogenic activities. The findings suggested that drought cycles are an integral component of ecosystems and have a prolonged period of drought that surpasses common perceptions, and tree dieback appears to be an adaptive response to these drought cycles, achieved by reducing the overall green biomass. The proliferation of dense epiphytes is believed to occur as a consequence of their ability to exploit weakened trees and capitalize on available sunlight following leaf shedding and branch exposure. Increased future drought intensity and duration will likely increase juniper dieback rates, extending its prevalence to various other tree species in the study area.

Keywords: Al-JabalAl-Akhdar, dendrochronology, dieback, drought, juniper trees.

Code: ENV. S. 302

Distribution of *Thapsia garganica* in Al-Jabal Al Akhdar (The Green Mountain) Area in Libya

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Abstract:

Al-Jabal Al-Akhdar region is located in the northwest of Libya, Dryas (*Thapsia garganica*) is toxic to cattle, camels, and sheep when dried as feed. Dryas appear to grow in wooded areas, areas prepared for cultivation, and rocky areas; plants can grow in a variety of different combinations of soil and also in different areas of shade and light, and it also spreads in urban areas (in cultivated and uncultivated lands and between roads). The aim of this study is to identify the factors that promote its growth. (such as temperature, precipitation, and type of soil). That may affect plant growth and has been found to occupy very diverse areas. Most of the plants are distributed between Derna and Taknis and the Mediterranean coast. Usually the temperature is a major factor in the growth of the plant, however, changes in temperature did not seem to affect the plant (Dryas), and the range of temperatures recorded in Al-Jabal Al-Akhdar did not appear to be inconsistent with sustainable growth in which temperature, day length, and light levels are important regulators of plant growth. It can also be found in regions with different climatic conditions, just as dracaena plants grow individually and in groups. Many other plants were found around it. Some of these plants are in different quantities and juniper is considered. Juniperus phonicea is most closely related to Dryas plants.

Keywords: *Thapsia garganica*, Al-Jabal Al-Akhdar, Libya.

Section 4

Mathematics

Code: MATH 401

A New Study Stable Symmetric Families of Exponential Distribution

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Abstract

In this paper, we introduce a new class of density functions that depend on the addition of two parameters through a family of distributions. By the mixture of the baseline distribution and its reverse, after multiplying and dividing, respectively, the same scale parameter, is stable (the stable symmetric family of distribution functions (cdf's) is a family that contains the reverse of every cdf that belongs to it). This method is applied to yield a new three-parameter extension of the exponential cdf, which may be symmetric and has a non-constant hazard rate function. The properties of this class of density functions are studied.

Keywords: Stable symmetric family, Mixture distribution, Parametric family, Exponential function, Skewness, Kurtosis.

Code: MATH 402

Addressing the Missing Data Challenge in Time Series Analysis: Strategies and Implications

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Abstract:

Missing data is a common and challenging issue in time series analysis, which can significantly affect the accuracy and reliability of the results. This article explores the problem of missing data in time series analysis and investigates data with all values and same data with randomly missing values to address this challenge effectively. We examine the implications of missing data on statistical estimation, forecasting, and interpretation of time-series behavior patterns. We provide a time series data of different percentage of randomly missing for handling missing data in time series, the randomly missing will be varied between 5 and 50 percentage of all data. The advantages and limitations of each missing percentage are discussed, along with statistical estimation, forecasting, and interpretation of time-series behavior patterns. Furthermore, we highlight the importance of understanding the mechanisms leading to the effect of missing data and the potential biases that can arise if not properly handled. This article aims to provide researchers and practitioners in time series analysis with valuable insights and guidance to effectively address the challenge of missing data, ultimately improving the robustness and validity of their analyses.

Keywords: Missing data; Time Series Model; Stationary, Autocorrelation; imputation methods.

Code: MATH 403

The Connection between Regular Relation and Subcanonical Hypergroup of Canonical Hypergroup

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Abstract:

For various hyperstructures, such as semihypergroups, hypergroups, and canonical hypergroups, we specifically examine the concept of quotient. In order to understand the concepts of regular relations, the canonical hypergroup is used as the basis for their introduction and analysis. This allows us to connect the subcanonical hypergroup and the regular relation defined on the canonical hypergroup.

Keywords: Canonical hypergroup, subcanonical hypergroup, normal subcanonical hypergroup, regular relation, and quotient of canonical hypergroup.

Section 5

Microbiology

Code: MICRO 501

Evaluation of the Activity of Alcoholic Extract from the Leaves of *Salvia officinalis* and *Mentha longifolia* Against Some Fungi Isolated from soil

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Abstract:

The inhibitory effect of alcoholic extracts of *Salvia officinalis* and *Mentha longifolia* was studied. Five concentrations for each type of these extracts (5%, 10%, 15%, 20%, 25%) were tested for their effect in inhibiting the fungal growth of four types of filament fungi isolated from the soil (*Aspregillus niger, Penicillium chrysogenum, Fusarium solani, Alternaria alternata*) on the SDA food medium in the laboratory, the results showed that the ethanol extracts of both plants had an inhibitory effect on the growth of fungi in food medium, measured by Abbott's formula equation, where the alcohol extract of *M. longifolia* plant at a concentration of 25% gave the highest inhibition rate for the fungus *A. niger* with an inhibition of 61.09%, and The inhibitory effect of both plant extracts increased with increasing concentration, and chemical detection tests showed that they contain active antifungal and antisuppressive substances to the growth of fungi such as flavonoids, glycosides, and volatile oils. Therefore, we recommend using these botanical extracts as an alternative to chemical fungicides because of their cost-effectiveness, safe application, and absence of harmful effects on the environment.

