5th ANNUAL CONFERENCE OF POST GRADUATE STUDIES

APPLIED SCIENCES Serving a Smart, Healthy, & Sustainable Future

Under the Auspices of

Prof. Abdel Aziz Qansouh	***Prof. Nasser Elgizawy***
Minister of Higher Education and Scientific Research	*President of Benha University*
Prof. Gehan Abdelhady Mousa	***Prof. Hesham Rashid***
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5th Annual Conference of Post Graduate Studies for Applied Science

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ABSTRACTS BOOK

كتاب الملخصات

Under Auspices of:

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Minister of Higher Education and Scientific Research

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Vice President of Benha University for Postgraduate Studies & Research
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Prof. Mohamed H. Refaat

Vice Dean for Postgraduate Studies & Research Faculty of Agriculture
Co-Editor-in-Chief Benha Journal of Applied Sciences

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About Conference

5thAnnual Conference of Post Graduate Studies for Applied Science - Benha University, which is organized annually by the Post Graduate Studies and Research Sector at Benha University with the aim of capacities building of students and young researchers in presenting and discussing research papers or scientific articles in the various research areas of applied sciences.

Conference Objectives:

1) Opportunities for networking between Benha University graduate students and other universities.
2) Deepening the scientific research methodology for postgraduate students.
3) Providing an environment for students to present their scientific research experiences in their theses.
4) Giving the opportunity for postgraduate students to participate in the exhibitions of ideas.
5) Achieving the University's objectives in supporting students' research projects.

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President word

The Annual Postgraduate Conference for Applied Sciences has become a well-established academic tradition at Benha University, bringing together a distinguished group of researchers, postgraduate students, and faculty members. It serves as a platform for exchanging ideas and discussing the latest developments in the fields of applied sciences.

Benha University is committed to organizing this series of conferences on a regular basis, driven by its strong belief in the importance of scientific research and its role in serving society. The university also strives to provide a stimulating academic environment that fosters creativity and innovation, while opening new horizons for postgraduate students to present and discuss their research with experts and specialists. This commitment reflects the university's ongoing dedication to strengthening its academic and research standing, as well as reinforcing its leading role in supporting sustainable development.

We firmly believe that scientific research is the cornerstone of progress, and that postgraduate students are the future leaders who will carry the responsibility of advancing knowledge and applying it to serve society.

From this perspective, this conference aims to enhance collaboration among researchers, provide opportunities to present and discuss research findings, and contribute to bridging the gap between scientific research and the needs of society and the labor market.

Prof. Nasser Elgizawy

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Conference Chairman Word

It gives me great pleasure to present the Book of Abstracts for the Fifth Annual Conference of Postgraduate Studies in Applied Sciences, held under the theme "A Healthy, Smart, and Sustainable Future".

This conference reflects our university's strong commitment to advancing postgraduate studies, promoting scientific research, and encouraging innovation in applied sciences. The abstracts presented in this book represent valuable research efforts and innovative ideas that address contemporary challenges and contribute to building a better future for society.

We highly appreciate the efforts of all researchers, scholars, and participants whose contributions have enriched this scientific event. We also extend our sincere gratitude to the organizing committees for their dedication and outstanding work in making this conference a success.

We hope that this Book of Abstracts will serve as a valuable scientific reference and inspire further collaboration, creativity, and excellence in research.

Wishing the conference every success and continued progress.

Prof. Gehan Abdelhady

****

Conference Rapporteur Word

In the name of Allah, the Most Gracious, the Most Merciful,
Distinguished guests,
Esteemed attendees,
Researchers and postgraduate students,
Peace be upon you all,

It is my great pleasure and honor to declare the opening cermony of the Postgraduate Conference for Applied Sciences. This scientific event brings us together on a shared platform of knowledge, ambition, and the pursuit of innovation.

This conference represents a valuable opportunity to exchange expertise, present the latest scientific research, and strengthen collaboration among researchers and academic institutions. It also reflects our commitment to supporting scientific research as a cornerstone for achieving sustainable development and keeping pace with global advancements.

As we openning of this conference, we emphasize the vital role of young researchers in driving positive change. We look forward to distinguished outcomes and recommendations that contribute to the advancement of applied sciences and the service of our communities.

In conclusion, we warmly welcome you all and wish you a successful and productive conference.

Thank you very much for your kind attention.

Peace be upon you.

Prof. Hesham Rashid

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EO of Egyptian Space Agency
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1. Diagnostic and Prognostic Significance of Circulating hsa_circ_0001445 in Patients with Coronary Heart Disease

Manar Gad Abd EL Razik Gad EL Barbary, Adel Farag El Kholy, Mamdouh Zaki Abadeer, Doaa Abd Al-Aziz Mohamed, Nashwa El-Sayed Ahmed

Medical Biochemistry Department, Faculty of Medicine, Benha University, Egypt.
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Abstract:

Coronary heart disease (CHD) continues to be a main contributor to global mortality and morbidity internationally, despite significant advances in diagnostic and therapeutic strategies. Increasing evidence highlights the fundamental role of non-coding RNAs (ncRNAs) in cardiovascular pathophysiology, among which circular RNAs (circRNAs) have been implicated as important regulatory molecules. CircRNAs are a novel class of endogenous ncRNAs characterized by a covalently closed circular structure that confers exceptional stability, tissue specificity, and resistance to exonuclease-mediated degradation. Recent experimental and clinical investigations have demonstrated that circRNAs are actively involved in the development and progression of CHD through multiple molecular mechanisms, including microRNA (miRNA) sponging, interaction with RNA-binding proteins (RBPs), regulation of transcription, and modulation of signaling pathways associated with endothelial dysfunction, cardiomyocyte apoptosis, inflammation, oxidative stress, and vascular smooth muscle cell proliferation. Dysregulated circRNA expression profiles have been identified in myocardial tissue, peripheral blood, and plasma of patients with CHD, suggesting their potential utility as non-invasive diagnostic and prognostic biomarkers. Furthermore, emerging therapeutic approaches targeting circRNAs, such as antisense oligonucleotides, RNA interference (RNAi) strategies, and synthetic circRNA constructs, offer promising avenues for precision medicine in CHD. Nevertheless, issues concerning delivery efficiency, tissue specificity, and long-term safety still need to be addressed. A review article was performed using the electronic databases PubMed, Scopus, Google Scholar and Web of Science, that evaluated the prognostic and diagnostic significance of gene expression level of hsa_circ_0001445 in blood samples of CHD patients. hsa_circ_0001445 has been reported to play a role in vascular homeostasis and endothelial cell function. Dysregulation of hsa_circ_0001445 may contribute to the pathogenesis of coronary heart disease (CHD) by affecting key processes such as inflammation, oxidative stress, and vascular remodeling. This study included investigations analyzing the association between gene expression level of hsa_circ_0001445 and patients' clinical data and radiologic findings on CT coronary angiography. The results revealed a significant downregulation of hsa_circ_0001445 expression in peripheral blood leukocytes obtained from patients with CHD when compared to age- and sex-matched healthy controls.

Keywords: Circular RNA, Coronary heart disease, Non-coding RNA, hsa_circ_0001445, gene expression, CT coronary angiography.

2. Irisin in Psoriasis and Relation to Disease Severity

Aliaa Mohammed Ibrahiem[1], **Shymaa Mostafa Mostafa Rezk**[1], **Yassmen Mohammed Marie**[2], **Adel Ali Ibrahiem**[1]

[1] Dermatology, Venereology and Andrology Department, Faculty of Medicine, Benha University, Egypt.

[2] Medical Biochemistry Department, Faculty of Medicine, Benha University, Egypt

Email: lolomhamad123@yahoo.com

Abstract :

Introduction: Psoriasis is a chronic immune-mediated inflammatory skin disease increasingly recognized as a systemic disorder. Irisin, a circulating myokine, has recently emerged as a potential biomarker in inflammatory conditions.

Aim:To evaluate the role of irisin in psoriasis and its association with disease severity and treatment response.

Method:A systematic review was conducted by searching PubMed, Scopus, Web of Science, and Google Scholar for clinical studies published between 2015 and 2025 that assessed circulating irisin levels in patients with psoriasis. Studies meeting the inclusion criteria were included in the qualitative synthesis.

Results: Four eligible studies were included. Patients with chronic plaque psoriasis consistently demonstrated higher serum irisin levels compared with healthy controls. Positive correlations were observed between irisin concentrations and Psoriasis Area and Severity Index (PASI) scores. Furthermore, irisin levels decreased following systemic therapy, particularly methotrexate, in parallel with clinical improvement.

Conclusion: Irisin may reflect inflammatory disease activity in psoriasis and could serve as a non-invasive biomarker for assessing disease severity and monitoring treatment response.

Keywords: Irisin; Psoriasis, Disease activity, Biomarkers, Systemic therapy.

3. Retinoid Acid-Related Orphan Receptor Alpha (RORα) Serum Level and Gene Polymorphism in Acne Vulgaris Patients

Bousi Elnady Mohamed Yousef, Ahmed Mohamed Hamed, Naglaa Fathy Alhusseini, Hanan Hassan Sabry

Dermatology, Venereology and Andrology Department, Faculty of Medicine, Benha University, Egypt.

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Abstract:

Acne is a persistent inflammatory disease of the pilosebaceous unit in which Cutibacterium acnes–induced immune dysregulation has a central function. Retinoic acid receptor-related orphan receptor alpha (RORA), essential transcription factor regulating Th17 differentiation and inflammatory responses via the JAK/STAT pathway, is involved in several chronic inflammatory diseases, suggesting a potential function in acne pathogenesis. This work aims to explain pathogenesis of acne vulgaris, pivotal function of Th17 and its relation to serum level of RORA and its gene polymorphism. The significant elevation of serum RORA protein levels and the predominance of polymorphic RORA genotypes in patients with acne vulgaris suggest an essential function for RORA in acne pathogenesis.

Keywords: RORA, Polymorphism, Th17 pathway, Serum biomarkers, GAGS, Inflamatory dermatosis.

4. Role of the NLRP3 Inflammasome and Its Genetic Polymorphisms in Varicocele-Associated Male Infertility: A Narrative Review

Eman Azmy Ahmed El tesh, Samy Hanafy Mohamed, Nehad Ahmed Fouad Abdelwahed, Karem Taha Ibrahim Khalil

Dermatology, Venereology and Andrology Department, Faculty of Medicine, Benha University, Egypt.

Abstract:

Background: Male infertility is a serious health concern, with varicocele being one of the most common identifiable causes. Increasing evidence indicates that oxidative stress and inflammation play key roles in varicocele-associated testicular dysfunction. The NLRP3 inflammasome, a central regulator of innate immune responses, has been implicated in inflammation-mediated tissue injury and may represent a mechanistic link between oxidative stress and impaired spermatogenesis. **Objective:** To review current evidence regarding the role of the NLRP3 inflammasome and its genetic polymorphisms in the pathogenesis of male infertility associated with varicocele. **Methods:** A comprehensive literature search was performed using PubMed, Google Scholar, and Medscape for relevant studies published up to 2025. **Study Selection:** English-language, peer-reviewed articles addressing male infertility, varicocele, oxidative stress, inflammasome activation, and NLRP3 genetic polymorphisms were included. Relevant data were extracted with emphasis on molecular mechanisms, inflammatory pathways, and genetic susceptibility. **Conclusions:** Available evidence demonstrates that activation of the NLRP3 inflammasome and related genetic variations contribute to inflammation-driven testicular dysfunction in men with varicocele. Further studies are required to clarify the diagnostic and therapeutic implications of targeting inflammasome-related pathways in varicocele-associated male infertility.

Keywords: Male infertility, varicocele, NLRP3 inflammasome, oxidative stress, inflammation, genetic polymorphism.

5. Foam Sclerotherapy Versus ND:YAG Laser in the Ttreatment of Telangiectasias and Spider Veins

Hager Helmy Salem Mohamed, Amany Ibrahim Mustafa, Ayman M. Abdelmofeed, Karem Taha Ibrahim Khalil

Dermatology,Venereology and Andrology Department, Faculty of Medicine, Benha University, Egypt.
Email: hagerhelmym@gmail.com

Abstract:

Background : Telangiectasias and spider veins affecting the lower limbs represent frequent aesthetic and clinical complaints. Among minimally invasive therapeutic options, foam sclerotherapy and long-pulsed ND:YAG laser are extensively utilized. Nevertheless, available comparative evidence addressing clinical efficacy, safety, and procedural considerations remains unclear.

Objective : To critically examine and integrate the existing literature comparing foam sclerotherapy and Nd:YAG laser therapy with regard to effectiveness, safety profile, and patient-reported outcomes in the treatment of telangiectasias and spider veins .

Methods : We analyzed randomized and prospective comparative studies, clinical trials, and systematic reviews evaluating outcomes of foam sclerotherapy and long-pulsed 1064-nm Nd:YAG laser, alone or in combination. Outcomes assessed included vessel clearance, number of treatments, pain, adverse events, and patient satisfaction.

Results : Both foam sclerotherapy and 1064nm longpulsed Nd:YAG laser achieve significant improvement in telangiectasias and spider veins, with high patient satisfaction. Sclerotherapy may produce quicker visible regression and treat feeder veins, while Nd:YAG laser is effective for smaller vessels and preferred in patients with needle aversion. Pain perception is often higher with laser therapy. Reported complications are generally minor and comparable between modalities .

Conclusions : Foam sclerotherapy and Nd:YAG laser are effective, safe options for treating telangiectasias and spider veins. Modality selection should consider vein size, patient tolerance, and clinical context. Larger randomized trials are warranted to refine comparative effectiveness and optimize treatment algorithms.

Keywords: Telangiectasias, Spider veins, Foam sclerotherapy, Nd:YAG laser, Vascular lesions.

6. Evaluating the Efficacy of Hematological and Chemical Inflammatory Biomarkers as Potential Predictors of Psoriasis Improvement: A Narrative Review

Amira M. Agha, Menha A. Ibrahim, Hamasat A. Abdel-Khalik, Shymaa M. Rezk

Dermatology, Venereology and Andrology Department, Faculty of Medicine, Benha University, Egypt.

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Abstract:

Background: Psoriasis is a chronic immune-mediated inflammatory disorder characterized by systemic immune activation and variable response to biologic therapy. Despite the effectiveness of tumor necrosis factor alpha (TNF-α) inhibitors such as adalimumab, reliable biomarkers for predicting therapeutic response remain lacking. **Objective:** To synthesize current evidence on hematological and molecular inflammatory biomarkers as predictors of clinical response to adalimumab in psoriasis**. Methods:** A narrative review of studies retrieved from PubMed (MEDLINE) and Medscape up to 2025 was conducted. Eligible studies evaluated associations between inflammatory biomarkers—particularly complete blood count-derived indices and molecular markers—and treatment outcomes in psoriasis patients receiving adalimumab. Data were extracted and qualitatively synthesized due to heterogeneity in study designs and endpoints. **Results**: Hematological indices, including neutrophil-to-lymphocyte ratio, platelet-to-lymphocyte ratio, monocyte-to-lymphocyte ratio, systemic immune-inflammation index, and systemic inflammation response index, reflect systemic inflammatory burden and show potential in predicting treatment response. Lower baseline inflammatory indices are generally associated with better therapeutic outcomes, although findings are inconsistent across studies. Molecular biomarkers, particularly the interferon-stimulated enzyme OAS2, demonstrate strong correlations with disease activity and may enhance predictive accuracy when combined with hematological markers. However, variability in study methodologies, small sample sizes, and lack of standardized cutoffs limit clinical applicability. **Conclusion:** Systemic inflammatory biomarkers represent promising, accessible tools for predicting response to TNF-α inhibition in psoriasis. Nevertheless, their translation into clinical practice requires large, prospective, multicenter studies with standardized methodologies and validated thresholds to support personalized therapeutic strategies.

Keywords: Biologic therapy, inflammatory markers, tumor necrosis factor inhibition, treatment response prediction, systemic inflammation.

7. Effectiveness and Safety of Exosome Versus Platelet Rich Plasma in Treatment of Male Androgenetic Alopecia: A narrative review

Proosha W. Fatah[1], Hanan H. Sabry[2], Karem T. Khalil[2]

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[2]Dermatology, Venereology and Andrology Department, Faculty of Medicine, Benha University, Egypt.

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Abstract:

Background: Early diagnosis of androgenetic alopecia (AGA) and intervention could considerably decelerate hair loss progression and improve patients' quality of life.

Objective: Investigating the role of platelet-rich plasma (PRP) and exosomes in the treatment of AGA.

Methods: By searching and reviewing Medline databases (Pub Med and Medscape) for the treatment of AGA available till 2026. All studies were independently assessed for inclusion. They were included if they fulfilled the following criteria: 1. Published in English language. 2. Published in peer-reviewed journals. 3. Discuss the role of PRP or exosomes acid in patients with AGA. If the studies did not fulfill the inclusion criteria, they were excluded. Study quality assessment included whether ethical approval was gained, eligibility criteria specified, appropriate controls and adequate information and defined assessment measures. Data from each eligible study were independently abstracted using a data collection form to capture information related to our concerned study outcomes.

Conclusion: Exosomes are promising treatments for patients with AGA.

Keywords: Androgenenetic alopecia, platelet-rich plasma, exosome.

8. Role of Prostaglandin F2 Alpha in Vitiligo: A Narrative Review

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Abstract:

Background: Vitiligo is an acquired pigmentary disorder that affects individuals globally. Vitiligo lesions occur when melanocytes are depleted in the afflicted skin, resulting in a reduction of melanin pigment. In recent decades, prostaglandins have been proposed as a novel treatment approach for stable vitiligo, with promising success. Multiple investigations have shown that the pigmentation of the iris and periorbital area is a prevalent adverse effect of latanoprost, a prostaglandin F2alpha analogue utilized in glaucoma therapy. **Objectives:** To review literature to evaluate the role of prostaglandin F2 Alpha in vitiligo treatment. **Conclusions:** Prostaglandin F2 Alpha is useful in treatment of Vitiligo.

Keywords: Vitiligo, Melanocyte, Topical prostaglandin F2-alpha, Fractional Co2 laser.

9. Efficacy of Microneedling Combined with Topical Sildenafil 1% Versus Topical Minoxidil 5% in the Treatment of Androgenetic Alopecia

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Abstract:

Background: Microneedling combined with topical therapies establishes a synergistic effect that enhances drug penetration and triggers hair follicle regeneration, potentially improving clinical outcomes in androgenetic alopecia. **Aim**: To evaluate and compare the clinical efficacy and safety of combining microneedling with topical sildenafil 1% versus topical minoxidil 5% monotherapy in patients with androgenetic alopecia. **Design**: A clinical comparative research study design was implemented to achieve the aim of the study. **Setting**: The study was carried out at the outpatient clinic of the Dermatology, Andrology, and Venereology Department at Benha University Hospital. **Sample**: A sample of 30 patients with mild to moderate androgenetic alopecia was included after obtaining informed written consent and ethical approval. **Tools of data collection**: Clinical assessment tools were used, including digital photography, dermoscopic evaluation of hair density and diameter, and a patient satisfaction scale. **Results**: The study observations suggested that the combination of microneedling and topical sildenafil 1% led to a significant increase in hair counts and shaft thickness. Furthermore, this therapeutic approach showed comparable or superior results in patients non-responsive to conventional treatments compared to the minoxidil 5% group. **Conclusion**: There was a significant clinical improvement in hair restoration parameters among patients treated with the microneedling-sildenafil protocol, marking it as a promising and safe alternative to traditional monotherapy**.** **Recommendations**: Implementing the use of topical sildenafil 1% in combination with microneedling as a routine dermatological protocol for hair loss. Further large-scale studies are recommended to standardize the frequency of microneedling sessions for optimal follicular nourishment.

Keywords: Microneedling, Sildenafil, Minoxidil, Androgenetic Alopecia.

