



ICAZ-2024 Abstract Book

7th International **Conference on Applied Zoology** (ICAZ-2024) (Hybrid Mode)



The Applied Zoological Society of Pakistan (AZSP) in Collaboration with University of Sargodha (SU), Sargodha

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Welcome Remarks by AZSP Chairman



Dear Friends and Colleagues,

It is a great privilege to have you in the 7th International Conference on Applied Zoology-2024 (ICAZ- 2024). This will be held from 22-23rd October, 2024 under the shelter of The Applied Zoological

Society of Pakistan in collaboration with Department of Zoology, University of

Prof. Dr. Muhammad Ali Chairman AZSP Sargodha, Sargodha which includes 2 day's scientific sessions. On the behalf of the Applied Zoological Society of Pakistan (AZSP), I would like to extend our sincere gratitude for your contribution as a participant until the completion of ICAZ-2024. It is our sincere hope that this conference also provides stimulating environment and satisfaction to all the researchers from different national and international universities



K-1/ICAZ-2024

Unlocking the Potential of Yak (Bos grunniens) in Northern Pakistan: A Gateway to Sustainable Livelihoods and Biodiversity

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Abstract

Yak (Bos grunniens), a unique species of the high-altitude regions of Northern Pakistan, plays a vital role in the local pastoral economy and the biodiversity of the region. Despite its significance, yak populations in Pakistan remain largely understudied, and conservation efforts are minimal. Our research group is focused on exploring the genetic diversity of yak populations and the implementation of conservation strategies to ensure the species' sustainability and the livelihoods of yak-dependent communities in Gilgit-Baltistan. We conducted genetic analyses of yak populations from various regions in Gilgit-Baltistan, employing molecular markers to assess genetic diversity and identify unique haplotypes. Our findings reveal substantial genetic variation within and between populations. offering insights into their adaptability to extreme environments. The study also explores the effects of global climate change (GCC) on yak habitats, highlighting the need for targeted conservation programs to preserve genetic diversity and mitigate the impacts of changing environmental conditions especially in Northern Pakistan. Our research emphasizes the importance of integrating local communities into conservation initiatives. By promoting sustainable breeding programs and educating local farmers about the benefits of genetic conservation, we aim to enhance the longterm viability of yak populations. Additionally, community-driven efforts can safeguard traditional knowledge, which is crucial for maintaining ecological balance and ensuring food security in these high-altitude regions as this species act as lifeline for them under harsh climates. This study highlights the urgent need for a multidisciplinary approach to safeguard yak populations, combining molecular research, sustainable livestock practices, and active community involvement. It lays the foundation for adaptive strategies that not only protect this iconic species but also strengthen the resilience of the local communities that rely on them, particularly in the face of global climate change (GCC). Keywords: Yak (Bos grunniens), genetic diversity, conservation, climate change, sustainable breeding, Northern Pakistan, community engagement.

K-2/ICAZ-2024

Anti-ageing effects of elite football and team handball trainings Muhammad Asghar1, Marie Hagman2, Bjørn Fristrup2,3, Magni Mohr2,3,4, Peter Krustrup2,3,4,5,6. 1 Department of Biology, Lund University, Sweden.

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Abstract

For a long time, scientists believed that ageing was unmodifiable process, which happened at the same rate for everyone. However, over the past decades researchers has shown that a variety of genes are associated with longer lifespan through different mechanisms in both mice and other mammals. A growing body of research published over the past 10 years also suggests that ageing can be influenced by behavioural changes, such as calorie restriction and lifestyle changes. This has raised the exciting possibility that we might be able to slow the ageing process.Regular physical activity can make a big impact on both health span and lifespan. Beneficial effects of regular exercise have been demonstrated to reduce the risk and severity of several lifestyle diseases, such as cardiovascular diseases, type 2 diabetes, metabolic syndrome, osteoporosis, and cancer. Football training efficiently combines endurance training, aerobic high-intensity interval training (HIIT), and resistance training in one activity and has been shown to have positive effects on cardiovascular, metabolic, and musculoskeletal fitness (Krustrup et al., 2019). Here we have



investigated whether team football and team handball training slowdown cellular aging in women in a cross-sectional study of 129 healthy no smoking women, including young elite football players (YF, n=29), young untrained controls (YC, n=30), elderly team handball players (EH, n=35) and elderly untrained controls (EC, n=35). Our results show that young elite football players have ~23% longer telomeres and higher mtDNA copy number compared to young untrained controls, while elderly team handball players showed healthy mitochondria compared to elderly untrained controls. These cellular adaptations were also positively correlated with VO2max and the amount of weekly exercise, emphasizing the importance for these women, irrespective of age, to maintain a reasonable fitness and activity level (Hagman et al. 2021). We expanded our study by performing RNA-seq analysis using illumina nextseq 550 sequencing platform to understand how football and team handball training impact the global gene expression pattern. Our preliminary results from the transcriptomic analysis show 51 genes were differentially expressed between young football players (YF) compared to young untrained controls (YC), including telomere maintenance genes (POT1 and TERT). While 46 genes were differentially expressed between elderly team handball players (EH) compared to elderly untrained control (EC). By comparing all the four groups, our systematic analysis identified 19 genes that were associated with physical training. We further aim to take holistic approach, performing system biology analysis, combining epigenetics, proteomics, transcriptomics, metabolomics and phenomics to understand the molecular mechanism underlying the anti-aging mechanisms in elite football and team handball women.

K-3/ICAZ-2024

Functional Foods and Nutraceuticals: "Let Food be Your Medicine"

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Pakistan.

²Centre for Applied Molecular Biology (CAMB), University of the Punjab, Lahore, 53700 Punjab, Pakistan Abstract

Recent developments in the field of optimal nutrition have led to an increase in the use of functional foods and nutraceuticals. Nutraceuticals are isolated, concentrated portions of naturally occurring foods that are high in nutrients. They are available in medical forms such as tablets, capsules, and ampules, among others. They have components that aren't usually thought of as nutrients, yet they have advantageous physiological effects that aid in the prevention of chronic illnesses. Different names for nutraceuticals exist in different countries: designer foods, phytochemical-rich foods, functional foods, and natural health supplements. The physiological and therapeutic health benefits of nutraceuticals are attributed to a wide range of bioactive substances and high-value constituents, such as biopeptides, carotenoids, essential fatty acids, dietary fiber, isothiocyanates, flavonoids, polyols, plant stanols/phytosterols, phytoestrogens, prebiotics/probiotics, soy protein, sulfides/thiols, etc. They prolong life expectancy, maintain the body's structural integrity, improve well-being, slow down the ageing process, prevent chronic illnesses (diabetes, cancer, viral infections, etc.), and control gene expression. Secondary metabolites, or plantbased compounds with medicinal properties, are the main bioactive ingredients in nutraceuticals. The World Health Organization has acknowledged the potential of nutraceuticals as a safer, more focused, and more successful treatment for a variety of prevalent diseases, such as obesity, hypertension, cancer, diabetes, viral infections, and cardiovascular disorders. Nevertheless, there is an urgent need to explain the molecular mechanisms behind the activities of these beneficial compounds. This talk will focus on the concept, categorization, and potential medicinal and therapeutic applications of a number of commercially available nutraceuticals. It also emphasizes the opportunities, problems, and trends that the nutraceutical industry is currently confronting.

Keywords: Nutraceutical; supplements; phytochemical; functional food; nutrigenomics

K-4/ICAZ-2024 Fisheries and agricultural integration for food security

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Abstract

The food security is a global challenge now days. To ensure the food security for future generation the scientists and researchers are engaged to introduce the new technology and methodology to maximize the production level in the field of agriculture. Aquaponics is a one of the food production system that might fulfill the future food demand. Aquaponic is a combine intensive system of aquaculture and hydroponics. In term of aquaculture we raise

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aquatic animals, especially fish, in tanks and through the hydroponic we cultivate the plants in a nutrient solution. It is the system to improve sustainability and develop an affordable small-scale food production system to tackle the problems of malnutrition and food insecurity. In general, in between the vegetable and fish there is a symbiotic relation in the aquaponic system, those are growing together in a control water circulation system.

Aquaponic is one of the best sustainable developments of food production system not only in the urban area but also for the metropolitan cities. Home-based aquaponics is the typical forms of aquaponics for different urban development. The Aquaponic is a system that to fulfill all of three (environment, social economic) sustainable criteria. Therefore, it might be anticipated the assessment of impact in this system. It is still a rather new concept for food production. In future it might be promoted up to its maximum level, because of its significant food production. Keywords: Agriculture, Fisheries, Integration, Food security.

K-5/ICAZ-2024

Inspired by nature: evolution and diversification of spider silk genes and approaches for artificial synthesis Sara

Abstract

The diversity of silks produced by spiders has allowed them to thrive in many different ecological niches, from arid deserts to underwater environments. Much is understood about the physical properties of silks, but the underpinning genetic basis for this diversity is much less well-understood, and the mechanism by which the proteins assemble is also largely unknown. Reconstructing the evolutionary history of the silk gene family gives insights into the likely forces that have shaped current patterns of diversity. It also allows predictions to be made about how these proteins assemble and how we might produce synthetic versions. We have used these insights to make our own copies – but with an added chemical 'twist', which is to functionalise them with useful molecules of choice, producing silk that is arguably even 'smarter than a spider's own'.

K-6/ICAZ-2024

Unleashing the Potential of Indigenous Fungi from Pakistani Coal Mines for Transforming Subbituminous Coal: A Green and Economical Approach Towards Chemical Stock Production Prof. Dr. Muhammad Ishtiaq Ali

Department of Microbiology, Quaid-i-Azam University Islamabad Pakistan

Abstract:

Background and Aim: Harnessing the power of fungal strains isolated from a coal mine in Pakistan, this research delves into the depolymerization of sodium hydroxide pretreated subbituminous coal. The aim is to explore a sustainable and cost-effective methodology for converting low rank coal into valuable chemical feedstocks. Methods: By optimizing conditions and employing fungal isolates AD-3 (Neurospora crassa) and AD-5 (Penicillium simplicissimum), this study achieved significant organic compound release through incubation with glucose and pulverized coal. The synergistic effects of NaOH treatment and sodium acetate as enhancers further amplified the fungal-mediated liberation of organic compounds. Results: Gas chromatography/mass spectrometry (GC/MS) analysis revealed a diverse array of organic compounds in the solubilized fraction of chemically treated coal compared to untreated coal. The biotransformation process yielded polycyclic aromatic hydrocarbons (PAHs), ketones, aldehydes, fatty acids, nitrogen- and oxygen-containing compounds. Fungal activity targeted ether bonds, hydroxyl groups, and aliphatic structures, releasing valuable aromatic constituents. Notably, solubilization rates reached 31.29% (AD-3) and 44.9% (AD-5) for untreated coal, and 50.9% (AD-3) and 68.4% (AD-5) for chemically treated coal within just 5 days. Conclusion: The innovative combination of chemical pretreatment and biotransformation by indigenous fungal species presents a promising avenue for transforming subbituminous coal into chemical feedstocks. This study underscores the potential of leveraging native fungi from coal environments to unlock the untapped value of low rank coal reserves.

O-1/ICAZ-2024

How does water depth influence the growth rate, condition, and shell shape of Manila clams (Ruditapes philippinarum) in the Sea of Marmara?

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61530, Trabzon, Türkiye

Abstract:

The Manila clam (Ruditapes philippinarum), native to the temperate western Pacific coasts of China, Japan, and Korea, is the world's most economically significant molluscan shellfish, with an annual market value exceeding US\$6 billion. It now has a cosmopolitan distribution, including North America, the Mediterranean, north-western Europe, and elsewhere. In Türkiye, where it is predominantly fished in the Sea of Marmara, it has become the most commercially valuable bivalve for local fishers. The species naturally inhabits sheltered substrates in waters 1-10 m deep, typically below the mid-tide line in lagoons and estuaries. This study aimed to evaluate the influence of water depth on the growth rate, condition index, and shell shape of R. philippinarum in the Sea of Marmara. Samples were collected in July 2024 from four different depths within the Sea of Marmara. Shell shape was analysed using elliptical Fourier analysis and shape indices. Data were examined using multivariate and univariate analyses of variance, as well as discriminant function and principal component analyses. In addition to assessing the effects of water depth, sexual dimorphism in shell shape, growth rate, condition index, and length-weight relationships was also investigated. The results of this study revealed that water depth significantly influences the growth and condition of R. philippinarum, highlighting its importance as a critical environmental variable.

Keywords: Elliptical Fourier analysis, Mussels, Shell Morphology, Shellfish, Turkiye

O-2/ICAZ-2024

Advances in Sustainable Aquafeed Formulation: Utilization of Plant by-Products and Associated Challenges Syed Makhdoom Hussain

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Abstract:

Aquaculture is the fastest developing industry that is becoming increasingly vital across the globe in order to feed the world's starving population. Nowadays, the total production of aquatic animals in aquaculture has reached about 87.5 million tonnes. More than 70% production of this industry relies on the external feed. The primary feed ingredient in aquaculture is fish meal (FM), which has a balanced nutritional profile, great palatability, and a high concentration of growth-promoting substances. It has become expensive as a result of its high demand and static supply, which limits the expansion of this industry. Therefore, there is an urge to locate FM substitutes that are both broadly available and cost effective. This review highlights the use of plant protein sources in the feed industry, due to their various advantages such as sustainability, availability, cost effectiveness etc. Some of the alternatives such as soy bean meal, Moringa oleifera leaf meal, Moringa oleifera seed meal, canola meal, sunflower meal, and cottonseed meal, have been used extensively to replace FM, since they are more environment friendly, conveniently available, cost effective and sustainable than FM. Although, some antinutritional factors (phytate, tannins, saponins, trypsin inhibitors, gossypol) limit their usage in aquaculture. The first consideration for formulation of feed is the quality of the feed ingredients. Therefore, feed additives (antioxidants, antibacterial agents, pigments, enzymes, organic acids and hormones) are substances that are added to the fish feed, to not only fulfill the nutritional demands but also enhance the health, quality and composition of fish. This study also focuses on the addition of different supplements, i.e., enzymes, probiotics, organic acids, nanoparticles and biochar, to fish diets in order to address the limitations of plant by-products. By collating knowledge, it implies that further research work will be needed to ascertain the impacts of these alternatives for cost-effective and eco-friendly aquafeeds.