Keywords: Lamiaceae, *Salvia officinalis*, *Mentha longifolia*, Soilborne fungi.

Code: MICRO 502

Staphylococcus xylosus Isolated from Surface Plants in the El-Beida Medical Center Garden and their Antibiotics Sensitivity

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Abstract

The present study collected isolates from the surfaces of plants surrounding the El-Beida medical center and subjected them to bacteriological examination. Furthermore, biochemical characteristics by use of the Phoenix system. The results found that the bacterial isolates were identified as *Staphylococcus xylosus* was gram positive cocci clusters, catalase positive, coagulase negative, and for its resistance to antibiotics. All isolates were resistant to Imipenem, Cefotaxime, Ampicillin, Penicillin, Oxacillin, Amoxicillin-clavulanate and sensitive to Gentamycin, Daptomycin, Trimethoprim- sulfamethoxazole, Teicoplanin, Vancomycin, Clindamycin, Erythromycin, Linezolid, Mupirocin, Nitrofurantion, Ciprofloxacin, Moxifloxacin, Rifampin and Tetracycline, respectively. *S. xylosus* type, as pathogenic and causes urinary tract infections, as these bacteria have never been isolated from the vicinity of hospitals, indicates the leakage of bacteria from the hospital to the surrounding area, which is dangerous for visitors and also for patients while inside the garden. During sample collection, the presence of a sewage leak inside the hospital garden was noticed, which is considered the main cause of the bacteria leakage in the hospital environment.

Keywords: *Staphylococcus xylosus*, isolation, surface plants, El-Beida medical center, sensitivity to antibiotics.

Code: MICRO 503

Investigate the Prevalence of Pathogenic Bacteria on Randomly Selected Surfaces and Preventive Practices among Working Staff in the Neonate Care Unit in Benghazi Medical Center

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Abstract:

Neonates admitted to hospitals in a neonatal care unit (NCU) have host determinants that not only make them more susceptible to the acquisition of nosocomial infections, but also increase their risk of developing more serious diseases. This study aims to investigate some items in the NCU that may act as reservoirs of nosocomial infection pathogens and to investigate whether workers are aware of the importance of preventive measures practices. A mixed-method descriptive cross-sectional study, combining structured self-administered questions with bacteriological sampling of selected environmental surfaces. This study was carried out from January 18 to August 18, 2022, in the Neonate Unit of the Benghazi Medical Center located in Benghazi City, Libya. Of 31 samples, bacterial growth was found in 4 samples that represent 13% of the samples; their contamination rate was 13%**.** A total of 21 workers responded to questions measuring working experience, specialty, practices and measures of infection prevention. The results revealed that alcohol is the main disinfectant applied in the NCU with a percentage of 61.5% of the responses, and 67% of the workers had not attended any training before.

Keywords: Nosocomial infection, Neonatal Care Unit**,** preventive measures, awareness.

Code: MICRO 504

Studying the Bacterial Species that Cause Urinary Tract Diseases and their Resistance to Some Antibiotics in Laboratories of Al-Marj City

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Abstract:

The current study included a study and knowledge of some types of bacteria that cause urinary tract infection, as this disease is one of the most serious health problems facing a large number of people annually. For analysis, laboratories within the city of Al-Marj and the samples taken were of different ages and for both sexes. The results showed that of these pathological samples, (36) isolates belonging to *Escherichia coli* (45%) were diagnosed, *Staphylococcus aureus* 19 isolates (23%), *Proteus spp* 4 isolates (5%), *Pseudomonas spp* 9 isolates (11%). *Streptococcus pyogenes* were 12 isolates (15%), as shown in Table (2).It was higher in women than in men, as it reached 65% in women, while the incidence of male infection was 35%. A drug sensitivity test was performed on bacterial samples diagnosed using antibiotics. *E.coli* and Staphylococcus bacteria showed the highest percentage of resistant strains.

Keywords: Urinary tract infection, *Escherichia coli*, *Staphylococcus* bacteria, Drug sensitivity.

Code: MICRO 505

Effect of Aqueous and Alcoholic Extracts of Frankincense Plant on the Growth of Bacteria

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Abstract:

This study is based on the evaluation of the antimicrobial activity of aqueous and alcoholic extracts of normal frankincense and *Boswellia sacra* against *Staphylococcus aureus*, *Streptococcus pyogenes*, *Escherichia coli*, and *Salmonella enterica*, and different concentrations of extracts (25%, 50%, 75%, and 100%) were used in an agar well diffusion method. The results indicated that there were significant differences between the ethanolic extract of normal frankincense and *Boswellia sacra* (p 0.005) for *E. coli*, (p 0.023) for *S. enterica*, and (p 0.004) for *S. aureus*. However, there were no significant differences between the ethanolic extract of normal frankincense and *Boswellia sacra* used against *S. pyogenes*. Furthermore, the current results showed that there are no statistically significant differences between the effect of the aqueous extract of normal frankincense and *Boswellia sacra* on the bacteria species used in the study.

Keywords: frankincense, *Boswellia sacra*, *Staphylococcus aureus*, *Streptococcus pyogenes*, *Escherichia coli*, *Salmonella enterica*.

