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The 5th International Conference on Biological, Biomedical Sciences, Biotechnology and Applications

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INTRODUCTION

On behalf of the ***BBSBA2024*** organizing committee, we extend a warm welcome to all attendees! We look forward to a stimulating conference filled with thought-provoking presentations, insightful discussions, and valuable networking opportunities.

GOALS

BBSBA2024 has featured a cutting edge research on Biosciences and Applications. Speakers have covered a range of mechanisms underlying Biological sciences and their Applications. New findings in biology and interdisciplinary science have been highlighted, along with emerging technologies in bioengineering, structural biology, and imaging for high-resolution studies.

BBSBA2024 is specifically directed to:

1- Foster Collaboration: BBSBA2024 *creates a platform for researchers, scientists, and industry professionals to connect, share ideas, and foster new collaborations across disciplines.*

2- Advance Knowledge: BBSBA2024 *provides a forum to present and discuss the latest research findings in biological, biomedical sciences, biotechnology, and their applications.*

3- Identify Challenges and Solutions: BBSBA2024 *addresses critical challenges in these fields and explore innovative solutions through discussions and presentations.*

4- Promote Innovation: BBSBA2024 *encourages the development and implementation of new biotechnology solutions to improve human health, agriculture, and the environment.*

5- Inspire the Next Generation: BBSBA2024 *sparks interest and inspire future generations of scientists and researchers in these fields.*

All papers were reviewed using a blind review process: names and affiliations of the authors were removed from the manuscript, and reviewers did not know each other's identities, nor did the authors receive information about who had reviewed their manuscript.

Conference Chair, BBSBA2024

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All accepted abstracts will be published in the *BBSBA2024* proceedings having ISBN no.: **978-1-63802-006-6**

Optionally, authors can choose to publish full articles in one of the following journals according to journal requirements and Fees:

- ***Bioscience Research (APC applied).***
- ***Advances in Animal and Veterinary Sciences (APC applied).***
- ***Journal of Animal Health and Production (APC applied)***
- ***WAS Science Nature Journal (Free).***

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MESSAGE FROM THE HOSTING PARTNER *BBSBA2024*

The World Advanced Science (WAS) LLC. and University of Vienna are proud hosting partners of the ***5th International Conference on Biological, Biomedical Sciences, Biotechnology, and Applications*** **held at the halls of** ***Division of Pharmacology and Toxicology, University of Vienna, Austria*** **on 25-26 July, 2024.** This is our fifth time collaborating with **WAS Press** to organize this important conference. We are excited to be a part of a conference that allows scholars and practitioners from around the world, especially Saudi Arabia, to present their research and practical ideas to enhance Life Sciences.

We were founded in 2018 as a developing publisher in the USA. We launched our first Open Access, Multidisciplinary journal ***WAS Science Nature journal (WASSN), having ISSN: 2766-7715***. We plan to publish additional WAS Journals, Books, and Proceedings that will cover a wide range of fields shortly. WAS intended to offer many online Webinars, Training Courses, and Workshops to prepare

instructors and educators for future promising jobs.

This International Conference on Life Sciences fits with the mission of WAS to enhance and improve scientific practice worldwide. More information about WAS can be obtained from our website (https://worldascience.com/waspress/index.php/press/) or by emailing to: **waspress@worldascience.com**, WAS Press Principal and WAS Manager OR to: **worldascience@gmail.com**, WAS Press Technical Support.

MESSAGE FROM THE CONFERENCE CHAIR *BBSBA2024*

Hello and welcome, everybody.

It is my great pleasure to serve as a Conference Chair for the fifth time for the ***International Conference on Biological, Biomedical Sciences, Biotechnology and Applications***, organized by WAS LLC., and WAS Press. All conferences were very lively events where Life Science researchers and practitioners from around the world came together to discuss a wide array of important issues in biosciences.

I would like to thank all members of our Organizing Committee, Keynote Speakes, Presenters, and Attendees for supporting all aspects of ***BBSBA2024*** Planning and Success. This year we are proud to have distinctive keynote speakers who shared their knowledge and explained many lighting ideas about the hottest topics of research and innovations. We had Sixty Nine attendees and presenters from different countries.

I hope the conference allowed us to engage with our peers,

discuss our ideas for research and practice, and enhance opportunities for collaboration with other scientists.