O-3/ICAZ-2024

Characterization and Pathogenicity of Aeromonas hydrophila associated with high mortalities in Rohu (Labeo rohita).

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2Department of Biological Sciences, University of Veterinary and Animal Sciences, Lahore, Ravi Campus, Pattoki, Pakistan



Abstract

The present research was conducted to identify potential pathogens contributing to the mass mortalities observed in Labeo rohita at the semi-intensive fish farm. Forty dead fish were collected from different ponds of fish farms. Fish have manifested clinical indications including abdominal dropsy and ulcerative lesions. The kidney of the fish was cultured on Aeromonas isolation media base with ampicillin. The target colonies were selected and further screened through gram staining, API-20E, DNA extraction, and PCR. Confirmed strains were screened for the presence of the seven virulent genes, including Aer, hyl, Alt, Act, Ast, Ela, and lip. The antibiogram of isolates was determined through the disc diffusion method (Kirby-Bauer). Isolates from diseased fish grew well on Aeromonas isolation media base with light green corner and dark green center colonies. The Gram staining results revealed small coccobacilli gram-negative rods. The result of API-20E concluded that isolates were tentatively identified as Aeromonas hydrophila. NCBI Blast analysis of gyrB sequences revealed that isolates were A .hydrophila of the same strain. A. hydrophila was resistant against Ampicillin (10 µg), Cefuroxime sodium (30 µg), Meropenem (10 µg) and Penicillin (10 µg). The genes Act, ela, alt, lip, and hyl were present in A. hydrophila. In conclusion, this study highlights the emergence of A. hydrophila as a major causative agent in Labeo rohita within a semi-intensive farming system.

Keywords: Labeo rohita, Kidney, API-20E, Virulent gene, Antibiotic resistance

O-4/ICAZ-2024 Exploring the promising effects of dietary Aloe vera supplementation on the health and physiology of Catla catla

Rabee Hassan, Syed Makhdoom Hussain, Mubashir Hussain, Muhammad Adnan, Maryam Bibi 1Fish Nutrition Laboratory, Department of Zoology, Government College University Faisalabad, Faisalabad, Punjab, Pakistan.

Abstract

Aloe barbadensis (L.) Mill. (A. vera) is a well-recognized herbal supplement in aquaculture feeds, known for its ability to promote growth and digestive health. This research demonstrates the beneficial effects of incorporating A. vera supplements in the diet of fingerlings of Catla catla. 270 fingerlings of C. catla (6.50 ± 0.03 g), each were randomly distributed into six groups. Each group was tested in triplicate and fed diets with equal amounts of canola meal and varying levels of A. vera supplementation: 0%, 1%, 2%, 3%, 4%, and 5%. The purpose was to investigate the impact of these diets on growth, carcass composition, nutrients, and hematology. The fingerlings were fed at a rate equivalent to 5% of their live wet body weight. The outcomes indicated that fingerlings that were given a diet supplemented with 3% A. vera saw a substantial (p < 0.05) increase in weight growth (%) and an improvement in feed conversion ratio. The greatest observed digestibility coefficient of nutrients, namely crude protein, gross energy, and crude fat, and the optimal carcass values, including fat and crude protein content, were also documented at the same level as A. vera. The result from hematology analysis indicated significant differences (p < 0.05) in the levels of WBCs, RBCs, PLT, and Hb when fish were fed a diet incorporating 3% A. vera. Supplementation with A. vera does not affect MCHC, MCH, and MCV. Scientific evidence demonstrates that adding A. vera to the diet of C. catla fingerlings leads to a considerable improvement in their performance, especially when supplemented at a level of 3%. To enhance the utilization of A. vera as a supplement in aquaculture, it is crucial to conduct a more comprehensive and comparative study.

Keywords: Aquaculture, fish nutrition, nutrient digestibility, body composition, blood indices

O-5/ICAZ-2024

Assessing the Growth and Lysozyme Activity of Nile Tilapia (Oreochromis niloticus) Under Different **Stocking Densities in Biofloc System**

Andleeb Zahra, Abdul Mateen, Shahnila Younas, Amna Abbas, Muhammad Naveed, Nudrat Aslam Fish Nutrition Laboratory, Department of Zoology, Wildlife & Fisheries, University of Agriculture, Faisalabad Abstract

The current study was planned to assessed the comparative effect of stocking density (40, 50 fish/m3) on growth performance and lysozyme activity of Oreochromis niloticus in biofloc culture system. The experiment was conducted over a period of 6 months under indoor conditions at the Department of Zoology, Wildlife, and





Fisheries, University of Agriculture, Faisalabad. Before the start of experiment, the juveniles of Nile Tilapia were collected and distributed in 6m3 tarpaulin sheet tanks to acclimatized for one week. Nile Tilapia were fed with 25% crude protein @6% of fish body weight. Nile Tilapia were grouped into two stocking densities; T1 (40 fish/m³) and T2 (50 fish/m³). The experiment involved daily monitoring of water quality parameters, weekly measurements of growth parameters and lysozyme activity were measured at the end of the experiment. The study showed that the temperature, DO, pH, TAN, nitrite and nitrate ranges were (27-29oC), (6.8-5.7mg/L), (7.6-6.2), (0.82-0.60mg/L), (0.22-0.39mg/L) and (7.75-11.83mg/L) respectively. Floc volume of T1 was (19.41±0.12ml/L) and T2 was (21.74±0.14ml/L). TSS of T1 was (662.51±0.18mg/L) and T2 was (801.61±0.16mg/L). The values of TDS for T1 and T2 were (750.16±0.11mg/L) and (791.86±0.14mg/L) respectively. Results showed that the total weight gain of Nile Tilapia in T1 (259.19±1.19g) was statistically significant as compared to T2 (239.07±2.71g). The length gain also showed significantly high value in T1 (19±0.57cm) as compared to T2 (16.56±0.62cm). The FCR of T1 (1.39±0.11) showed the lower value than T2 (1.75±0.27). The SGR in group T1 was (2.32±0.23%) and in T2 was (2.16±0.31%). The results of lysozyme activity were also significant for T1 (36.36±0.37µ/ml) and T2 (34.40±0.49µ/ml). The results of this research showed that the Nile Tilapia had better growth performance, lysozyme activity in T1 as compared to T2 with high stocking density.

O-6/ICAZ-2024

Impacts assesment of toxic industrial efluents on artimia

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Mutaquim¹

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Abstract

This study evaluates the acute toxicity of textile effluents on Artemia sp. (brine shrimp), utilizing cysts, nauplii, and adults as test organisms. Artemia, known for its osmoregulatory capabilities and adaptability to hypersaline environments, serves as a model organism in ecotoxicology due to its rapid life cycle and sensitivity to pollutants. The research focused on determining the lethal concentrations (LC50) of various textile effluent concentrations (0.0001% to 100%) and their effects on hatching rates, mortality, and behavioral changes. Initial tests indicated that concentrations between 0.0001% and 1% had negligible effects on both nauplii and adults, while concentrations above 1% exhibited significant mortality. Notably, 100% concentration resulted in rapid lethality within five minutes for both life stages. Statistical analysis demonstrated a strong correlation between effluent concentration and mortality, with nauplii exhibiting higher sensitivity ($R^2 = 0.906$) compared to adults ($R^2 = 0.816$). This study underscores the utility of Artemia as an effective bioindicator for assessing the ecological impacts of textile industry pollutants, contributing to better management practices for aquatic environments.

Keywords: Bioindicator, Mortality, Ecological impacts, Toxicity, effluents, Artimia, Osmoragulatory, Ecotoxicology O-7/ICAZ-2024

Ameliorative Effects of Ocimum sanctum in Oreochromis niloticus Against Waterborne Sub-lethal Cadmium Toxicity

Muhammad Attaullah Saad, Syed Makhdoom Hussain, Syed Farhan Ali Shah, Zeeshan Yousaf, Danish Riaz Department of Zoology, GC University, Faisalabad-38000, Pakistan.

Abstract

This research was conducted to evaluate the beneficial effects of Ocimum sanctumin Oreochromis niloticus against waterborne cadmium toxicity. Total 180 fish (18.41 ± 0.11) were distributed into six experimental groups each with three replicates consisting of 18 experimental tanks. The experimental groups were: Negative Control group: without supplementation and exposure to Cd; positive control group: no supplementation but exposed to Cd; 10g/ kg supplementation along with Cd exposure; 20 g/kg supplementation along with Cd exposure; 30 g/kg supplementation along with Cd exposure; 40g/kg supplementation along with Cd exposure. Cadmium chloride was used at a concentration of 1.775mg/L. The trial continued for a period of 60 days. Waterborne Cd had a deleterious effect on fish growth performance, body composition and blood profile, along with elevated Cd accumulation in various tissues. Conversely, consumption of O. sanctum effectively mitigated the toxic potential of Cd and enhanced fish longevity. Notably, 30 g/kg supplementation boosted growth, improved carcass quality, reversed blood indices, and mitigated



Cd accumulation in tissues. In conclusion, the findings revealed that incorporating 30 g/kg of *O.sanctum* as a dietary supplement in O. niloticus aquaculture could effectively counteract heavy metal toxicity. *Keywords:* Cadmium toxicity, Oreochromis niloticus, Ocimum sanctum.

O-8/ICAZ-2024

Comparison of Astaxanthin and Fucoxanthin on Gut Microbiota and Skin pigmentation of Cyprinus carpio

Zunaira Jamal^{*1}, Shakeela Parveen¹, Fayyaz Rasool², Muhammad Haroon¹, Sana Abid¹, Ifrah Mustafah¹ ¹Department of Zoology, Wildlife and Fisheries, University of Agriculture, Faisalabad ²Department of Zoology, University of Education, Lahore, Faisalabad Campus

Abstract

This research primarily aimed to compare the effects of fucoxanthin and astaxanthin on skin pigmentation and gut microbiota of Cyprinus carpio. For this experiment, fish was collected from research ponds. The feeding trial was of 2 months. The analyses and comparison of the skin pigmentation and gut microbiota of fish fed with astaxanthin and fucoxanthin were done after the feeding trial and for detailed comparison, commercial feed was also given to control group. Skin pigmentation was checked using spectrophotometer and culturing of bacteria from gut samples was evaluated using NA, TSA and EMB media. The physicochemical parameters were monitored at regular intervals. Quantitative results obtained from different treatments were compared with each other with the help of CRD under Tukey's test. All the mean values were significantly different. The results showed that minimum numbers of colonies were obtained in experimental group fed with fucoxanthin as compared with astaxanthin and control group (P<0.05). While maximum skin pigmentation was observed in experimental group supplemented with astaxanthin in contrast with fucoxanthin and control group (P<0.05). It is summarized that fucoxanthin and astaxanthin yielded positive results in improving fish microbial profile and skin pigmentation as compared to commercial feed.

O-9/ICAZ-2024

Dietary exposure of iron oxide nanoparticles in Common carp (C. carpio) fingerlings: Evaluation of growth, nutrient absorption, body composition and blood indices

Eman Naeem*, Syed Makhdoom Hussain, Danish Riaz, Muhammad Adnan Khalid, Zeeshan Yousaf, Eram Rashid and Adan Naeem

¹Department of Zoology, Government College University Faisalabad, Faisalabad, Pakistan.

Abstract

The bioavailability, small size and direct absorption in the blood, make nanoparticles (NPs) a remarkable feed additive in the aquaculture industry. Therefore, dietary iron oxide nanoparticles (Fe2O3-NPs) were used to examine their effects on growth, nutrient absorption, body composition and blood indices in Cyprinus carpio (Common carp) fingerlings. Healthy C. carpio fingerlings (n=270) were fed with six canola meal based experimental diets (D1-control, D2, D3, D4, D5, D6) supplemented with 0, 10, 20, 30, 40 and 50 mg/kg Fe2O3-NPs, respectively. 15 fingerlings (average initial weight 5.51 ± 0.04 g/fish) were kept in triplicates for 70 days. The results indicated that maximum growth performance, apparent digestibility coefficient, body composition and hematological parameters were observed in 40 mg/kg Fe2O3-NPs supplementation. All the experimental diets were significantly improved (p<0.05) in all the above parameters than control diet. In the present research, the recommended dosage of Fe2O3-NPs as dietary supplement is 40 mg/kg for improving the growth, nutrient absorption, body composition and hematological indices in C. carpio fingerlings. Hence, this study demonstrates the potential of NPs to improve the health of fish.

O-10/ICAZ-2024

New Record of Bivalvia: Noetiidae species with detailed morphological descriptions from the coast of Pakistan (Northen Arabian Sea)

Saedul Bibi¹*, Shahnaz Rashid¹, Rabia Bibi¹, Pervaiz Iqbal¹, Pirzada Jamal Ahmed Siddiqui¹, Sumaiya Adil¹ ¹Center of Excellence in Marine Biology, University of Karachi, 75270, Pakistan.

Abstract

The family Noetiidae, a minor bivalve group containing of 12 genera and 39 valid species worldwide, is mostly found in tropical and warm temperate seas, usually inhabiting the undersides of rocks, crevices, and soft substrates. Despite its presence in the molluscan fauna, the existence of Noetiidae in Pakistan remains poorly documented. This study purposes to fill this knowledge gap by surveying the distribution and diversity of Noetiidae along Pakistan's extensive 980 km coastline in the subtropical northern Arabian Sea. Fieldwork conducted from 2014



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to 2018 involved biodiversity assessments in intertidal zones of rockSSSy and sandy beaches across Sindh and Baluchistan. Our findings confirmed the presence of three previously reported species: Striarca symmetrica, Didimacar tenebrica, and the newly documented Sheldonella lateralis, which had not been recorded in Pakistan before. Shell specimens were collected and cataloged at the Center of Excellence for Marine Biology (CEMB- Bivalve Biodiversity Lab-BBL), Notably, while our surveys expanded the known distribution of Noetiidae. This study boosts the understanding of Noetiidae distribution and diversity in Pakistani coast and provides the first detailed morphological descriptions of these species from the region, contributing valuable data to the malacological knowledge of the area. Future research should focus on the ecological roles and conservation status of these bivalves within their habitats.

Keywords: Noetiidae, Sheldonella lateralis, new record, taxonomy, Distribution, Pakistan Coast.