Code: MICRO 506

A Study of Gram Positive Bacterial Profile on Computer Keyboards and Mice in Benghazi University Offices and the Efficiency of Disinfectants

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Abstract:

The objective of this study was to evaluate Gram positive bacterial contamination on computer keyboards and mice surfaces in Benghazi University offices and the efficiency of disinfectant to eliminate contamination. This study included 100 samples, 50 samples from keyboards and 50 samples from mice. All bacterial species in this study were identified by shape characteristics morphology (size, odour, and color), Gram stains, and biochemical tests. This study showed that the percentage of Gram-positive bacteria isolated reaches 46%. *The Staphylococcus epidermis* has a high contamination rate of 28%, followed by *Staphylococcus aureus* 14% and *Streptococcus mitis* 12%. This study also showed that the percentage of bacterial contamination on multiple users was higher than in the personal user. The percentage of Gram-positive bacteria among personnel from the total of keyboards and mice showed that the highest bacterial contamination of the *Staphylococcus epidermis* was 39%, followed by *Streptococcus mitis* 13%, *Staphylococcus aureus*12%. Multi-users of both keyboards and mice showed high contamination with *Staphylococcus epidermis* reaching 41%, followed by *Staphylococcus aureus* 27%, *Streptococcus mitis* 20%. The rate of contamination was higher among multi-users than among personal users. This study demonstrated that the rate of contamination among females was with *Staphylococcus epidermis* reaching 41%, *Staphylococcus aureus* 24%, *Streptococcus mitis* 16%. However, among males, different rates of bacteria were observed such as *Staphylococcus epidermis* 39%, *Streptococcus mitis* 17%, and *Staphylococcus aureus* 15%. The effect of disinfectant against isolated bacteria was also studied. The results showed that Dettol had a great effect against Gram-positive bacteria.

Keywords: Computer key, Mice, Dettol, Gram Positive, Bacterial contamination.

Code: MICRO 507

Antibacterial Activity of *Ulva lactuca* Extracts from the Coast of Sousa City (Libya)

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Abstract

During the past several years, the indiscriminate use of antibiotics has resulted in the emergence of microbial resistance to common antibiotics, which ultimately threatens the effectiveness of the treatment of bacteria-causing infections. This forced researchers to search for novel antimicrobial substances from various sources, e.g. seaweeds. In the present study, Green alga *Ulva lactuca* was taken and evaluated for its antimicrobial activity against pathogenic bacteria, two species of Gram negative bacteria-*Escherichia coli*, *Salmonella* ssp, and Gram positive bacteria-*Streptococcus pneumoniae*, *Staphylococcus aureus*. The green algae *Ulva lactuca* was extracted separately with ethanol, acetone, and water as solvents using a rotary evaporator. All extracts revealed antimicrobial activity using the disc diffusion method. The results obtained from this study showed that the average diameter of the inhibition zones resulting from the effect of algae extracts on four types of bacteria ranged between 2, 15 mm, ethanol extract showed the strongest activity against bacteria compared to other solvents used. Also, the lowest inhibitory concentration of the tested bacteria was in water. These results give an indication of the presence of compounds in marine algae that show antibacterial activities and their most promising applications.

Keywords: Antibacterial, Pathogenic bacterial, *Ulva lactuca*, *Staphylococcus aureus*, *Escherichia coli*.

Code: MICRO 508

Molecular characterization of multidrug-resistant *Klebsiella pneumoniae* isolated from teaching hospitals in Benghazi, Libya

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Abstract

Klebsiella pneumoniae is one of the leading causes of hospital outbreaks worldwide, mainly in hospitalized or immunosuppressed individuals. Also, this could be due to the emergence of multidrug resistance (MDR) Extended Spectrum Beta Lactamase (ESBL) and carbapenemase-producing strains. The main goals of this study were to evaluate the prevalence of resistance demonstrated by the *K. pneumoniae* strains found in clinical samples from Benghazi Medical Center and AL-jalaa Hospital and to find evidence of ESBL strains and their resistance to certain antibiotics. During the study period, *K. pneumoniae* was isolated from 320 clinical samples (urine, sputum, blood, and wound). The procedure for processing of samples, identification, susceptibility to antimicrobials, and evidence of ESBL, MBL strains were carried out according to the recommended standards. PCR was used to detect β-Lactamase and carbapenemase. Of a total of *K. pneumoniae* isolates, 120 (37.5%) were isolated from hospital patients. The isolates exhibited high resistance to all antibiotics used. Forty-eight (40%) of the isolates were ESBL producers. MDR and XDR were identified in 89% and 56% of isolates, respectively. The ESBL-CTX-M-15 gene and OXA-48 were detected in all isolates. Furthermore, SHV and NDM were identified in four isolates. In this study, the high rate of MDR in clinical isolates of *K. pneumoniae* in hospitals is shown. An urgent need to implement an antibiotic resistance surveillance system to regulate and continuously monitor the emergence of antimicrobial resistance.

Keywords: *K. pneumoniae*, β-lactamase, MDR/XDR, PCR analysis, Resistance gens.

Section 6

Physics

Code: PHYS 601

Effect of Flame Retardants and 1% Stabilizer on Melting and Dripping Behaviour of Thermoplastic Polymers due to the Furnace Test

Part 1: Furnace Modulated and Calibrated

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Abstract:

This study aimed to understand the mechanism of combining the action of different types of flame retardants (FR) on the melting and dripping behaviour and it is a moderation of the. Polypropylene polymer was chosen to be blend in a twin-screw extruder with the flame retardants and an additive, which is a 1% stabilizer, to investigate polypropylene melting, dripping moderation, and reduce it by studying its melting behavior and dripping. The melting and dripping behaviour tests, known as the furnace test melting and dripping tests conditions, were applied in this study after the furnace setup developed, for the furnace test. The development is set up by following 3 stages, which are applied modulated whilst adjusting the furnace set up, ready for the mean furnace melting and dripping test in this experimental work. PP polymer samples were examined at various furnace temperatures. The relationship between melting and dripping behavior could be obtained and proved by experimental results. When thermogravimetric (TGA) and diffusion-through-dot analysis of the polymers and their molten drops are performed, a degradation degree will possibly be expected. The values found from both methods have been compared to understand the melt dripping and degradation behaviours of polymers to obtain the relationship between melting and dripping behavior of thermoplastic polymers. Most of the previous works on melt and dripping behaviours were concentrated on study of fire operating conditions and modelling of the thermal process.