10. Association between Toll Like Receptor- 7 Gene Polymorphism and Alopecia Areata: A narrative review

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Abstract:

Background: Alopecia areata (AA) is an autoimmune hair loss disorder in which both adaptive and innate immune mechanisms contribute to disease pathogenesis. Genetic factors affecting immune regulation are implicated in susceptibility. Toll-like receptor-7 (TLR7), an innate immune sensor of single-stranded RNA, activates pro-inflammatory and type I interferon pathways. **Objective:** To critically review the evidence on the association between TLR7 gene polymorphisms & AA susceptibility, and in order to contextualize findings within innate immune contributions to AA. **Methods:** By searching and reviewing Medline databases (Pub Med and Medscape) for TLR7 in cases with AA available till 2025.**Results:** While TLR7 expression is elevated in AA and innate immunity is genetically implicated in AA, specific association studies of TLR7 single nucleotide polymorphisms (SNPs) in AA populations are limited or underpowered. Functional TLR7 variants have been linked to altered immune responses & raised risk in other auto-immune diseases (e.g., systemic 1upus erythematosus), indicating biological plausibility for TLR7 polymorphisms influencing AA risk. **Conclusion:** Current evidence supports a potential role for TLR7-mediated innate immunity in AA pathogenesis; however, definitive associations between TLR7 gene polymorphisms and AA susceptibility remain insufficiently established. Well-designed genetic association studies examining TLR7 variants are necessary to clarify their contribution to disease risk and phenotype.

Keywords: Alopecia areata, Toll-like receptor-7, Gene polymorphism, Innate immunity, Autoimmune genetics.

11. Tranexamic Acid versus Metformin in the Treatment of Melasma

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Abstract:

Background: Melasma, a prevalent acquired hypermelanosis, significantly impacts psychological well-being. It presents as irregular, bilateral patches of brown or gray skin discoloration and currently lacks a curative treatment. Management focuses on controlling disease progression and preventing further hyperpigmentation through photoprotection, topical and oral medications, and dermatological procedures including chemical peels, lasers, and microneedling. **Objectives:** Investigating the role of topical metformin versus topical tranexamic acid (TXA) in the treatment of melasma. **Data Sources:** Relevant investigations were identified through a systematic search of Medline databases, including PubMed and Medscape, focusing on the use of metformin or TXA in patients with melasma. The search included all publications available up to the year 2025. **Study Selection:** All retrieved investigations were independently evaluated for eligibility. Investigations were included if they met the following criteria: publication in the English language, appearance in peer-reviewed journals, and specific discussion of the therapeutic role of metformin or TXA in patients diagnosed with melasma. **Data Extraction:** Investigations that did not meet the predefined inclusion criteria were excluded from analysis. Assessment of study quality considered several methodological aspects, including documentation of ethical approval, clear specification of eligibility criteria, use of appropriate control groups, adequacy of reported information, and clearly defined outcome assessment measures. Data from each eligible study were independently extracted using a standardized data collection form designed to capture information relevant to the outcomes of interest in the present review. **Conclusions:** this review can conclude that metoformin or TXA are promising treatments in patients with melasma.

Keywords: Melasma, metformin , tranexamic acid.

12. Evidence-Based Phototherapy for Vitiligo: A Comprehensive Review

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Abstract:

Vitiligo is a common depigmenting disorder driven by immune-mediated melanocyte loss and oxidative stress, with substantial quality-of-life impact. Phototherapy remains a cornerstone because it can both suppress pathogenic cutaneous inflammation and promote melanocyte recovery. This review summarizes the evidence supporting contemporary phototherapy for vitiligo, with emphasis on practical implementation and emerging combination strategies. A structured narrative review of English-language literature published up to July 2025 was conducted using PubMed, Scopus, Web of Science, and Google Scholar. Search terms encompassed vitiligo, phototherapy, NB-UVB, dosing protocols, safety, and combination treatments including topical anti-inflammatory agents and JAK inhibition. Clinical trials, observational studies, meta-analyses, systematic reviews, guideline statements, and relevant translational work were prioritized. Reference lists of key publications were manually screened to enhance coverage. Narrowband UVB (311–313 nm) remains the preferred whole-body phototherapy for generalized non-segmental vitiligo, offering a favorable balance of effectiveness and tolerability when delivered with standardized dosing and monitoring. Treatment outcomes are optimized by patient selection based on subtype, extent, activity, and site, supported by standardized assessment and high-quality photographic documentation.

Keywords: Vitiligo, Narrowband UVB, Phototherapy, Repigmentation, Combination therapy.

13. Alopecia Areata: Pathogenesis, Clinical Spectrum, Diagnosis, and Current Therapeutic Strategies

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Abstract*:*

Background: Alopecia areata (AA) is a common immune-mediated disorder characterized by non-scarring hair loss with a highly variable clinical presentation, ranging from limited patchy disease to alopecia totalis and alopecia universalis. Although not life-threatening, it carries a substantial psychosocial burden and is frequently associated with autoimmune, atopic, and psychiatric comorbidities. Advances in understanding its immunopathogenesis, particularly the roles of hair follicle immune privilege collapse, cytotoxic T-cell activation, and cytokine signaling pathways, have significantly reshaped current concepts of the disease and opened new therapeutic avenues. **Methods:** This narrative review synthesizes the current evidence on AA based on a structured search of major biomedical databases up to July 2025. Key topics include epidemiology, genetic and immunologic mechanisms, clinical features and classification, associated comorbidities, diagnostic approaches, severity assessment, prognostic factors, current treatment strategies, psychological impact, and recent advances in targeted therapies, especially Janus kinase inhibitors. **Conclusions:** AA remains a clinically important and often challenging disorder because of its heterogeneous presentation, unpredictable course, and frequent recurrence. Diagnosis is primarily clinical, but management requires an individualized approach that considers disease extent, activity, comorbidities, and psychosocial burden.

Keywords: Alopecia areata, non-scarring alopecia, autoimmune hair loss, trichoscopy, JAK inhibitors, management.

14. Assessment of Glucocorticoid Receptor Gene Polymorphism in Alopecia Areata: A narrative review

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Abstract:

Background: Alopecia areata (AA) is a common chronic tissue-specific autoimmune disease targeting hair follicles. Glucocorticoid (GC) is a fundamental drug used to treat AA, binds to its corresponding receptor (GR) to formulate a complex that increases production of anti-inflammatory factors. GR is a nuclear receptor superfamily protein, encoded by NR3C1 gene. Studies suggest that polymorphisms of the NR3C1 gene contribute to a decreased response to GC, even leading to drug resistance. **Aim**: to investigate the glucocorticoid receptor gene polymorphism (NR3C1) in cases with alopecia areata. **Methods:** By searching and reviewing Medline databases (Pub Med and Medscape) for glucocorticoid receptor gene polymorphism (NR3C1) in cases with alopecia areata available till 2025. All studies were independently assessed for inclusion if they fulfilled the following criteria: 1. Published in English language. 2. Published in peer-reviewed journals. 3. Discuss the glucocorticoid receptor gene polymorphism (NR3C1) in cases with alopecia areata. Studies did not meet inclusion criteria were excluded. A standardized form captured information on study design, sample characteristics, genetic analysis, and outcomes. Study quality assessment considered ethical approval, eligibility criteria, use of controls, and clarity of outcome measures. **Results:** The genotype frequencies of the NR3C1 Bcl-1 polymorphism did not differ between the AA patients and controls. **Conclusions:** From this review can conclude that Glucocorticoid-receptor gene (NR3C1) polymorphism are not key players in development or clinical course of Alopecia areata (AA); they might affect glucocorticoid action and, together with other endogenous and exogenous factors, interfere with the pathomechanism of AA.

Keywords: Alopecia areata, Glucocorticoid (GC), Glucocorticoid Receptor (GR), Single Nucleotide Polymorphism (SNP).

15. Platelet Rich Plasma Injection and Hyaluronic Acid Vaginal Ovules in the Treatment of Post-Menopausal Vulvovaginal Atrophy: A Comprehensive Evidence Rreview

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Abstract:

Background: Post-menopausal vulvovaginal atrophy (VVA), is a chronic and progressive in nature, significantly deteriorating the quality of life for those affected. While local and systemic estrogen therapies have been the standard management, many women have contraindications to hormonal therapy, such as those surviving breast cancer or other hormone-sensitive malignancies. Furthermore, many women are reluctant to use hormones due to personal preference or safety concerns. This has led to the emergence of regenerative medicine, specifically platelet rich plasma (PRP) and hyaluronic acid (HA), as effective non-hormonal alternatives. **Objectives:** Investigating the role of PRP injection and HA vaginal ovules in the treatment of post-menopausal vulvovaginal atrophy. **Data Sources:** By searching and reviewing Medline databases (Pub Med and Medscape) for the use of PRP injection and HA vaginal ovules in the treatment of post-menopausal vulvovaginal atrophy till the end of 2025. **Study Selection:** All studies were independently assessed for inclusion. They were included if they fulfilled the following criteria: 1. Published in English language. 2. Published in peer-reviewed journals. 3. Discuss the role of PRP injection and HA vaginal ovules in the treatment of post-menopausal vulvovaginal atrophy. **Data Extraction:** If the studies did not fulfill the inclusion criteria, they were excluded. Study quality assessment included whether ethical approval was gained, eligibility criteria specified, appropriate controls and adequate information and defined assessment measures. Data from each eligible study were independently abstracted using a data collection form to capture information related to our concerned study outcomes. **Conclusions**: This review can conclude that PRP injection and HA formulations represent safe, evidence-based treatments that significantly improve vaginal health and sexual function.

Keywords: Vulvovaginal atrophy, Hyaluronic acid, Platelet rich plasma.

16. Aloe Vera Uses in Dermatology

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Abstract:

Background: Aloe vera (AV) is a widely used in dermatology. Its cactus-like plant belonging to the family Asphodelaceae (formerly Liliaceae) and is well recognized for its therapeutic properties. Its diverse bioactive constituents contribute to its therapeutic role in numerous dermatological conditions, including acne and acne scarring. AV gel has been used to treat several conditions, including burns, wounds, insect stings, and skin inflammation. It exhibits many biological actions such as anti-inflammatory, antiseptic, antimicrobial, antitumor, skin-protective, antidiabetic, antibacterial, and antiviral effects, which contribute to its important role in wound healing. **Objective:** To evaluate the dermatological applications of AV, with particular emphasis on its role in acne scar management. **Discussion:** AV is a multifunctional dermatological agent with significant benefits in both general skin conditions and acne scar management. Its anti-inflammatory, antioxidant, and collagen-stimulating properties make it particularly valuable as an adjunctive therapy. Combination approaches integrating AV with procedural treatments such as microneedling and laser therapy provide superior clinical outcomes compared with monotherapy. **Conclusion:** AV demonstrates significant therapeutic benefits in dermatology and plays an important adjunctive role in acne scar treatment. Its combination with procedural modalities enhances clinical outcomes while maintaining a favorable safety profile.

Keywords: Aloe vera, Dermatology, Acne scars, Wound healing, Skin regeneration.

17. Right Ventricular Speckle Tracking Echocardiography to Predict Short Term Mortality after Acute Pulmonary Embolism

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Abstract:

Background: Acute pulmonary embolism (APE) is a common and potentially lethal disease in clinical practice. Right ventricular (RV) dysfunction is a major predictor of mortality; thus, early recognition of right ventricular dysfunction is an essential step in the management and follow-up of acute pulmonary embolism. Right ventricular structures are best assessed by cardiac magnetic resonance imaging (CMRI) due to its high spatial resolution; however, two dimensional echocardiography (2DE) is still an effective method for detecting right ventricular dysfunction. In clinical practice, two-dimensional echocardiography (2DE) is a portable, low cost, real-time, and non-invasive diagnostic modality that is convenient for the diagnosis and follow-up of patients with acute pulmonary embolism. Recent right ventricular dysfunction investigations now involve myocardial mechanics and strain analyses in different clinical settings. This new modality might supply additional quantitative parameters for the determination of prognosis and management of patients with acute pulmonary embolism. Speckle tracking strain echocardiography is a technique that quantifies myocardial deformation and incorporation of strain imaging parameters is increasingly used in clinical practice. Right ventricle free wall strain (FWS) and electromechanical dispersion (EMD) have been demonstrated to be adverse prognostic factors in pulmonary embolism patients. **Purpose of review:** The aim of our work was to evaluate right ventricular function, using Speckle tracking echocardiography and its ability to predict short-term mortality patients after Acute pulmonary embolism.

Keywords: Right Ventricular, Speckle Tracking Echocardiography, Acute Pulmonary Embolism.

18. Cardiogenic Shock: Contemporary Diagnostic and Imaging Approaches

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Abstract:

Cardiogenic shock (CS) is a life-threatening state of circulatory failure caused by inadequate cardiac output and systemic hypoperfusion. Despite advances in reperfusion therapy, vasoactive support, and mechanical circulatory support, mortality remains high. Because CS arises from diverse ischemic and non-ischemic causes, early identification of the underlying mechanism is essential, and imaging has become central to diagnosis, hemodynamic assessment, and treatment guidance. This narrative review summarizes current evidence on the diagnosis and imaging evaluation of CS based on a structured search of major biomedical databases up to July 2025. The review addresses etiology, pathophysiology, clinical and hemodynamic assessment, and the role of transthoracic echocardiography, transesophageal echocardiography, point-of-care ultrasonography, cardiac computed tomography, cardiac magnetic resonance, and imaging-guided management strategies. CS remains a complex syndrome requiring rapid diagnosis and timely etiologic clarification. Contemporary imaging plays a pivotal role in identifying the cause of shock, detecting structural and mechanical complications, guiding hemodynamic support, and monitoring treatment response. An integrated multimodality imaging approach is therefore fundamental to contemporary CS care and may improve diagnostic accuracy and clinical decision-making.

Keywords: Cardiogenic shock, echocardiography, point-of-care ultrasonography, cardiac imaging, mechanical circulatory support.

19. Role of Cellular Communication Network Factor 3 in knee osteoarthritis

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Abstract:

Background: Knee osteoarthritis is an often-degenerative joint disease influenced by mechanical, metabolic, and inflammatory factors. Cellular Communication Network Factor 3 (CCN3) protein is a matricellular protein, its overexpression suggests cellular senescence & arrest of cell cycle. It has role in numerous key aspects of OA and a potential contributor to OA progression. **Aim:** To summarize key aspects of knee osteoarthritis and highlight the emerging role of CCN3 in its pathogenesis. **Methods:** A narrative review was conducted using published literature on the epidemiology, clinical features, pathogenesis, and treatment of knee OA, along with experimental and clinical studies evaluating CCN3 expression and function. **Conclusion:** Knee OA results from a complex interaction of biomechanical stress, metabolic changes, and inflammatory pathways. CCN3 appears to play a protective role by supporting cartilage matrix production and modulating catabolic activity. Its reduced expression in OA suggests it may serve as a promising biomarker & a possible therapeutic target.

Keywords: Knee osteoarthritis, CCN3, Cartilage degeneration.

20. Endoscopic Medial Maxillectomy for Sinonasal Inverted Papilloma: Evolution Toward Anatomy-Preserving Techniques

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Abstract:

Background: A benign tumor that originates from the Schneiderian mucosa of the nasal cavity and paranasal sinuses is known as a sinonasal inverted papilloma (IP). It demonstrates locally aggressive growth, a tendency for postoperative recurrence, and a recognized potential for malignant transformation in approximately 5–15% of cases. Complete surgical excision with precise identification and removal of the point of tumor attachment is essential for management, especially for lesions in the maxillary sinus. In the past, external approaches were commonly used to ensure sufficient exposure but were linked to significant morbidity. **Objective:** To summarize the evolution of endoscopic medial maxillectomy (EMM) for sinonasal IP, focusing on anatomy-preserving strategies and their clinical outcomes. **Methods:** This narrative review summarizes the evolution of EMM for sinonasal IP, with emphasis on anatomy-preserving modifications designed to maintain nasal physiology while ensuring adequate tumor resection. **Results:** The invention of endoscopic sinus surgery represented a significant advancement in the management of sinonasal IP. Endoscopic medial maxillectomy (EMM) offers a comprehensive approach to the maxillary sinus, enabling total tumor excision while avoiding external incisions. Despite its efficacy, traditional EMM frequently requires resection of the inferior turbinate and nasolacrimal duct, which may result in postoperative morbidities such as epiphora and symptoms of empty nose syndrome. Anatomy-preserving modifications of EMM have been developed, including inferior turbinate sparing, nasolacrimal duct preservation, prelacrimal recess preservation, and extended anterior/inferior approaches, allowing adequate tumor resection with reduced morbidity. **Conclusion:** Anatomy-preserving modifications of EMM allow for effective management of sinonasal IP while preserving nasal physiology and reducing postoperative morbidity.

Keywords: Endoscopic medial maxillectomy, Sinonasal inverted papilloma, Anatomy-preserving surgery, Maxillary sinus, Endoscopic sinus surgery.

Scientific Sessions

Topics of Health & Clinical Science II (Nursing)

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1. Effect of Toolkit Teaching Strategy on Pediatric Nursing Students' Performance and Satisfaction regarding Preterm Infants' Care

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Abstract:

Background: Toolkit teaching strategy is a combination of two or more teaching methods. It is an effective teaching strategy that is used in pediatric nursing education to enhance students' performance and satisfaction. **Aim:** to the evaluate effect of toolkit teaching strategy on pediatric nursing students' performance and satisfaction regarding preterm infants' care. **Design:** An experimental design. **Subject:** A systematic random sample of 230 third year pediatric nursing students studying in first semester of 2024-2025 academic year. **Setting:** The pediatric nursing teaching classroom and the clinical pediatric skills' labs of Faculty of Nursing at Benha University. **Tools: (1)** A pre-designed interviewing questionnaire sheet, **(2)** Observational checklists regarding preterm infants' care, and **(3)** Pediatric nursing students' satisfaction assessment scale. **Results:** The majority and nearly three quarters of the study and control groups of pediatric nursing students had satisfactory knowledge level regarding preterm infant and preterm infants' care post-teaching compared to less than half of them pre-teaching respectively. Less than one third of the study and control groups of nursing students had competent total practices level pre-teaching compared to the majority and more than three quarters of them post-teaching respectively. Less than three quarters of the study group of studied nursing students had high total satisfaction level regarding toolkit teaching strategy post-teaching. **Conclusion:** Toolkit teaching strategy was effective in enhancing pediatric nursing students' performance and satisfaction regarding preterm infants' care. **Recommendations:** Conducting the study in different nursing faculties and institutions on large number of pediatric nursing students for findings' generalization.

Keywords: Pediatric nursing students, Performance, Preterm infants' care, Satisfaction, Toolkit Teaching strategy.

2. Effect of an Educational Program on Mothers' Performance Regarding Care of their Children Undergoing Ptosis Surgery

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Abstract:

Ptosis surgeries are one of the most performed surgeries by the ophthalmic plastic surgeons worldwide. Mothers, as primary caregivers, are essential in ensuring continuity of postoperative care and supporting their children's recovery. This study aimed to evaluate effect of an educational program on mothers' performance concerning care of their children undergoing ptosis surgery. A quasi-experimental research design was conducted in Ophthalmology Clinics of Benha University Hospital which is affiliated to Ministry of Higher Education and Scientific Research. This study was involving a simple random sample of 140 mothers and their children aged three to 18 years undergoing ptosis surgery. A structured interviewing questionnaire was used to collect characteristics of mothers and their children, medical data and mothers' knowledge. Mothers' reported practices and attitude were evaluated via a validated interview questionnaire sheet. The findings revealed that, an educational program achieved research hypothesis, which improved performance of mothers. A highly statistically significant positive correlation was found between total knowledge level, total reported practice level, and total attitude level among the studied mothers pre and post educational program and at follow-up. These findings indicate that an educational program may contribute to enhancing mothers' performance.

Keywords: Children, Educational Program, Mothers' Performance, Ptosis Surgery.