We also invite you to attend our coming ***6th International Conference on Biological, Biomedical Sciences, Biotechnology, and Applications. BBSBA2025*** is intended to be held in Vienna, Austeria, by the next July, 2025. We hope you will spend some time exploring **Vienna**, one of the most dazzling cities worldwide. Meanwhile, we will keep you updated timely with our news and events.

Thank you,

Conference Chair BBSBA 2024

Prof. AlaaEddeen M. Seufi

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ABSTRACTS & POSTERS

Sequence and phylogenetic analysis of Influenza A/H1N1 and Influenza B viruses in Riyadh, Saudi Arabia

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Abstract

Objectives: Influenza virus infections pose a serious threat to public health worldwide. Epidemiological details and molecular characteristics of influenza viruses in Saudi Arabia are scarce, hampering the development of effective preventive and therapeutic processes. Herein we carried out the epidemiological, phylogenetic, and molecular analyses of influenza A virus (IAV) and influenza A virus (IBV). **Methods**: The study was carried out in Riyadh, Saudi Arabia using 311 clinical samples collected during five epidemic seasons (2014/15, 2015/16, 2016/17, 2017/18, 2019/20) from hospitalized children. **Results**: IAV was more prevalent in 88 out of 311 samples (28.3%) compared to IBV in 6 samples out of 311 (1.9%). All IAV strains were subtyped into A/H1N1 in 45 out of 88 samples (51.2%) and A/H3N2 in 43 out of 88 samples; (48.8%). Sequence and phylogenetic analyses of full-length hemagglutinin (HA) and neuraminidase (NA) genes of A/H1N1 have enabled the categorization of Riyadh strains into five clusters viz. 6B.1, 6B.1A.5a, 6B.1A.5b, 6B.1A.6, and 6B.1A.7. While IBV Lineages shifted from B/Yam-like during the 2014/15 season to B/Vic-like for 2019/20) **Conclusion**. These data identify the dominant circulating influenza virus subtypes in Riyadh and unravel their genetic makeup which may help in the development of novel vaccines targeting the studied population for the effective prevention of influenza infections in Saudi Arabia.

Introduction

Acute respiratory tract infections (ARTIs) are the major cause of hospitalization and mortality in young children worldwide (1). Of about 200 viruses incriminated in ARTI, the majority of cases were diagnosed as infected by one or more of human respiratory syncytial virus (HRSV), metapneumovirus (MPV), influenza viruses (IAV and IBV), parainfluenza viruses; PIVs (1–3), and coronaviruses (CVs). Influenza is a major respiratory disease that causes significant annual morbidity and mortality. It is usually associated with a total of 250,000 to 500,000 deaths every year worldwide (2–4). The current study was designed to investigate the epidemiological characteristics and genetic diversity of influenza A/H1N1 and IBV during (2014–2020) in Riyadh, Saudi Arabia.

Methodology

Sample population:
(n = 311 clinical samples seasons (2014–2018; 2019/20) were collected from the hospital wards of King Khalid University Hospital (KKUH) in Riyadh, Saudi Arabia.

Influenza A/H1N1 and IBV detection:
Influenza samples were screened for A/H1N1 and IBV using a One-step RT-PCR kit. Each virus was targeted with its correlated universal primers. Then, for gene sequencing, the complete HA and NA genes for A/H1N1 and IBV were amplified.

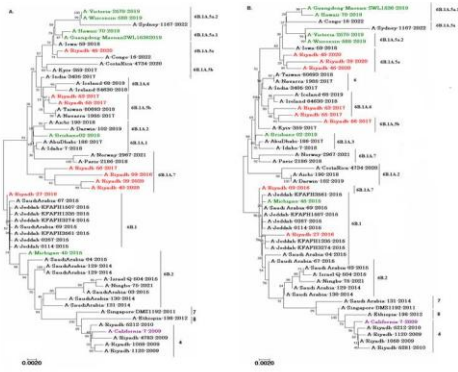
Sequence Data Analysis and Phylogenetic analysis:
BioEdit and DNA laser gene were used for sequence editing, alignment, and translation.
The phylogenetic tree was constructed with MEGA 7.

Table (1): List of the primers used in the present study for detection, typing, and sequencing of IAV and IBV.