O-11/ICAZ-2024

Efficacy of MCP (mono-calcium phosphate) added plant meal based diet on the mineral absorption, hematology and carcass composition of Labeo rohita (rohu) juveniles Muhammad Mudassar Shahzad ^{1*}, Fatima Yasin ¹, Muhammad Usman ¹ ¹Department of Zoology, Division of Science and Technology, University of Education,

Township, Lahore, Pakistan.

Abstract

In terms of development, world is advancing rapidly but, still hunger is a constant challenge affecting the globe. To overcome this issue aquaculture is providing promising growth in animal based food production. Therefore, improving the aquaculture productivity is indispensable need. This study was carried out to estimate the effects of MCP (mono-calcium phosphate) supplementation on carcass composition, hematology and mineral absorption of rohu (Labeo rohita) fingerlings. During 60 days of trial, triplicate groups of rohu fingerlings were fed with five trial diets differing in level of MCP supplementation (0 g/kg, 0.25 g/kg, 0.5 g/kg, 0.75 g/kg and 1 g/kg). Sesame seed meal was used in diet as protein source. Fish were fed twice a day. A complete randomized design (CRD) was selected to compare each diet supplemented with MCP to the control diet. The outcomes represented the maximum values for carcass composition {crude protein (18.62%), crude fat (9.05%) and gross energy (2.64K.cal /kg)}, blood parameters {Red corpuscles (3.03 ×10 6 mm -3), PLT (64.48%), Hb (8.73 g/100ml), PVC (29.11%), MCHC (36.77) and Ht (34.38%)} and improved mineral absorption {Ca (70.75%), Na (75.68%), K (71.54%), P (69.35%), Fe (63.56%), Cu (61.62%), Al (56.57%) and Zn (59.63%)} were recorded with 0.75% MCP added diet. On the basis of these findings, it was concluded that the addition of 0.75% MCP had the best results for carcass composition, hematological parameters and better absorption of majority of minerals required by rohu. Therefore, the supplementation of 0.75% MCP for better outcomes in rearing rohu fingerlings was recommended by this study.

Keywords: Hunger, Sesame seed meal, Trial diet, anti-nutritional factors, Fish Meal, feed pelleting.A.

O-12/ICAZ-2024

Modulatory effects of zinc nanoparticles as a dietary supplement in mori, Cirrhinus mrigala, fingerlings

Adan Naeem, Syed Makhdoom Hussain, Danish Riaz, Muhammad Adnan Khalid, Muhammad Faisal, Muhammad

Amjad and Eman Naeem

Government College University, Faisalabad-38000, Pakistan

Abstract

In this study, zinc oxide (ZnO) was used as nano-form in diet of Cirrhinus mrigala (initial weight: 7.13 ± 0.05 g) to evaluate growth, nutrient digestibility, carcass composition, hematology and fatty acid (FA) profile. NPs were characterized by using X-ray diffraction analysis. Six iso-nitrogenous diets were synthesized with graded concentrations of ZnO-NPs (0, 10, 20, 30, 40, and 50 mg/kg) in Moringa oleifera seed meal based diet. A total of 15 fingerlings in each tank (N=270) were reared in replicate and fed twice a day throughout 70 days. Feeding fingerlings with 30 mg/kg of ZnO-NPs led to significant (p<0.05) improvements in weight gain%, specific growth rate and feed conversion ratio. Moreover, maximum digestibility of crude protein, lipid and gross energy were also observed when 30 mg/kg of ZnO-NPs were fed to fingerlings. In case of carcass and hematology, optimum level was noted at 30 mg/kg of ZnO-NPs. Conclusively, 30 mg/kg ZnO-NPs supplementation showed markedly elevated (p<0.05) effects on overall health status of C. mrigala. However, adding more than this amount could compromise quality of fish.



O-13/ICAZ-2024

Effect of a dietary short chain fatty acid (sodium acetate) on growth, proximate, serum biochemistry and enzyme activities of *labeo rohita*

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Abstract

The organic acid salt sodium acetate can be used in fish feed to overcome the negative effects of fish meal alternatives (plant-based protein-rich ingredients and other alternative protein sources) used in modern fish feed formulations. In this study, sodium acetate was used to prepare fish feed to assess the effects of sodium acetate on the growth performance, intestinal digestive enzyme activity and serum biochemistry of Labeo rohita. Five diets were prepared with different concentrations of sodium acetate; D1 (0.5%), D2 (0.5%), D3 (1%), D4 (2%) and D0 (0% as a control). Accilimized L. rohita fingerlings (N=225) with an initial body weight of 4 ± 0.5 g were randomly distributed in 15 tanks (15 fish/tank) and fed their respective diets upto apparent satiation for 60 days. After a 2-month careful feeding trial and maintenance of the best conditions for the optimal growth, the fish were harvested and subjected to laboratory analysis. The results confirmed that the growth performance and digestive enzyme activity of the fish increased steadily from 0% to 1% and decreased further at the 2% level. Highest weight gain (), weight gain % (), and specific growth rate () were observed on D3 (1%). A diet supplemented with 1% sodium acetate improved the feed conversion ratio (). The results of the serum biochemistry analysis revealed that the quantity of alkaline phosphatase, alanine aminotransferase and aspartate aminotransferase decreased linearly up to the 1% level and then increased to the 2% level. The whole-body proximate composition was not significantly different (p < 0.05). These findings suggest that 1% sodium acetate improved the growth performance, digestive enzyme activity and serum biochemistry of Labeo rohita.

Keywords: Sodium acetate, fish meal, Labeo rohita, serum.

O-14/ICAZ-2024

Development of Cost Effective and Eco-Friendly Fish Feed by Using Di Calcium Phosphate Supplemented Plant Meal Based Diet for *Cirrhinus mrigala* (Mori) Juveniles Maria Sana^{1,} Abdul Ghafar², Muhammad Mudassar Shahzad ², Fatima Yasin^{1,2}, Marzia Batool¹,

Sana¹, Abdul Ghafar², Muhammad Mudassar Shahzad², Fatima Yasin^{1,2}, Marzia Batool Sadia Muhammad Din⁴, Usman Elahi³

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Abstract

The goal of current study is to provide a cost-effective and environmentally sustainable diet for Cirhinus marigala fingerlings by incorporating Di Calcium Phosphate (DCP) into a plant- based diet to improve hematological indices, nutrient digestibility, and mineral absorption. Six test meals (0, 1, 2, 3, 4, 5) were created using different DCP levels (0, 0.20, 0.40, 0.60, 0.80 and 1.00 g/Kg). Twenty fingerlings were placed in each glass tank for the trial and were fed twice daily. Result showed that improved values of RBCs (3.05 10 6 mm -3), Hb (8.01 g/100ml), and Ht (32.47%) were computed at diet 3 having 0.60 g/kg level of DCP, whereas test diet 2 (0.40g/kg) had the maximum value of PLT (63.40%). Maximum values of crude protein (69.50%) and fat (69.26%) observed at test diet 3 having 0.60g/kg level of DCP. At test diet 3 (0.60%), mineral absorption was likewise at its maximum value (Ca, 72.21%, Na, 72.45%, K, 66.55%, and P, 72.47%). Results showed that, because diet 3 (0.60g/kg) reduces the outflow of minerals and nutrients into water bodies, it is the optimal DCP level for producing affordable and environment friendly feed for C. marigala fingerlings.

Keywords: DCP, nutrient digestibility, mineral absorption, hematology

O-15/ICAZ-2024

Immunological and Haematological Responses of *Labeo rohita* under Starving Conditions Naila Noreen Kanwal¹, Sajid Abdullah², Sikandar Hayat³ and Sidra Abbas^{*4}





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²Department of Zoology, Wildlife and Fisheries, University of Agriculture, Faisalabad, Pakistan ⁴Department of Zoology, University of Jhang, Jhang, Pakistan

Abstract:

In aquaculture, fish food and fish health is much important. Improper management of aquaculture leads to disturbed fish health and fasting stress. Food shortage is experienced by all aquatic animals including fish and this food shortage completely changes the immune system of fish. The present research work was aimed to study the immunological parameters of rohu under fasting condition. Duration of experimental trial was 60 days. For this purpose, the fish were divided into two groups. The 1st group called a control group and was fed with diet twice a day. 2nd group called a starved group and in this group fish were kept in starved conditions for 10 days, 20 days and 30 days. The physico-chemical parameters such as water temperature, dissolved oxygen, pH, total hardness, electrical conductivity, calcium and magnesium were also determined during this experiment. After experimental trial the blood sample from the fish caudal vein was collected to examine hematological and immunological parameters such as hemoglobin, red blood cells, hematocrit, white blood cells, MCV, MCH, MCHC, monocytes, lymphocytes, eosinophils neutrophils and granulocytes. The data obtained from blood samples and physicochemical parameters were statistically analyzed by analysis of variance and correlation. The correlation analysis was executed to determine relationship between different physico-chemical parameters. Keywords: Labeo rohita, Immunology, Hematology, Starvation, RBC's, WBC's

O-16/ICAZ-2024

A holistic approach of sustainable waste management for more cleaner and greener Environment of Pakistan

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⁴Fisheries Development Board of Islamabad

Abstract:

Sustainable waste management practices provide comprehensive waste management solutions. It is a popular approach to make positive impact on environment and creating eco-environmentally friendly awareness to establish a clean and green sustainable environment. During the industrial revolution the burning of fossil fuel began that started emission of greenhouse gases that increased the earth temperature produce the worst consequences of global warming. For the reduction of greenhouse gases, land fill waste, and carbon foot prints the proper disposal and sustainable waste management practice, planning and cutting edged technology are essential for the creation of cleaner and geener tomorrow of Pakistan. To achieve our objectives, it is crucial to reduce landfill waste, promote source segregation and champion a circular economy will help towards environmental excellence and brighter future. The main purpose of this work is to spread the awareness and trainings to all corner of community to establish a sustainable waste management practice for cleaner and greener Environment of Pakistan In priority basis switch towards to reduce, reuse, repair and recycle.

Key words: Waste management, fossil fuel, greenhouse gases, global warming, recycle, Carbon footprints.

O-17/ICAZ-2024

Physiological, Biochemical, and Histological Responses of Cirrhinus mrigala upon Dietary Exposure to Iron Oxide Nanoparticles Afshan Shareef

Bahauddin Zakaria University Multan Pakistan

Abstract:

The current study examines the impact of the differential quantity of iron oxide nanoparticles incorporated feed on the physiological, biochemical, and histological characteristics of 40 Cirrhinus mrigala. Iron oxide nanoparticles were synthesized and analyzed using energy-dispersive X-ray spectroscopy (EDX) and X-ray diffraction analysis (XRD). Three experimental feeds were prepared by utilizing differential quantities of iron oxide nanoparticles such as 0mg/kg (T1), 10mg/kg (T2), and 50mg/kg (T3). Physiological, biochemical, and histological characteristics





of Cirrhinus mrigala were measured after 21 days of research trials. Physiological characteristics were measured in terms of morphometric characteristics i.e. wet body weight (g) and body length (cm) were recorded at the start and end of the trial period. The results revealed a dose-dependent response, where T2 (10 mg/kg) significantly enhanced growth, specific growth rate (SGR), survival efficiency rate (SER), feed conversion ratio (FCR), and behavior accompanied by improved hematology (RBCs, HGB, WBCs, LYM). Biochemical characteristics were measured in terms of serum protein, albumin, and globulin levels. A significant increase in biochemical composition (serum protein, albumin, and globulin levels) was also noticed in T2 when compared to the control group. Conversely, T3 (50 mg/kg) induced adverse effects on hematology, biochemistry, and liver histology, indicating toxicity at higher levels. From the results, it was concluded that iron oxide 10mg/kg level is more suitable for Cirrhinus mrigala with great growth potential and improved biochemical composition as compared to other levels of iron-oxide nanoparticles. The current research also provides a significant parameter for investigating the ecotoxicological effects of increased quantity of iron oxide nanoparticles on fish populations.

O-18/ICAZ-2024

Effect of vitamin e on growth performance and biochemical Parameters of Oreochromis niloticus

Zulfiqar Khursheed ¹, Huma Naz ^{1*}, Tanveer Ahmed ², Syed Qaswar Ali Shah ¹, Sajid Abdullah ³, Muhammad Umar Ijaz³, Muhammad Adeel Hassan⁴, Murtaza Manzoor¹, Igra Zulfigar¹ and Muhammad Hamid Irshad 1

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³ Department of Zoology, Wildlife and Fisheries, University of Agriculture, Faisalabad, Pakistan ⁴ Department of Parasitology, Cholistan University of Veterinary and Animal Sciences, Bahawalpur, Pakistan

Abstract

The objective of this study was to evaluate the effect of Supplementary Vitamin E (VE) on the growth performance and biochemical parameters viz peroxidase (POx), superoxide dismutase (SOD), catalase (CAT), and digestive protease activity of Nile tilapia (Oreochromis niloticus). The fish were fed with four different levels of VE designated as: (T 0) 0 mg/kg, (T 1) 200 mg/kg, (T 2) 400 mg/kg, and (T 3) 600 mg/kg for two months. Daily length gains (DLG), daily weight gain (DWG), specified growth rate (SGR), feed conservation ratios (FCR), and condition factor (CF) were used to measure the growth performance of the fish during the trial. The results indicated that the T 3 group shows significantly higher growth performance by their superior DWG, DLG, SGR, and FCR. This study also evaluated the biochemical parameters such as POx, SOD and CAT in the gills, muscles, liver, brain, and digestive protease in gut of fish. The significant increase in the activities of POx, SOD, CAT, and protease were observed in VC fed fish as compare to control. The results suggest that vitamin E supplementation increase the growth performance, antioxidant activity and protease activity in O. niloticus.

Keywords: Enzymes, tilapia, Growth performance, organs herbicide.

O-19/ICAZ-2024

Efficacy of Di-Calcium phosphate (DCP) supplemented plant meal-based diet on overall performance of Cirrhinus mrigala (Mori) fingerlings

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² Department of Biological Sciences Faculty of Sciences Superior University Lahore.

³ Faculty of Agriculture and Veterinary Sciences Superior University Lahore.