3. Academic Self-Efficacy Level among Pediatric Nursing Students Engaged in Problem-Based Learning: Descriptive Study

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Abstract:

Academic self-efficacy is an important psychological factor that influences students' motivation, learning performance, and academic achievement in nursing education. Problem-Based Learning (PBL) is an active learning strategy that enhances students' critical thinking, problem-solving abilities, independence, and confidence in managing real clinical situations. This study aimed to assess the academic self-efficacy of pediatric nursing students engaged in Problem-Based Learning. A descriptive research design was utilized. The study was conducted at the Pediatric Nursing Department, Faculty of Nursing, Benha University. A purposive sample of 50 third-year pediatric nursing students. Data were collected using two tools: A structured interviewing questionnaire to assess students' knowledge regarding PBL and an academic self-efficacy scale to evaluate students' confidence in their academic performance. The findings revealed that more than half of the students demonstrated correct knowledge regarding the main aspects of PBL, achieving moderate to high mean knowledge scores in pediatric nursing content. Additionally, more than two-thirds of the students reported a high level of academic self-efficacy. A strong positive correlation was found between the total knowledge scores and academic self-efficacy levels among the students ($r = 0.968$, $P \leq 0.001$). Students' knowledge of PBL significantly contributes to their academic self-efficacy. Integrating structured PBL strategies within nursing curricula is essential to enhance knowledge acquisition, self-confidence, and clinical performance.

Keywords: Nursing education, Self-efficacy, Active learning, Student confidence, Pediatric nursing.

4. Stress level and Practices among Mothers Caring for Children with Juvenile Idiopathic Arthritis: An assessment study

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Abstract:

Juvenile Idiopathic Arthritis represents the most prevalent long-term rheumatological disorder among children and adolescents, identified by enduring joint inflammation, pain, and stiffness that interfere with growth, daily activities, and social development. The prolonged course of the disease, frequent hospital visits, and continuous caregiving responsibilities place mothers under sustained emotional and physical strain, making maternal stress a critical concern in pediatric rheumatic healthcare. This study aimed to assess stress levels and practices among mothers caring for children with Juvenile Idiopathic Arthritis. A descriptive research design was utilized a purposive sample of fifty mothers was recruited from the rheumatology outpatient clinic at Benha Specialized Pediatric Hospital. Information was gathered through using three tools: a structured survey to assess mothers' and children's characteristics and medical history, a mothers' stress scale, and a Mothers' Reported Practices. The findings demonstrated that 60% of the sampled mothers had high total levels of stress, while 70% of them showed inadequate total levels of reported practices. There was a highly statistically significant negative correlation between mothers' total stress scores and total reported practices scores. These outcomes emphasize the importance of delivering psychological and educational support for mothers having children with Juvenile Idiopathic Arthritis. Training pediatric nurses to offer counseling sessions and stress management strategies may help mothers improve coping abilities and enhance practices.

Keywords: Children, Juvenile Idiopathic Arthritis, Mothers, Stress level.

5. Effect of Competency Based Program for Nurses on Health Outcomes of Patients with Accidental Chest Trauma

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Abstract:

Background: Chest trauma is acritical condition requiring prompt intervention to prevent life -threating complication. Nurses play a pivotal role in the early identification and management of such cases, necessitating high clinical competency to improve patient survival and health outcomes. **Aim:** To evaluate the effect of a competency-based program for nurses on health outcomes of patients with accidental chest trauma. **Design:** A quasi-experimental research design was used to do the research. **Setting**: The study was done in the emergency ICU and cardiothoracic ICU at Banha University Hospital. **Subjects**: A convenience sample of all available nurses (50 nurses) working in the previously mentioned settings and purposive sample of 50 patients were included. **Tools:** Four tools were used for data collection 1- Assessment of nurses' knowledge questionnaire, 2- Nurses attitude Likert scale, 3- Nurses' observational checklist, 4- The patients' health outcomes assessment**. Results:** A statistically significant enhancement was observed in nurses' knowledge, practice, attitude, and patients' outcomes. Before program implementation, 32.0%, 24.0%, and 46.0% of the studied nurses had satisfactory knowledge, positive attitudes, and competent practice levels, respectively. After program implementation, these findings significantly improved to 82.0%, 94.0%, and 88.0%. Furthermore, patients' health outcomes showed significant improvement in respiratory rates (from 48.0% to 84.0%) and PaO2 levels (from 68.94 to 80.70) respectively. **Conclusion:** Implementing competency-based program for accidental chest trauma patients had improved nurses' knowledge, practice and significantly enhanced patient health outcomes. **Recommendations:** Establish chest trauma management protocol and guidelines for emergency nurses.

Keywords: Accidental chest trauma, Competency based program, Health outcomes.

6. Nurses' Knowledge and Attitude Toward Caring for Patients with Accidental Chest Trauma

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Abstract:

Background: Chest trauma continues to be a frequently encountered condition in emergency department among injured patients. Nurses play an essential role in managing these cases, from initial presentation in emergency department to subsequent follow-up care in the trauma clinic. **Aim**: To assess nurses' knowledge and attitudes concerning the management of cases with accidental chest trauma. **Design:** This study was done by a descriptive associational research design Setting: The study was done in the emergency ICU and cardiothoracic ICU at Banha University Hospitals. **Subjects**: A sample comprising all available nurses (n = 50) working in the previously mentioned settings. **Tools**: two instruments were utilized for data collection: (1) A self-administered knowledge questionnaire to assess nurses' theoretical knowledge regarding accidental chest trauma and (2) the nurses' attitude Likert scale to measure their attitudes toward caring for these patients. **Results:** Overall, 68.0% & 76.0% of the participating nurses exhibited inadequate knowledge and unfavorable attitudes, respectively, toward the care of patients with chest trauma. **Conclusion**: positive relationship was found between knowledge & attitude of the nurses toward caring for accidental chest trauma patients. **Recommendations:** Providing regular on-the-job training programs for emergency nurses on the treatment of cases with chest trauma.

Keywords: Accidental Chest Trauma and Nurses' knowledge, Attitude.

7. Critical Care Nurses' Awareness and Perception Toward Utilizing Artificial Intelligence

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Abstract:

Background: Artificial intelligence plays an expanding position in modern healthcare, especially within critical care environments that require timely clinical judgments and ongoing patient surveillance. However, nurses' awareness and perception toward AI utilization remain key factors influencing successful adoption. **Aim:** this study sought to evaluate the leve1 of awareness and views of crucial care nurses regarding the utilization of AI in health care practice. **Design:** Research employing a descriptive design was done in this work. **Setting:** the research was performed in (ICU), emergency care unit and cardiac care unit at Benha University Hospital, Qalyubia Governorate, Egypt. A convenience sample of all available critical care nurses (n = 186) was included in the study. **Tools:** 3 instruments were utilized within this research: Tool I Self-administered feedback form assessing nurses' personal data and knowledge about AI, Tool II: Attitudes toward AI, Tool III: Perception toward AI utilization**. Results** The findings indicated that 72.6% of the nurses had a suboptimal understanding of AI application in healthcare, while 62.9% demonstrated a positive attitude toward its utilization, and 40.9% & 39.8% of studied nurses exhibited high & perception at a moderate degree toward AI respectively **Conclusion:** Lower than three quarter of the nurses studied demonstrated insufficient information about the utilization of artificial intelligence, while fewer than two thirds exhibited a positive attitude toward its us. With respect to perception, fewer than ha1f of the studied nurses showed a high leve1 of perception. **Recommendations:** It is recommended to organize in service training programs aimed at strengthening critical care nurses' problem-solving abilities and enhancing their practical Integration of AI technologies.

Keywords: Critical Care Nurses, Awareness, and Perception, Artificial Intelligence.

8. Effect of Hoffman's Exercise on Breastfeeding Level among Primiparous Women with Flat and Inverted Nipples

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Abstract:

Flat and inverted nipples are common conditions that may negatively affect breastfeeding effectiveness and maternal satisfaction. Hoffman's exercise is a simple, non-invasive technique used to improve nipple protrusion and breastfeeding outcomes. This study aimed to evaluate the effect of Hoffman's exercise on breastfeeding level among primiparous women with flat and inverted nipples. A quasi-experimental research design was conducted at the Obstetrics and Gynecology Outpatient Clinics at Benha University Hospital. A purposive sample of 76 primiparous women was selected and allocated into two equal groups (38 women each). Four tools were used for data collection: a structured interview questionnaire, the Nipple Type and Inversion Grade Assessment Tool, the LATCH Breastfeeding Assessment Tool (LATCH), and the Maternal Breastfeeding Evaluation Scale (MBFES). The results revealed that, after implementing the intervention, the study group demonstrated significantly improved breastfeeding levels and higher maternal satisfaction compared to the control group ($p < 0.001$). A significant positive correlation was found between total breastfeeding level and maternal satisfaction ($p < 0.001$). The findings of the present study indicated that Hoffman's exercise significantly improved breastfeeding levels and increased maternal satisfaction among mothers with flat or inverted nipples during the postpartum period. Integrating Hoffman's exercise into routine maternity nursing care is recommended.

Keywords: Breastfeeding effectiveness, maternal satisfaction, nipple protrusion, nursing intervention, postpartum women.

9. Maternal and Fetal Outcomes of Teenage Pregnancy at Benha University Hospital

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Abstract:

Background: Teenage pregnancy is a significant public health concern that is strongly associated with adverse maternal and fetal health outcomes. **Aim:** To assess the maternal and fetal outcomes of teenage pregnancy at Benha University Hospital. **Research Design:** A descriptive study design was employed to achieve the aim of the study. **Setting:** The study was conducted in the postpartum ward of the Obstetrics and Gynecology Department at Benha University Hospital. **Sample:** A purposive sample of 126 teenage mothers was selected for the study. **Data Collection:** Data were collected using two tools: **Tool I:** A structured interviewing questionnaire. **Tool II:** Assessment of Maternal and Fetal Outcomes during child birth and immediate postpartum. **Results:** Less than half (46.0%) of the studied teenagers were in the age group of 18- <19 years old with mean age of 17.81±0.76 years old. The majority (84.1%) of the studied teenagers delivered by Cesarean section, more than one third (35.7%) of them suffered from adverse events during the child birth, nearly one third (31.7%) and less than one fifth (19.0%) of them had premature baby and signs of fetal distress; more than one fifth (22.2%) of the studied teenagers had abnormal vital signs during puerperium, while, more than half (55.6%) of them reported delayed mobilization, additionally more than one tenth (13.5%) of them had postpartum hemorrhage. **Conclusion:** The majority delivered via cesarean section. Over one-third experienced adverse effects during childbirth, while a small proportion had premature infants and signs of fetal distress. Additionally, more than one-fifth exhibited abnormal vital signs during the puerperium, and over half reported delayed mobilization. Furthermore, more than one-tenth experienced postpartum hemorrhage. **Recommendation:** Design and implement preventive strategies and comprehensive pre-natal care tailored to the needs of teenage pregnancies.

Keywards: Maternal and Fetal Outcomes, Teenage pregnancy.

10. Burden of Care among Mothers Regarding their Children with Cerebral Shunt

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Abstract:

Mothers' burden represents a complex response involving physical, emotional, social, psychological factors, and financial stressors related to the caregiving practice for their children with cerebral shunt. This study aimed to assess the burden of care among mothers regarding their children with cerebral shunt using a descriptive research design. The research was performed at the Surgical Neurology Outpatient Clinic in Benha University Hospital on a purposive sample of fifty mothers having children with cerebral shunt who attended for treatment and follow-up after surgery. Data were collected using a structured interviewing questionnaire to assess mothers' sociodemographic characteristics, children's personal and medical data, mothers' knowledge and care practices, alongside the Zarit Burden Interview scale to evaluate physical, psychological, social, emotional, and financial burdens. Results showed that fifty-two percent of the studied mothers had poor total knowledge regarding cerebral shunts, and fifty-six percent reported inadequate care practices. Furthermore, forty-two percent of mothers experienced a severe level of burden, while thirty-eight percent faced a moderate to severe burden. A highly significant statistical correlation was found between the mothers' total burden and their total knowledge and practice scores. The study concludes that more than two-fifths of mothers suffer from a severe burden of care, which is closely linked to their lack of knowledge and improper care practices. Therefore, it is recommended to implement educational programs and support groups for these mothers to enhance their caregiving skills and alleviate their psychological and social distress.

Keywords: Caregiving stress, Ventriculoperitoneal Shunt, Maternal health, Zarit scale.

11. Relation Between Motivation, Empowerment and Negative Symptoms Among Patients with Schizophrenia in Benha Psychiatric Hospital

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Abstract:

Background: Schizophrenia is frequently associated with significant distress and impairment in personal, family, social, educational, occupational, and other important areas of life. Schizophrenia and lack of motivation affect on patient empowerment leading to negative affect in mental functioning and interfere with daily functioning. **Aim:** This study aimed to assess relationship between motivation, empowerment and negative symptoms among patients with schizophrenia in Benha Psychiatric hospital. **Design:** A descriptive correlational study design was used in this study. **Setting:** The study was conducted at Benha psychiatric and Mental Health and Addiction treatment hospital in Benha City, Qalyubia governorate, Egypt. **Subjects:** A convenient sample of (100) patients with schizophrenia were included in the study. **Tools:** four tools were utilized in this study **Tool (1)** A Structured Interview Questionnaire that consisted of two parts, part one socio-demographic date, part two included clinical date of studied patients. **Tool** (**2)** Motivation and Pleasure Scale–Self-Report. **Tool** (**3)** Empowerment Scale. **Tool (4)** Scale for assessment of negative symptoms. **Results:** The present study revealed that less than one quarter of studied the patients with schizophrenia had a high level of total motivation and pleasure, less than half of the studied patients with schizophrenia had a high level of total empowerment and more than one third of the patient had a high level negative symptoms. **Conclusion:** The present study findings, concluded that there was a highly statistically significant negative correlation between' total motivation, empowerment and negative symptoms among studied patients. When the motivation and empowerment increase the negative symptoms decrease among studied patients with schizophrenia. **Recommendation:** Advocating for increased training for healthcare professionals on identifying and addressing the psychological effects of negative symptoms of schizophrenia, to enhance strategies that increase motivation and empowerment.

Keywords: Schizophrenia, Motivation, Empowerment, Negative Symptoms.

12. The Relation between Decision Making Involvement and Work Flourishing among Nurses

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Abstract:

Background: Decision making involvement establish the expectation for nurses participation and the acceptance of personal accountability and improve work flourishing among nurses**. Aim:** To assess the relation between decision making involvement and work flourishing among nurses. **Design:** A descriptive correlational research study design implemented to achieve the aim of the study**. Setting:** The study was carried out in all inpatient units at medical and surgical departments at Benha University Hospital. **Sample:** A simple random sample of 248 staff nurses out off (653), who are working in the above-mentioned study setting. **Tools of data collection:** Two tools were used tool I: Nurses Decision making Involvement Questionnaire and tool II: Work Flourishing Questionnaire. **Results:** The study result revealed that, more than half (55.6%) of studied nurses had high level of decision-making involvement, more than three quarters (75.8%) of studied nurses had high level of work flourishing. **Conclusion**: there was a highly statistically significant positive correlation between total decision-making involvement and total work flourishing among studied nurses. **Recommendations**: Implementing training programs, and policies that promote decision making involvement among nurse. Identify strategies that increase work flourishing and nurses' engagement at work.

Keywords: Decision-making involvement, Nurses, Work flourishing

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1. H. pylori Urease Inhibition Using Bimetallic Nanoparticles

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Abstract:

Nearly half of the world's population is infected with Helicobacter pylori, which is linked to gastric cancer and peptic ulcer disease. The International Agency for Research on Cancer has designated it as a Group I carcinogen. Multidrug-resistant strains have emerged as antibiotic resistance has increased, primarily because of genetic changes that alter antibiotic targets or obstruct drug activation within bacterial cells. Alternative antimicrobial approaches are therefore desperately needed. Recently, nanoparticles have drawn interest as a potentially effective strategy for treating bacterial infections that are resistant to many drugs. A green synthesis technique was used to create bimetallic silver–zinc oxide nanoparticles (Ag–ZnO NPs). Transmission electron microscopy (TEM), X-ray diffraction (XRD), and UV-visible spectroscopy were used to analyze the produced nanocomposites. Additionally, a clinical isolate of H. pylori was subjected to a urease inhibition assay and antibacterial activity using the agar well method to assess the possible inhibitory of the produced nanoparticles against the urease enzyme. The Ag–ZnO nanocomposite's production was verified by UV–Vis. spectroscopy. Spheroidal and somewhat monodispersed nanoparticles with diameters ranging from 44.5 to 90.34 nm were found by TEM investigation. It was determined that the average particle diameter was 55.5 ± 1.5 nm. Additionally, the produced nanoparticles showed inhibitory efficacy against the clinical H. pylori isolate's urease enzyme. The obtained data imply that green-synthesized Ag–ZnO bimetallic NPs offer remarkable anti-urease activity.

Keywords: Helicobacter pylori, Ag–ZnO nanoparticles, antibacterial activity.

2. Nano-vanillin as a Multifunctional Bioactive Nanomaterial: Enhanced Antioxidant, Antimicrobial, and Anti-biofilm Efficacy with Controlled Cytotoxicity

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Abstract:

Vanillin is a naturally occurring phenolic compound with antioxidant and antimicrobial properties. Nano-encapsulation can enhance its bioactivity and stability. Objective: To synthesize and characterize nano-vanillin and evaluate its antioxidant, antimicrobial, anti-biofilm, and cytotoxic activities. Methods: Nano-vanillin was prepared using a green nanoprecipitation method with PLGA and PVA. Particle size, PDI, zeta potential, and encapsulation efficiency were assessed. Antioxidant activity was determined via DPPH and ABTS assays. MIC, MBC/MFC, and biofilm inhibition were evaluated against E. coli, S. aureus, P. aeruginosa, and C. albicans. Cytotoxicity on HepG2 cells was assessed using MTT assay. Statistical analyses included ANOVA, post-hoc Tukey test, and effect size calculations. Results: Nano-vanillin particles were spherical (~98 nm) with a zeta potential of -28.6 mV and 91.5% encapsulation efficiency. It exhibited dose-dependent antioxidant activity (IC50: DPPH 18.7 µg/mL; ABTS 21.3 µg/mL) and potent antimicrobial effects (MIC: 40–70 µg/mL) with strong biofilm inhibition (>80%). Cytotoxicity was moderate (IC50: 32.4 µg/mL). Statistical analyses confirmed significant differences across concentrations and microbial strains.

Conclusion: Nano-vanillin is a multifunctional bioactive nanomaterial with enhanced antioxidant, antimicrobial, and anti-biofilm activities and a favorable safety profile, highlighting its potential for biomedical and nutraceutical applications.

Keywords: Nano-vanillin, antioxidant, antimicrobial, biofilm inhibition, HepG2 cytotoxicity, nanoprecipitation.

3. Nano-Vanillin as a Multifunctional Bioactive Nanomaterial: Anti-Metastatic, Antioxidant, and Antimicrobial Effects via Multi-Target Network Modulation

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Abstract:

Metastasis is the primary cause of cancer mortality, driven by epithelial-mesenchymal transition (EMT), extracellular matrix degradation, and angiogenesis. Natural phenolic compounds like vanillin exhibit anti-cancer properties but are limited by poor solubility and bioavailability. Nano-formulation offers a strategy to enhance therapeutic efficacy. Objective: This study aimed to examine the anti-metastatic potential of nano-vanillin, integrating experimental validation and network pharmacology analysis to elucidate its multi-target mechanisms. Methods: Nano-vanillin was synthesized via nanoprecipitation and characterized for particle size, zeta potential, and encapsulation efficiency. EMT and metastasis-related gene and protein expression (E-cadherin, N-cadherin, MMP-2, MMP-9) were assessed in cancer cells using qPCR and Western blot. Predicted molecular targets and signaling pathways were analyzed via TCMSP, STITCH, DAVID, KEGG, and STRING for network pharmacology and protein-protein interaction (PPI) analysis. Results: Nano-vanillin upregulated E-cadherin and downregulated N-cadherin and MMPs in a dose-dependent manner at both mRNA and protein levels. Network pharmacology identified AKT1, MMP9, VEGFA, EGFR, and PIK3CA as key targets, enriched in PI3K-Akt, ECM-receptor, VEGF, TGF-β, and focal adhesion pathways. PPI analysis highlighted AKT1 and MMP9 as central hub proteins. Conclusion: Nano-vanillin exerts multifunctional anti-metastatic activity through EMT modulation and multi-target pathway regulation, offering a promising natural nanotherapeutic candidate for metastasis suppression.