Aim	Virus subtype	Primer name	Sequence 3'–5'	Amplicon size (bp)	Reference
IAV detection (*M* gene)	IAV	M30F2/08	ATGAGYCTTYTAACCGAGGTCGAAACG	244	(5)
		M264R3/08	TGGACAAANCGTCTACGCTGCAG		
IBV detection (*NS-2* Gene)	IBV	INFB-Univ-F	ATGGCCATCGGATCCTCAAC	238	
		INFB-Univ-Ra	TGTCAGCTATTATGGAGCTG		

Results

Figure (1): Phylogenetic trees of A/H1N1. (A): HA gene and (B): NA gene

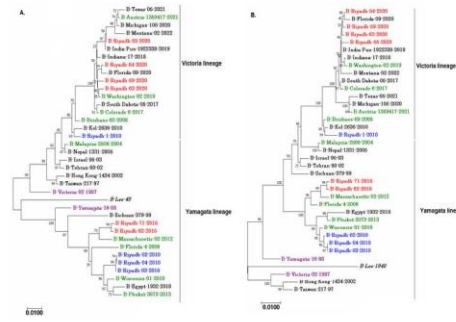


Study isolates of seasons are denoted by red. Vaccine strains are shown in green color. Reference strain is denoted by purple.

Table (2): Distribution of clinical samples collected during the study period

Item	Variables	No. of samples n(%)	No. of Positive Samples			
			IAV	A/H1N	A/H3N2	IBV
			n(%)	n(%)	n(%)	n(%)
Season	2014–2015	24(7.7)	0(0.0)	0(0.0)	0(0.0)	2(8.3)
	2015–2016	14(4.5)	14(100.0)	11(78.5)	3(21.5)	0(0.0)
	2016–2017	42(13.5)	42(100.0)	22(52.4)	20(47.6)	0(0.0)
	2017–2018	15(4.8)	15(100.0)	1(6.7)	14(93.3)	0(0.0)
	2019–2020	216(69.5)	17(7.9)	11(64.7)	6(35.3)	4(1.9)

Figure (2): Phylogenetic trees of IBV. (A): HA gene and (B): NA gene



Study isolates of seasons are denoted by red. Vaccine strains are shown in green color. Reference strain is denoted by purple.

Conclusion

This study revealed the dominant circulating influenza virus subtypes and revealed their genetic makeup in Riyadh, Saudi Arabia. Consequently, the currently used flu vaccines in Saudi Arabia may require reconsideration by the inclusion of more relevant vaccines for the effective prevention of influenza infections in the coming epidemic seasons

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Antimicrobial effect of the pygidial gland extract of some coleopteran from Sakaka, AlJouf, Saudi Arabia

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Abstract

Aim: The present study aimed to investigate the antimicrobial effect of the pygidial gland extract. **Methods**: *Blaps gigas, N. laevioctostriatus* and *S. acutidens* beetles were collected, identified and dissected under a stereo-microscope to show the whole pygidial gland. The glands were pooled, well-ground by using liquid nitrogen, and extracted using 70% ethanol. Ethanolic pygidial gland extract was then investigated as antimicrobial agent. Three fungal species (*Fusarium verticolloids*, *Alternaria alternata* and *Fusarium proliferatum*), and four bacterial species (*Salmonella typhimurium, Staphylococcus aureus, Envinia carotovora* and *Ralastonia solaniserum*) were utilized in this study. **Results**: *F. verticolloids, A. alternata* and *F. proliferatum* fungi were subjected by the ethanolic pygidial-extracts of *B. gigas, N. laevioctostriatus* and *S. acutidens* (individually or as a mixture). Individual pygidial-extracts of *B. gigas, N. laevioctostriatus* and *S. acutidens* caused significant reduction in the radial growths of the three fungal species. This reduction ranged from 43.3 to 75.6% when compared to the control. Additionally, serial dilutions of the three pygidial-extracts mixture reduced the radial growths of the three fungi. The reduction of fungal growth is directly proportional to the concentration of the pygidial mixture. IC50s of the pygidial mixture were 4.54, 5.3 and 5.2% for *F. verticolloids, A. alternata* and *F. proliferatum*, respectively. However, the pygidial mixture showed no change in bacterial growth of the human pathogens; *S. typhimurium* and *S. aureus* or the plant pathogens; *E. carotovora* and *R. solaniserum* when compared to control. **Conclusion**: Our results showed that the three beetles exhibited a strong antifungal, but not antibacterial activity when compared to controls. Future extensive research is recommended on the potential medicinal use of beetles' extracts.