Abstract

The objective of this study was to evaluate the effect of Supplementary Vitamin E (VE) on the growth performance and biochemical parameters viz peroxidase (POx), superoxide dismutase (SOD), catalase (CAT), and digestive protease activity of Nile tilapia (Oreochromis niloticus). The fish were fed with four different levels of VE designated as: (T 0) 0 mg/kg, (T 1) 200 mg/kg, (T 2) 400 mg/kg, and (T 3) 600 mg/kg for two months. Daily length gains (DLG), daily weight gain (DWG), specified growth rate (SGR), feed conservation ratios (FCR), and condition factor (CF) were used to measure the growth performance of the fish during the trial. The results indicated that the T

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3 group shows significantly higher growth performance by their superior DWG, DLG, SGR, and FCR. This study also evaluated the biochemical parameters such as POx, SOD and CAT in the gills, muscles, liver, brain, and digestive protease in gut of fish. The significant increase in the activities of POx, SOD, CAT, and protease were observed in VC fed fish as compare to control. The results suggest that vitamin E supplementation increase the growth performance, antioxidant activity and protease activity in O. niloticus.

Keywords: Enzymes, tilapia, Growth performance, organs herbicide.

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O-20/ICAZ-2024

Developmental toxicity of domestic produced antimicrobial compound TCC (Triclocarban) in zebrafish (Danio rerio) embryos

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Abstract

This study aims to explore the developmental toxicity of an antimicrobial compound, Triclocarban (TCC), a substance used in most household items as an ingredient. The study utilized the Zebrafish as the model subject and were exposed to different TCC concentrations. The TCC impact on the embryonic development, survival rates, and morphological abnormalities was thus evaluated. The TCC exposure was managed in different concentrations of $0.2\mu g/L$, $2\mu g/L$, $20\mu g/L$, and $200\mu g/L$ after the fertilization. The dose of TCC was managed after 5 hours of fertilization and it continued till 5th day of post fertilization. The results showed elevated concentrations and a dose-dependent relation to the developmental anomalies, characterized by delayed hatching, pericardial edema, and axial malformations. High rate of reduction in survival at increased TCC concentrations was also observed and analyzed in this study. This study also investigated the potential mechanisms of TCC -induced toxicity that included the biomarkers of oxidative stress and gene expression changes in the development pathway. *Keywords*: Zebrafish, Triclocarbon, Embryonic Toxicity, Developmental Abnormalities

O-21/ICAZ-2024

Effects of di-butyl and di-isononyl phthalate on antioxidant enzyme status and DNA damage in *Cyprinus carpio* (Common carp)

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Abstract

The current study was conducted to check the acute toxicity of di-butyl phthalate (DBP), di-isononyl phthalate (DINP) and their mixture (DBP+DINP) in Cyprinus carpio (common carp). The 96 hours LC50 of DBP and mixture was 15.90mg/L and 13.13mg/L while, LC50 of DINP was found at its highest dissolving concentration 300mg/L determined by probit analysis. The fish were exposed to 1/3rd of LC50 of DBP, DINP and mixture. Antioxidant enzymes activity of catalase, superoxide dismutase and peroxidase were decreased with the increase in activity of reactive oxygen species and thiobarbituric acid reactive substance in the liver, kidney, gills and muscles of fish exposed to DBP, DINP and their mixture. DNA damage in kidney and liver cells were assessed by comet assay, results indicated that with the increase in ROS activity damage in DNA increased in treatment groups with more prominent change in mixture group. Increase in DNA tail (%), tail length and tail moment of liver and kidney cells whereas decrease in head length and head DNA (%) was observed with the increase in toxicity in mixture group showing more prominent changes. Studies concluded that DBP and DINP has the potential to cause organ impairment and DNA of C. Carpio.

Key words: Di-butyl phthalate, Di-isononyl phthalate, Cyprinus carpio, Antioxidant enzymes, DNA damage

O-22/ICAZ-2024

Effect of Vitamin E on health Indices of fish, Labeo rohita

Mohammad Zaman¹, Huma Naz ¹*, Tanveer Ahmed ², Syed Qaswar Ali Shah ¹, Sajid Abdullah ³, Muhammad Umar





Ijaz³, Muhammad Adeel Hassan⁴, Murtaza Manzoor¹, Iqra Zulfiqar¹ and Zainab Noor¹ ¹ Department of Zoology, Cholistan University of Veterinary and Animal Sciences, Bahawalpur, Pakistan ² Department of Life Sciences, Khwaja Fareed University of Engineering and Information Technology, Rahim Yar Khan, Pakistan

³ Department of Zoology, Wildlife and Fisheries, University of Agriculture, Faisalabad, Pakistan ⁴ Department of Parasitology, Cholistan University of Veterinary and Animal Sciences, Bahawalpur, Pakistan Abstract

The aim of the research was to determine the impact of supplementary vitamin E (VE) on growth rate, antioxidant enzymes and digestive protease of Labeo rohita. Three groups of fish were used: one was the control group (T0), and the other two were provided supplemental VE at 100 mg kg-1 (T1), 200 mg kg-1 (T2) respectively. There was a two-month trial period. Weekly measurements of the fish's daily weight gain, daily length increases, specific growth rate, condition factor, and feed conservation ratio was employed to monitor the fish's growth performance during the experiment. In order to measure the protease activity, the fish gut was also be examined. Superoxide dismutase, catalase, and peroxidase activities in the intestine, heart, liver, muscles, as well as gills were all be measured. Results showed the significant improvement in growth, antioxidant enzymes and protease level of VC fed fish as compare to control.

Keywords: VE, rohu, Growth performance, organs, Biochemical parameters, gut

O-23/ICAZ-2024

Efficacy of watermelon seed meal based diet on overall performance of rohu (Labeo rohita) Fingerlings

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Township, Lahore, Pakistan

Abstract

Fish require high-quality protein in their meals, which was being provided by fish meal (FM). Prices of FM have gone up due to its restricted availability and competition for use in fish diets. Growth performance, nutrients digestibility and hematological parameters were evaluated by One-way Analysis of Variance (ANOVA). Fish fingerlings were divided into six test groups. Test diets (TDI-TDVI) were given with varying WMSM levels as (0%, 20%, 40%, 60%, 80%, and 100%). Fishes were placed in tanks having 70L water holding capacity and were fed twice daily. The purpose of this study was to examine how growth performance, nutrient digestibility and hematological indices of Labeo rohita fingerlings got affected when FM was completely replaced with watermelon seed meal (WMSM). It was observed that fish fed with 60% WMSM- based diet (TD-IV) achieved the maximum growth indices (final weight(29.27g), weight gain (21.72g), weight gain % (289%), specific growth rate (1.51) and survival rate (98%) as compared to fingerlings fed on other test diets as well as control diet. Maximum counts of hematological parameter indices (red blood cells 3.12×106mm-3, PLT 69.38, Hb 8.27g\100ml as well as hematocrit 36.13%) and the highest nutrient digestibility values (crude protein 73% and crude fat 74%) were found maximum in diet-IV at 60% replacement of FM with WMSM. On the findings of current study, it was recommended that, WMSM can be added to replace FM up to 60% without compromising the performance of L. rohita fingerlings. Keywords: Growth performance, WMSM, Hematology, Nutrient digestibility, Fish meal

O-24/ICAZ-2024

Evaluation of Toxic Effects of Benzophenone on Histopathology of Labeo rohita

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Abstract

Benzophenones (BPs) are organic ultraviolet filters widely used in sunscreens and personal care products. These compounds enter aquatic ecosystems due to industrialization, wastewater treatment, and domestic effluents, which pose serious threats to aquatic organisms, considered as emerging pollutants. This laboratory-based study assessed the median lethal concentrations (LC50) and sub-lethal effects of benzophenone on the histology of gills and muscles of Labeo rohita. Fish fingerlings of the same size and weight were subjected to different concentrations of



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BP ($100\mu g/L$ to $1000 \mu g/L$) and tested for their 96-hr LC50 which was determined as $612.822\pm37.38\mu g/L$. To determine the sub-lethal effects, the fish were exposed to 1/5th of 96-hr LC50 of BP for 35 days to investigate the organ-specific responses. The results indicated significant damage in the exposed organs, showed damage in pillar cells and intraluminal debris in the mucous cells of the gills. Moreover, fragmentation of intact muscle structures, intraluminal debris, and vascular necrosis were observed in the exposed muscles of L. rohita. In conclusion, these results confirmed the histopathological changes in the gills and muscles of L. rohita due to BP exposure, confirming its risk to aquatic life.

Keywords: Histopathology, Benzophenone, Labeo rohita, Ultraviolet filters, Chronic toxicity

O-25/ICAZ-2024

O-26/ICAZ-2024

Role of Fish Feed in Management of Fish Health

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¹ Department of Zoology, Wildlife and Fisheries, Muhammad Nawaz Shareef MNS) University

of Agriculture, Multan, Punjab, Pakistan.

Abstract

Feed plays a substantial importance in health maintenance of fish. Feed affects major things like non susceptibility to diseases, enhancement of growth and overall wellbeing of body. Fish feed with proper proportion of components like proteins, lipids, vitamins and minerals improve body defense mechanism by protecting it from pathogens. Prebiotics, probiotics and immunostimulants are special nutritional additives that boost immune response of fish to various environmental stressors. On the other hand, poor quality feed or feed with insufficient nutritional requirement invites diseases more often than good quality feed. Fish health management is strongly related to proper feeding methods, feeding schedules and right composition of feed. Good feed is related to feed having low wastage in water that contributes minimum in environmental pollution. Hence, viable aquaculture system is important for fit fish populace and great production outcomes which is only possible by using right feeding plans in aquatic ecosystem. *Keywords:* Fish Feed, Fish Health, Diseases, Feeding Methods, Fish Production

Exploring the Protective Effects of Natural Herbal Supplements on Heavy Metal Toxicity in Freshwater Fish (*Cyprinus carpio*)

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Abstract:

This research investigated the effectiveness of natural herbal supplements in reducing the harmful effects of heavy metals (HMs) toxicity on Cyprinus carpio (6.53 ± 0.01 g/fish). This study evaluated the potential protective effects of natural herbal supplements on the growth, body composition, hematology, digestibility and liver histopathology of Common carp against the mixture of HMs. In phase 1, fingerlings were exposed to a mixture of HMs such as ($100 \mu g/L$ Lead acetate trihydrate/Pb (C2H3O2)2·3H2O; $250 \mu g/L$ cadmium chloride anhydrous/CdCl2; 800 mg/L zinc sulfate heptahydrate/ZnSO4·7H2O and 2.5 mg/L copper sulfate/CuSO4.5H2O) and in phase 2, seven groups were established such as control positive group (CON+ve, HM e xposure + without any treatment), control negative group (CON-ve, without HM exposure), and five groups with 1% turmeric (TUR), cinnamon (CUR), ginger (GIN), garlic (GAR) and their mixture (MIX), respectively. A total of 315 fingerlings were shifted to experimental tanks, i.e., 15 fingerlings per tank, and seven groups were made in triplicates. The results demonstrated that the carp exposed to HMs alone suffered detrimental health impacts. In contrast, when the fish treated with natural herbal supplements, MIX group exhibited noticeable positive improvements. In conclusion, the study suggests that natural herbal supplements are potential solution to counteract HMs toxicity in *C. carpio*.

O-27/ICAZ-2024

Role of dietary Bifidobacteria on gut microbiota and growth performance in Labeo rohita

Tahreem Fatima¹, Shakeela Parveen^{1*}, Fayyaz Rasool², Muhammad Ahmad¹, Muhammad Haroon¹, Zia ur Rehman¹, Arooj¹

¹Fish Microbiology and Immunology Lab, Department of Zoology, Wildlife and Fisheries, University of Agriculture, Faisalabad

²Department of Zoology, University of Education Lahore, Faisalabad Campus, Pakistan.

Abstract





Fish culture effectively uses nutrients to increase fish production per unit area. Present study evaluated Bifidobacteria on the gut microbiota and growth performance of Rohu (Labeo rohita) in aquaculture. Changing the intestinal microbiome improve fish health and lower infection rates. The study was conducted for two months. Freshwater pond Rohu split into experimental (T1) and control (T0) groups. The experimental group given 2% dietary bifidobacteria in powdered form according to bodyweight of fish twice a day, while the control group was fed a 40% basal diet at 2% body weight of fish. The gut flora and growth characteristics were observed by using paired t-test. All the treatment were significantly different. Thus, the results showed that maximum number of colonies in experimental group fed with dietary bifidobacteria. Experimental group (T1) was resulted in significantly (p<0.05) higher LG (1.26\pm0.19), WG (0.76\pm0.19) and SGR (10.94\pm7.53) then the control group (T0) resulted in LG (1.15\pm0.15), WG (0.27\pm0.05) and SGR (2.47\pm2.10) were obtained. It was also observe that T1 was higher in FCR (0.85\pm0.19) then T0 (0.43\pm0.08). Therefore, dietary bifidobacteria proved a potential probiotic feed that yields positive results in improving fish gut microbiota and growth.

O-28/ICAZ-2024

Studies on the Gut Content and its Variation in relation to size of Freshwater Catfish, *Wallago attu* from River Indus

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²Department of Fisheries (Inland) Government of Sindh, Thandi Sarak, Hyderabad Marine Fisheries Department Government of Pakistan, West-Warf, Karachi

Abstract

The studies on the gut content analysis of freshwater catfish, Wallago attu was carried out from November 2021 to January 2022 from the catch of local fishermen of River Indus. Total 65 fish of different size ranging from 20.0 to 45.5 cm and from 130 to 580 g in length and weight respectively were taken into account for the present investigations. The gut content analysis was revealed that the experimental fish mainly fed upon fish as most prefer food item (40%) in all three size groups (small, medium and large) followed by insects (25%) and third preference was worms with (15%) as recorded from the gut content of experimental fish. It was noted that the fish Wallago attu found to be carnivorous in feeding habit with piscivores preference Keywords: Gut content, Wallago attu, River Indus, Seasonal variation and Feed preference.