Keywords: Nano-vanillin, Anti-metastasis, EMT, Network pharmacology, MMPs, AKT1, Cancer therapy.

4. Bacterial Arginase Dynamics as a Metabolic Strange Attractor in Renal Homeostasis

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Abstract:

Bacterial ureohydrolase arginase catalyzes L-arginine hydrolysis, intersecting with host nitric oxide and nitrogen metabolism. Its role in kidney physiology, particularly regarding cellular stress, gene regulation, and oxidative balance, remains poorly understood. This study investigated the dose-dependent effects of bacterial arginase on renal epithelial cells, evaluated its enzymatic efficiency, and explored structural determinants that may enhance bioavailability. A panel of 320 bacterial isolates was screened for ureohydrolase arginase activity. Human renal epithelial cells were exposed to low and high enzyme concentrations under basal and stress conditions. Cellular viability, reactive oxygen species (ROS), nitric oxide (NO) levels, and expression of key genes (Bax, Bcl-2, Cyclin D1, p53) were assessed using MTT and qPCR assays. Computational modeling was performed to predict enzyme stability, substrate affinity, and active-site flexibility. Data were analyzed using multivariate statistics to establish correlations between enzymatic activity and cellular outcomes. Arginase exhibited variable activity across isolates, with moderate levels restoring cell viability and oxidative balance under stress while higher levels induced cytotoxicity. Gene expression analysis revealed downregulation of pro-apoptotic genes and normalization of proliferation markers at optimal enzyme doses. Computational analysis indicated strong substrate binding and moderate structural stability. Integrated modeling suggested arginase activity as a key predictor of renal cell homeostasis. Bacterial arginase acts as a dose-dependent metabolic modulator, potentially functioning as a “strange attractor” in renal homeostasis, with implications for therapeutic strategies targeting microbial enzyme regulation.

Keywords: Bacterial arginase, Qpcr, renal cell homeostasis.

5. Beyond Nitrogen Metabolism: Functional and Regulatory Dimensions of Bacterial Ureohydrolase Arginase in Renal Systems

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Abstract:

Bacterial ureohydrolase arginase is a key enzyme in nitrogen metabolism with emerging implications in host–microbe interactions. Its ability to compete with nitric oxide synthase for L-arginine suggests a potential role in modulating renal physiological processes. This study aimed to investigate the presence of arginase-producing bacteria, optimize enzyme production conditions, and evaluate its physiological and regulatory effects in renal systems using integrated in vitro and computational approaches. A total of 320 bacterial isolates were screened for arginase activity using a colorimetric assay. Enzyme production was optimized under varying pH, temperature, and substrate conditions. Kinetic parameters were determined using nonlinear modeling. Physiological effects were assessed by measuring nitric oxide, urea, and oxidative stress markers. Human renal epithelial cells were used to evaluate cellular responses, including viability and inflammatory signaling. Multivariate statistical analyses were performed to identify key determinants. Approximately 65.7% of isolates exhibited measurable arginase activity, with optimal performance at pH 8.0 and 37°C. Kinetic analysis revealed moderate substrate affinity and high catalytic efficiency. Arginase activity significantly reduced nitric oxide levels while increasing urea production and oxidative stress. In cell models, enzyme exposure decreased viability and upregulated inflammatory cytokines. Multivariate analysis confirmed arginase activity as the primary predictor of physiological disruption. Bacterial arginase demonstrates significant metabolic and regulatory effects in renal contexts, highlighting its potential role in host–microbe interactions and as a target for future therapeutic investigation.

Keywords: Bacterial arginase, Qpcr, renal cell homeostasis**.**

6. Bacterial Production of Collagen Nanoparticles and Their Antimicrobial

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Abstract:

Marine ecosystems, particularly the Red Sea, offer a vast reservoir of microbial diversity with significant biotechnological potential. This study investigated the biogenic synthesis of collagen nanoparticles (NPs) using bacterial isolates recovered from marine sponges (SPONG 1 and SPONG 2) collected from the Hurghada coast, Egypt. Fifteen distinct bacterial strains were isolated, with isolate Nagh1 identified as the most potent candidate for collagen-NP biosynthesis based on significant turbidity and color transitions. Collagen was successfully extracted from fish cartilage and scales through a systematic acid-solubilization and demineralization process, serving as the biological precursor for nanoparticle formation. Transmission Electron Microscopy (TEM) analysis of the synthesized collagen-NPs revealed predominantly spherical structures ranging from 20 to 100 nm, characterized by electron-dense clustering attributed to natural bacterial capping agents. Antibacterial assays demonstrated that the transformation into a nano-formulation significantly amplified the antimicrobial efficacy of the Nagh1 metabolites. Specifically, inhibition percentages against Escherichia coli surged from 35.10% (crude extract) to 73.10% (collagen-NPs), while Staphylococcus aureus showed an increase to 47.33%. These results indicate that biogenic collagen-NPs possess robust structural integrity and potent antibacterial properties, positioning them as promising, biocompatible alternatives for biomedical applications and synergistic antibiotic therapies.

Keywords: Collagen nanoparticles, Marine sponge bacteria, Biogenic synthesis, Antibacterial activity, Red Sea microbiota.

7. Preparation of Collagen Nanoparticles by Bacteria with Antioxidant

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Abstract:

The increasing demand for biocompatible and sustainable nanomaterials has directed research toward the intersection of "blue" biotechnology and green synthesis. This study explores the isolation of specialized microbial populations from soil samples in Benha, Egypt, and their application in the biosynthesis of collagen nanoparticles (NPs) derived from fish processing byproducts. Nine distinct bacterial strains (Nagh16–Nagh24) were isolated from high-salinity terrestrial environments, with isolate Nagh17 demonstrating the most robust biosynthetic potential, characterized by significant turbidity (+++) and opalescent color transitions (++) during screening. Type I collagen was successfully extracted from fish cartilage and scales obtained from Obour Market, Cairo, using a stabilized acid-soluble extraction method that preserved its native triple-helix structure. Transmission Electron Microscopy (TEM) of the synthesized Nagh17-collagen-NPs revealed well-defined, spherical nanostructures with diameters ranging from 10 nm to 60 nm. These nanoparticles exhibited a superior antioxidant profile, achieving a DPPH radical scavenging activity of 65.02%, which significantly outperformed the standard ascorbic acid (55.12%). The results suggest that the integration of microbial metabolites during synthesis acts as a natural capping mechanism, enhancing both the stability and the biological functionality of the nanoparticles. This study positions biogenic collagen-NPs as high-potential candidates for advanced biomedical applications, particularly in oxidative stress management and tissue engineering.

Keywords: Collagen nanoparticles, soil bacteria, Biogenic synthesis, Antioxidant activity, Red Sea microbiota.

8. Isolation of Soil Bacteria and Their Antibacterial Activity

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Abstract:

This study focused on the isolation, characterization, and antimicrobial evaluation of bacterial strains recovered from the National Research Centre (NRC) garden soil in Egypt. Using serial dilution and spread plate techniques, 18 distinct bacterial isolates were successfully obtained. Morphological and Gram-staining characterization revealed a diverse microbial community, with 76% of the isolates identified as Gram-positive and 24% as Gram-negative. The antimicrobial potential of these isolates was evaluated against Staphylococcus aureus, Escherichia coli, and Candida spp. using MTP inhibition assay. Results demonstrated significant antagonistic activity, with Isolate E4 emerging as a highly potent broad-spectrum candidate, achieving inhibition rates of 93%, 92%, and 91% against the respective pathogens. Other high-performing isolates included A10, A12, and A6, which consistently maintained inhibition levels above 80%. Conversely, certain strains like A8 exhibited specialized antifungal activity (85%) with lower antibacterial efficacy (42%). These findings underscore the biotechnological value of soil-derived microorganisms from botanical environments as a robust source for novel bioactive metabolites and secondary compounds to combat multi-drug-resistant pathogens.

Keywords: Soil bacteria, Antimicrobial activity, Gram-positive and Gram-negative bacteria, Bioactive metabolites, Multidrug-resistant pathogens.

9. Bacterial Isolation from Air and Water with Antibacterial Evaluation

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Abstract:

The escalating prevalence of multidrug-resistant (MDR) pathogens necessitates the bioprospecting of diverse ecological niches for novel antimicrobial scaffolds. This study focused on the isolation and characterization of bacterial communities from two distinct Egyptian environments: the marine waters of Hurghada (Red Sea) and the atmospheric boundary layer of the National Research Centre (NRC) gardens. A total of 36 pure colonies were recovered, with marine isolates demonstrating remarkable resilience, including strain C2 recovered at 10^{10} dilution. Phenotypic characterization revealed a predominance of Gram-positive taxa (67%), predominantly of the Bacillus and Actinobacteria groups, alongside specialized pigmented strains (C4 and C6) adapted to high ultraviolet (UV) exposure. Antimicrobial screening against Staphylococcus aureus, Escherichia coli, and Candida albicans identified several potent candidates. Marine isolate D3 emerged as a master antagonist, exhibiting broad-spectrum efficacy with inhibition rates of 85%, 77%, and 86%, respectively. Air-borne isolates C4 and C3 also displayed significant potency, particularly against E. coli and C. albicans. These results underscore the potential of Red Sea and atmospheric microbiota as prolific sources of bioactive secondary metabolites. The structural and metabolic diversity of these isolates provides a critical biological foundation for future applications in green nanotechnology and the development of biogenic antimicrobial agents.

Keywords: Air and water bacteria, Antimicrobial activity, Gram-positive and Gram-negative bacteria, Bioactive metabolites, Multidrug-resistant pathogens.

10. Detection of fungi associated with white and yellow Corn grains (Zea mays L.)

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Abstract:

Maize (*Zea maize* L.) is one of the oldest human cultivated crops. This study aimed to focus on two cereals crop yellow and white corn grains for testing of seed health, analyze all fungal flora association, frequencies occurred and focusing on the mycotoxigenic fungi for ability of these genera to make mycotoxin. Results presented that, examination of yellow and white maize showing that, infection caused abnormalities in seed coat color, decreasing in seed size and abnormal seed shape. Fungal infection and insect infestation of corn grains were found to decrease the percentage of weight compared to the normal grains. Isolation of mycoflora association yielded 237 fungal isolates by 2 standard methods namely Blotter test and PDA medium). Five fungal genera were isolated and identified from tested yellow corn grain samples. These are, *Aspergillus flavus, A. parasiticus, A. niger, Fusarium verticillioides* (Sacc.) & Rhizopus nigricans. Whereas, only four fungal genera were isolated from tested white corn grains namely *Aspergillus flavus, A. parasiticus, A. niger*, and *Fusarium verticillioides* (Sacc.). Tested of mycotoxin production indicated that, only three isolates of *Fusarium verticillioides* (Sacc.) were found to produce Fumonisin FB1. Fusarium verticillioides (Sacc.) isolate No.7 was found to produce 137 ng/g of Fumonisin (FB1), isolate No.8 gave 10.97 ng/g of Fumonisin (FB1) which isolated from white corn grains. Whereas, isolate No.4 from yellow corn grains was found to produce 1o.3 ng/g of Fumonisin (FB1).

Keywords: Corn Grains (Zea maize L.), Seed Health, Deterioration, Fungi, Mycotoxin.

11. Selective Antibacterial Activity and In Silico ADME/Toxicity Profiling of Activated Biochar Derived from Water Hyacinth as a Sustainable Antimicrobial Agent

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Abstract:

The global rise of multidrug-resistant bacteria underscores the need for sustainable and environmentally benign antimicrobial alternatives. Biochar offers promise in this regard, yet the link between its physical structure and antimicrobial function remains poorly defined. This study evaluates the antibacterial, antibiofilm, and pharmacokinetic properties of water Hyacinth (WH)-activated biochar using in vitro assays and in silico prediction tools. Under scanning electron microscopy (SEM) coupled with EDX analysis, WH-activated biochar displayed a surface morphology that is uneven and diverse with high roughness, powerful porosity and a high oxygen content along with several mineral elements. Transmission Electron Microscopy (TEM) revealed thin, sheet-like layers with disordered edges, indicative of high surface reactivity. Functionally, the WH-activated biochar exhibited strong inhibition against Listeria monocytogenes (84.22%), moderate activity against Acinetobacter sp. (59.98%), while displaying limited or no activity against most Gram-negative strains and Candida albicans. Biofilm inhibition analysis showed modest suppression against Bacillus subtilis (32.25%) and Staphylococcus aureus (20.02%), with no detectable activity against Escherichia coli or Pseudomonas aeruginosa. In silico ADME/Toxicity modeling indicated high solubility, Lipinski compliance, moderate intestinal absorption, low permeability of the blood–brain barrier, minimal CYP inhibition, rapid clearance, and low predicted cardiotoxicity. Overall, WH-activated biochar demonstrates selective Gram-positive antibacterial activity, modest antibiofilm potential, and a favorable preliminary safety profile, supporting its suitability as a lead candidate for further optimization.

Keywords: Water Hyacinth activated biochar, Antibacterial activity, Biofilm inhibition, ADME prediction, physicochemical properties.

12. Detection and Identification of Mycoflora Associated with some Popular Rice Grains (Oryza sativa L.) in Egypt

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Abstract:

As a primary global dietary staple, rice (Oryza sativa) is critical to international nutritional security; however, the pervasive threat of grain contamination by toxigenic fungi remains a formidable obstacle to food safety. This study sought to isolate and characterize the mycotoxigenic mycoflora associated with seven rice seed varieties—including Basmati, Giza 104, Sakha 178, and Ballady cultivars—sourced from the Gharbia Governorate to evaluate fungal proliferation risks. Using a comparative diagnostic approach, A total of 799 fungal isolates were obtained using both agar plate and blotter test methods, followed by surface disinfection trials using 1% sodium hypochlorite to determine inoculum localization. High-performance liquid chromatography (HPLC) was then utilized to assess the mycotoxin production capacity of the predominant species. Results revealed that the agar plate method demonstrated superior recovery efficiency, yielding 571 isolates (71.46%) compared to the 228 isolates from the blotter test. Furthermore, surface disinfection significantly mitigated infection rates, indicating that contaminants are primarily localized on the seed exterior. The most frequently identified taxa included Alternaria alternata, Aspergillus flavus, Aspergillus parasiticus, Fusarium spp., Nigrospora spp., Penicillium spp., and Rhizopus oryzae, with Aspergillus species being the dominant genus. HPLC analysis confirmed Aflatoxin B_1 (AFB_1) production in two Aspergillus flavus isolates; strain H6S2 synthesized 34.375 µg/kg, while strain H7 N1 produced 0.088 µg/kg. These findings underscore the role of surface sterilization in reducing fungal loads and highlight the necessity of rigorous HPLC screening to prevent potent aflatoxins from entering the food supply chain, ensuring the safety of diverse rice cultivars.

Keywords: Oryza sativa, Mycotoxigenic fungi, Aflatoxin B_1, Aspergillus flavus.

13. Effects of Chemical Synthesized Silver Nanoparticles and X-Ray Radiation on Some Probiotics Bacteria

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Abstract:

The combination of vegetable probiotics, prebiotics, and the nutritional value of functional foods can result in several potential advantages for symbiotic vegetables. This study aimed to determine effects of chemical synthesized silver nanoparticles and of X-ray radiation on some probiotics bacteria. Probiotic bacterial isolates were successfully identified using MALDI-TOF MS, demonstrating the reliability and rapidity of this technique for accurate microbial identification at the species level. A diverse group of lactic acid bacteria, predominantly belonging to *Lactobacillus*, *Lacticaseibacillus*, *Levilactobacillus*, and *Enterococcus genera*, were identified, confirming their relevance as probiotic strains. Silver, nanoparticles were successfully synthesized using chemical reduction method, and their formation was confirmed through TEM and EDS, analyses, which verified their nanoscale size, elemental composition, and functional groups. The exposure of probiotic bacterial cells to varying concentrations of AgNPs (0.1 to 1.0%), revealed that nanoparticles can influence probiotic growth in a concentration-dependent manner. Additionally, doses of X-ray irradiation 0.1 - 2.0 kGy for 10 min exhibited a dose-dependent effect on probiotic bacterial growth, with increasing radiation levels leading to reduced bacterial viability. Overall, the findings emphasize the need for balanced application of nanoparticles and irradiation technologies to ensure microbial safety without compromising beneficial probiotic populations. These results provide valuable insights for future research aimed at developing safe nanotechnology-based and irradiation-assisted strategies in food and health-related industries.

Keywords: Probiotics, MALDI-TOF MS, AgNPs, X-ray irradiation, TEM and ED

14. Engineering Zwitterionic Copper Oxide Nanoparticles to Enhance Selective Cytotoxicity Against Triple-Negative Breast Cancer

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Abstract:

Triple-negative breast cancer (TNBC) is an aggressive breast cancer subtype lacking hormone receptors and HER2 expression, limiting targeted therapeutic options. Engineering nanoparticle surfaces to improve tumor selectivity while preserving redox-mediated cytotoxicity remains a key challenge in nanomedicine. Objective: This study aimed to develop sulfobetaine methacrylate (SBMA)-functionalized copper oxide nanoparticles (ZwitCuO) and evaluate their physicochemical properties, selective cytotoxicity, and apoptosis mechanisms in TNBC cells. CuO nanoparticles were functionalized with SBMA to generate a zwitterionic nanoplatform. Structural and interfacial properties were characterized using TEM, SEM, XRD, FTIR, dynamic light scattering, and zeta potential analysis. Cytotoxicity was assessed in MDAMB231 (TNBC) and MCF10A (normal breast epithelial) cells using MTT assays. Apoptosis was quantified by flow cytometry. Mitochondrial membrane potential was evaluated using JC-1 staining. Intracellular reactive oxygen species (ROS) and caspase-9/3 activities were measured, with N-acetylcysteine (NAC) used for mechanistic validation. Zwitterionic functionalization preserved CuO crystallinity while shifting surface charge toward near neutrality and significantly enhancing colloidal stability. ZwitCuO exhibited markedly increased cytotoxicity in MDAMB231 cells compared with bare CuO, reducing viability to below 30% at 50 µg/mL, while maintaining higher viability in MCF10A cells, indicating improved selectivity. Flow cytometry demonstrated significant increases in early and late apoptotic populations. ZwitCuO induced pronounced mitochondrial depolarization, elevated intracellular ROS levels, and enhanced caspase-9 and caspase-3 activation. NAC pretreatment attenuated ROS accumulation and reduced caspase activity, confirming a ROS-dependent intrinsic apoptotic pathway SBMA-mediated zwitterionic engineering enhances dispersion stability, tumor selectivity, and ROS-driven mitochondrial apoptosis, positioning ZwitCuO as a rational redox-active nanoplatform for selective TNBC therapy.

Keywords: TNBC; CuO, Zwitterionic surface engineering, Sulfobetaine methacrylate (SBMA).

15. Engineering Interfacial Redox Dynamics of Copper Oxide Nanoparticles to Amplify Apoptotic Vulnerability in Triple-Negative Breast Cancer.