Keywords: Materials treatment, polymer melting, polymer dripping, polypropylene polymer, flame retardants.

Code: PHYS 602

The Prospective Use of Locally Produced Borate Glass as Windows and Shields in Imaging Photon and Neutron Environments

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Abstract:

The potential use of borate glass as windows and shields in imaging photon environment as well as a shield for neutrons has been investigated in this research. Borate glass was produced locally in four different compositions that contain Bi_2O_3, PbO, Al_2O_3, Na_2O and Tl_2O_3 oxides. Their densities were measured and compared with empirically calculated values that showed reasonable correlation and accuracy that could be improved. Imaging photon attenuation parameters: LAC, HVL and TVL, at the energy range 15 -150 keV, were calculated using *Phy-X* and *WinXcom* codes. Sample S4 showed the best attenuation properties followed by S1, then S3 and S2 due to their high lead and bismuth content. Good accuracy was obtained in the LAC calculations using the two codes. Neutron attenuation was conducted by comparing the samples' FNRCS values which showed that sample S2 was the best neutron attenuator due to its high boron content compared with the others.

Keywords: Attenuation coefficient, Borate glass, FNRCS, Phy-X/PSD, WinXcom, Radiation shield, radiation window.

Code: PHYS 603

Physical Properties of Bi_2O_3–PbO–P_2O_5 Glasses

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Abstract

Six glass samples were prepared in the system of xBi_2O_3–(25–x) PbO–$75P_2O_5$ ($0 \leq x \leq 25$; x in mol %) were prepared using the conventional melt quenching technique. The physical properties investigated in this research are glass density; ρ, molar volume; V_M, oxygen molar volume; V_O, oxygen packing density; OPD Poisson's ratio; σ and oxygen ion concentration, $N_{O\text{-ions}}$. The glass density was evaluated experimentally using the Archimedes method and theoretically calculated using an empirical formula. The comparison result for determining the density by the two methods was reasonable but not accurate enough. The results showed that the density and molar volume increased with increasing Bi_2O_3 content. For oxygen molar volume (V_O) and oxygen packing density (OPD), their behavior was inconsistent as a slight increase in V_O was observed, a decrease in OPD. The Poisson's ratio values indicate the tightening of the bonds in the glass matrix. The number of oxygen ions increases as the bismuth content in the glass increases. Overall, the findings demonstrated that the addition of bismuth improved the physical properties of the glass samples.

Keywords: phosphate glass, density, molar volume, oxygen molar volume, oxygen packing density, Poisson's ratio.

Section 7

Zoology

Code: ZOOL 701

The Prevalence and Morphology of Toxoplasmosis in Domestic and Semi-Domestic cat in El-Beida City, Libya

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Abstract:

This study was the first study to determine the prevalence and morphology of toxoplasmosis in domestic and semi domestic cat from El-Beida City, Libya. A total of 306 domestic and semi-monastic cat fecal samples were collected from 11 regions of the city. The fecal samples were divided according to sex, age and bread of the cats. And using the modified Sheather's sugar floatation technique. The 90 samples were infected. The result showed the description of the morphology *Toxoplasma gondii Pri-oocyst* was observed as the smallest size of the Oocyst, and on the basis of the dimensions, the length was 7-9 µm and the width was 6-9 µm. Although fertilized was larger and its color was 7-12µm and display 7-10 µm, and the prevalence of infection according to sex was 77.78% (n=70) and 22.22% (n=20) in female and male cats, respectively. The African breed of experimented cat was more infected by the toxoplasma parasite with a prevalence of 35.60%, the bread of the Siamese cat was the lowest rate of infection, 4.40%. The study showed that the seventh line and Al-Gharigah of the study areas were the most prevalent site of infection with the *Toxoplasma* parasite (47.05%), and the lowest prevalence of toxoplasmosis infection in Al-300 Villat and the new El-Beida (4.40%).

Keywords: Cat, toxoplasmosis, *Toxoplasma gondii*, El-beida, Libya.

Code: ZOOL 702

Chromium (VI)-Induced Oxidative Stress and Biochemical Perturbations in Rabbits

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Abstract:

The destructive effects of chromium (VI) compounds are diversified and affect almost all organ systems in a wide variety of animals. Therefore, the present study was carried out to determine the toxic effect of chromium (VI) on certain biochemical parameters, lipid peroxidation, and enzyme activities of male New Zealand white rabbits. Six rabbits per group were assigned to one of two treatment groups: 0 mg control; 5 mg Cr(VI)/kg BW, respectively. The rabbits were administered orally their respective doses every day for 12 weeks. The results obtained showed that Cr(VI) significantly increased free radical levels ($P < 0.05$) increased the levels of free radicals and the activities of AST and ALT increased significantly in plasma, while AlP and high-density lipoprotein (HDL)decreased. Chromium (VI) treatment caused a significant decrease in plasma total protein (TP) and increased cholesterol, triglycerides (TG), low-density lipoprotein (HDL), glucose, urea, creatinine, and bilirubin concentrations.

Keywords: Rabbits; Chromium (VI); Enzyme activities; TBARS.