O-29/ICAZ-2024

Impact of supplementary vitamin C on growth performance, biochemical parameters, gastro- and hepatosomatic index of *Nile tilapia*

Muhammad Hamid Irshad¹, Huma Naz¹, Tanveer Ahmed², Syed Qaswar Ali Shah¹, Sajid Abdullah³, Muhammad Umar Ijaz³, Muhammad Adeel Hassan⁴, Murtaza Manzoor¹, Iqra Zulfiqar¹ and Zulfiqar Khursheed¹
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The effects of vitamin C (VC) at different doses on the growth parameters, biochemical parameters, digestive enzymes, gastro- and hepato-somatic index of fish Nile tilapia was examined. The fish was fed with various VC supplemented doses like 0.0 mg/100g (control), 250 mg/100 g, 500 mg/100 g, and 750 mg/100 g for two months. The growth parameters like weight gain, length gain, feed conversion ratio, specific growth rate and condition factor were measured on weekly basis. To assess the biochemical investigation antioxidant enzymes such as peroxidase (POx), superoxide dismutase (SOD), and catalase (CAT) in organs and protease activity in gut of fish was assessed. The gastro-somatic index (GSI) and hepatosomatic index (HSI) were also determined. Results show that performance was significantly enhanced by vitamin C supplementation; the most notable results were observed at a dosage of 750 mg/100g, which was higher than the 500 mg/100g and 250 mg/100g dosages, as well as the control. The highest activity of antioxidant enzymes, such as CAT, SOD, and POx in organs of VC fed fish was observed as compare to control. In the 750 mg/100 g group, protease activity was at its peak, suggesting better digestive efficiency. Additionally, the 750 mg/100g dosage had a beneficial effect on both GSI and HSI, indicating improved general health



and organ development. These results suggest that optimum dose of vitamin C was 750 mg/100g in terms of stimulating growth, antioxidant defense, and the activity of digestive enzymes, as well as enhancing fish health indices. Keywords: Fish, Vitamins, enzymes, intestine, liver

O-30/ICAZ-2024

Xylooligosaccharide supplementation in rice protein concentrate based diets: A comprehensive analysis of performance and health of Labeo rohita

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Abstract

The primary aim of this study was to examine the impact of xylooligosaccharide (XOS) in rice protein concentrate (RPC) based diets on the growth performance, body composition, digestive enzymes, intestinal morphology and blood biochemistry of Labeo rohita fingerlings. Four different XOS levels (0, 0.5, 1 and 2%) were used at each RPC (75 & 100%) level. Twenty-five fish per tank with an average initial weight of 25±0.05 g were randomly assigned (Randomized complete block design) to each of the 8 groups in triplicate aquaria $(36 \times 16 \times 12'')$ and then fed with respective diets @ 3% body weight for 90 days. The results showed significant improvements in growth performance, such as increased weight gain %, specific growth rate, and protein efficiency ratio and improved feed conversion ratio in 1% XOS supplemented diet at 75% RPC. A significant decrease in serum alkaline phosphatase activity (ALP) and plasma melanodialdehyde (MDA) were observed at 1% XOS level in 75 % RPC based diets, respectively. Meanwhile, the lowest total cholesterol and highest lysozyme activity were observed in 1% XOS supplemented diet at 75% RPC levels. Moreover, the serum (alanine aminotransferase and aspartate transaminase) and plasma (superoxide dismutase, triglyceride, high density and low density lipoprotein) activities showed nonsignificant effects among the treatments. Furthermore, the digestive enzymes (protease & lipase) and intestinal morphology were significantly influenced at 1% XOS in the 75% RPC-based diet. Polynomial regression analysis showed that 1.25% XOS is the optimum requirement for the growth of rohu fingerlings when fed at 75% RPC based diets. Overall, it was concluded that the 75% RPC diet was efficiently replaced by fishmeal along with 1% XOS addition in L. rohita fingerlings without any negative effect on growth performance and intestinal health. Keywords: Intestinal health; Immunity; Rohu; Rice protein concentrate; Xylooligosaccharide; Plasma profile.

O-31/ICAZ-2024

Alleviating Heavy Metal Toxicity in Nile Tilapia (Oreochromis niloticus) Using Natural Herbal Supplements Ulfat Batool, Syed Makhdoom Hussain

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Abstract

The present research investigates the efficacy of herbal supplements in mitigating heavy metals (HMs) toxicity in Nile tilapia (Oreochromis niloticus). This study aims to explore potential alternative strategies to alleviate HM-induced stress and mitigate its adverse impacts on Nile tilapia (8.83±0.02 g). The experiment was conducted in two phases: in stress phase, fish were exposed to sub-lethal concentrations of HMs, including lead, cadmium, zinc, and copper for 15 days, whereas in feeding phase, herbal supplements were given for 70 days to ameliorate their effects. Seven groups were established: control negative group (CON-ve), control positive group (CON+ve, without any treatment), and five groups with 1% turmeric (TUR), cinnamon (CUR), ginger (GIN), garlic (GAR), and their mixture (MIX), respectively. A total of 315 fingerlings were shifted to experimental tanks, i.e., 15 fingerlings per tank, and seven groups were made in triplicates. Results revealed that exposure to HMs led to significant (p < 0.05) alterations in all tested parameters, i.e., liver damage and growth reduction. The herbal supplements, especially MIX groups, seemed to reduce the harmful effects of HMs and improved growth, body composition, nutrient digestibility and liver health. In conclusion, study suggests that natural herbal supplements are promising supplements to protect Nile tilapia from HMs toxicity.

O-32/ICAZ-2024

Effect of watermelon seed meal on overall performance of rohu (Labeo rohita) fingerlings Muhammad Mudassar Shahzad^{1*}, Fatima Yasin¹, Muhammad Arshad¹ ¹Department of Zoology, Division of Science and Technology, University of Education, Township,



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Abstract

Fish rely on a diet that includes high-quality proteins to facilitate their normal growth. Traditionally, fish meal (FM) has been the preferred source of protein in the fish diet. The uncertain future of FM forced us to investigate alternative protein sources such as plant-based diets which have good nutritional quality, readily available and are cost effective. The purpose of this study was to examine how Labeo rohita were effected when Watermelon seed meal (WSM) is substituted for FM. Six diets were prepared by using graded levels (0%, 20%, 40%, 60%, 80%, 100%) of WSM (Citrullus lanatus) based diets to examine the carcass composition, mineral absorption and immunology of L. rohita fingerlings. Fifteen fingerlings with average body weight (6.32 g) were kept in each triplicated tank and fed at 4% of their wet body weight. On the basis of results of carcass composition, It was observed that the best results of crude protein (18.5%), gross energy (2.43%) and fat (8.98%), and that of mineral absorption, the maximum values of (Ca: 68%, Na: 73%, P: 74%, K: 74%, and Fe: 62%) were noticed in fish fed with 60% of WSM based diets as compared to fingerlings fed on other test diets. As per given results of immunology, the best values were discovered at 40% inclusion level. From the results, it was concluded that 60% replacement of fish meal with WSM showed positive results in carcass composition, Immunology, and mineral absorption of L. rohita fingerlings and can be used to prepare environmentally sustainable and economic fish feed.

Keywords: Mineral estimation, Immunology, Carcass Composition, Citrullus lanatus, Labeo rohita

O-33/ICAZ-2024

Recuperative effects of herbal feed supplement in freshwater fish, *Hypohthalmichthys molitrix*: Improvement in physiology and histopathology against waterborne-induced heavy metals toxicity

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Abstract

Heavy metal (HM) toxicity is a threat to both aquatic life and the environment. Therefore, this research assessed the recuperative effects of dietary turmeric (TU) (Curcuma longa) and ginger (GN) (Zingiber officinale) on growth performance, hematology, carcass composition, hepatic antioxidant indices, and histopathological profile of silver carp (Hypothalmichthys molitrix) fingerlings that were exposed to mixtures of heavy metals (HM) (Pb [1.71 mgL-1], Cd [2.47 mg L-1], Cr [0.1 mgL-1], and Zn [0.4 mgL-1]). A total of 250 fish (7.16 ± 0.01 g) were randomly assigned to seven groups in triplicate. Fish in the negative control group were fed a basal diet (canola meal; without HM treatment), positive control group were fed a basal diet (canola meal+HM mixture), T1 group (1% TU), T2 group (1% GN), T3 group (1% TU+HM treatment), T4 group (1% GN+HM treatment), and T5 group (combination of 1% TU and GN + HM mixture) at 1% inclusion level. Waterborne HM mixture negatively affected the growth performance, crude protein (CP), white blood cells (WBCs) and red blood cells (WBCs), hemoglobin (Hb), hematocrit (Ht), superoxide dismutase (SOD), glutathione peroxidase (GPX), and catalase (CAT) levels. On the other hand, fish groups fed with alone TU and GN supplemented diet showed a significant increase in growth, hematology, CP level, and antioxidant enzyme level of H. molitrix. In addition, GN, TU, and their combination supplementation with HM recuperated the above-mentioned parameters. Moreover, degeneration of hepatocytes, necrosis, and central vein damage were observed in HM-exposed fish and improved in the T3, T4, and T5 groups. Overall, the results of this study demonstrated that feeding canola meal to H. molitrix supplemented with 1% GN, TU, and their combination resulted in HM-induced negative effects in terms of growth performance, carcass composition, antioxidant activity, hematology, and histopathological alterations in the liver. This study provided proof of the promising therapeutic properties of GN, TU, and their combination, and enhanced its possible use in carp aquaculture, as it improved the growth performance and antioxidant status of HM.

Keywords: Heavy metals, ginger, turmeric, body composition, growth performance, antioxidant enzymes

O-34/ICAZ-2024

Assessment of aloe vera extract supplementation on growth performance and body composition of *Labeo* rohita and *Catla catla*

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Abstract:

Aloe vera, rich in polysaccharides, is recognized as immunostimulant and having antimicrobial properties, making it beneficial in fish feed formulations. This study aimed to explore the impact of aloe vera leaf extract (ALE) on the growth performance and body composition of Labeo rohita and Catla catla, with the goal of developing sustainable growth enhancement methods and reducing reliance on chemical treatments. The experiment was run in triplicates and divided into four treatments i.e. T0= Control, T1=1%ALE, T2=5%ALE, T3=10%ALE dietary supplementation mixed with the basal feed. The research span was three months using glass aquaria having 10 fish per aquarium. Results showed significantly improved growth performance under T2 and T3, in terms of increase in weight (g), increase in length (cm) and feed conversion ratio (FCR). Body composition analysis demonstrated significantly higher levels of crude protein (%) and fat (%) in T2 and T3, while moisture content (%) was significantly higher in T0 and T1 and lower in T2 and T3. These findings suggested that aloe vera extract have significant potential as eco-friendly promoter to improve the growth performance and body composition of commonly culturable Major carps (*Labeo rohita* and *Catla catla*).

Keywords: Aquaculture, Aloe vera extract, Labeo rohita, Catla catla, growth performance, body composition.

O-35/ICAZ-2024

Cost-Effective Fishmeal Replacers: Comparative Evaluation of Animal By-Products in Cirrhinus mrigala Diet

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Abstract

In recent years, the aquaculture sector has grown swiftly, but the only obstacle to its growth is unsustainability of fishmeal (FM). Thus, researchers are making significant efforts to find new substitutes for FM. Among the several potential alternatives for FM, various animal by-products (ABPs) have not yet been comparatively studied in Cirrhinus mrigala fingerlings. Therefore, this research was done to inspect the impacts of various ABPs diets on the physiological health of C. mrigala fingerlings. Six iso-nitrogenous and iso-lipidic test diets were prepared. As a control diet, FM was used. Other five diets contain poultry by-product meal (PBM), insect meal (IM), meat and bone meal (MBM), blood meal (BM) and feather meal (FeM). Fifteen fingerlings were kept in each triplicate for each test diet under controlled experimental conditions. After 70 days feeding trial, it was confirmed that IM caused maximum increase in weight gain (WG: 12.04g) and specific growth rate (SGR: 1.69%) in C. mrigala fingerlings superior to other groups. Fish fed with PBM also showed improved results in terms of growth rate (WG: 9.82g). No significant differences (p>0.05) were observed in digestibility of lipid, protein and gross energy in fish fed IM, PBM, MBM and control diets. Fish fed IM and PBM showed significant improvement in blood parameters such as RBCs, Hb, WBCs and PLTs while fish fed BM and FeM showed poor results. In conclusion, IM and PBM could be used as better alternatives to FM without compromising fish health.

Keywords: Fishmeal, Animal by-products, Growth performance, Digestibility, Insect meal

O-36/ICAZ-2024

The effect of chronic exposure of cadmium and zinc on the hematological parameters of Cirrhinus mrigala

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Abstract

Water pollution poses significant hazards to humans and aquatic creatures. Heavy metals are one of the contaminants that are degrading aquatic life. Human and anthropogenic factors are the primary causes of heavy metals increased environmental toxicity. The present study was conducted to analyze the alternation in hematological variables like red blood cells (RBCs), white blood cells (WBCs), hemoglobin (Hb), hematocrit (Hct), mean corpuscular hemoglobin (MCH), mean corpuscular hemoglobin concentration (MCHC) and mean corpuscular volume (MCV) of Morakhi (Cirrhinus mrigala) subjected to metals like cadmium and zinc. Fish fingerlings were acquired and given two weeks to adjust to the lab environment. During the chronic exposure, first (T 1), second (T 2), and third (T 3) treatment groups were provided with $1/3^{rd}$, $1/5^{th}$, and $1/7^{th}$ of the LC 50 concentration of Cd and Zn for a period of 15, 30, 45, and 60 days and there was no metal exposure for the control group. Blood markers such as hemoglobin,



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red blood cells, and hematocrit revealed a notable decline in their values, although the quantity of white blood cells increased. Variations in MCV, MCH, and MCHC levels were also observed, suggesting possible effects on the morphology and functionality of erythrocytes. From all the results of hematological parameters, it was clear that by increasing metal concentration the effect of metal increased and it was maximum in the T 3 metal-treated group. These results highlight the sensitivity of hematological parameters as biomarkers for identifying stress in fish caused by metals.

O-37/ICAZ-2024

Evaluation of commercial probiotics on the health, growth, digestibility, hematology, and carcass composition of *Cirrhinus mrigala*

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Abstract

Probiotic supplements have the potential to improve the gut flora and enhance nutritional efficacy and blood indices. In this study, sunflower seed meal based diet (SFM) supplemented with a commercial probiotic (protexin®) was examined to evaluate the effects on the survival, growth, digestibility, hematology, antioxidant status and carcass of Cirrhinus mrigala fingerlings. A 12-week feeding session was conducted to evaluate the effects of probiotics on fingerlings. Seven diets with different probiotic levels (0, 0.5, 1, 1.5, 2, 2.5, and 3 g kg-1) were prepared and randomly assigned to 21 tanks, each stocked with 15 fingerlings, resulting in a total of 315 fish used in the experiment. Analysis showed that fish treated 2 g kg-1 probiotics level exhibited a remarkable 100% survival rate. The results indicated that 2 g kg-1 probiotics supplementation revealed significant differences in weight gain (19.76 g), weight gain% (283.15%), FCR (1.31) and SGR (1.49% d-1) than other probiotic concentrations and control. Overall findings demonstrated that adding 2 g kg-1 of probiotics to the SFM feed positively impacted the digestibility, hematology, antioxidant status and carcass composition of C. mrigala fingerlings. To sum up, the dose of 2 g kg-1 probiotics dramatically enhanced survival rates, growth and health in C. mrigala.