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Abstract:

Triple-negative breast cancer (TNBC) is considered a highly proliferative subtype associated with inadequate targeted therapies. Copper oxide nanoparticles (CuO NPs) exhibit intrinsic redox-mediated cytotoxicity but suffer from colloidal instability and nonspecific interactions, limiting therapeutic selectivity. Surface engineering offers a strategy to enhance tumor specificity while maintaining cytotoxic potency. This study aimed to develop sulfobetaine methacrylate (SBMA)-functionalized zwitterionic CuO nanoparticles (ZwitCuO) and evaluate their physicochemical properties, selective cytotoxicity, and ROS-mediated apoptotic mechanisms in TNBC cells. Methods: CuO nanoparticles were functionalized with SBMA and characterized using TEM, XRD, zeta potential, hydrodynamic size, and PDI measurements. Cytotoxicity and selectivity were examined in MDA-MB-231 (TNBC) and MCF10A (normal) cells, including dose–response modeling. Apoptosis, mitochondrial potential across the inner membrane, intracellular ROS, and caspase-9/3 activation were evaluated, with N-acetylcysteine (NAC) used for mechanistic validation. Results: Zwitterionic functionalization preserved crystallinity while shifting surface charge from −31.8 ± 2.4 mV to −3.6 ± 1.1 mV and reducing aggregation by over 50%. ZwitCuO exhibited enhanced TNBC cytotoxicity (IC_{50} 31.8 ± 2.9 µg/mL vs 54.6 ± 3.8 µg/mL for CuO) and a doubled selectivity ratio (2.59 vs 1.30). Total apoptosis increased to 64.9 ± 4.2%, mitochondrial depolarization to 76.4%, and ROS levels to 3.87-fold. Caspase-9 and caspase-3 activation were significantly elevated; NAC pretreatment reduced ROS and caspase activity by over 50%, confirming ROS-dependent intrinsic apoptosis. Conclusion: SBMA-mediated zwitterionic engineering enhances nanoparticle dispersion, tumor selectivity, and ROS-driven mitochondrial apoptosis in TNBC cells. ZwitCuO represents a rational, redox-active nanoplatform with improved potency, selectivity, and mechanistic efficacy for selective TNBC therapy.

Keywords: TNBC; Zwitterionic surface engineering, Sulfobetaine methacrylate, ROS-mediated apoptosis, Intrinsic apoptotic pathway.

16. Anticancer Activity of Citrate-Stabilized Gold Nanoparticles Coupled with Cardioprotective Outcomes through Apoptosis Pathway Regulation

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Abstract:

Background: Gold nanoparticles (AuNPs) are promising nanomaterials with applications in cancer therapy and cardiovascular protection because of their distinct physicochemical characteristics and biocompatibility. However, their simultaneous anticancer and cardioprotective effects have not been fully explored. This study aimed to synthesize citrate-stabilized AuNPs and evaluate their selective anticancer activity, antioxidative and anti-inflammatory properties, and cardioprotective effects, elucidating underlying molecular mechanisms. AuNPs were produced by the citrate reduction process and examined using TEM, DLS, and UV-Vis spectroscopy, zeta potential, and XRD. Cytotoxicity against HepG2 and MCF-7 cells was assessed by MTT assay, ROS generation, and Annexin V/PI apoptosis analysis. Cardioprotective effects were investigated in H9c2 cardiomyocytes under hypoxia/reoxygenation and in vivo in rat models. Antioxidant enzyme activities (GPx, CAT) and lipid peroxidation (MDA) were measured by ELISA. Gene expression of apoptosis, proliferation, and inflammation markers was quantified by qPCR. AuNPs were spherical (~15 nm), monodispersed, and stable (−30 mV zeta potential). They exhibited dose-dependent anticancer cytotoxicity (IC_{50}: 25–28 µg/mL) with minimal effects on normal fibroblasts. ROS-mediated apoptosis involved upregulation of BAX and CASP3 and downregulation of BCL2. In cardiac models, AuNPs enhanced viability, increased GPx and CAT activities, decreased MDA levels, reduced TNF-α and IL-6, and promoted proliferation (Ki67). Citrate-stabilized AuNPs demonstrate selective anticancer activity coupled with cardioprotective and anti-inflammatory effects, highlighting their potential as multifunctional nanomedicine for cancer therapy with cardiac safety.

Keywords: Gold nanoparticles, anticancer activity, cardioprotection, apoptosis, reactive oxygen species, inflammation

17. Multifunctional Citrate-Stabilized Gold Nanoparticles: Selective Anticancer Activity Coupled with Cardioprotective and Anti-Inflammatory Effects via ROS and Cytokine Modulation

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Abstract:

Gold nanoparticles (AuNPs) have emerged as multifunctional nanomaterials with applications in cancer therapy and cardiovascular protection because of their special physicochemical characteristics, such as their adjustable size, surface chemistry, and biocompatibility. Despite extensive research, few studies have simultaneously investigated their anticancer and cardioprotective potential. This study aimed to synthesize citrate-stabilized AuNPs, evaluate their antitumor activity against MCF-7 and HepG2 cells, assess cardioprotective and anti-inflammatory effects in H9c2 cardiomyocytes, and elucidate underlying mechanisms involving apoptosis and oxidative stress. The Turkevich citrate reduction process was used to create AuNPs, which were then examined using TEM, DLS, and UV-Vis spectroscopy, zeta potential, and XRD. Anticancer activity was assessed via MTT assay, ROS measurement, and Annexin V/PI apoptosis detection. Cardioprotective effects were evaluated under hypoxia/reoxygenation conditions, including ROS, caspase-3 activity, lipid peroxidation, and pro-inflammatory cytokine levels. Gene expression of apoptosis- and inflammation-related markers was analyzed using quantitative real-time PCR. AuNPs were spherical (~15 nm), monodispersed, and stable (−30 mV zeta potential). They induced dose-dependent cytotoxicity in cancer cells (IC_{50}: 25–28 µg/mL) with minimal toxicity to normal fibroblasts. ROS-mediated apoptosis, downregulation of BCL2, upregulation of BAX and CASP3, and reduction of TNF-α and IL-6 were detected. In H9c2 cells, AuNPs enhanced cell viability, decreased caspase-3 activity, and reduced oxidative stress. Citrate-stabilized AuNPs exhibit selective anticancer activity coupled with cardioprotective and anti-inflammatory effects, highlighting their potential as multifunctional nanomedicine for cancer therapy with reduced cardiac toxicity.

Keywords: Gold nanoparticles, anticancer activity, cardioprotection, apoptosis, reactive oxygen species, inflammation.

18. Time-Dependent Enhancement of BAM-22P Cytotoxicity in HT-29 Colon Cancer Cells: IC_{50} Dynamics and Dose-Response Analysis

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Abstract:

Background: Colorectal cancer remains a major cause of cancer-related mortality worldwide, highlighting the need for novel therapeutic strategies. Bioactive peptides have emerged as promising anticancer agents due to their specificity and modulatory effects on cellular signaling pathways. BAM-22P, a proenkephalin-derived peptide, has not been extensively evaluated in colorectal cancer models. Methods: The cytotoxic effects of BAM-22P were investigated in HT-29 human colorectal adenocarcinoma cells using the MTT assay. Cells were treated with 0–80 µg/mL BAM-22P for 24, 48, and 72 hours. Dose–response relationships were analyzed using nonlinear regression with a four-parameter logistic model to determine IC_{50} values. Effect sizes were calculated using Cohen's d to quantify treatment magnitude. Results: BAM-22P induced significant, dose-dependent reductions in cell viability at all time points. The IC_{50} decreased from 33.9 µg/mL at 24 hours to 16.8 µg/mL at 48 hours, demonstrating a time-dependent leftward shift in the dose–response curve. At 72 hours, maximal cytotoxicity was observed, with viability reduced to 9% at 80 µg/mL. Effect size analysis revealed extremely large treatment effects across concentrations at 48 hours. Conclusion: BAM-22P exhibits potent, time-dependent cytotoxic activity against HT-29 cells, supporting further mechanistic and translational evaluation as a potential peptide-based therapeutic candidate in colorectal cancer.

Keywords: BAM-22P, Colorectal Cancer, HT-29 Cells, Anticancer peptides, Cytotoxicity, MTT Assay.

19. BAM-22P Nanoparticles as a Dual-Action Therapeutic: Inhibition of Migration and Induction of Mitochondrial

Apoptosis in HT-29 Colorectal Cancer Cells with High Hemocompatibility

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Abstract:

Background: Colorectal cancer (CRC) progression is critically dependent on cell migration and resistance to apoptosis. Novel therapeutic agents that simultaneously inhibit metastatic potential and induce tumor cell death are urgently needed. BAM-22P, a redox-active nanoparticle, has been proposed as a multifunctional anticancer agent with selective cytotoxicity and high biocompatibility. Methods: HT-29 colorectal adenocarcinoma cells were treated with BAM-22P, and migratory activity was assessed using a 48-hour wound healing assay. Apoptotic gene modulation was quantified by qRT-PCR for Caspase-3, Bax, and Bcl-2. Hemocompatibility was evaluated through human erythrocyte hemolysis assays at multiple concentrations. Data were analyzed using triplicate experiments and statistical significance was determined at $p < 0.05$. Results: BAM-22P significantly inhibited HT-29 migration, reducing wound closure from 80.33% in controls to 41.00% (Migration Inhibition Index: 48.96%, $p < 0.001$). Apoptosis-related genes were strongly modulated: Caspase-3 and Bax were upregulated by 3.33- and 2.81-fold, respectively, while Bcl-2 was downregulated to 0.45-fold, indicating activation of the intrinsic apoptotic pathway. Hemolysis remained minimal (<12.23%) even at the highest tested concentration (80 µg/mL), demonstrating favorable biocompatibility. Conclusion: BAM-22P effectively suppresses migration and promotes mitochondrial-mediated apoptosis in HT-29 colorectal cancer cells while maintaining hemocompatibility. These findings support its potential as a multifunctional therapeutic agent targeting metastatic progression and tumor cell survival in colorectal cancer.

Keywords: BAM-22P, Colorectal Cancer, HT-29 Cells, Anticancer peptides, Cytotoxicity, MTT Assay.

20. Synthesis and Evaluation of heterocyclic Cationic Surfactants

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Abstract:

Benzoquinazoline derivatives were synthesized and chemically modified to enhance their antimicrobial activity and performance as cationic surfactants. The target compounds were obtained via conversion to N-(3-(dimethylamino)propyl)-3-(4-oxo-4Hbenzo[d][1,3]oxazin-2-yl)propanamide, followed by quaternization with fatty alkyl 2chloroacetates. The synthesized cationic surfactants possess a quaternary ammonium hydrophilic head and hydrophobic alkyl chains, The hydrophobic head of an organic heterocyclic surfactant component attracted polar water, whereas the hydrophobic tail attracted non-polar solvents like oil. As a result, they dissolve in both polar and nonpolar liquids and are amphipathic. This characteristic has been used to produce surfactants as emulsifiers, solubilizers, and wetting agents. giving them amphipathic character. They effectively decrease surface and interfacial tension, show low values of the critical micelle concentration (CMC)., and demonstrate superior aggregation behavior at low concentrations. These properties make the prepared compounds economically attractive and suitable for industrial applications. In particular, they show favorable surface activity as effective emulsifying agents for cosmetic formulations.

Keywords: Benzoquinazolines, Cationic surfactants, Emulsifying agent.

21. Biosynthesis of Nanoparticles by Marine-Derived Bacteria and Their Biological Evaluation

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Abstract:

The increasing demand for eco-friendly nanomaterial synthesis has driven the exploration of marine microorganisms as sustainable biofactories for metallic nanoparticle production. In the present study, marine water samples were collected from Hurghada, a unique hypersaline and oligotrophic ecosystem known for its metabolically versatile microbiota. A total of 15 bacterial isolates (SH1–SH15) were obtained and screened for their ability to biosynthesize platinum–copper (Pt–Cu) bimetallic nanoparticles (BNPs) via an extracellular reduction mechanism. Qualitative and spectroscopic analyses revealed that 73% of the isolates successfully mediated nanoparticle formation, as indicated by characteristic colorimetric changes and UV–Vis surface plasmon resonance (SPR) patterns. Among them, isolate SH2 demonstrated the highest biosynthetic efficiency. Furthermore, biosynthesized bimetallic nanoparticles exhibited significant antimicrobial activity compared to monometallic counterparts. Au–Pt BNPs showed strong antibacterial activity against Escherichia coli (65.02%), Staphylococcus aureus (56.02%), and Pseudomonas aeruginosa (63.25%), whereas monometallic AuNPs displayed no detectable inhibition. Moderate antifungal activity was also observed against Candida albicans and Aspergillus niger. The enhanced bioactivity of BNPs is attributed to synergistic physicochemical properties, including increased surface reactivity and reactive oxygen species (ROS) generation. These findings highlight the Red Sea marine microbiota as a promising source for the green synthesis of multifunctional bimetallic nanoparticles with potential biomedical and industrial applications, particularly in combating multidrug-resistant pathogens.

Keywords: Multidrug-resistant pathogens, Marine bacteria, Red Sea, Bimetallic nanoparticles, Platinum–copper nanoparticles (Pt–C)

22. Marine Bacterial Production of Nanoparticles and Assessment of their Antioxidant Activity

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Abstract:

The growing demand for sustainable nanotechnology has shifted focus toward biogenic synthesis methods that utilize the unique metabolic pathways of marine microorganisms. This study investigates the potential of bacterial isolates derived from seagrass-associated habitats in the Red Sea (Hurghada, Egypt) for the green synthesis of Platinum-Copper (Pt-Cu) bimetallic nanoparticles (BNPs). Seven bacterial strains, designated SH16 through SH22, were isolated and screened for their biosynthetic capacity. Qualitative and spectroscopic analyses confirmed the successful formation of Pt-Cu BNPs in five of the seven isolates, with strain SH17 exhibiting the highest biosynthetic efficiency as evidenced by a pronounced visual color change and characteristic Surface Plasmon Resonance (SPR) peaks in UV-Vis spectroscopy. Furthermore, the antioxidant potential of the SH17-mediated BNPs was evaluated using the DPPH radical scavenging assay. Results indicated that the biosynthesized nanoparticles possessed significant antioxidant activity (17.02%), which was superior to the standard antioxidant, ascorbic acid (15.33%). The bacterial crude extract alone showed the highest activity at 22.22%, suggesting that the nanoparticles are capped with bioactive microbial metabolites that retain functional properties. These findings highlight the efficacy of Red Sea microbiota as a versatile platform for producing functionalized bimetallic nanostructures with potential applications in biomedicine and oxidative stress management.

Keywords: Multidrug-resistant pathogens, Marine bacteria, Red Sea, Bimetallic nanoparticles, Platinum–copper nanoparticles (Pt–Cu)

23. Bioprospecting of Red Sea-Derived Bacteria from Thalassia hemprichii and Crella cyathophora for Potent Antibacterial Metabolites

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Abstract:

The escalating prevalence of multidrug-resistant pathogens necessitates the exploration of untapped biological reservoirs for novel therapeutic agents. This study investigates the bioprospecting potential of marine-derived bacteria isolated from two ecologically distinct hosts—the seagrass *Thalassia hemprichii* (1m) and the marine sponge *Crella cyathophora* (2m)—collected from the Red Sea coast of Hurghada, Egypt. A total of sixteen bacterial isolates were recovered (nine from *T. hemprichii* and seven from *C. cyathophora*) and subjected to small-scale fermentation. Crude extracts were evaluated for their antibacterial efficacy against *Listeria monocytogenes* and *Klebsiella spp.* The results revealed significant antagonistic potential, with isolate 2m-B5 exhibiting 80.23% inhibition against *L. monocytogenes*, and isolate 1m-B8 demonstrating 79.25% inhibition against *Klebsiella spp.* Extract yields varied between 0.5 g and 1.2 g, indicating diverse metabolic efficiencies. These findings underscore the Red Sea's marine microbiota as a robust source of specialized secondary metabolites with potential applications in pharmaceutical biotechnology and green nanotechnology.

Keywords: Red Sea Microbiota, Marine Bioprospecting, Thalassia hemprichii, Crella cyathophora, Secondary Metabolites; Antibacterial Activity.

24. Isolation and Antimicrobial Screening of Bacteria Associated with the Red Sea Sponges Siphonochalina siphonella and Latrunculia magnifica

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Abstract:

The escalating prevalence of multidrug-resistant pathogens necessitates the exploration of untapped biological reservoirs for novel therapeutic agents. This study investigates the bioprospecting potential of marine-derived bacteria isolated from two ecologically distinct hosts—the seagrass *Thalassia hemprichii* (1m) and the marine sponge *Crella cyathophora* (2m)—collected from the Red Sea coast of Hurghada, Egypt. A total of sixteen bacterial isolates were recovered (nine from *T. hemprichii* and seven from *C. cyathophora*) and subjected to small-scale fermentation. Crude extracts were evaluated for their antibacterial efficacy against *Listeria monocytogenes* and *Klebsiella spp.* The results revealed significant antagonistic potential, with isolate 2m-B5 exhibiting 80.23% inhibition against *L. monocytogenes*, and isolate 1m-B8 demonstrating 79.25% inhibition against *Klebsiella spp.* Extract yields varied between 0.5 g and 1.2 g, indicating diverse metabolic efficiencies. These findings underscore the Red Sea's marine microbiota as a robust source of specialized secondary metabolites with potential applications in pharmaceutical biotechnology and green nanotechnology.

Keywords: Marine Sponges, Bioactive Metabolites, Antibacterial Activity, Red Sea Bacteria, Siphonochalina siphonella.

25. Multifactorial Experimental Optimization of Polyhydroxybutyrate Production from Bacillus sp. Using Taguchi Design

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Abstract:

In the production of bioplastics, poly-3-hydroxy butyric acid (PHB) is the most common type of polyhydroxy alkonoates (PHA). A Bacillus sp. strain that was isolated for biosynthesis and optimization was used in this study to investigate the potential of Taguchi experimental design to generate PHB. PHB production by Bacillus was optimized using a Taguchi L_{27} (3^7) orthogonal array, evaluating seven key process variables: glucose concentration, ammonium chloride concentration, production time, pH, temperature, agitation rate, and inoculum size. Signal-to-noise (S/N) ratios, mean PHB yield, and standard deviation were analyzed to identify both optimal performance and robustness. The multi-response optimization maximum PHB production under the following conditions: Glucose concentration: 25 g/L, Ammonium chloride concentration: 0.1 g/L, Production time: 72 h, pH: 9, Temperature: 25 °C, Agitation rate: 300 rpm and Inoculum size: 20%. Under these conditions, the PHB mean yield was approximately 2.66 g/L, with high composite desirability (~0.81), indicating a good balance between yield and process robustness. pH emerged as the most significant factor affecting PHB production across S/N ratio, mean response, and variability analyses ($P < 0.001$). Production time and ammonium chloride concentration were also statistically significant ($P < 0.05$), indicating the importance of nitrogen limitation and sufficient cultivation duration. Temperature had a moderate but significant effect, with better PHB accumulation at lower tested temperatures. Glucose concentration, agitation rate, and inoculum size showed comparatively minor or statistically insignificant effects within the tested ranges.

Keywords: Polyhydroxybutyrate, Bacillus sp., multifactorial optimization, Taguchi design.

26. Detection of Toxigenic Fungi Associated with Some Infant and Young Children's Food in Egypt

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Abstract:

Baby food is an important source of nutrition for infants; however, incorrect processing, storage, and handling can lead to fungal contamination, posing health hazards. This study examined fungal contamination in commercially available cereal-based baby food and infant milk samples from Egypt and tested the mycotoxin-producing capacity of fungal isolates in the laboratory. Six samples were tested; three (50%) contained fungal contaminants. Fungal counts rangedfrom 3.2×10^2 to 5.6×10^3 CFU/g, with an average of 2.96×10^3 CFU/g ($\pm 1.2 \times 10^3$). Three different fungal genera were found. Aspergillus spp. was most common (70% of total isolates), followed by Penicillium spp. (20%), and Fusarium spp. (10%). All Aspergillus isolates were most commonly found in infant's milk and baby food samples. The potential for mycotoxin production was assessed using Yeast Extract Sucrose medium (YES) broth. Of the five examined Aspergillus isolates, 60% generated aflatoxin B_1 at doses ranging from 302.5 to 775 µg/kg, but ochratoxin A was not detected. These results represent the toxigenic potential of the isolates under laboratory conditionsand demonstrate the presence of mycotoxins in the cultured baby food and infant's milk samples. Overall, these findings suggest that cereal-based baby foods sold in local markets may contain fungi capable of producing toxic metabolites, emphasizing the importance of proper storage, routine monitoring, and strict adherence to good manufacturing practices in ensuring baby food safety and quality. Despite the small sample size, the findings offer preliminary insight into fungal contamination in local infant meals.