Code: ZOOL 703

Effects of Ginger and Garlic on Semen Quality in Male Rabbits

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Abstract:

Ginger powder and extracts have been studied for their antioxidant and antimicrobial properties in both dietary supplementation and food preservation. Researchers have shown that garlic has medicinal, antimicrobial properties, speeds up digestion and is widely used as preservatives, spice, and condiment in many homes. This study was aimed at studying the effects of these antioxidants on semen quality levels in male rabbits. The animals were assigned to one of three treatment groups control group, 40mg A garlic or 100 mg ginger /kg BW. In general, the two plants show a similar effect on different measured parameters. The results obtained showed that garlic or ginger treatment caused a significant ($P<0.05$) increase ($P <0.05$) in BW compared to control animals. In the same table, results were found to significantly increase ejaculate volume (EV), sperm concentration and total sperm output (TSO),Packed sperm volume PSV sperm motility (%), total motile sperm (TMS) , total functional sperm fraction (TFSF) , normal sperm, initial fructose (IF) and significant ($P<0.05$) decrease in pH, dead sperm and reaction time (RT) compared to control group.

Keywords: Rabbits; garlic; ginger; semen

Code: ZOOL 704

Comparative Study between Vitamin E and Graviola on Hematological Parameters in Male Rabbits

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Abstract:

Vitamin E may have various roles as a vitamin. Many biological functions have been postulated, including a role as a fat-soluble antioxidant. Graviola (*Annunona muricata* L.), a plant that grows in tropical regions, has many names and a range of ethno-medicinal uses. The key active components are believed to be annonaceousacetogenins, and more than 100 such compounds have been isolated from *A. muricata*. Five rabbits per group were assigned to three groups: 0 mg of A. vitamin E and 0 mg of graviola BW (control); 100 mg of Vit E / kg of BW; 100 mg of Graviola / kg of BW. The rabbits were administered orally the respective doses every day for 12 weeks. Treatment with graviola did not affect red blood cells (RBC), white blood cells (WBC), packed cell volume (PCV), platelet count (PLT), hemoglobin (Hb), mean cell volume (MCV), mean cell hemoglobin (MCH), and mean cell hemoglobin concentration (MCHC). On the other hand, the results indicated that vitamin e treatment caused a significant increase in red blood cells (RBC), white blood cells (WBC), packed cell volume (PCV), platelet count (PLT), hemoglobin (Hb), mean cell volume (MCV), mean cell hemoglobin (MCH), and mean cell hemoglobin concentration (MCHC). The aim of the study is to compare vitamin E and graviola on hematological parameters in male rabbits.

Keywords: Rabbits; Vitamin E; Graviola; Hematological parameters.

Code: ZOOL 705

A Study of the Association between Blood Pressure and Study Stress, Gender and ABO in a Random Sample of Students from Al-Mahara Institute at El-Beida City, Libya

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Abstract:

The present study was carried out to study the association between blood pressure (BP) levels, gender, type of blood group, and study stress. 40 students (28 women and 12 men) from al-Mahara Higher Institute of Health and Administrative Sciences in El-Beida City, Libya, were included in this study in the period 9-5-2023 to 30-5- 2023. BP measurement result shown 23 students had a drop in BP on exam day compared to their BP measurement during the normal school day. In contrast, 16 students had an increase in BP and there were no changes when measuring BP for one student between normal and exam day. Furthermore, the individuals with the blood group (A+) had the highest number of 12 followed by the group (O +) 11, and the group (B +) recorded 10. Meanwhile, the (AB+) recorded 4, the lowest number was O- recorded only 3students. The results show there are non-significant decreases in BP on the normal day and the exam day. Meanwhile, the results show there are ($P<0.05$) significant differences in BP between males and females on the normal study day, and nonsignificant differences on the exam day. Furthermore, there were no significant differences in BP measurement in different types of blood groups. The highest rate of BP recorded on the normal study day was (139/89) and the day of the exam was (124/82); conversely, the lowest pressure rate recorded on the normal school day (100/72) and the day of the exam was (95/60).

Keywords: Blood pressure, study stress, type of blood group, normal study day, exam day.

Code: ZOOL 706

The Influence of *Moringa oleifera* on Liver Enzyme and Glucose in Male Rabbits

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Abstract:

The phytochemical components of *Moringa oleifera* (MO) have been reported to have antimicrobial roles and antioxidant activities and thus, (MO) is commonly used in numerous medicinal applications to control various diseases such as digestive disturbance, asthma, inflammatory disease, and cancer. This work explored the influence of *Moringa oleifera* on biochemical parameters in male rabbits. The rabbits were given *Moringa oleifera* orally (400 mg/kg BW).The tested doses were administered to the rabbits every other day for 12 weeks. The results showed that *Moringa oleifera* caused a significant (P>0.05) decrease (P> 0.05) in plasma levels of aspartate aminotransferase (AST), alanine aminotransferase (ALT), alkaline phosphatas (ALP), and glucose.

Keywords: Rabbits, *Moringa oleifera*, biochemical parameters, glucose.

Code: ZOOL 707

Comparing the Role of Garlic and Folic Acid on Hematological Parameters of Male Rabbits

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Abstract:

Studies have shown that garlic has medicinal and antimicrobial properties, speeds up digestion, and is widely used as preservatives, spices, and condiments in many homes. It has potent antioxidant properties essential for the stabilization of biological membranes, protecting cells from oxidative stress, and inhibiting angiogenesis. The present work was conducted to investigate alterations in hematological factors in male rabbits after administering orally a single dose of garlic (GA) by gavage at a dose of 40 mg/kg B. W./day, and folic acid by gavage at a dose of 5 mg/kg B. W./day for 12 weeks. Twenty male rabbits weighting (1.891±27.6 Kg), were divided into four groups with 5 animals. The result indicated that treatment with garlic and folic acid significantly increased the significant increase in red blood cells (RBC), white blood cells (WBC), packed cell volume (PCV), platelet count (PLT), hemoglobin (Hb), mean cell volume (MCV), mean cell hemoglobin (MCH), while the mean cell hemoglobin concentration (MCHC) increased. The general aim of this research was to determine the comparative effect of garlic and folic acid on the hematological parameters of male rabbits.