Introduction

Beetles are the most diverse insect order. A vast array of potential applications was offered by beetles (Guo, 2017). Ground beetles have pygidial glands at their rear end, which can ooze, spray, or pop defensive secretions when attacked. These glands serve as a powerful deterrent against predators. In their mature secretions, certain species of ground beetles even have antibacterial qualities (Nenadic et al., 2017). However, not much research has been done on the pygidial glands in species of darkling beetles.

Methodology

INSECTS AND MICROBES:
Adult beetles were collected manually from various locations within Sakaka city, at Al-Jouf region, between January and December 2023. Beetles were identified using the available taxonomic keys (Aballay et al., 2016).

ANTIFUNGAL ACTIVITY:
Radial mycelial growth method was used to assess antifungal efficacy of the three selected individual pygidial extracts. Potato dextrose agar (PDA) medium were treated with successive concentrations of the pygidial-extract mixture (0.31, 0.62, 1.25, 2.5, 5, and 10%) in order to determine the IC 50 value of the three *F. verticolloids, A. alternata*, and *F. proliferatum* using the formula:
RGI %= C-T/C * 100, where C is the pathogen radial growth in the control (mm), T is the pathogen radial growth in treatments (mm), and RGI is the percentage decrease of fungal growth in the test.

ANTIBACTERIAL ACTIVITY:
Well diffusion method was used on solid Luria-Bertani (LB) agar plates. Pygidial extracts of insects were tested for antibacterial activity against *E. carotovora, R. solaniserum, S. typhimurium* and *S. aureus*. The measurements were made in triplicate in three distinct fixed directions, and the average, values were tabulated. Gentamicin and DMSO were used as positive and negative controls, respectively.

STATISTICAL ANALYSIS:
The antifungal, and antibacterial data are shown as mean ± standard deviation. The significance level was obtained by applying the LSD test to the data and performing a one-way ANOVA at a significance level of 0.05.

Results

Antifungal activity of insect pygidial extracts:

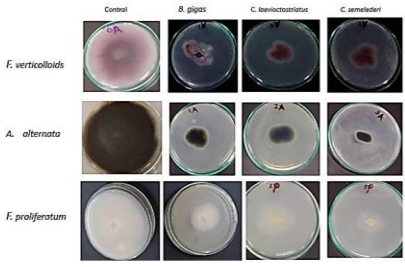

Figure (1): The effect of three different ethanolic pygidial-extracts (*B. gigas, N. laevioctostriatus and S. acutidens*) on radial growth (mm) of *F. verticolloids, A. alternata and F. proliferatum* compared to their control.

Fungal strains	Control	Fungal radial growth (mm) (% reduction)		
		B. gigas	*N. laevioctostriatus*	*S. acutidens*
F. verticolloids	9.0	5.1±0.2[a] (43.3)	3.6±0.2[c] (60.0)	4.1±0.1[b] (54.4)
A. alternata	9.0	3.6±0.3[a] (60.0)	3.7±0.1[a] (58.9)	2.2±0.0[b] (75.6)
F. proliferatum	9.0	4.0±0.3[ab] (55.6)	4.2±0.1[a] (53.3)	3.5±0.2[b] (66.7)
Measuring unit		mm		

Table (1): The effect of three different pygidial-extracts (*B. gigas, N. laevioctostriatus and S. acutidens*) on radial growth (mm) of *F. verticolloids, A. alternata* and *F. proliferatum*. Data are means of three replicates ± SD. Different letters in **each row** reveals significant variations at P<0.05.