Keywords: C. mrigala, Probiotics, Survival, Growth performance, Carcass composition, Sunflower meal

O-38/ICAZ-2024

The dietary addition of bromelain enzyme to a plant-based fish diet: Effects on the growth, proximate composition, enzyme activities and gut morphometrics of *Labeo rohita*

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Abstract

This study investigates the impact of bromelain supplementation on the growth, enzymatic activity, and gut morphometrics of *Labeo rohita* fed a plant-based diet. A total of 300 fingerlings (initial weight = 12.27 ± 0.11 g) were acclimatized and randomly distributed into 15 aquaria, fed diets (30 % CP) supplemented with bromelain at concentrations of 0, 10, 20, 30, and 40 g/kg (Do, D₁, D₂, D₃, and D₄) for 90 days at 3 % body weight. Bromelain supplementation at 20 g/kg significantly (p < 0.05) enhanced growth parameters like weight gain % and feed conversion ratio, along with improved enzymatic activities (lipase, protease and lysozyme), followed by a decline at higher concentrations (30 and 40 g/kg) whereas the amylase activity decreased significantly with the increase in the supplementation of bromelain. No significant (p>0.05) changes were noted in survival rate or body composition (moisture, crude fat, ash, or crude protein), but the mineral content in the fillets, particularly copper, zinc, calcium, magnesium, and phosphorus showed significant improvements. Furthermore, bromelain up to 20 g/kg significantly improved the serum alkaline phosphatase activity (58.51 ± 0.15) and gut morphometrics, i.e., increasing goblet cell count (54.66±1.52), mucosal length (27.66±1.52), villus length (476.00±8.18), and width (157.00±4.58). Moreover, polynomial regression analysis determined 25.82 g/kg bromelain as the optimal concentration for enhancing growth and health status of *L. rohita which highlights the potential of bromelain* as an effective dietary supplement to enhance fish performance in plant-based aquaculture systems.

Keywords: Bromelain, Growth, Labeo rohita, Digestive enzymes, Gut morphometric, Plant-based diet



O-39/ICAZ-2024

Dietary Exposure of Polystyrene Microplastics Impairs Growth Performance, Reduces Feed Utilization, Alters Nutritional Composition, Hematology and gut Histopathology of *Catla catla* Fingerlings

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Abstract

Global concerns over the hazards of microplastic pollution to aquatic life have intensified. To assess the negative impacts of polystyrene microplastics (PS-MPs) on fish, growth performance, body composition, nutrient digestibility, hematological indices, and gut histopathology in Catla catla were evaluated during dietary exposure. C. catla were exposed to varying concentrations of PS-MPs (0%, 0.5%, 1%, 1.5%, 2%, and 2.5%) over a 60-day period. PS-MPs exposure significantly inhibited the growth of C. catla, with a decrease in nutrient digestibility observed. At the highest concentration (2.5%), fish exhibited the lowest weight gain and the highest feed conversion ratio compared to the control (0% PS-MPs). Furthermore, exposure to higher PS-MPs concentrations led to a reduction in crude protein (CP) content and an increase in crude fat (CF) content, indicating a deterioration in the nutritional quality of the fish. Hematological indices were also affected in a concentration-dependent manner, with higher PS-MPs levels showing more significant adverse effects. Overall, the study demonstrated that PS-MPs have pronounced negative effects on growth, body composition, nutrient digestibility, hematological health, and gut histopathology, with the severity of these impacts increasing at higher concentrations

O-40/ICAZ-2024

Changes in gut microbiota, hematological parameters and immune response following dietary administration of *Pleurotus ostreatus* in *Hypophthalmichthys molitrix*

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Abstract

The primary aim was to evaluate the impact of Pleurotus ostreatus on the gut microbiota, hematological parameters and immune response of Hypophthalmichthys molitrix. Antibiotics in polyculture systems are expensive and cause resistance, but are now replaceable with mushroom, which improves immunity and fish well-being. Silver Carp (n=40) were allocated into two groups, experimental group was given P. ostreatus powder and control group was fed with commercial feed. Culturing of bacteria, hematological tests and Immunological assays were done to evaluate the outcomes of feed on Silver Carp. Physico-chemical parameters were maintained end-to-end during the trial period. The quantitative outcomes were compared using the t-test. In all three-culturing media such that NA, TSA, EMB, the results indicated significant decrease (P<0.05) in bacterial colonies in mushroom diet when compared to commercial feed. Compared to control group, the treatment group had significantly higher RBC, Hemoglobin, Hematocrit levels, MCV and MCHV (P<0.05). White Blood Cells (WBC), neutrophils and lymphocytes in the treatment group had a significantly higher count (P<0.05) than control group. However, parameters like MCH and monocytes remained unchanged in the treatment and control groups (P>0.05). Hence, using immunostimulants such as mushrooms in aquaculture increases natural resistance to infection and promotes overall wellbeing.

O-41/ICAZ-2024

Biochar Supplementation in Grass Carp Diets: Effects on Body Composition, Digestibility, Growth, and Blood Parameters

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Abstract

Animal health is generally improved by biochar (BC), a promising dietary supplement made from various organic materials including wheat straw, corn cob, home trash, agricultural waste and wood waste. In the current investigation, effects of different BCs inclusion on the growth, digestibility, body composition, hematological indices and mineralization of Ctenopharyngodon idella (6.11 ± 0.02 g; n = 315 fish) fed diets based on sunflower meal (SFM)



were investigated over a 60-day period. Seven diets were prepared: first was the control diet i.e., CON and six other diets were supplemented with 2% different types of BCs, i.e., cotton stick BC (CSBC), wheat straw BC (WSBC), corn cob BC (CCBC), house waste BC (HWBC), grass waste BC (GWBC), and green waste BC (GwBC). A triplicate tank design was employed for each experimental diet, with fifteen fingerlings per tank. Throughout the experimental duration, they were fed 5% of their live wet weight. The results revealed that CCBC supplementation significantly (p<0.05) improved the growth, digestibility, and body composition of C. idella, followed by CSBC and WSBC, whereas HWBC showed negative effects. Supplementing with a diet based on 2% CCBC resulted in the maximum efficiency in mineral absorbance (Cu, Fe, Ca, P, Zn, Ca and K). Moreover, CCBC administration positively impacted all hematological parameters (Hb. PLT, WBCs, RBCs). Conclusively, CCBC was found to be the most efficacious in enhancing the growth, body composition, hematology, nutrient and mineral digestibility of C. idella. *Keywords:* Dietary supplement, Grass Carp, Corncob biochar, House waste biochar, Sunflower meal

O-42/ICAZ-2024

Growth and hematology of *Ctenopharyngodon idella* and *Cirrhinus mrigala* under various *Aloe vera* extracts supplementation

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Abstract

Aquaculture growth is hindered by high feed costs, poor seed quality and disease outbreak. Aloe vera as a growth promoter can offer a natural solution to enhance fish growth in aquaculture facilities. Therefore, the present research was designed to investigate the effect of aloe vera leaf extract (ALE) on the growth performance, meat quality, and blood indices of Ctenopharyngodon idella and Cirrhinus mrigala. Four treatments i.e. T₀; Control, T₁; 1%ALE, T₂; 5%ALE and T₃; 10%ALE dietary supplementation mixed with the basal feed with three replications for each treatment and fish were used. The trial was performed for three months using glass aquaria of 100L water capacity. The growth [increase in weight (g), increase in total length (cm), and specific growth rate (SGR %)] and hematological parameters [total RBC, total WBC and Hb content) were analyzed during the research trials. The results revealed that increase in body weight(g) and total body length (cm), and SGR (%) were significantly higher (p<0.05) in the T2 and T3 treatments as compared to the T0 and T1 groups for both the fish following the order T3 > T2 > T1 > T0. Ctenopharyngodon idella exhibited growth significantly higher than Cirrhinus mrigala. ALE supplementation (T2 and T3) significantly influenced hematology of both fish species in terms of increased RBC count and Heamoglobin (Hb) content.

Keywords: Aquaculture, aloe vera extract, Ctenopharyngodon idella, Cirrhinus mrigala, growth, hematology

O-43/ICAZ-2024

Protective effects of Ocimum sanctum against cadmium-induced toxicity in Cyprinus carpio

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Abstract

This study aimed to explore the ameliorative impacts of *Ocimum sanctum* in *Cyprinus carpio* against waterborne cadmium (Cd) toxicity. A total of 180 fish (20.50 ± 0.22) were distributed into six experimental groups each with three replicates consisting of 18 experimental tanks. 2 groups were established as negative control group: exposed to Cd without supplementation, positive control group: exposed to Cd without supplementation and other 4 groups received varying levels of O. sanctum supplementation (10 g/kg-40 g/kg) and exposed to 1.755 mg/L Cd. Cadmium chloride was used at a concentration of 1.775mg/L. The trial lasted for sixty days. In addition to increased Cd deposition in different organs, waterborne Cd had a detrimental effect on fish growth, composition of the body, and blood profile. Though, eating *O. sanctum*, particularly increased fish lifetime and reduced the harmful potential of Cd. Notably, supplementing at a rate of 30 g/kg increased growth, enhanced the condition of the carcass, reverted circulatory indices, and reduced the accumulation of Cd in tissues. Ultimately, the results showed that heavy metal toxicity could be successfully mitigated in C. carpio aquaculture by adding 30 g/kg of *O. sanctum* as a dietary supplement.

Keywords: Cadmium, Cyprinus carpio, Ocimum sanctum, Toxicity, Supplement



O-44/ICAZ-2024

Determination of bioaccumulation of ciprofloxacin in thaila and rohu

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Abstract

Antibiotics, used extensively in both veterinary medicine and humans to treat different infectious diseases have made them one of the important environmental contaminants. These pharmaceutical residues bioaccumulate in fish and other aquatic organisms' tissues. This study aimed to evaluate the bioaccumulation of ciprofloxacin which is a fluoroquinolone in various tissues of Catla catla and Labeo rohita in response to its different doses. For 14 days, fish were acclimatized and three groups were made, one control and the other two experimental groups with 10 fish each. Acute exposure to low (7.7mg/L for L. rohita and 5.7mg/L for C. catla) and high concentrations (18mg/L for L. rohita and 13mg/L for C. catla) of ciprofloxacin was given to experimental groups. Physico-chemical parameters were maintained regularly. Sampling was done after 24, 48, 72 and 96 hours respectively. At the end of the trial, fish were dissected and HPLC analysis was conducted. Data was analyzed statistically by one-way ANOVA and Tukey test was applied for mean comparison. Results showed that ciprofloxacin bioaccumulation was significant (p<0.05) in T2 (high dose group) compared to the T1 (low dose group) and control for both fish. For L. rohita, maximum bioaccumulation measured was 45.95±0.74µgg-¹, 41.59±0.99µgg-¹ and 25.08±0.69µgg-¹ while for C. catla, maximum bioaccumulation measured was $50.98\pm0.72\mu$ gg⁻¹, $43.88\pm0.50\mu$ gg⁻¹ and $31.21\pm0.94\mu$ gg⁻¹ in the liver, gills and muscles respectively. This study concluded that the bioaccumulation pattern of ciprofloxacin in different organs of both fish was similar; liver>gills>muscles. However, ciprofloxacin bioaccumulation was greater in different organs of C. catla than L. rohita. Keywords: Ciprofloxacin, Bioaccumulation, High-performance liquid chromatography (HPLC), Acute exposure

O-45/ICAZ-2024

Effect of Chlorella vulgaris meal as a soybean replacement on growth performance, feed utilization, digestive enzymes activity, amino acid profile, hematobiochemical parameters, disease resistance, and histopathological changes in Ctenopharyngodon idella

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Abstract

Chlorella vulgaris is a promising, cost-effective protein source for fish feed, enhancing growth, immunity, and digestive health compared to soybean. The study examined the effect of replacing soybean with *C. vulgaris* in grass carp diets on growth, digestive enzymes, and bacterial resistance. Five diets were formulated, wherein soybean meal was replaced with *C. vulgaris* meal at 0% (control), 25% (CVPM-I), 50% (CVPM-II), 75% (CVPM-III), and 100% (CVPM-IV). A total of 2500 grass carp fingerlings were stocked in 5 ponds and fed diets. After the feeding trial, fish from CVPM-III and CVPM-IV exhibited the highest crude protein levels at 22.31% and 21.96%, final body weights of 2734g and 2871g respectively, compared to the control group (2192g), with survival rates of 100% and 96%, and bacterial prevalence at 3.2% and 4.04% respectively. Hematobiochemical analysis of CVPM-III and CVPM-IV showed WBC counts of 13.34 and 16.41 (106/µl), RBC counts of 2.06 and 2.09 (106/µl), and total protein in serum and plasma at 3.41 and 3.83 g/dl for CVPM-III and CVPM-IV, respectively. Analysis of digestive enzyme activity in CVPM-III and CVPM-IV revealed 504.53 and 536.12 unit/mg protein for protease, glutathione peroxidase at 359.33 and 391.64 µ/mg, catalase at 46.07 and 51.53 µ/mg, and superoxide dismutase at 168.41 and 189.55 µ/mg respectively. The control diet (100% SBM) caused intestinal histopathological changes such as inflamed muscularis, swelling, increased goblet cells, and constricted villi. In conclusion, CVPM-III (a combination of 75% CV and 25% SBM) is the suitable diet for optimal growth and health of grass carp.