Keywords: Garlic, folic acid, hematological parameters, Rabbits.

Code: ZOOL 708

Role of Vitamin E in Ameliorating the Chloropyrfios Induced Changes in Body and Organs Weight in Male Rabbits

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Abstract

Chlorpyrifos (CPF) is one of the most widely used organophosphate (OP) insecticides in Libya. It is also the compound most studied (OP). The use of CPF is still on the increase, with its attendant consequence on the health and well-being of humans, animals and the environment. Since the use of CPF is on the increase, especially in agriculture, there is a need to identify agents that would mitigate the adverse health consequence posed by long-term exposure to this chemical pesticide. Vitamin E is a group of eight fat-soluble compounds that include four tocopherols and four tocotrienols. Vitamin E is a fat-soluble antioxidant that may help protect cell membranes from reactive oxygen species. Therefore, the present experiment was carried out to determine the effectiveness of vitamin E in alleviating the toxicity of chloropyrfios on the body and organ weight of male rabbits. The animals were assigned to 1 of 4 groups: control; 33.3 mg CPF/kg/b. w.; 100 mg of vitamin E/kg/b. w.; CPF (33.3mg/kg/b. w.) plus vitamin E (100 mg/kg/b. w.), respectively. The rabbits were administered the respective doses orally every other day for 12 weeks. The results obtained showed that vitamin E alone caused an increase in body weight, liver, lung, heart, and kidney weights.

Keywords: Chlorpyrifos, Vitamin E, Body weight, Rabbits.

Code: ZOOL 709

The Toxic Effect of Some Environment Polusion (Phathalate and Aluminum) On Oxidative Stress in Rabbits

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Abstract:

Phthalates (PAEs) are esters of phthalic acid; in particular, they act as plastic additives and add plasticity to industrial polymers. The reaction between phthalic anhydride and alcohol causes the formation of phthalates. Aluminum (Al) is a plentiful element in the earth's layer and is widely distributed throughout the environment. Currently, aluminum salts are included in greasepaints, food handling, and packaging and are also used in various non-prescription drug. Different forms of aluminum (Al) are environmental xenobiotics that induce free radical-mediated cytotoxicity. Therefore, this study aimed to clarify the toxic effects of phathalate and aluminum chloride ($AlCl_3$) in male rabbits. Group1: served as control. Group 2: received 34 mg $AlCl_3$/kg b. w. (1/25 LD_{50}). Group3: was administered 500 mg phathalate/kg b. w./day (1/50 LD_{50}). Treatment was continued for three months. Treatment with phathalate and aluminum chloride ($AlCl_3$) caused a significant ($P<0.05$) decrease ($P <0.05$) in GST, SOD and CAT activity in plasma and testes homogenates compared to control. However, caused a significant ($P<0.05$) increase (P0.05) in blood plasma and testes homogenates TBARS compared to the control.

Keywords: phathalat; Aluminum; Antioxidant enzyme; rabbits.

Code: ZOOL 710

Effects of Chromium(VI) on Body Weight and Organ Weights in Male Rabbits: The Protective Role of *Moringa oleifera* Leaf

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Abstract:

Chromium (VI) is one of the major causes of acute diseases in humans due to its mutagenicity, toxicity and carcinogenicity. *Moringa oleifera* (MO) is a rich source of phytochemicals such as myricetin, phenolic substances, phenolic acids, flavonoids, isothiocyanates, tannins and saponins, quercetin, zeatin and kaempferol flavonoids, which are effective antioxidants with several therapeutic benefits. This work explored the defensive impacts of *Moringa oleifera* against chromium(VI) on body and organ weight in rabbits. Five rabbits per group were assigned to one of four treatment groups: 0 mg *Moringa oleifera* and 0 mg Cr(VI)/kg BW (control); 400 mg MO/kg BW; 5 mg Cr(VI)/kg BW; 400mg MO/kg BW plus 5 mg Cr(VI). The results indicated that Cr (VI) treatment alone caused a significant ($P<0.05$) decrease ($P<0.05$) in BW and relative weight of the liver, kidney, spleen, and heart compared to control animals. On the other hand, BW and the relative weight of liver, kidney, lung, spleen, and heart were significantly ($P<0.05$) increased ($P<0.05$) in rabbits treated with MO alone compared to control animals.

Keywords: Rabbits; Chromium (VI); *Moringa oleifera*; Weight.

Code: ZOOL 711

Curcumin Attenuated Inflammation on Hepatic Induced by Tramadol in Male Rabbits

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Abstract:

Tramadol is used throughout the world. It has some side effects and adverse reactions and may cause psychological and physical addiction similar to that of other opiates. Curcumin, an important component of turmeric, is known for various biological activities, primarily due to its antioxidant mechanism. Therefore, the present experiment was carried out to determine the effectiveness of curcumin in alleviating the toxicity of tramadol on the hepatotoxicity of male rabbits. Twenty rabbits were randomly divided into four equal groups (each five rabbits). The first group was used as a control and received an equivalent volume of distil water. The second group was used to study the effect of tramadol at 50mg /kg body weight. The third group was used to study the effect of curcumin 10mg /kg body weight. The fourth group was used to study the effect of tramadol plus curcumin. The The rabbits were administered orally their respective doses daily for 6 weeks. The results obtained showed that tramadol significantly ($P < 0.05$) increase aspartate transaminase (AST), alanine transaminase (ALT), alkaline phosphatase (AlP) and total bilirubin. Curcumin alone significantly decreased the levels of all parameters. Furthermore, the presence of curcumin with tramadol alleviated its harmful effects on most of the parameters tested. Therefore, the present results revealed that curcumin treatment could minimize the toxic effects of tramadol.