No.	Concentrations (%)	Radial fungal growth (mm) (% reduction)		
		F. verticolloids	*A. alternata*	*F. proliferatum*
1	Control (0)	9.0±0.0[a] (0)	9.0±0.0[a] (0)	9.0±0.0[a] (0)
2	0.31	8.2±0.3[b] (11.1)	7.7±0.4[b] (14.4)	7.1±0.2[b] (21.0)
3	0.62	7.5±0.2[c] (16.7)	7.0±0.2[c] (22.2)	6.4±0.5[c] (28.9)
4	1.25	6.1±0.5[d] (32.2)	6.2±0.1[d] (31.1)	5.4±0.3[d] (40.0)
5	2.5	5.0±0.2[e] (44.4)	5.1±0.1[e] (43.3)	4.6±0.2[e] (48.9)
6	5	4.5±0.2[f] (50.5)	4.2±0.1[f] (53.3)	3.9±0.2[f] (56.6)
7	10	3.6±0.3[g] (61.1)	3.3±0.2[g] (63.3)	3.0±0.2[g] (66.7)
	IC_{50} (%)	**4.54**	**5.3**	**5.2**

Table (2): Evaluation of different concentrations of the pygidial-extract mixture against mycelial growth of three phyto-pathogenic fungi, and the IC50 value of each fungus. Data are mean of three replicates ± SD. The values with the same letters in **each column** are not significantly different from each other at P < 0.05.

ANTIBACTERIAL ACTIVITY:

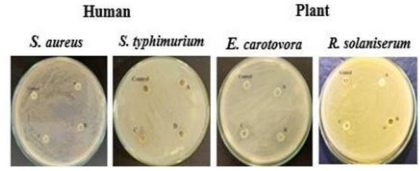

Figure (2): The effect of pygidial-extracts of *B. gigas* (A), *N. laevioctostriatus* (B) and *S. acutidens* (C) on bacterial growth of two pathogenic human bacteria (*S. typhimurium* and *S. aureus*) and two pathogenic plant bacteria (*E. carotovora* and *R. solaniserum*) compared to their not-treated control.

Conclusion

From this study it could be concluded that the three beetles exhibited a strong antifungal, but not antibacterial activity when compared to controls. Future extensive research is recommended on the potential medicinal use of beetles' extracts.

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Computer-aided discovery of 2,7-dimethylnaphthalene derivatives from J. curcas leaves extract as potential anti-Pf CK2 and Pf CLK1: a combination of molecular docking, druglikeness, MMGBSA, and molecular dynamic simulation analyses

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ABSTRACT

Malaria, caused by five Plasmodium species, is still a major concern in many regions of the world, accounting for roughly 247 million clinical cases and 619,000 fatalities in 2021, primarily among children under the age of five and expectant mothers in Sub-Saharan Africa. There is growing concern that resistance to artemisinin-based medicines will extend to additional locations, jeopardizing the efficacy of this standard therapy. Kinases, both protein and lipid, are a class of molecular therapeutic targets that have been widely studied in a variety of disease areas, particularly oncology. In this study, 23 compounds from GC-MS phytoconstituents characterization of partially purified fraction 1 and 2 of J. curcas leaves extract from our previous work were retrieved and computationally docked into the binding site of Pf CDPK1 (3Q5I), Pf CDPK2 (4MVF), Pf CDPK4 (4QOX), Pf CK2 (5XVU), Pf CLK1 (3LLT), Pf MAPK2 (3NIE), and Pf PK7 (2PMN) which are

all Plasmodium protein kinases targets for malaria. The top binders were revalidated and subjected to druglikeness properties. To completely analyze the complex stability and structural flexibility, as well as to appreciate the protein-ligand interactions, the best ligand's ligand-receptor complexes (Pf CK2 -Compound 124 and Pf CLK1-Compound 81) were subjected to molecular dynamics simulation. In addition, the MMGBSA method and additional evaluations of the simulation findings were performed which included pharmacokinetic and pharmacodynamics analysis. Findings in this study indicated good dynamics and stability of the complexes within the binding sites of Pf CK2 and Pf CLK1, thus, a possible anti-plasmodium activity. However, additional experimental studies are required to ascertain the claims in this study.
Keywords: Malaria; *Plasmodium* species; Protein kinases; Druglikeness properties; *Jatropa curcas*

Antimicrobial peptides and therapeutic applications

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ABSTRACT

The first line of defense of insects against pathogens and parasites is the cuticle. Once this barrier has been breached, a complex interaction of innate humoral and cellular immune reactions is induced in both tissues and haemocoel, which results in the rapid elimination of microorganisms. Insects defend themselves against infectious microorganisms by a sophisticated set of reactions: (A) Haemocyte mediated cellular immune response (1) phagocytosis and encapsulation by blood cells, (2) proteolytic cascades leading, in particular, to

coagulation and melanization; (B) Humoral defences (l) Secretion of a battery potent antimicrobial peptides. In the present review, discovery, definition, sources, classification, structure and characteristics, methods of induction, mode of action, therapeutic applications, and limitations of using AMPs are discussed.