Keywords: Chlorella vulgaris; Ctenopharyngodon idella; Bacterial resistance; Digestive enzymes; Growth performance

O-46/ICAZ-2024

Microbial analysis of traditional salted fish and farm raised fish in district Faisalabad





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Abstract

The microbial load in both conventionally salted fish and fish raised on farms was assessed in this study. Fish's internal microbiota aid in effective digestion and nutrient absorption, which supports the growth and development of the fish contributing to improved health. Traditional salted fish and fish bred on farms in Pakistan's District Faisalabad underwent a thorough microbiological screening. While modern aquaculture techniques and conventional salting methods are common in this area, a systematic analysis of their microbial profiles has not been conducted. Nutrient agar medium and bacterial culturing procedures were employed to close this gap. In sterile polythene bags, fifteen samples of Rohu (Labeo rohita) were taken from the oral and stomach regions, brought to the lab, and chilled for additional examination. As the purpose of study, samples are subjected to nutrient agar media plates and assessed via bacterial culturing protocol. Data obtained was subjected to MINITAB software. Graphically, the results demonstrate the variations in microbial populations in both types and provide insights into the safety and quality of fish products in the vibrant fish industry of Faisalabad. The findings also depicted that as compared to fish produced on farms, salted fish had a very lower microbial count.

Keywords: Salted fish, Farm raised fish, Labeo rohita, Nutrient agar, Microbiota, Antibacterial, microbiological screening.

O-47/ICAZ-2024

Effect of fermented moringa (*Moringa oleifera*) leaves as a feed ingredient in the diet of rohu fish Naheed Bano*1, Sadia Maalik², Sajida Mushtaq², Mishal Shabir¹ ¹MNS-University of Agriculture, Multan ²GC Women University, Sialkot

Abstract

The world population is increasing enormously day by day. So to fulfill the feed requirements of such a great population, there must be an increase in productivity of the agriculture sector and its related industries. Therefore, the demand for fishmeal is increasing that result in its high prices. Thus there is a need to find a cost-effective substituent for fish feed. The present study was designated to check the effect of the cost-effective fermented Moringa diet on the body composition and growth of Labeo rohita. Fermentation of Moringa leaves was done with Aspergillus niger at room temperature for 7 days to decrease anti-nutritional factors present in Moringa leaves. The current experiment was carried out for 9 months to find the composition level of Moringa leaves meal in the diet of L. rohita. Initial body weight and length of fish was measured before stocking. Fish was divided into four experimental groups referred to as T1, T2, and T3 including one control group (T0). Experimental fish was fed with four different types of experimental feed containing fermented Moringa oleifera leaf meal at levels of 0%(control), 10%, 20%, and 30% respectively. At the end of the study, percentage weight gain (WG), net weight gain, and final weight were calculated. In body composition, crude protein %, Fat% and Dry matter % content were also evaluated. The data was statistically analyzed to validate the results. We concluded that substituted of costly fish feed with FMOLM up to 30% inclusion level has improved growth, weight gain and body composition of fish without having any negative impact on fish quality.

Keywords: Moringa oleifera leaf meal, Labeo rohita, Aspergillus niger, fermentation

O-48/ICAZ-2024

Evaluation of carbohydrate utilization and its protein-sparing effects in the diet of Catla catla

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Abstract

The impact of different protein to carbohydrate ratios on growth, biological indices, biometric indices, proximate composition, blood biochemistry and liver enzymes of thaila, Catla catla was examined in a 60 day trial. Four iso-nitrogenous diets of 30% crude protein (CP) differing in carbohydrate level (20%, 23%, 26% and 29%) named DCP30/C20, DCP30/C23, DCP30/C26 and DCP30/C29 respectively were formulated. In three replicates, fish

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with an average weight of 9.34 ± 0.06 g were fed with respective experimental dies. Fish fed diet containing 30% protein and 26% carbohydrates (DCP30/C26), showed best performance in terms of weight gain, weight gain percentage, specific growth rate (SGR), protein efficiency ratio (PER), feed conversion ratio (FCR), protein productive value (PPV), lipid productive value (LPV) and energy productive value (EPV). Moreover, the levels of CP and crude fat were increased by increasing carbohydrate level up to 26% and 30%, while moisture and ash showed insignificant results. Whereas, the viscerosomatic index and hepatosomatic index increased with increasing carbohydrate supplementation. Additionally, the increase in levels of triacylglycerol, low-density lipoprotein and cholesterol were observed when dietary carbohydrate levels increased up to 30%. Meanwhile, the liver enzymes like alkaline phosphatase (ALP); aspartate aminotransferase (AST) and alanine aminotransferase (ALT) also showed best performance in diet comprising of 26% carbohydrate and 30% CP (DCP30/C26). In conclusion, the fish fed a diet including 26% carbohydrates and 30% protein had the highest protein-sparing effect in Catla catla fingerlings. *Keywords:* Protein: Carbohydrates; Catla catla; Enzyme activity; Blood chemistry

O-49/ICAZ-2024

First observations of role of fish introduction and salinity as regulator of benthic macroinvertebrates in Loa river basin (Antofagasta region, CHILE): potential regulator of mosquito?

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Abstract

Inland waters in North of Chile are habitats of high diversity of macroinvertebrate, including Diptera larvae that would propagate tropical diseases. As control of mosquito were introduced Gambusia affinis. The objective was to analyze macroinvertebrate data of benthic macroinvertebrate in different zones of Loa river basin in the North of Chile and determine the potential role of G. affinis and/or salinity as regulator of benthic macroinvertebrate community in term of species richness. Benthic macroinvertebrate and salinity of Loa river basin were collected between 2022 and 2023, sites were considered in groups with G. affinis presence and absence. Although in G. affinis presence the species composition was high in comparison to sites without fishes, the difference was not significant. For total sites it was a significant inverse correlation between salinity and species richness, however it has not significant differences under G. affinis presence and absence. The exposed results although did not show significant differences under G. affinis presence and absence, and the inverse relation between salinity and species richness are similar with first observations for littoral inland waters of North of Chile and Easter Island and surrounding zones. The presence of G. affinis that was introduced as biological control for tropical diseases, would be effective, but there are risk of extinction of endemic species.

Keywords: Loa river, Atacama Desert, benthic macroinvertebrates, G. affinis, biological control.

O-50/ICAZ-2024

Ameliorative potential of Cinnamon (*Cinnamomum zeylanicum*) in *Catla catla* against waterborne lead toxicity

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Abstract

This research was conducted to validate the beneficial effects of incorporating dietary cinnamon



(Cinnamomum zeylanicum) powder (CzP) in alleviating lead (Pb) poisoning in fish. Healthy Catla catla individuals $(16.36 \pm 0.19 \text{ g/fish})$ were distributed across 18 tanks in triplicate groups. The experimental groups were as follows: Control group: fish without supplementation or exposure to Pb; positive control group: fish without supplementation but exposed to 1 mg/L Pb; 5 g/kg CzP along with 1 mg/L Pb exposure; 10 g/kg CzP along with 1 mg/L Pb exposure; 15 g/kg CzP along with 1 mg/L Pb exposure; and 20 g/kg CzP along with 1 mg/L Pb exposure. The trial continued for a period of 60 days. Waterborne Pb had a deleterious effect on fish growth performance, body composition, blood profile, and digestive enzyme activity, along with elevated Pb accumulation in various tissues. Conversely, consumption of cinnamon effectively mitigated the toxic potential of Pb and enhanced fish longevity. Notably, 10 g/kg CzP boosted growth, improved carcass quality, reversed blood indices, restored enzyme function in the gut, and mitigated Pb accumulation in tissues. In summary, the findings revealed that incorporating 10 g/kg of CzP as a dietary supplement in C. catla aquaculture could effectively counteract heavy metal toxicity.

O-51/ICAZ-2024

Effects of commercial probiotics on proximate body composition of grass carp (Ctenopharyngodon Idella)

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Abstract

The fastest-growing food production industry in the world is aquaculture due to the increasing population requirement for food and the depletion of natural fish stocks. One of the most significant aspects of aquaculture is nutrition. Probiotics have a significant role as bio-friendly agents and are utilized to boost fish's growth, disease resistance and proximate body composition. This research project was designed to study the impact of commercial probiotics (Saccharomyces cerevisiae and Bacillus subtilis) on the proximate body composition of Grass Carp (Ctenopharyngodon idella). A trial was conducted for three months in the Toxicology Laboratory, Department of Zoology, Wildlife and Fisheries in Agriculture University Faisalabad. The fish was acclimatized for two weeks in a cemented tank. Fish was fed with a standard diet during acclimatization. After acclimatization, fish fingerlings were distributed randomly into each aquarium. Four experimental groups were designed as T0 (control group), T1 (contain 0.5mlL⁻¹ probiotics), T2 (contain 0.8mlL⁻¹ probiotics) and T3 (contain 1.0mlL⁻¹ probiotics) with replicates. Fish was examined every month during an experimental period. Proximate composition parameters like crude protein, fat, moisture, and ash contents were statistically analyzed using ANOVA and the Tukey test. Maximum percentage of crude protein was observed in T3 groups having 1.0ml/L of probiotics with 45.2533±0.09713, 43.5933±0.50143 and 41.2333±0.07506 percentage for the 3rd, 2nd and 1st month respectively. Maximum percentage of crude fat was observed in T1 groups having 0.5ml/L probiotics with 37.0467±0.09074, 35.7133±0.61501 and 33.9167±0.27737 percentage for 3rd, 2nd and 1st month respectively. Maximum values for total ash were observed in T1 groups having 0.5ml/L probiotics with 11.2467±0.07506, 10.1867±0.09074 and 9.19333±0.0611 percentage for 3rd, 2nd and 1st month respectively. The maximum values for moisture content were observed in T1 groups having 0.5ml/L probiotics with 75.9533±0.03215, 73.4533±0.06028 and 71.4367±0.09074 percentage for the 3rd, 2nd and 1st month respectively. Physico-chemical parameters were checked and maintained every week and to check the mean value of physicochemical parameters correlation studies were used.

O-52/ICAZ-2024

Nigella sativa fortified diet alleviates copper toxicity in Bighead carp (Hypophthalmichthys nobilis)

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Abstract

The purpose of this particular study is to evaluate and determine the ameliorative effects of Nigella sativa supplemented canola meal based diet on the growth performance, body composition, hematology and histology of Hypophthalmichthys nobilis fingerlings under copper (Cu) stress. For this purpose, five canola meal based diets were prepared including one control diet (without N. sativa supplementation) and four other diets containing 2%, 4%, 6% and 8% with N. sativa supplementation. Fingerlings were fed at the rate of 5% of their live wet weight. The chromic oxide was added at the rate of 1% as an indigestible marker in feed. A 60-day exposure to waterborne Cu resulted in significant impairment of fish growth performance, alterations in body composition, and disruptions to blood profiles, accompanied by increased Cu bioaccumulation in various gill tissues. Although, administration of N. sativa at 2% dietary inclusion level effectively ameliorated Cu-induced toxicity, resulting in improved fish growth, enhanced



carcass quality, restored hematological parameters, and reduced Cu bioaccumulation in gill tissues. In conclusion, the results demonstrated that dietary supplementation with 2% N. sativa effectively alleviated heavy metal toxicity in bighead carp, indicating its potential as a nutritional counteract against metal-induced stress.

O-53/ICAZ-2024

A review: Role of collagen consumption in the treatment of skin

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Abstract

This literature review is on the scientific evidence regarding the beneficial effects of collagen consumption in treating skin and orthopedic diseases. Literature data have shown that hydrolyzed collagen supplementation promotes skin changes, such as decreased wrinkle formation; increased skin elasticity; increased hydration; increased collagen content, density, and synthesis, which are factors closely associated with aging-related skin damage. The natural decline in collagen production with age leads to the loss of skin firmness, elasticity, and hydration resulting in wrinkles and sagging. Collagen consumption benefits individuals with skin disorders such as eczema, psoriasis, and acne scars due to its ability to support skin regeneration and reduce inflammation.

Keywords: Skin, Inflammation, Collagen, Supplementation

O-54/ICAZ-2024

Effect of dietary Zinc (Zn) requirement on growth performance, tissue lipid peroxidation and ALP activity in Labeo rohita juveniles.

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Abstract

The present study was designed to estimate the zinc (Zn) requirement of Labeo rohita juveniles fed practical diet. Treatments used for the study were consisted of six experimental diets supplemented with graded levels of Zn (0, 21, 42, 63, 84 and 104 mg/kg diet) from Zn gluconate. For each experimental diet, two replicates were allocated, and 18 fish were stocked in each replicate. The feeding trial was lasted for 90 days. Results showed that final weight, absolute weight gain, weight gain% and specific growth rate increased with increasing dietary Zn levels up to 42 mg/kg and started to decrease with further increase in dietary Zn level. Quadratic regression analysis of weight gain% data indicated that L, rohita juveniles required 62.58 mg/kg Zn for normal growth. Maximum Zn absorption was observed in fish fed diet supplemented with 42 mg/kg Zn compared with other dietary treatments. Alkaline Phosphatase (ALP) activity in kidney and spleen of L. rohita juveniles increased with the increase in dietary Zn levels up to 42 and 63 mg/kg, respectively. Conclusively, supplementation of graded levels of dietary Zn-gluconate improved the growth performance and increased the Zn bioavailability and ALP activity up to a certain limit in L. rohita juveniles.

Keywords: Absorption, ALP, L. rohita, TBARS, Zn requirement

O-55/ICAZ-2024

Study on effect of Chenopodium quinoa on growth performance, carcass composition and antioxidant activity of Oreochromis niloticus and Cyprinus carpio

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Abstract

Plant-based protein sources are suitable and profitable for aquaculture. Chenopodium quinoa is one of the pseudo-cereal plants and promising source of protein. A 60-day feeding experiment was designed to check the impacts of C. quinoa seed meal (CQSM) on growth indices, carcass composition and antioxidant activity of Oreochromis niloticus and Cyprinus carpio. Six test diets as I, II, III, IV, V and VI were formed by using COSM as replacement of



fishmeal (FM) at 0%, 10%, 20%, 30%, 40% and 50%, respectively. Triplicate tanks having 15 juveniles in each were used and juveniles were fed at a diet equivalent to 5% of their live wet weight. Digestibility was measured with the help of feces. In O. niloticus and C. carpio, maximum results for weight gain (13.65g), (14.12g), feed conversion ratio (FCR) (0.98), (0.92), weight gain% (168.80), (199.15), and specific growth rate (SGR) (1.63), (1.21), respectively, were seen at level-III (20%) replacement of FM with C. quinoa seed meal based diet. For nutrient digestibility, best results in O. niloticus and C. carpio were also noticed at 20% replacement of FM with CQSM as crude protein (CP) (68.59), (66.30), crude fat (CF) (65.82) (65.65) and gross energy (GE) (72.36), (65.60), respectively. The antioxidant activity was maximum: 6.56 for O. niloticus and 7.13 for C. carpio at 20% replacement of FM. The findings indicated that the substitution of FM with CQSM up to 20% has a positive effect on fish growth, carcass composition, antioxidant activity and nutrient digestibility.