Keywords: Rabbits; Tramadol; Curcumin; liver.

Code: ZOOL 712

Effects of Sodium Benzoate and *Ephedra alata* on Body Weight and Some Organs Weight in Male Rats

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Abstract:

Sodium benzoate is one of the most commonly used chemical preservatives, used in a variety of foods, beverages, and condiments to prevent alteration or degradation caused by microorganisms during storage. *Ephedra alata* (*E. alata*) is used in folk medicine to treat urinary tract, cardiovascular, respiratory, and digestive systems disorders and to treat cancer, fungal and bacterial infectious diseases. The present study aimed to investigate the effects of sodium benzoate and *Ephedra alata* on body weight and weight of the liver, kidney, heart and testes in male rats. Twenty male albino rats ranging in weight from 195-300 g were divided into four equal groups each containing 5 male rats: The first group was kept, as control received distilled water daily. The second group received sodium benzoate (100 mg/kg/b. w.) orally in a daily dose for 2 weeks. The third group was treated with *E. alata* (1 g/kg/b. w.) orally for 2 weeks. The fourth group (combination group) was administered Ephedra and sodium benzoate for 2 weeks. The results of the present study revealed that no significant effects were observed on body weight, liver weight, kidney weight, heart weight, testis weight, relative liver weight, relative kidney weight, relative heart weight, and relative testis weight between control and all treated groups, except that there was a significant increase in body weight and kidney weight in the combination group. In conclusion, the results of this study confirm that sodium benzoate and *E. alata* have no effect on body weight and organ weight.

Keywords: Sodium benzoate, *Ephedra alata*, Body weight, relative organ weight.

Code: ZOOL 713

Epidemiology of Cattle Gastrointestinal Helminthes in Almarj District, Libya

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Abstract:

Almarj is one of the most important areas of agriculture and animal production in Libya. It is a source for producing meat and milk. This study shows the prevalence and intensity of gastrointestinal helminth in cattle. 406 cattle fecal samples from different sexes, ages, and breeds have been examined by the Modified Wisconsin Sugar Fecal Worm Egg Flotation Method. The prevalence of infection was 65.27%. In males, the infection was 70.45%, and in females it was 62.64%. Age does not have a significant effect on infection. The prevalence rate ranged from 65% to 68.94% among young and old calves and adults. The prevalence of weaned cattle was 47.46%. Santa was more infected, with a prevalence rate of 81.82%. The intensity ranged between minor infection and medium. The fecal samples contained eggs of *Taenia*, *Moniezia*, *Toxocara*, *Trichuris*, *Enterobius*, and roundworms. The infection by only one type of worm egg is 50.94% and the samples infected by two types of parasites were 36.23%. The samples that contained three types of eggs were 10.19%, while the samples that contained four types of eggs were 2.26%. 47.54% of the samples were infected with roundworms. 28.57% of the samples were infected by Toxocara. Taenia was found in 88 samples. Moniezia was 4.19%, and the prevalence of *Enterobius* was 3.94%. The lowest percentage was for two samples that contained *Trichuris*, with a rate of 0.49%. The southwest of Almarj was the most likely site for the cattle gastrointestinal helminths, where the infection rate was 78.44%.

Keywords: Almarj, Cattle, Gastrointestinal helminthes.

Code: ZOOL 714

Histopathological Changes Induced by Heavy Metals (Lead and Cadmium) in *Siganus rivulatus* Fish Collected from the Benghazi Sea Port

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Abstract:

Marine pollution is problematic, and its impacts have devastating effects on marine resources and ecosystems. *Siganus rivulatus* (*S. rivulatus)*, one of five species of Siganidae. The present study aimed to detect the effects of heavy metals lead (Pb) and cadmium (Cd) on the histological structural of the gills and liver of the fish *S. rivulatus*. The fish were caught from Benghazi Sea Port in September 2020. The gills and liver tissues were removed for histopathological investigation. The results of this study illustrated in the gills section of *S. rivulatus* showed extensive hypertrophy leading to severe lamellar fusion of secondary lamellae and congestion in the gill lamellae. In addition, secondary lamellae are irregular and curved with vasodilation and epithelial lifting. Chloride cell hyperplasia revealed cleavage and congestion. Furthermore, substantial lifting of the lamellar secondary, leukocyte infiltration, respiratory epithelium sloughing, congestion and ballooning dilatation of primary lamellae were observed. Chloride cell hypertrophies with filament chondrocytes and hypertrophic fusion lamellar of gills were seen. Inspection of liver sections in *S. rivulatus* that show interstitial hemorrhage and congestion, as well as some hepatocytes, has enlarged nuclei of irregular shape. Additionally, the results showed narrowing of the hepatic sinuses and vacuolation of some hepatocytes. Also, areas of fatty degeneration were noted. In addition, odema was indicated in some cells, in addition to necrosis and central vein congestion surrounded by areas of enlarged hepatocytes containing hydropic degeneration. With dilation with congestion of the blood vessels and blood sinusoids, some of the hepatocytes lost their boundaries. The results of this study confirm the minimal effects of Pb and Cd on the histological structure of the gills and liver tissues in fish organs.

Keywords: Histopathology, Gills, Liver, Muscle, *Siganus rivulatus*.

Code: ZOOL 715

Effect of hibernation on DNA of Testis in *Uromastyx acanthinra* (BELL, 1825)

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Abstract:

The objective of this study was to investigate the effect of hibernation on testis genomic DNA fragmentation and comet assay in *Uromastyx acanthinra*, during two seasons (hibernation season and summer season) and the results revealed that the serum testosterone level was markedly increased during summer while declining during the hibernation season, and the genomic expression of the degree of laddering (total DNA fragmented) increased during the hibernation season and was more expressed. Genomic DNA damage was not detected during the summer.