Keywords: Antimicrobial peptides; innate immune reactions; phagocytosis and encapsulation; coagulation and melanization

Study on the role of albendazole in physiological and histological changes in farm chicken infected with environmental parasites in Dawmat AlJandal, AlJouf, Saudia Arabia

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ABSTRACT

Farm birds, or chickens, are susceptible to a variety of parasite infections that are spread by people. The anti-parasitic medication of choice is albendazole (ABZ). This article's main objective is to examine the effects of ABZ on the intestine and hepatic tissue of farm hens. ABZ recorded an egg reduction rate (ERR) of almost 100% and a cure rate (CR) of 96% (egg negative conversion rate, or NCR) with 400 mg given all at once. A total of 20 farm chickens were divided into 4 groups (5 chickens/ group): (G1) non-infected, untreated gro (G4) (17.3%) compared to those infected only. AST levels showed a significant increase in groups (G2) and (G4) compared to the normal control group. The percentage increase reached 124.65% and 256.33%, respectively at $P<0.001$ and $P<0.01$. While (G3) treated with albendazole recorded a decrease rate of 51.85%. AST levels in the plasma of groups (G3) and (G4) recorded a significant increase compared to the infected control group (G2). An increase in ALT was recorded in groups (G2) compared to the control group (G1). The percentage increase reached 127%. An increase in ALT was recorded in groups (G2) and (G4) compared to the normal group (G1). The percentage increases reached 127% and 48.03%, respectively. The histological study of both the liver and intestines demonstrated the pathological effect of the tissues treated with albendazole, and on the contrary, the treatment affected the decrease in the number of worms in the intestines. The study indicates that treatment with albendazole for chickens infected with various parasites led to a decrease in the number of

worms. It also led to an increase in the values of liver enzymes and some abnormalities in both the liver and intestines.

Keywords: Albendazole; liver enzymes; pathological effect; cure rate; egg reduction rate; intestinal tissue; liver toxicity; drug resistance

Effect Of *Mesembryanthemum* sp. On The Date Pest *Oryzaephilus surinamensis* (Saw Toothed Grain Beetle)

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ABSTRACT

The saw toothed grain beetle, *Oryzaephilus surinamensis*, is a destructive stored product pest which diminishes the yield, quantity, and quality of many stored products. This study was designed to investigate effect of the wild plant, *Mesembryanthemum* sp. Powder on the adult *O. surinamensis*. Beetles were collected from infested dates in Sakaka, Saudi Arabia, and identified, morphologically. Beetles were exposed to the *Mesembryanthemum* powder for varying times. Results demonstrated that the daily mortality of adult *O. surinamensis* was significantly increased ($P > 0.05$) when compared to the control, throughout the experimental period. Additionally, the median mortality time (IT_{50}) of *Mesembryanthemum* on adult *O. surinamensis* was 3.7 days. These findings suggested that the usage of *Mesembryanthemum* powder in fighting stored product insects is a promising eco-friendly approach for managing these pests. Incorporating this natural powder into date storage practices could empower farmers and businesses to minimize losses inflicted by *O. surinamensis*. Further research is crucial to optimize the application methodology and to confirm long-term efficacy and safety.

Keywords: *Oryzaephilus surinamensis*; *Mesembryanthemum* sp.; Mortality; Bio-pesticides; Eco-friendly

Biosynthesis of Ag nanoparticles and possible role in extending the shelf life for various seeds