Keywords: Aflatoxin B1, Aspergillus flavus, Aspergillu sparasiticus, Food safety, Fungal contamination, HPLC, infant food.

27. Isolation and identification of the mycotoxigenic fungi associated with peanut seed (Arachis hypogaea L.) samples

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Abstract:

Arachis hypogaea L. (Peanuts) is highly susceptible to colonization by mycotoxigenic fungi, particularly during pre- and post-harvest phases, leading to significant economic and health-related repercussions. Objectives: This study aimed to characterize the fungal microflora associated with peanut accessions and evaluate the toxigenic potential of Aspergillus species, focusing on Aflatoxin B1 (AFB1) contamination Methods: 114 fungal isolates were recovered from various localities using comparative diagnostic methods (blotter and PDA). Results: The PDA agar plate method demonstrated superior diagnostic sensitivity, accounting for 64.04% of the total recovery. Surface decontamination with 1% NaOCl significantly attenuated the fungal load, indicating that the majority of the inoculum was epiphytic. Taxonomic profiling identified six species, with Aspergillus niger (36.84%) and A. flavus (34.21%) as the dominant taxa. HPLC analysis revealed that A. flavus isolate No. 4 exhibited high toxigenicity, synthesizing 18.625 µg/kg of total aflatoxins. Conclusion: These findings emphasize the critical need for rigorous post-harvest monitoring to mitigate aflatoxin risks in the food chain.

Keywords: Aflatoxins, Fungi, Mycotoxins, Peanut seed.

28. Biogenic Selenium-Doped Carbon Quantum Dots as Redox-Engineered Nanotherapeutics: Inducing Mitochondrial Apoptosis in Liver Cancer and Disrupting Fungal Biofilms

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Abstract:

Hepatocellular carcinoma remains a major global health challenge due to limited therapeutic options and increasing resistance to conventional treatments. Nanotechnology-based therapeutics, particularly carbon quantum dots (CQDs), have attracted considerable attention because of their tunable optical properties, high biocompatibility, and potential for redox modulation. Selenium, an essential trace element with well-known antioxidant and anticancer properties, can enhance the biological activity of CQDs when incorporated into their structure. This study aimed to synthesize biogenic selenium-doped carbon quantum dots (Se-CQDs) using medicinal plant extracts and evaluate their anticancer and antifungal activities. Se-CQDs were synthesized through a green hydrothermal approach using plant phytochemicals as reducing and stabilizing agents. The nanoparticles were characterized using UV–Vis spectroscopy, fluorescence spectroscopy, transmission electron microscopy, X-ray diffraction, and zeta potential analysis. Cytotoxic effects were assessed in HepG2 liver cancer cells using the MTT assay, while intracellular reactive oxygen species (ROS) production was measured using the DCFH-DA fluorescence assay. Apoptosis-related gene expression (TP53, BAX, BCL2, and CASP3) was quantified by real-time PCR. Antifungal activity and biofilm inhibition were evaluated against Candida albicans and Aspergillus fumigatus. The synthesized Se-CQDs exhibited nanoscale size (~6 nm) and stable colloidal properties. The nanoparticles demonstrated strong dose-dependent cytotoxicity against HepG2 cells with an IC_{50} of 18.7 µg/mL. Se-CQDs significantly increased intracellular ROS levels and modulated apoptosis-related genes, indicating activation of mitochondrial apoptotic pathways. Additionally, the nanoparticles displayed potent antifungal activity with MIC values as low as 12.5 µg/mL and inhibited fungal biofilm formation by up to 78%. Biogenic Se-CQDs represent promising multifunctional nanomaterials with significant potential for liver cancer therapy and antifungal applications.

Keywords: Biogenic carbon quantum dots, Selenium-doped nanoparticles, Green nanotechnology, Hepatocellular carcinoma, Reactive oxygen species (ROS), Apoptosis signaling pathway.

29. Biogenic Selenium-Doped Carbon Quantum Dots as a Redox-Modulating Theranostic Platform for Selective TNBC Cytotoxicity and MDR Biofilm Disruption

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Abstract:

Triple-negative breast cancer (TNBC) and multidrug-resistant (MDR) bacterial infections remain major clinical challenges due to limited therapeutic options and biofilm-associated resistance. Selenium-doped carbon quantum dots (Se-CQDs) offer a promising redox-modulating nanoplatform with potential anticancer, antioxidant, and antibiofilm activities. Se-CQDs were synthesized via hydrothermal reaction using neem (Azadirachta indica) extract and sodium selenite. Physicochemical characterization included TEM, DLS, zeta potential, UV-Vis, FTIR, and XRD analyses. Cytotoxicity and apoptosis in MDA-MB-231 and MCF-10A cells were evaluated using MTT, Annexin V/PI flow cytometry, ROS assays, JC-1 mitochondrial potential, and caspase-3/9 activity. Antimicrobial and antibiofilm effects against MDR S. aureus and P. aeruginosa were assessed via MIC/MBC determination, crystal violet biofilm quantification, and SEM imaging. Antioxidant and redox modulation were evaluated using FRAP and DCFDA ROS scavenging assays. Se-CQDs exhibited dose-dependent cytotoxicity, selectively reducing MDA-MB-231 viability (10.7 ± 2.8% at 80 µg/mL) with minimal effect on MCF-10A cells. Apoptosis induction involved ROS-mediated mitochondrial dysfunction and caspase activation. Se-CQDs inhibited MDR bacterial growth (MIC: 10.6–42.7 µg/mL) and disrupted biofilm architecture (36–52% reduction). Antioxidant assays confirmed significant ROS scavenging and redox modulation in a concentration-dependent manner. Biogenic Se-CQDs represent a novel multifunctional nanoplatform capable of selective anticancer activity, redox modulation, and antibiofilm effects, highlighting their potential for theranostic and antimicrobial applications.

Keywords: Selenium-doped carbon quantum dots, TNBC, Redox modulation, Antibiofilm, Antioxidant, Apoptosis.

30. Phenotypic and Antibiotic Resistance Profiles of Clinical Bacterial Isolates from Egyptian Hospitals

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Abstract:

Antimicrobial resistance among pathogenic bacteria represents a significant global public health challenge, particularly in clinical environments where infections are common and treatment options may be limited. The increasing resistance of bacteria to commonly used antibiotics complicates disease management and contributes to higher morbidity, mortality, and healthcare costs. Therefore, understanding the phenotypic characteristics and resistance patterns of bacterial isolates is essential for accurate diagnosis, appropriate antimicrobial therapy, and effective infection control strategies. This study aimed to investigate the antibiotic resistance profiles of selected bacterial isolates obtained from different hospitals. In addition, the research focused on examining their morphological, physiological, and biochemical characteristics to provide a comprehensive identification and classification of the isolates. By analyzing these features, the study seeks to contribute to a better understanding of the distribution of resistant bacterial strains in clinical settings. The findings may help guide clinicians in selecting suitable antibiotics and support ongoing efforts to monitor and control the spread of antimicrobial resistance.

Keywords*:* Antimicrobial resistance, Antibiotics, phenotypic characteristics.

31. Antibiotic Resistance Patterns and Characterization of Nosocomial Bacterial Isolates in Menoufia, Qalubiya, and Behira Governorate, Egypt

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Abstract:

Antibiotic resistance is a major global public health concern, particularly in relation to nosocomial infections acquired within healthcare settings. These infections are frequently caused by multidrug-resistant (MDR) bacteria, which significantly increase morbidity, mortality, and healthcare costs. The growing prevalence of resistant pathogens complicates treatment options and threatens the effectiveness of commonly used antibiotics. Therefore, continuous monitoring and evaluation of antimicrobial resistance patterns are essential. The World Health Organization (WHO) has highlighted the urgent need for comprehensive surveillance systems to track resistance trends and support evidence-based clinical decision-making. Such efforts are critical for improving patient outcomes and strengthening infection prevention and control strategies. The goal of this study is to examine the antibiotic susceptibility patterns of pathogenic bacterial isolates obtained from nosocomial infections in the Egyptian governorates of Menoufia, Qalubiya, and Behira, focusing on their response to routinely used antimicrobial agents.

Keywords: Antibiotic resistance, Nosocomial infections, Multidrug-resistant bacteria

32. Frequency-dependent Inactivation of Escherichia coli by Microwave Radiation

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Abstract:

The increasing demand for efficient and chemical-free disinfection methods has brought attention to microwave-based treatments. This study investigates the inactivation of Escherichia coli when exposed to microwave radiation, focusing on both thermal and non-thermal mechanisms. We evaluated the effects of low, medium, and high microwave output power levels on bacterial inactivation. The tested conditions in this study output powers correspond to the low, medium, and high "frequency" settings as labelled on the device interface, since most domestic microwave ovens operate at a fixed frequency. Temperature profiles of the irradiated liquid medium revealed a non-linear response over time: no temperature increase was observed during the first minute, followed by a sharp rise after two minutes, a gradual, approximately linear increase between 2–4 minutes, a plateau at 84–86 °C, and finally boiling at 98–100 °C. Despite the absence of measurable heating (20 °C) during 1 min of high-output power exposure, disinfection efficiency reached 33.34 ± 17%, which is higher than that observed at low and medium output power (6.7%). The observed inactivation mechanism is attributed to a combination of thermal effects and non-thermal interactions. These findings indicate that microwave treatment is a rapid and effective approach for E. coli inactivation, highlighting its potential applications in water treatment, food safety, and medical sterilization processes.

Keywords: Microwave disinfection, Escherichia coli, Bacterial inactivation, Microwave output power.

33. Preparation, Study and Optical ZnS nanoparticles for Magnesium Batteries

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Abstract:

ZnS nanoparticles were synthesized using precipitation methods in the presence of different surfactants (CTAB, SLS and tween80). The obtained surfactant-modified ZnS nanoparticles were characterized using x-ray diffraction (XRD), Fourier Transform Infrared Spectroscopy (FTIR) and Diffusion Reflectance Spectroscopy (DRS). Structural characterization by X-ray diffraction (XRD) confirms that all samples crystallize in the cubic ZnS phase in nanosized. XRD analysis confirmed that all samples crystallized in the cubic ZnS phase with nanoscale dimensions. FTIR spectra revealed characteristic absorption bands at ~620 cm^{-1} (Zn–S stretching), ~1450 cm^{-1} (C–H bending), ~1620 cm^{-1} (C=C stretching), and ~3420 cm^{-1} (O–H stretching), confirming successful surface modification of ZnS nanoparticles. Optical band gap and color determined from DRS measurements. Cathodes were fabricated using ZnS as the active material with a normalized composition ratio of ZnS: sulfur: Super P carbon while polyvinylidene fluoride (PVDF) binder was added to the mixture. The obtained ZnS nanoparticles were then analyzed in cells with a halogen-free electrolyte to determine their electrochemical properties in a magnesium ion environment.

Keywords: Surfactant-modified ZnS, Magnesium batteries, Interfacial effects.

34. Larvicidal, Biochemical, and Histopathological Effects of Trigonella foenum-graecum and Vitis vinifera Seed Oils against Culex pipiens (Diptera: Culicidae)

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Abstract:

Mosquito-borne diseases remain a significant global public health concern, necessitating the development of effective and environmentally sustainable vector control strategies. This study aims to evaluate the larvicidal activity of Trigonella foenum-graecum and Vitis vinifera seed oils and analyze their effects on histopathology and some biochemical parameters of Culex Pipiens. Third instar larvae of C. pipiens subjected to various concentrations of the two seed oils over 24 and 48 h to establish dose–response relationships. Both oils induced a significant increase in larval mortality with increasing concentration and exposure time. Probit analysis revealed that T. foenum-graecum oil exhibited higher toxicity, with LC_{50} values of 77.31 and 47.66 ppm at 24 and 48 h, respectively, compared to 95.62 and 82.97 ppm for V. vinifera, indicating greater larvicidal potency. Biochemical analysis demonstrated significant alterations in alanine aminotransferase (ALT) and aspartate aminotransferase (AST) activities, reflecting metabolic disruption and compromised cellular integrity. Also the histopathological examination of larval mid gut tissues revealed pronounced epithelial degeneration, cytoplasmic vacuolization, and structural disorganization. Ultrastructural observations further confirmed severe cellular damage, including microvilli disruption, organelle degradation, and membrane disintegration. The effectiveness in killing C. Pipiens larvae and the observed biochemical and structural alterations demonstrate that plant-derived oils exert potent larvicidal effects through multi-level physiological disruption, highlighting their potential as eco-friendly alternatives for sustainable mosquito control programs.

Keywords: Culex pipiens, Larvicidal activity, Trigonella foenum-graecum, Vitis vinifera, ALT and AST biomarkers, Midgut histopathology, Ultrastructural alterations, Botanical insecticides, Sustainable vector control.

35. Nanoselenium Provokes Antioxidant and Drug Detoxification Machineries in Hepatic Tissues 0f Deltamethrin Treated Rats

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Abstract:

Deltamethrin is a potent insecticide that exhibits global attention in the chemical control strategies of public health and agriculture concerns. However, its adverse effects on non-target organisms are known. Thus, the ultimate aim of this work is to confer a fair insight on the backing role of selenium nanoparticles (SeNPs) in dealing with the induced disorders in livers of deltamethrin received rats. Four rat sets were liable to oral administrations once daily for 35 days; a control group received only corn oil injection as vehicle; test groups were given SeNPs (0.5 mg/kg of animal weight), deltamethrin (27 mg/kg of animal weight) and SeNPs engaged with deltamethrin, respectively. Primary hepatic deteriorations were revealed in the form of abnormalities of liver biochemistry in deltamethrin received sets. Consequently, histological portraits revealed liver tissue distortions associated with antioxidants status imbalance and significant rise in cytochrome P450 enzymes. Whilst, SeNPs intervene could confer prompt remedies that could act on restoring the hepatic architecture normality and restore the hepatic enzymatic machinery thus, we could detect encouraging rise of antioxidant enzymes activities besides cytochrome P450enzymes modest activities in deltamethrin-treated rats that received SeNPs.

To conclude, SeNPs are influential supplements that could encounter hepatocytes deltamethrin induced lesions for non-target organisms.

Keywords: Cytochrome P450, Liver biochemistry, Liver histology, Oxidative stress, Selenium nanoparticles.

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1. Effect of Waxing Concentration and Drying Temperature on Shelf-Life and Quality of Orange Fruits During Storage.

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Abstract:

The present study aimed to evaluate the effect of several wax coating concentrations (60, 80 and 100%) combined with different drying temperatures (35, 40 and 45 °C) on the storage life and quality attributes of Valencia orange fruits during refrigerated storage. Different physical and chemical quality parameters were investigated including cumulative weight loss, decay incidence, fruit firmness, respiration activity and TSS/acidity ratio. The obtained results demonstrated that weight loss in orange fruits gradually increased as the storage period progressed. The control treatment recorded the greatest cumulative weight loss (4.74%) after 90 days of storage. Fruit decay values varied among treatments, ranging between 3.22% and 24.30% throughout the storage period. Fruit firmness gradually declined during the storage period but improved with higher waxing concentrations. The maximum firmness value (17.48%) was recorded in fruits treated with 100% waxing concentration after 90 days of storage. In contrast, the control fruits showed the lowest firmness value (15.45%) after the same storage duration. Respiration rate values for all treatments varied between 3.13 and 4.05 ml CO_2 kg^{-1} h^{-1}. The control fruits exhibited the highest TSS-to-acidity ratio (8.64%) at the end of the 90-day storage period.

Keywords: Orange- Weight loss- Decay- Firmness, TSS, storage, cold-Shelf-life.

2. Study on Some Physical and Mechanical Properties of Orange Fruits (Valencia Orange)

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Abstract:

This study investigated the physical and mechanical characteristics of Valencia orange fruits. The obtained results indicated that the fruit dimensions varied within relatively narrow ranges, where the length ranged from 76.67 to 81.70 mm, the width from 68.22 to 76.33 mm, and the thickness from 67.15 to 76.33 mm for all studied samples. As fruit weight increased from less than 160 g (category I) to more than 200 g (category IV), both the geometric mean diameter and the arithmetic mean diameter increased from 70.55 to 77.66 mm and from 70.68 to 77.71 mm, respectively. The average fruit weights recorded for categories I, II, III and IV were 150.25, 176.60, 193.90 and 208.45 g, respectively. The true density of the fruits ranged approximately between 991.53 and 993.99 kg m^{-3}, while the moisture content varied from 86.41 to 89.60% among the different categories. Moreover, the calculated volumes based on oblate spheroid and ellipsoidal shapes increased with the increase in fruit mass. The angle of repose also showed an increasing trend, rising from 23.78° in category I to 27.57° in category IV. In contrast, the cutting force slightly decreased with increasing fruit size, with values of 27.48, 26.39, 25.06 and 24.65 kg for categories I, II, III and IV, respectively. Similarly, fruit firmness values were 93.55, 86.24, 77.22 and 83.10 kg for the corresponding categories. In addition, the coefficient of static friction tended to decrease as the fruit weight increased.

Keywords: Orange-physical properties-Mechanical properties-dimensions, surface area-volume-density-firmness-repose angle.

3. Assessing Gamma Irradiation in Enhancing Cowpea Grains During Storage

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Abstract:

Cowpea (Vigna unguiculata) is widely consumed as a staple food in many parts of the world. However, it is highly susceptible to infestation by the cowpea weevil (Callosobruchus maculatus), a major storage pest that can cause significant economic losses. To support sustainable agricultural practices and reduce reliance on chemical insecticides, γ- ray was investigated as an alternative method for pest control. This study evaluated the effects of γ-irradiation with different doses 0 (control), 100, 150, 200 and 250Gy on cowpea grains with the dual aim of controlling C. maculatus infestation during storage, without affecting the viability (final germination percentage, and speed of germination). The results showed that all irradiation doses eliminated weevil infestation compared to control. Germination tests revealed that, grains treated with150Gy exhibited the highest germination rate among the irradiated groups, indicating that this dose offers the best choice to effective insect control and grain viability. These findings demonstrate that gamma irradiation is an effective, environmentally friendly technique for enhancing cowpea grain storage without adversely affecting germination.

Keywords: Cowpea, Gamma dose, Cowpea weevil, Storage, Grains quality and viability.

4. UV-C as a Sustainable Strategy to Preserve Stored Cowpea Grains

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Abstract:

Postharvest insect infestation and grain viability deterioration are major constraints to safe cowpea storage. This study evaluated the effect of ultraviolet-C (UV-C) irradiation at different doses ≈ 0.714, 1.428, 2.856, 11.424, and 22.848Jcm^{-2}., on grain damage percentage "D" (%), grain mass loss " GML" (%), germination percentage "G" (%) and grain rate index "GRI" (% day^{-1}) of cowpea grains during nine months of storage. Higher doses (≈11.424, and 22.848Jcm^{-2}) were most effective in preserving grain quality, indicating that reduced insect damage contributed to sustaining physiological integrity. While GML increased progressively in all treatments, the extent of mass loss was strongly dose-dependent. The control sample showed severe damage, with losses rising from 1.98% at the beginning of storage to 86.04% after nine months. In contrast, UV-C treatments significantly reduced cumulative losses. Final GML values reached 45.4%, 32.6%, 15.7%, 8.6%, and 4.7% for ≈ 0.714, 1.428, 2.856, 11.424, and 22.848 Jcm^{-2}., respectively. On the other hand, G declined over time in all treatments, UV-C exposure grain maintained higher viability compared with the control sample. Overall, UV-C irradiation demonstrated a clear dose-dependent capacity to minimize grain mass loss while maintaining seed viability, suggesting its potential as a safe and sustainable alternative to chemical control in cowpea storage systems.