Keywords: hibernation, testis, DNA damage.

Code: ZOOL 716

Effect of Caffeine on the embryonic brain development in chick

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Abstract:

Caffeine is a natural ingredient found in coffee, tea, and cocoa, and is added to some soft drinks, energy drinks, and to some over-the-counter medications, pregnant women consume caffeine during pregnancy, which leads to a teratogenic effect on embryos; where it passes easily from a mother's blood to embryos through a placenta. This study examined the effect of caffeine on morphological abnormalities in the brain of chicken embryos, fertilization eggs were incubated at a temperature ranging from 37-38°C, and embryos were injected with caffeine at concentrations of 0.5 mg/ml in the second day of incubation at stage HH8. Embryos were collected later at stages HH17, HH21, and HH29 and morphological changes were observed. The results showed abnormalities in the brain, where a small size of the brain and sometimes a fusion of the brain in the cranium caffeine could affect the neural tube parting through signaling inhibition.

Keywords: Caffeine, Brain, Chicken embryos development.

Code: ZOOL 717

The Protective Role of Melatonin against the Toxic Effect of Sodium Arsenite on Hematological Parameters in Rabbits

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Abstract:

Today, arsenic is considered a serious toxic metallic pollutant of great concern for health and is available indiscriminately in groundwater in a natural way and in the agricultural runoff and mining process in an anthropogenic way. Melatonin showed strong antioxidant activity and possessed protective properties against oxidative stress. The present study was carried out to evaluate the therapeutic efficacy of melatonin in terms of normalization of altered hematological parameters after sodium arsenite treatment in rabbits. The animals were divided into four groups. The first group was used as a control. However, groups 2, 3 and 4 were orally treated with melatonin (ME, 10 mg/kg BW), sodium arsenite (Sa, 5 mg/kg BW) and sodium arsenite plus melatonin, respectively. The results showed that Sa significantly (PB/0.05) decreased hemoglobin (Hb), total erythrocyte count (TEC) and packed cell volume (PCV), while total leukocyte count (TLC) increased. Melatonin produces a significant decrease in the concentration of PCV and Hb in treated rabbits. However, a significant increase was observed in platelet counts and total lymphocyte count in melatonin-treated rabbits compared to controls. The results conclude that while melatonin treatment may not be of any assistance to an anemic patient, it will definitely be of immense benefit to those who require platelet and lymphocyte replacement. The results demonstrated the beneficial influence of melatonin in reducing the negative effects of Sa on the blood hematology parameters of male rabbits.

Keywords: Rabbits; *melatonin*; sodium arsenite; hematological parameters.

Code: ZOOL 718

The Potential Protective Effect of Sidr Honey on Some Hematological Changes Caused by Exposure to Cigarette Smoke on Male Albino Rats

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Abstract:

The present study investigated the effect of cigarette smoke (CS) on some hematological changes in adult male rats and the protective effect of sidr honey. Twenty-four adult male rats were divided into four groups: Normal control (NC), H group: received Sidr honey orally (100 mg/kg b.w./d.) for 4 weeks, CS group: exposed to five lit cigarettes (5 times/d.) for 4 weeks, and P group: received Sidr honey orally (100 mg/kg b.w./d.) for 2 weeks, then treated with machine-generated smoke after taking the Sidr honey for 4 weeks. The results indicated that cigarette smoke treatment caused significantly decreased ($P<0.05$) in red blood cells (RBCs), haemoglobin (HB), hematocrit (HCT), mean corpuscular volume (MCV), and platelets (PLT). While, there was a significant increase in white blood cells (WBCs) count compared to control and honey animals. On the other hand, the p group showed a slight increase in the mean value of HG, HCT, MCV, and PLT, but showed a significant positive decline in WBCs compared to the CS group. This study indicates that Sidr honey treatment caused a slight improvement against CS-induced hematological changes in male albino rats.

Keywords: Cigarette smoke, Sidr honey, Hematological changes, rats.

Code: ZOOL 719

Some Biological and Fisheries Indicators of the Golden Gray Mullet, *Liza aurata* (Mugilidae) in the Southern Mediterranean Coast (Libya)

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Abstract:

The objective of the present study was to establish some biological traits and fishery indicators of *L. aurata* (mullet) in the Umm Hufayn lagoon in eastern Libya's southern Mediterranean Sea coast to help construct management plans for the fishery. Eighty *L. aurata* collected randomly from the artisanal lagoon catch during January and February 2018 were used in the study. The fish were individually aged by reading the annuli on the opercula and scales and by the length-frequency distribution of the sample. The mean length of the fish was 21.33 cm, corresponding to a weight of 89.01 g. The instantaneous rate of total mortality, Z, was 0.665 to 0.798, natural mortality, M, was 0.251 to 0.487, and fishing mortality, F, was 0.262 to 0.507. Survival, S, ranged from 0.450 to 0.514. The exploitation ratio (E) was 0.360 to 0.669 with a mean of 0.468, length at first maturity, L_m, was 10.360 to 14.434 cm with a mean of 11.836 cm, length at optimum yield, L_{OPt}, was 19.633 to 25.864 cm with a mean of 22.32 cm, and longevity, T_{max}, was 18.237 to 42.857 years, with a mean of 23.112 years. These values indicated that the *L. aurata* fishery was healthy and ran close to the maximum sustainable yield. However, certain causes of concern must be taken into account in future planning.

Keywords: *Liza aurata*, golden mullet, mortality, E, L_m, L_{OPt}, T_{max}, Libya, southern Mediterranean.