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ABSTRACT

Background: The most important causes of damage to seeds and grains are the growth of microorganisms, insect infestation, attack by rodents, and others, which result in a loss in nutritional value, as well as a loss in the quality of seeds and grains, and also a loss in seeds, which is linked to a decrease in the germination rate. Mycotoxins, of all kinds, are considered one of the most dangerous and important problems facing humans because they cause significant health damage that is difficult to treat as a result of eating food contaminated with them or with the organisms that secrete them. **Aim:** The aim of this study is to find preventive solutions that can reduce or prevent the spread of mold in grains and crops during the storage

period. This study investigated the impact of AgNPs on seed germination rate and seedling growth. **Methods:** This can be achieved by biosynthesizing silver nanoparticles using olive kernels, which can effectively combat the causes of mold without compromising the efficiency or quality of grains and food products. **Results:** The results showed that the seeds coated with AgNPs@OSE had an antifungal effect on the tested fungi: *Alternaria porri* (MT550031), *Asperigillus flavus* (MT550030), *A. niger* (MW596373), *Fuserium oxysporium* (MT550034), and *Candida parapsilosis* (MW960416). It was also noted that the Ag-seed coat did not affect the growth and germination of the seeds, as the coating helped the *(Cucumis sativus)* cucumber seeds resist the growth of fungi. The seed germination was not affected when the optimum conditions of germination were available. It is also resistant to mold, and the effect was clear when compared to the control. The germination rate of cucumber seeds coated with AgNPs@OSE was 100%. Additionally, the results indicated that AgNPs@OSE had no toxic effect on cucumber seed germination. Protecting the embryo from hazardous external influences is a major function of the seed coat. Selective permeability is possible in seed coverings. **Conclusion:** The Ag-seed coat of the seed protected them from harmful fungi that may infect them. There was no impact on germination rate or selective permeability. Thus, the Ag-seed coat might increase the shelf life of the seeds.

Keywords: *Cucumis sativus*; olive seeds; biosynthesis of

silver nanoparticles; seed growth and germination; toxicity

The influence of copper and silver interlayers on the antifungal properties of zinc telluride films

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ABSTRACT

Background: This study investigates the antifungal efficacy of zinc telluride (ZnTe) nanocomposites enhanced with silver (Ag) and copper (Cu) nanoparticles.

Aim: To evaluate the antifungal efficiency of ZnTe nanocomposites with Ag and Cu nanoparticles and to understand their mechanisms of action against *Candida albicans*. **Methods:** The antifungal efficacy of ZnTe/Ag (ZAZ) and ZnTe/Cu (ZCZ) nanocomposites was assessed by determining the minimum inhibitory concentrations (MICs) for *C. albicans*. Scanning electron microscopy (SEM) was used to analyze morphological changes in treated cells. **Results:** ZAZ exhibited the most pronounced antifungal efficacy, with a MIC of 0.3 mol/L against *C. albicans*, while ZCZ showed a slightly increased MIC of 20 mol/L, indicating lower efficacy. ZnTe alone demonstrated the lowest antifungal activity among the compounds studied. The high antifungal activity of ZAZ is attributed to the adhesion of ZAZ nanoparticles to microbial surfaces, disrupting cellular membranes, essential proteins, and altering microbial respiratory chains, which affects mitochondrial function by impairing the electron transport chain, leading to reduced ATP production. The study also revealed that Ag and Cu layers in ZnTe nanocomposites significantly inhibited *C. albicans* growth, with inhibition values of 85% for ZAZ and 70% for ZCZ, compared to the control sample's inhibition value of 20%. The antifungal action of Ag nanoparticles is linked to their infiltration of cellular structures, production of reactive oxygen species (ROS), and disruption of cell proteins. SEM analysis revealed substantial morphological changes and increased cell debris in treated *C. albicans* cells, highlighting the increased permeabilization of cell

membranes by Ag nanoparticles. **Conclusion:** These findings contribute to the understanding of the potential use of Ag and Cu nanoparticles in ZnTe nanocomposites for antifungal applications, particularly against *C. albicans*. The study underscores the need for further research into their mechanisms and clinical applications.

Keywords: Antifungal; ZAZ nanoparticles; SEM

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Herein, we take the leed to invite all of you to prepare your valuable contributions to be shared in the ***6th International Conference on Biological, Biomedical Sciences, Biotechnology and Applications (BBSBA2025)***, planned to be held by the next July 2025 in Vienna, Austria.

Thank you for sharing our success, and we are expecting the continuity of your cooperation. Additionally, we are waiting to receive your valuable contributions and see you in Vienna, Austria the next July 2025.

Sincerely Yours;

BBSBA2024 Organizers