Keywords: cowpea, UV-C radiation, Callosobruchus maculatus, germination, grain mass losses, postharvest storage.

5. Effect of Some Control Agents on Biochemical and Histological Changes of Fall, Spodoptera frugiperda

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Abstract:

The fall armyworm, Spodoptera frugiperda, is a destructive agricultural pest that causes severe yield losses worldwide. This study investigated the impact of LC_{50} concentrations of different control agents on the biochemical activity and midgut histology of fourth-instar larvae of Spodoptera frugiperda. Biochemical analysis revealed significant reductions in carbohydrates, soluble proteins, and lipids across most treatments caused by emamectin benzoate. Enzyme assays showed insecticide-induced disruptions in key metabolic and digestive enzymes, with methomyl, spinosad, and emamectin benzoate notably inhibiting GPT, GOT, and phosphatases. Histological examinations confirmed extensive midgut damage with spinosad, emamectin benzoate and methomyl causing severe epithelial disorganization, vacuolation, and brush border degradation, while Bacillus thuringiensis and lufenuron had targeted but significant effects. These findings highlight the metabolic and structural disruptions caused by insecticides, reinforcing their efficacy for pest control while underscoring the need for further research into long-term impacts and sustainable application strategies.

Keywords: Biochemical activity, histology, Spodoptera frugiperda, inscticide, insects.

6. Influence of Some Control agents on Biological and Biochemical Aspects of Fall Armyworm, Spodoptera frugiperda

Marwan M. Tawfik, Ezzat F. El-Khyat[2], Amira M. El-Shewy[2] and Hassan F. Dahi[3]

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Abstract:

This investigation assessed the toxic effects of some control agents on second-instar larvae of Spodoptera frugiperda based on recorded mortality rates, lethal concentrations, toxicity indices and developmental effects. The findings indicated that emamectin benzoate exhibited the highest insecticidal efficacy, with an LC_{50} value of 0.348 ppm, while methomyl was the least effective (LC_{50} = 83.90 ppm). Bacillus thuringiensis, spinosad and lufenuron showed moderate efficacy. Exposure to LC_{50} concentrations influenced larval durations, pupation rates, and reproductive parameters, with emamectin benzoate causing the most significant developmental delays and malformations. Biochemical analyses revealed that insecticide treatments significantly altered enzyme activity and metabolic composition. Spinosad and B.t. caused the greatest reductions in amylase activity (-38.73% and -39.81%, respectively), while invertase activity increased with methomyl (3.99%) and emamectin benzoate (6.67%). Trehalase activity was suppressed across treatments, with spinosad showing the highest reduction (-61.92%). Additionally, the activities of glutamic pyruvic transaminase (GPT) and glutamic oxaloacetic transaminase (GOT) were markedly reduced, especially following exposure to spinosad and B. thuringiensis, indicating impairment of detoxification mechanisms. Methomyl induced the highest increase in α-esterase (444.90%), suggesting a strong detoxification response, while acetylcholinesterase (AChE) activity was significantly inhibited by spinosad (-54.30%), indicating neurotoxic effects. Overall, emamectin benzoate demonstrated the highest efficacy, but posed developmental risks, while Bt. and lufenuron were safer alternatives. These results demonstrated that insecticides significantly influenced enzymatic activity, metabolic processes, and insect development, underscoring the importance of adopting sustainable pest management approaches.

Keywords: Biochemical, Spodoptera frugiperda, biology, toxicity, insecticide, bio-pesticide.

7. Impact of Winter Feeding with Protein Diets on Wintering Ability, Development and Productivity Status of Honeybee Colonies, *Apis mellifera*

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Abstract:

Feeding honeybees with pollen substitutes is essential for managing and maintaining the health of honeybees, especially during dearth periods. This study aimed to evaluate the use of five pollen substitutes as winter feed for honeybee during the pollen scarcity period from October 2024 until spring in April 2025, and to compare their effects on wintering ability, growth of colonies, and citrus honey production. Cumulatively, honeybees consumed the largest amounts of diet4 (2073.34g), followed by diet3, diet1 and diet5 (1785.47, 1773.87 and 1767.44g, respectively), and the lowest amounts of diet 2 (1404.89g). The results showed increased wintering ability in colonies fed pollen substitutes compared to control colonies. Also, colonies fed on diet1 showed the highest growth rate in terms of sealed brood area, bee bread production, and worker bee density, followed by colonies fed on diet2 then diet5, while the lowest growth rate was observed in the control colonies. Similarly, citrus honey production increased in colonies supplemented with pollen substitutes compared to the control colonies. The diet1 diet2 and diet5, are based on spirulina and chlorella as primary ingredients, outperformed the others. These results bode well for the development of more effective diets, which could contribute to improved honeybee performance.

Keywords: *Apis mellifera,* pollen substitutes, brood production, population density, bee bread, honey yield.

8. Comprehensive Field Assessment of Cumin Wilt Caused by Fusarium oxysporum f. sp. cumini in Egypt

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Abstract:

Cumin (Cuminum cyminum L.), a vital spice crop in Egypt belonging to the Apiaceae family, faces severe production constraints due to biotic stressors, particularly fungal pathogens. Among these, Fusarium wilt, incited by Fusarium oxysporum f. sp. cumini (Foc), stands out as the most destructive disease threatening local production. This study presents a comprehensive field assessment of the disease during the 2024 and 2025 growing seasons across Egypt's major cumin-producing governorates. Survey data revealed widespread disease occurrence with significant variation in intensity. The highest disease incidence (81.3%) and severity (85.7%) were recorded in El-Idwa district (Minya Governorate). In Assiut Governorate, El-Qusiya district recorded 66% incidence and 76% severity. Conversely, in the New Valley Governorate, Paris Oasis recorded the highest incidence (49.7%), while El-Kharga Oasis exhibited the highest severity (66.3%). Isolation results confirmed F. oxysporum as the predominant pathogen, appearing at frequencies up to 99% in samples from Assiut district and El-Kharga Oasis, followed by El-Qusiya (89.7%) and Abu Tig (81.3%). Pathogenicity tests on single-spore purified isolates confirmed their high virulence, evidenced by detrimental impacts on cumin growth parameters, including significant reductions in plant height, root length, and biomass. Additionally, the pathogen demonstrated significant inhibition of seed germination due to toxic metabolite production. Among the morphologically diverse isolates, Isolate No. 1 from Minya proved to be the most virulent. Physiological assays indicated that Potato Dextrose Agar (PDA) was the optimal medium for mycelial growth. Furthermore, the identity of the most virulent strain was genetically confirmed via DNA sequencing.

Keywords: Cumin, Fusarium Wilt, Fusarium oxysporum f. sp. cumini, Field survey, Pathogenicity.

9. Survey and Population Dynamics of Key Pests and Their Natural Enemies on Municipal Roses

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Abstract:

A comprehensive two-year survey (2021–2022) was conducted on municipal roses (Rosa hybrida L.) in El-Giza Governorate to identify key arthropod pests and their associated natural enemies, and to monitor their population fluctuations in relation to climatic factors. The survey documented five pest species from different insect and mite groups, with Macrosiphum rosae (aphid) and Dolichothrips varipes (thrips) emerging as the most dominant pests. Tetranychus urticae (spider mite) occurred in moderate numbers, while Phenacoccus solenopsis and Nezara viridula were less abundant. Regular field monitoring revealed distinct seasonal trends: D. varipes and M. rosae peaked in early to mid-March, aligning with moderate temperatures and relative humidity, whereas T. urticae peaked later and persisted longer under warmer, drier conditions. Among predators, Phytoseiulus persimilis showed the highest abundance, especially during March–April, and maintained a strong association with T. urticae. Orius albidipennis and Coccinella spp. peaked earlier in the season and were more closely linked to D. varipes and M. rosae populations. Correlation analyses supported these ecological relationships and highlighted the role of relative humidity and minimum temperature in shaping predator-prey interactions. The findings emphasize the value of multi-season survey studies in understanding pest dynamics and natural enemy performance, providing essential insights for developing environmentally sound, seasonally timed pest management strategies in ornamental rose cultivation.

Keywords: survey, pests, Municipal roses, weather factor, predator.

10. Impact of Elevated Co_2 and Temperature on the Third Trophic Level: A Predator Cydonia vicina var. isis

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Abstract:

The world has witnessed significant climate changes in recent decades, becoming one of the most prominent environmental challenges of our era. The increasing concentration of carbon dioxide (CO_2) in the atmosphere is one of the key factors associated with these changes. This has resulted in a noticeable increase in the greenhouse effect, which in turn has led to rising global temperatures. These changes are not limited to the climate alone; they extend to directly and indirectly affect living organisms, such as plants this has an impact on herbivorous insects that rely on these plants for food, and the effect does not stop there but extends to natural enemies, thereby affecting biological control. In this paper, studied the effects of two levels of carbon dioxide and temperature, (600 ±45ppm and temp. ambient +2◦C) and (800 ±26ppm and temp. ambient +5◦C) on lady beetle life cycle of coccinellid predator Cydonia vicina isis muls on two aphid species *Aphid fabae* , Rhopalosiphum padi and feeding capacity of lady beetle larvae compare with ambient condition of CO_2 and temperature (400±12ppm and temp. 19±2◦C). The results were as follows: the oviposition period increased significantly at 600ppm was 60.00±3.96, 56.60±0.93 days for coccinellid rearing on A.fabae and R. padi while ambient condition , was 52.40±1.29 and 50.40±1.21 days ,respectively. Egg reproductively decreased under elevated of CO_2 it was the least at 800ppm it became 367.8 and 335.80 eggs after rearing on A. fabae and R. padi. The total duration of the pupal and larval stage decreased , also larval consumption of A. fabae and R. padi nymphs decreased under elevated CO_2 and temperature ,however the consumption rate at 600ppm was lower than that at 800ppm. Data indicated that increasing CO_2 concentrations could modify the preference of lady beetle to aphid prey and improve the biological control of aphids by lady beetle.

Keywords: *Cydonia vicina isis, Aphis fabae, Rhopalosiphum padi,* elevated CO_2 and temperature , open chamber

11. Evaluation of Some Chemical and Botanical Compounds Against Pests Infesting Municipal Roses

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Abstract:

This study evaluated the field efficacy of five control agents—three synthetic insecticides (Dioxin 20% EC, Belulond 15% SC, and Entocor 20% SP) and two botanical oils (Mentha microphylla and Citrullus colocynthis)—against three major pests of municipal roses: Dolichothrips varipes, Macrosiphum rosae, and Tetranychus urticae. The treatments were assessed during the 2022 season for their immediate and residual effects. Results showed that Dioxin 20% EC provided the most consistent and effective control, achieving up to 95.31% residual efficacy against T. urticae and significantly reducing D. varipes populations. Entocor 20% SP demonstrated the highest efficacy against M. rosae (89.30%), while Belulond 15% SC also maintained strong suppression across all pests. Botanical oils showed moderate control, with M. microphylla oil exhibiting high initial knockdown, particularly against T. urticae, but declining efficacy by Day 10. These findings highlight the superior performance of synthetic insecticides and support the complementary role of plant-based oils in integrated pest management (IPM).

Keywords: control, pests, insecticides, botanical oils , Municipal roses..

12. Extending the Shelf-Life of Barhee Dates Using Edible Coating Incorporated with Olive Leaf Extract: A Comprehensive Study on Physicochemical, Microbiological, and Sensory Properties

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Abstract:

This study investigated the efficacy of a chitosan-olive leaf powder extract (Ch-OLPE) composite coating for extending the shelf-life of Khalal-stage Barhee dates during frozen storage. Seven coating formulations with varying Ch-OLPE ratios (T2-T7) were applied to dates and compared to an uncoated control (T1) over six months of storage at -17°C to -20°C. Comprehensive analysis revealed that the T5 formulation (50% Ch:50% OLPE) provided the best overall protection. After storage, T5-coated dates showed significantly better-quality preservation than all other treatments, with minimal weight loss, superior color retention (browning index: 52.3 vs. 95.8 for control), enhanced bioactive compound preservation (TPC: 202.5 vs. 142.3 mg GAE/g for control), and exceptional microbial inhibition (TVC: 2.4 vs. 5.8 log CFU/g for control). Sensory evaluation confirmed these findings, with the T5 formulation receiving the highest scores for appearance, color, texture, and flavor. These results demonstrate that the synergistic effect between chitosan and olive leaf extract in the T5 formulation provides comprehensive protection, making it a promising natural solution for the post-harvest preservation of Barhee dates.

Keywords: Barhee dates, Edible coatings, Chitosan, Olive leaf extract Shelf-life extension, Khalal stage.

13. Biological Evaluation of Native and Modified Citrus Peel Pectins on Diabetic Experimental Animals

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Abstract:

The present study aimed to assess the efficacy of native and modified citrus pectin for reducing hyperglycemia. A total of 35 Wistar Strain rats were randomly divided into five experimental groups, each comprising seven animals. Hyperglycemia was induced in all groups except the negative control (G1) by an intraperitoneal alloxan injection. G2 was considered as a positive control, G3 was treated by glibenclamide as a standard drug (10mg/kg b.w), G4 and G5 were given (750 mg/kg b.w) of modified citrus pectin and native citrus pectin, respectively for 56 days. At the end of the experiment, body weight and biochemical markers, i.e. serum glucose levels, hepatic, kidney function tests and lipid profile were performed. The results obtained showed a significant decrease was observed in the final body weight of diabetes induced rats without treatment (positive control). Also, significant increments in liver functions i.e. Aspartate aminotransferase (AST), alanine aminotransferase (ALT) and Alkaline phosphatase (ALP) were achieved in rats with diabetes. In addition to that, the results obtained illustrated that a noticeable increase was recorded in kidney functions i.e. creatinine, uric acid, and urea. Besides that, serum blood glucose levels had a significant increment for the positive control during the same period of the experiment. Furthermore, the levels of parameters of lipid profiles had been significantly increased in diabetic rats except HDL-cholesterol was decreased compared to healthy negative control. Finally, it has been concluded that the application of native citrus pectin and its modified derivative improved the abovementioned parameters. Therefore, the native citrus pectin and its modified derivative can be considered as a natural inexpensive in therapeutic purposes of diabetic rats, comparing with chemical drugs without any side effects.

Keywords: Pectin, modified, citrus, diabetic, native.

14. Enhancement the Growth Performance and Photosynthetic Pigments of Echinacea purpurea Plants by Using Some Natural Materials

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Abstract:

This work aimed to investigate the effects of humic acid soil as addition and foliar application of salicylic acid (200 and 400 mgL^{-1}.), alginic acid (250 and 500 mgL^{-1}.) and chitosan (250 and 500 mgL^{-1}.) on growth performance and chlorophyll contents of echinacea (Echinacea purpurea L. Moench).) plants grown under open field conditions. The results showed that, all treatments significantly increased different studied growth parameters and photosynthesis pigments of echinacea plants during both seasons. In addition, the foliar application treatments of salicylic acid at 200 mgL^{-1}. and chitosan at 500 mgL^{-1}. individually or in combination with humic acid as soil addition significantly increased all the above mentioned traits of growth, as well as photosynthesis pigments (chlorophyll a, chlorophyll b, chlorophyll a + b and carotenoids) during both seasons. salicylic acid at 200 mgL^{-1}. in combination with humic acid as soil addition was the most effective treatment in this respect. Generally, the foliar application treatments with low concentration of salicylic acid and high concentration of chitosan in combination with humic acid as soil addition were the most effective treatments for improving growth and chlorophyll contents of echinacea (Echinacea purpurea L. Moench).) plants under normal conditions.

Keywords: Echinacea purpurea L., photosynthesis pigments, natural materials, salicylic acid, alginic acid.

15. The Complementary Effects of Salicylic Acid, Alginic Acid, Chitosan and Humic Acid to Improve the Yield and Bioactive Component of Echinacea Plants

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Abstract:

The current study aimed to evaluate the effects of different treatments foliar application with salicylic acid (200 and 400 mg/L.), alginic acid (250 and 500 mg/L) and chitosan (250 and 500 mg/L.) and humic acid at 3kg/Fadden as soil addition on flowering parameters (start of flowering heads anthesis (days),flowering heads number/ plant, dry weight of flowering heads, main flowering head height, main flowering head diameter and dry weight of main flowering head/plant) and some bio-active compounds content (caffeic acid derivatives and total alkamides) of purple coneflower (Echinacea purpurea L. Moench).) plants grown under open field conditions. The results clrealy show that, all treatments significantly enhanced all studied flowering parameters and some bio-active compounds content of echinacea plants in both seasons. In addition, foliar application treatments of salicylic acid at 200 mg/L. and chitosan at 500 mg/L. alone or in combination with humic acid soil adition significantly increased all the above mentioned flowering parameters. As for some bio-active compounds content (caffeic acid derivatives and total alkamides) in both seasons salicylic acid at 200 mg/L.with humic acid as soil addition was the most effective treatment in this respect. Generally, the foliar application treatments with 200mg/L.of salicylic acid and chitosan (500 mg/L.) in combination with humic acid soil addition were the most effective treatments for improving flowering parameters and some bio-active compounds content of echinacea (Echinacea purpurea L. Moench).) plants under normal conditions.

Keywords: Echinacea purpurea L., flowering parameters, caffeic acid derivatives, total alkamides, growth bio-stimulants.

16. Effects of Chemical and Green Nano Iron and Copper on Growth, Yield and Fruit Quality of Cucumber Plants (Cucumis sativus L)

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Abstract:

This study was conducted in a greenhouse at the Vegetable Research Farm of the Faculty of Agriculture at Benha University during the summers of 2023 and 2024 to study the effect of foliar spray iron and copper chemical and green nanoparticles, at different concentrations, on vegetative growth and the yield parameters of cucumber fruits (hybrid variety 'Viva Sun'). The results obtained showed that the foliar spraying with different applied treatments using green iron nanoparticles at 750 mg/l and green copper nanoparticles at 50 mg/l led to the highest recorded significant difference in all studied cucumber growth parameters (plant length, stem diameter, number of branches, number of leaves, leaf area, fresh weight, and dry weight); yield parameters (total yield per plant, total yield per treatment, number of fruits per plant, number of fruits per treatment, and fresh and dry weight); fruit quality (fruit length, fruit diameter, firmness, and total soluble solids); and photosynthetic pigments (chlorophyll a, chlorophyll b, total chlorophyll (a + b), and carotenoids). This increase in all the above-mentioned traits of growth and fruit yield parameters compared to the control treatment and other treatments was observed after 45 and 65 days of cultivation during both seasons. It can be concluded that the foliar application treatments of green nano-iron at 750 mg/l and green nano-copper at 50 mg/l have improved the growth, productivity, and quality of cucumber plants and were the most effective treatments that can be used as an alternative to chemical nano-nutrients.

Keywords: Chemical Nano nutrients , Green Nano nutrients , Cucumber , Nano iron Nano copper.

17. Impact on Vegetative Growth and Nutritional Status of Balady Mandarin Trees of Applying Iron, Zinc, and Manganese Mixes as A Foliar Spray and Soil Addition

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Abstract:

This study was conducted over two consecutive growing seasons (2024 and 2025) in a private orchard located in El-Nubaria, Beheira Governorate, Egypt. The experiment was performed on 15-year-old Baladi mandarin trees grafted onto sour orange rootstock. Trees were treated with iron (Fe), zinc (Zn), and manganese (Mn) applied either as foliar sprays or soil applications. Foliar treatments consisted of EDTA-chelated micronutrients containing 12% Fe, 14% Zn, and 13% Mn, applied at a rate of 1.5 g L^{-1}. Soil applications were supplied as sulfate forms ($FeSO_4$, $ZnSO_4$, and $MnSO_4$) at a concentration of 3 g L^{-1}. Both foliar and soil treatments were applied six times annually (March to August) during each growing season. The results demonstrated that foliar application of the EDTA-chelated micronutrient mixture was generally more effective than soil application of the sulfate forms. Among all treatments, T5 (Fe:Zn:Mn at a ratio of 2:1:1) produced the most pronounced improvements in vegetative growth parameters, including shoot number, shoot length increment, leaf area, leaf dry weight, and number of leaves per shoot. In addition, this treatment significantly enhanced the nutritional status of the trees, as reflected by increased leaf concentrations of macronutrients (N, K, Ca, and Mg), micronutrients (Fe and Cu), total chlorophyll and total carbohydrates. Overall, foliar application of EDTA-chelated Fe, Zn, and Mn (2:1:1) demonstrated potential in enhancing growth and nutritional status of Baladi mandarin trees.

Keywords: EDTA., micronutrient mixture ,sulfate forms total chlorophyll, mandarin trees

18. Enhancing Yield, Fruit set and Quality of "African Rose" plum trees through Integrated nutrition and growth strategies

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Abstract:

Background: Optimizing fruit set, yield, and fruit quality in plum cultivation requires effective nutritional and growth stimulant interventions. 'African Rose' plum trees often face challenges related to insufficient fruit retention and inconsistent fruit quality, necessitating integrated approaches to enhance orchard productivity. Aim. This study aimed to evaluate the effects of various combinations of nutrients and growth stimulants on improving fruit set, fruit retention, yield, and the physical and chemical characteristics of 'African Rose' plum fruits. Design: A field experiment was conducted over two consecutive seasons (2023 and 2024) using a randomized complete design (RCD) with multiple treatments applied as foliar sprays. Subjects. The study was carried out in a private orchard located in the Mashtoul El Souq region, Sharqia Governorate, Egypt. Tools. Six-year-old 'African Rose' plum trees grafted onto Mariana rootstock were used. Foliar sprays were applied four times: pre-bloom, at full bloom, after fruit set, and 21 days before harvest. Treatments included different combinations of algae extract, selenium (Se), benzyl adenine (BA), gamma amino butyric acid (GABA), vitamins (K, D, B12), and potassium citrate. Results: All applied treatments significantly improved fruit set percentage, fruit retention, total crop yield, as well as the physical and chemical fruit properties compared to the control in both seasons. The most effective treatment was the combination of algae extract (2.0 cm/L) + benzyl adenine (10 ppm) + selenium (10 mg/L) + potassium citrate (2 g/L). .Recommendations: The treatment comprising (Algae extract 2.0 cm/L + benzyl adenine 10 ppm + selenium 10 mg/L + potassium citrate 2 g/L) proved to be the most effective one in maximizing fruit set, fruit retention, yield, and enhancing the physical and chemical quality of fruits

Keywords: plum, Algae extract Benzyl adenine, Selenium, vitamins, GABA, potassium citrate, post-harvest quality, and crop yield.

19. Optimizing Nutritional Status and Enzymatic Activity in 'African Rose' Plum Trees by Using Different Nutritional Elements and Growth Stimulant Combinations

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Abstract:

Background: Plum trees (*Prunus salicina* L.), particularly the 'African Rose' cultivar, are widely cultivated but suffer from several physiological and environmental constraints that negatively affect productivity and fruit quality. The use of integrated nutritional elements and growth stimulants has emerged as an effective strategy to enhance plant performance and stress tolerance. Aim: This study aimed to evaluate the effect of different combinations of nutritional elements and growth stimulants on the physiological and biochemical performance of 'African Rose' plum trees. Design: A completely randomized design (CRD) with a descriptive experimental approach was used. Setting: The study was conducted in a private orchard in Mashtoul El-Souq, Sharqia Governorate, Egypt, during two consecutive seasons (2023–2024). Subjects: Twenty-one six-year-old 'African Rose' plum trees grafted on 'Mariana' rootstock were selected and divided into seven treatments, each with three replicates. Tools: Data were collected using multiple assessment tools, including (1) Measurement of physiological parameters such as leaf chlorophyll content and protein percentage (2) Biochemical analyses including carbohydrate content, nitrogen percentage, and C/N ratio (3) Enzymatic activity assays for peroxidase (POD) and polyphenol oxidase (PPO) (4) Protein electrophoresis (SDS-PAGE) to evaluate changes in protein banding patterns. Results: All applied treatments significantly improved physiological and biochemical parameters compared to the control. The treatment consisting of micronutrients + vitamins K and D + potassium citrate recorded the highest chlorophyll content, while the combination of algae extract + selenium + benzyl adenine + potassium citrate significantly increased protein content. Additionally, superior treatments enhanced C/N ratio and increased POD and PPO enzymatic activities, indicating improved plant defense mechanisms. Conclusion: Integrated application of nutritional elements and growth stimulants positively affects the physiological status, biochemical characteristics, and enzymatic defense system of 'African Rose' plum trees. Recommendations: It is recommended to apply optimized combinations of nutrients and growth stimulants as foliar treatments to improve plum tree productivity, enhance stress tolerance, and achieve better fruit quality under Egyptian environmental conditions.

Keywords: plum, growth stimulant, nutrients-enzymatic activity- protein profiling, nutritional status, chlorophyll content.

20. Isolation, Identification and Optimization of Alkaline Protease- Producing Bacillus subtilis

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Abstract:

Proteases are the main class of industrial enzymes that have a significant impact on biotechnology. This study aimed to isolate, screen, identify, and optimize protease-producing bacteria from different locations in the Qalyubia Governorate. Among 110 isolates, the highest alkaliphilic and proteolytic isolate BS19 had the highest clear zones of casein hydrolysis on skim milk agar and protease activity. The potent isolate was identified through further morphological and molecular characterization based on 16S rRNA gene sequencing. The isolate was determined to be *Bacillus subtilis* PP973533.1. The highest protease activity was achieved when *Bacillus subtilis* was cultivated in Malik and Mathur medium at 30°C and pH 8.0 for 48 hours. Galactose (5 g/L) was the most effective carbon source for protease production, followed by lactose and glucose. Beef extract (10 g/L) yielded the highest values for both biomass and protease activity, at 2.5 g/L and 690.26 U/L, respectively. Response Surface Methodology (RSM) was employed to optimize the culture conditions. Among the variables tested (incubation temperature, pH, shaking speed, incubation period, aeration ratio, inoculum size, and NaCl concentration) only shaking speed and incubation period were found to have a significant impact on protease production by *Bacillus subtilis*.

Keywords: alkaline protease, optimization, RSM, *Bacillus subtilis*.

21. Valorization of Buffalo Milk Proteins in Yoghurt: Antioxidant Activity and Quality Attributes

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Abstract:

Antioxidants are used medically to reduce oxidative stress in humans. Foods that naturally contain these antioxidants may be better at alleviating oxidative stress. This study intended to explore the antioxidant activity of buffalo milk casein and whey subjected to enzymatic hydrolysis by using pepsin and trypsin enzymes. Also, different yoghurt treatments were produced from buffalo milk to explore their potential antioxidant characteristics. The casein and whey samples were separated from buffalo milk after rennet coagulation or after the biological acidification using *Lactobacillus sp*. The different casein types subjected to pepsin hydrolysis showed higher antioxidant activity than those subjected to trypsin enzyme, while the whey samples treated with trypsin enzyme exhibited higher antioxidant activity than those treated with pepsin. The different yoghurt treatments manufactured using buffalo milk with the addition of pepsin, trypsin, or *Lactobacillus sp.* showed significantly higher antioxidant activity in contrast with the control treatment, when fresh or through refrigerated storage up to 14 days at 5±1 °C.

Keywords: casein, whey, lactobacillus, pepsin, trypsin.

22. Scanning Electron Microscopy and Elemental Composition in Coffee Beans Surface of Some Yemeni cultivars (Coffea arabica L)

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Abstract:

The microstructure and elemental composition of coffee beans (Coffea arabica L.) from nine Yemeni cultivars were investigated using scanning electron microscopy (SEM). The analysis revealed considerable microstructural variation among the cultivars, including those within the same genetic group (e.g., Udaini and Benan). These differences are strongly associated with fruit color (yellow versus red), genetic background, and likely biochemical composition. Such variability in structure is important, as it influences processing performance, roasting behavior, and ultimately the quality of the brewed coffee.The primary elements identified were boron (B, 29.75 ± 0.12%), carbon (C, 30.15%), oxygen (O, 31.82 ± 0.35%), and nitrogen (N, 6.68 ± 0.29%), together accounting for 98.4% of the dry matter. Boron, carbon, and oxygen exhibited relatively low variability, whereas nitrogen showed slightly greater variation (±0.29). Atomic percentage values followed a similar pattern, with boron (35.38%) being the most abundant, followed by carbon (32.28%) and oxygen (25.57%). The substantial levels of carbon, oxygen, and nitrogen confirm the predominantly organic composition of coffee fruits, which consist mainly of carbohydrates, proteins, and organic acids. Notably, the high concentration of boron (29.75%) is unusual, as boron is typically present only in trace amounts (<0.1%) in plant tissues, yet it appears here as a major component.

Keywords: Coffea arabica L, Microstructure, elemental composition, Genetic diversity, Yemeni coffee cultivars.

23. Effect of Different Concentrations of Cryoprotectant Agents on the Hatching of Nile tilapia Embryos, Oreochromis niloticus

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Abstract:

In this study, Nile tilapia embryos were successfully preserved using cryoprotectants for the first time. The current study investigates the toxicity of non-permeable, permeating cryoprotectants and their combination on Nile tilapia embryos. Two non-permeable cryoprotectants at 5 % and 10% (fructose and honey) and three permeating cryoprotectants at 5% and 10% (i.e., glycerol, DMSO and methanol) were used to treat embryos. Fertilized eggs exposed to vitrification solution; 5% fructose + 5% DMSO (96% hatching rate), 10 % fructose +5 % DMSO (96% hatching), 5% honey + 5% or 10% (DMSO and methanol) showed significantly higher in hatching rate of Nile tilapia. Hatching rate of fertilized eggs exposed to fructose alone with different levels 5% or 10% were significantly decreased (56 % and 43% hatching rate), respectively. While alone non-permeating cells agent honey significantly increased the hatching rate of fertilized eggs at level 5% (93% hatching rate) compared with fructose and permeating cells agent alone. Fertilized eggs exposed to vitrification solution; 5% fructose + 5% DMSO (96% hatching rate), 10 % fructose +5 % DMSO (96% hatching), 5% honey + 5% or 10% (DMSO and methanol) showed significantly higher in hatching rate of Nile tilapia. Hatching rate of fertilized eggs exposed to fructose alone with different levels 5% or 10% were significantly decreased (56 % and 43% hatching rate), respectively. While alone non-permeating cells agent honey significantly increased the hatching rate of fertilized eggs at level 5% (93% hatching rate) compared with fructose and permeating cells agent alone. The finding results showed that it is feasible to cryopreserve Nile tilapia embryos using non-permeable cryoprotectants and provide a reference for the use of combinations of cryoprotectants for the species.

Keywords: Cryopreservation, cryoprotectant, Nile tilapia, toxicity.

24. Effect of Alpha-tocopherol (Vit-E) and Ascorbic acid (Vit-C) Addition on Cryopreserved Sperm Viability, Motility, Velocity Parameters, Morphological Measurements(µm) and DNA Integrity at -196°C of Nile tilapia.

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Abstract:

The current study investigates the effect of Alpha-tocopherol (Vit-E) and Ascorbic acid (Vit-C) addition on cryopreserved sperm viability, motility, velocity parameters, morphological measurements(µm) and DNA integrity at -196°C of Nile tilapia. Vitamin E (Alpha-tocopherol) with different levels (0.5 mM, 1 mM, and 2 mM) or vitamin C (ascorbic acid, Sigma–Aldrich, Egypt) with different levels (1 mM, 5 mM, and 10 mM) to cryoprotectant solution Hanks with 6% glycerol on cryopreserved sperm quality during preservation under the liquid nitrogen -196 °C were used. The highest sperm viability (%), progressive motility (PM) and non-progressive motility (NPM) of sperm and stored for one week was detected in sperm exposed to 2 µm Vit-E and 10 µm Vit-C. The highest VCL (µm/sec) which was exposed to Alpha-tocopherol (Vit-E) 2µm and Ascorbic acid (Vit-C)10µm for one week was (19.36 µm/sec and 19.23µm/sec), while the value of VCL was significantly decreased at one week. Furthermore, values VSL in Alpha-tocopherol (Vit-E) 2µm and Ascorbic acid (Vit-C)10µm at one week was linearly decreased (9.83µm/sec and 9.73µm/sec) but significantly higher compared with other graded levels.

The highest sperm normality (%) which exposed to different of graded level (0.5 ,1, 2) vit E (1, 5, 10 mM) Vit C for one week was (66.73 and 70.7%) at 2µm Vit-E and 10µm Vit-C, respectively. No significant differences in Head length, head width, mid piece area and tail length of sperm exposed to 2µm Vit-E and 10µm Vit-C and stored for one week. DNA integrity at Alpha-tocopherol (Vit-E) 2µm and Ascorbic acid (Vit-C)10µm one week show the highest values were (54.40- 62.33%), respectively.

Keywords: Cryopreservation, cryoprotectant, Nile tilapia, Vit. E. Vit. C.

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1. The Impact of Hard Structures on Wave System and Sea Currents

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Abstract:

Coastal areas became the center of social and economic activities. Following the 1964 building of Aswan High Dam, which retained the sediments upstream of the river, erosion rates at Rosetta Promontory have increased. Studying the near shore is crucial in places where accretion and erosion have an impact on the coastline. More circulations and rip currents result from the necessity for protective structures such groins and detached breakwaters caused by erosion and accretion. In addition to observing the hazard rate (HR) of swimming at various water depths due to sea current velocity, this study attempts to monitor the speed, direction, and pattern of sea currents. The numerical model Delft-3D was used to simulate the currents produced by the eight groins' current patterns. Three hard structures scenarios were investigated. Among these scenarios were the use of detached breakwaters and groins. The best scenario is scenario (1) with the smallest value of velocity and the HR along the area study. The (HR) for first scenario up to 2.2 m/s^2 in the upstream and between 1.3, 1.7 m/s^2 in the downstream direction. This rate works well for the majority of swimming age groups. All scenarios are given similar result and they all solve the problem and reduce the hazard rate quickly at the downstream direction.

Keywords: Sea currents, Hazard rate, The northern shore of Egypt, Delft-3D.

2. Numerical Modeling and Simulation for Enhancing the Thermal Management of Lithium-ion Battery Based on Phase Change Material

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Abstract:

Background: Recently, electric vehicles have emerged as one of the most important sectors in sustainable transportation. Lithium-ion battery (LIB) is widely used as the primary energy storage systems in electric vehicles, and is characterized by high power density, high energy density, and fast charging capability. However, heat generation during battery operation can lead to safety and performance concerns. **Aim**: The study presents a numerical model to predict the thermal management of the LIB at different discharge rates (0.5C, 1C, and 2C) based on transient heat transfer with internal heat generation. The developed model is validated using experimental data, and its accuracy is evaluated using statistical indicators including Root Mean Error (RME), Mean Percentage Error (MPE), and Root Square Mean Error (RSME). Furthermore, the study investigates the effect of phase change material (PCM) as a cooling technique to enhance the thermal management in the battery. **Results:** The results show good agreement between the numerical model and experimental data with percentage of error reached to 2.871 % of MAPE at the discharging rate of 2C. Additionally, the findings demonstrate that the PCM decreased the maximum battery temperature, with temperature reductions of approximately 19% at 0.5C, 13% at 1C, and 49% at 2C compared with the natural convection cooling, indicating an enhancement in the thermal performance with increasing discharge rate. **Conclusion** These findings highlight the enhanced thermal performance achieved with PCM, particularly at higher discharge rates.

Keywords; Lithium-ion battery (LIB), State of charge (SOC), Phase change material (PCM), and Thermal management.

3. A Deep Q-Learning Approach for Energy-Efficient Pilot Optimization in XL-MIMO Systems

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Abstract:

Background: Hybrid-Field Extra-Large MIMO (XL-MIMO) systems combine both near-field and far-field communications, which makes efficient power allocation a critical challenge for achieving energy-efficient operation. **Aim:** This paper aims to develop an efficient pilot power optimization strategy that minimizes energy consumption while maintaining a reliable Signal-to-Noise Ratio (SNR) for all users. **Design:** A novel approach based on Deep Q-Learning (DQL) is proposed, where the model is trained in offline mode to determine the optimal distribution of pilot power across antennas. **Subjects:** The study considers multiple users and antennas within an XL-MIMO network environment. **Tools:** The proposed method utilizes DQL along with a carefully designed reward function that balances energy efficiency and system performance by penalizing excessive power usage while ensuring that the average SNR meets a predefined threshold. **Results:** Simulation results show that the proposed approach achieves significant power savings while maintaining reliable communication under different numbers of users and antennas. **Conclusion:** The integration of DQL with hybrid-field XL-MIMO systems provides an effective solution for optimizing energy efficiency without compromising communication quality. **Recommendation:** It is recommended to extend this work to real-time (online) learning scenarios and investigate its applicability in future 6G networks and more dynamic communication environments.

Keywords: Energy efficient pilot optimization, Hybrid-Field XL-MIMO, Deep Q-learning, Signal-to-Noise Ratio (SNR), 5G/6G wireless communication.

4. Transformer-Based Hybrid Beamforming Designs in mmWave MIMO-OFDM Systems

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Abstract:

Hybrid beamforming is crucial for millimeter-wave (mmWave) MIMO systems, as it achieves high data rates while limiting the required number of RF chains. However, designing hybrid beamforming with satisfactory performance and acceptable complexity is challenging, especially in wideband MIMO-OFDM systems. In this paper, a transformer encoder-based hybrid beamforming with quantized phase shifters is proposed for both the fully connected (FC) and sub-connected (SC) architectures. The self-attention mechanism can efficiently capture frequency correlations, enabling accurate design of analog and digital precoders. Furthermore, the transformer architecture's parallel attention mechanism significantly reduces processing time and computational complexity. The proposed transformer encoder-based network jointly generates the analog and digital precoders while satisfying the hardware constraints of FC and SC architectures. The FC and SC networks are trained via unsupervised training. Simulation results demonstrate that the proposed transformer encoder-based FC-HBF scheme achieves higher spectral efficiency than conventional and deep learning-based methods, while the proposed SC-HBF scheme outperforms the conventional scheme and achieves comparable performance to deep learning-based methods. In terms of BER performance, the proposed schemes outperform the conventional scheme in all HBF structures.

Keywords: Hybrid beamforming, deep learning, transformer encoder, mmWave MIMO, quantized phase shifters.

5. Utilizing Fabric Scraps to Design Fashion for Achieving Sustainable Development

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Abstract:

The clothing industry is a continuously growing industry, and with its growth comes an increase in its output and, consequently, an increase in its waste and byproducts. An important aspect is the increasing percentage of fabric scraps resulting from the various stages of manufacturing. As production increases, so does the waste of fabric scraps, and this increase in fabric scraps increases the burden they represent on factories and on the environment. This burden is represented in several aspects, whether economic or environmental. The research problem arises in studying the possibility of designing youth fashions from fabric scraps in a way that maximizes their use and supports the trends of sustainable development in the clothing industry. The research aims to utilize fabric scraps within clothing factories by transforming them from waste that represents an environmental burden into an economic resource that supports the principles of sustainability and the circular economy. It also aims to develop innovative alternative materials resulting from fabric waste that can be used as new inputs in the design and production of fashions, and to create and design contemporary youth clothing pieces that rely on fabric scraps, while achieving aesthetic and functional aspects in accordance with sustainability requirements. This research employs descriptive, analytical, and applied methodologies to investigate and test its hypotheses. It explores the statistically significant relationship between using fabric scraps in youth fashion design and promoting sustainable development principles. This is achieved by creating youth clothing from fabric remnants, incorporating aesthetic elements through embroidery or patchwork, resulting in contemporary designs that also adhere to the principle of sustainability. The findings demonstrate the potential for utilizing fabric scraps to design and create youth fashion that aligns with global fashion trends.

***Keywords*:** Fabric scraps, Fashion design, Sustainable development, Circular economy**.**

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