Keywords: Quinoa seed meal, Pseudocereal plants, Fishmeal, Growth performance, Antioxidant activity.

O-56/ICAZ-2024

The effect of chronic exposure of cadmium and zinc on the hematological parameters of cirrhinus mrigala

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Abstract

Water pollution poses significant hazards to humans and aquatic creatures. Heavy metals are one of the contaminants that are degrading aquatic life. Human and anthropogenic factors are the primary causes of heavy metal increased environmental toxicity. The present study was conducted to analyze the alternation in hematological variables like red blood cells (RBCs), white blood cells (WBCs), hemoglobin (Hb), hematocrit (Hct), mean corpuscular hemoglobin (MCH), mean corpuscular hemoglobin concentration (MCHC) and mean corpuscular volume (MCV) of Morakhi (Cirrhinus mrigala) subjected to metals like cadmium and zinc. Fish fingerlings were acquired and given two weeks to adjust to the lab environment. During the chronic exposure, first (T 1), second (T 2), and third (T 3) treatment groups were provided with 1/3 rd ,1/5 th, and 1/7 th of the LC 50 concentration of Cd and Zn for a period of 15, 30, 45, and 60 days and there was no metal exposure for the control group. Blood markers such as hemoglobin, red blood cells, and hematocrit revealed a notable decline in their values, although the quantity of white blood cells increased. Variations in MCV, MCH, and MCHC levels were also observed, suggesting possible effects on the morphology and functionality of erythrocytes. From all the results of hematological parameters, it was clear that by increasing metal concentration the effect of metal increased and it was maximum in the T 3 metal-treated group. These results highlight the sensitivity of hematological parameters as biomarkers for identifying stress in fish caused by metals.

O-57/ICAZ-2024

Hybridization between silver carp and bighead carp in River chenab as assessed by using microsatellite Markers

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Abstract

Inadvertent hybridization has been a main source of global biodiversity loss for the last several decades. Monitoring methods should be developed to identify the hybrids potential and estimate the risk of genomic contamination. This study was conducted to regulate the changing aspects of hybridization and introgressive hybrids in Silver and Bighead carp. A total of 150 individuals of each species were sampled from various sites of River Chenab. DNA was extracted by standard Phenol/Chloroform method. Isolated DNA was analyzed quantitatively as well as qualitatively by nanodrop and agarose gel electrophoresis, respectively. Five microsatellite loci were cross amplified, and amplicons were analyzed by PAGE. The results of this study revealed level of genetic diversity in terms of the average alleles number (Na), allelic richness (Ar), number of effective alleles (Nae) and heterozygosity (H) was observed moderate in all examined populations. The mean values of Na, Ar, Nae and Ho ranged from 6.200 to 6.400, 6.1452 to 6.3724, 3.7077 to 5.2193 and 0.6400 to 0.7067, respectively in all populations of H. molitrix, while in the population of H. nobilis, the mean values of Na, Ar, Nae and Ho ranged from 5.800 to 6.400, 5.7722 to 6.3858, 3.4326 to 5.3207 and 0.6267 to 0.6533, respectively. The average of expected heterozygosity (He) values was noted higher



as compared to the Ho. On average, the values of inbreeding coefficient (FIS) in examined populations were found positive. The pair-wise estimates of FST revealed moderate population differentiation between the populations. Analysis of genetic relatedness among all the examined populations was estimated by constructing UPGMA dendrogram and STRUCTURE admixture model which predicted that the populations in the same clusters had a close genetic relationship. The current study would provide broad genetic database for effective management of Chinese carps that would be helpful

to avert hybridization from becoming a hazard.

Genetic assessment of silver carp populations in River chenab as revealed by SS2376R markers

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Abstract

Freshwater fish stocks are being exposed to increasing threats as a result of fisheries and aquaculture practices. Integrating genetic knowledge into fisheries and aquaculture management is becoming increasingly important in order to ensure the sustainability of species. Here, SSR markers are used to evaluate the pattern of genetic variability in Silver Carp populations. The level of genetic diversity in terms of the average allelic richness (Ar), allelic number (Na), number of effective alleles (Nae) and heterozygosity (H) was observed moderate-to-high in the natural populations of Silver Carp. The highest mean values of Na, Ne, Ar and H were found in the Trimmu Headworks populations in comparison to the Marala Headworks, Oadirabad Headworks, Khanki Barrage and Chiniot Bridge populations. The average values of Na, Ar, Ne, Ho and He were from 5.8, 5.75, 3.4597, 0.6103 and 0.6833, respectively were observed in the natural populations of H. molitrix. The average values of expected heterozygosity (He) were higher as compared to the observed heterozygosity (Ho). The values of inbreeding coefficient (F IS) in natural populations were found approximately near to zero indicating very small inbreeding and some values were negative showing outbreeding. On average, the F IS values ranged from -0.0452 to 0.3658 in the examined natural populations of H. molitrix. Four out of 25 tests in natural populations of H. molitrix were found to deviate from Hardy-Weinberg Equilibrium. The pairwise estimates of F ST revealed low-to-moderate genetic differentiation between studied populations. The AMOVA revealed that most of the variations were within individuals in wild populations. Analysis of genetic relatedness among all the examined natural populations was estimated by constructing UPGMA dendrogram and STRUCTURE admixture model which predicted that the populations in the same clusters had a close genetic relationship. Genetic information collected from present study will be helpful in genetic monitoring of exploited fish stocks in future, which is essential for genetic integrity of wild populations.

O-59/ICAZ-2024

O-58/ICAZ-2024

Detection of hybridization between hatchery-reared Labeo rohita and catla using molecular markers

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Abstract

For biodiversity loss worldwide, human-induced inadvertent hybridization is the major reason from past few decades. Therefore, monitoring methods for identifying hybrids needs to be develop, so that this risk can be minimized. For this purpose, research work was conducted to detect the hybridization between hatchery-reared Labeo rohita and Catla catla using molecular markers. Samples of L. rohita and C. catla were collected from various hatcheries of Punjab. Samples were screened morphologically and genomic DNA was extracted by using Proteinase-K and standard phenol/chloroform DNA isolation methods. The agarose gel electrophoresis and nanodrop were used to analyze the quality and quantity of isolated DNA. The fish specimens were genotyped by using RAPD and SSR marker systems independently. The banding profilSe of each population was examined to find the species-specific unique diagnostic loci utilizing RAPD-based genetic analysis and decamer primers of random sequence. The species-specific fragments were found in two primers: OPA-2 983bp and OPY-10749bp for L. rohita and C. catla, respectively. These species-specific fragments appeared to be homozygous for the relevant species. In hatchery-reared populations of major carps, 16 hybrid animals were identified based on species-specific fragment patterns. Further, samples displaying signatures





of RAPD hybrid were screened with ten microsatellite markers for running PCR amplification. Allelic data obtained was subjected to statistical software. Data was analyzed by using software i.e., GENETIX, STRUCTURE and NEWHYBRID. The results of this study will be helpful in effective genetic management of L. rohita and C. catla in hatchery stocks.

O-60/ICAZ-2024

Catalase activity in different tissues of *Oreochromis niloticus* captured from Indus river as influenced by Heavy metals

Sajida

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Abstract

The current study was carried out to monitor the catalase activity in different tissues of Oreochromis niloticus captured from Indus River as influenced by heavy metals. For this purpose, fish samples were captured from the two selected sites of Indus River (Chashma and Taunsa Barrage) and pond of fisheries Research Farm, UAF. Muscles, Liver, Gills and Heart were extracted from Fish specimen. These organs were brought to the Aquaculture Biotechnology Lab, UAF. Half of the organs were used for enzyme activity essay and half for the estimation of metal concentration in respective organs. Fish organs were homogenized and centrifuged for the purpose of enzyme assay. The enzymatic activity was measured by using spectrophotometer at wavelength 240nm. The result of the present study showed higher catalase activity in liver (209 ± 6.59), heart (143 ± 6.43) and gills (171 ± 6.28) of O. niloticus captured from Taunsa Barrage as compared to the other experimental sites. By using Atomic Absorption Spectrophotometer, the metal concentrations were estimated in different organs of study fish and water samples collected from Taunsa barrage. The concentration of heavy metals in water samples was also determined these found in order Cr>Zn >Cu>Pb. Results indicated a significant difference $p \leq 0.05$ in the catalase activity in heart, gills and liver of O. niloticus captured from the sites. The inferences of present study would be helpful in understanding of fish can be used in biomonitoring of metal pollution in aquatic environment

O-61/ICAZ-2024

Effect of Cassia angustifolia on hematological parameters in inflammation-induced mice. Zainish Zafar, Iram Inayat, Aima Iram Batool, Fayyaz-ur-Rehman Department of Zoology, University of Sargodha Department of Chemistry, University of Sargodha

Abstract:

Cassia angustifolia commonly known as senna makki is well-known for its laxative properties. It has anthraquinones, sennoside A and sennoside B. Sennosides are responsible for laxative effect. The extract of plant also has alkaloids, flavonoids, phenols and tannins. It has medicinal importance and has therapeutic effects. The current study aimed to evaluate the effect of plant on hematological parameters in inflammation induced mice. Aqueous extract of 50 and 100 mg/kg dose and silver nanoparticles 5 and 10mg/kg dose of plant were given to the mice. Mice were injected with carrageenan in subplantar region in its hind paw. Inflammation was induced in albino mice and mice were dissected after 24 hours and blood samples were collected by heart puncture and stored in EDTA tubes. The carrageenan group showed increase in TLC, neutrophils, eosinophils, lymphocytes and monocytes while decrease in RBC, Hb, MCV, MCHC. When extract was given to the mice it causes increase in HCT and MCHC among the erythrocytic lineage, and decrease in the TLC and neutrophils. The results of this study are highly significant p value < 0.001. The response was observed to be highest at a dose of 10 mg/kg dose of nanoparticles. The results therefore indicate that the extract and nanoparticles of *Cassia angustifolia* affect the hematological parameters in inflammation



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induced mice.

Keywords: Cassia angustifolia, nanoparticles, carrageenan, inflammation, hematological parameters

O-62/ICAZ-2024

Effects of Papaya Seed Meal (PSM) and Tilapia Testes Powder (TTP) as Reproductive Inhibitors on Sex Control and Growth of Cyprinus carpio

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Abatract

The present study was designed to evaluate the effect of supplementation with papaya seeds (PSM) and tilapia testes powder (TTP) on reproductive parameters and growth performances of Cyprinus carpio. In the present study, fry (2-3 days old) were acclimatized for 2 days and then equally distributed into one control and five treatment groups and fed with one control and four experimental diets for 30 days, followed by a control diet for 60 days in each group with triplicates. These diets included Control: T0, different levels of papaya seed powder T1: 6g/kg T2: 7g/kg and fish (tilapia) testes powder T3: 70%, T4: 80%. Papaya seeds meal (PSM) showed significant improvements in growth performance in T2 (4.98±0.005) followed by (4.81±0.105) with a significant increase in final body weight. The best zootechnical performances (PER, SGR and CF) were observed in fish fed with papaya seed compared to control group. Reproductive analysis showed significant variations between treatment groups, with a large number of female C. carpio observed in the control group. Fish treated with T2 (7g/kg) increased the sex percentage in favor of male fish by achieving 90% male phenotype followed by T4 (80%) with 88% male. Natural resources are not only more cost-effective but also environmentally friendly and readily available; they are a superior choice for controlling the prolific breeding of C. carpio.

O-63/ICAZ-2024

Impact of Lead Chloride on Peroxidase and Catalase Activity of Mori

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Fish Toxicology Laboratory, Department of Zoology, Wildlife & Fisheries, University of Agriculture, Faisalabad Abstract

Heavy metal toxicity in the aquatic environment turns out to be a universal issue in recent years due to their unalterable nature. Heavy metals have increased density than other xenobiotics. Antioxidant enzymes can be used as biomarkers to assess their toxicity. During present study, effect of (PbCl2) on the peroxidase and catalase activity in Mori tissues (liver, kidney, gills and muscles) was determined. In the present study, Cirrhinus mrigala were given the exposure of sub-lethal concentrations such as 1/7th LC50 and 1/3rd LC50 of lead chloride for a period of one month and sampling of fish was done weekly. The control group of fish was kept in metal free medium. After chronic exposure fish were dissected and their organs were isolated and at -4°C, samples were kept for enzyme analysis. Peroxidase activity of PbCl2 exposed Mori tissues was compared to that of the control fish. In fish organs peroxidase enzyme activity was found to be higher significantly (p<0.05) in experimental fish after exposure of lead chloride in comparison to control group fish. The peroxidase enzyme activity was found to be higher significantly in experimental fish when exposed to PbCl2 in comparison to the control group. Catalase activity in fish organs decreased significantly in experimental fish when exposed to PbCl2 in comparison to the control group. Decrease in CAT activities in the experimental fish were determined as muscles<kidney<gillsliver. Catalase activity was found considerably higher in the control fish. Physico chemical parameters of the test media were also maintained. The data evaluated by ANCOVA (Analysis of variance and correlation) was statistically significant.

O-64/ICAZ-2024

Breeding biology of the White-headed Duck Oxyura leucocephala (Anatidae) in Lake Tonga: study of water quality descriptors

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Abstract.

The White-headed Duck (Anatidae) is a little-studied diving duck in North Africa. It is very abundant in Algeria's coastal wetlands, mainly in the northeast of the country. This species clearly prefers freshwater and slightly brackish areas rich in aquatic vegetation, far from cultivated land. In this study, we propose to take stock of changes in water quality (physico-chemistry, heavy metals, and microbiology) and their impact on the daily life of this species in Lake Tonga (2400 ha) (Ramsar site, extreme North-East Algeria), and to study its diurnal behavior throughout its presence in this wetland. To do this, we propose the following plan, which reveals the faecal contamination of the region 's waters, exhibited by a high level of bacteriological pollution (high levels of total germs, total coliforms, faecal coliforms and faecal streptococci). The results of physico-chemical analyses show that some parameters exceed current standards. This pollution affects the environment and constitutes a major threat to the health of this ecosystem and to the conservation of biodiversity in these sub-humid environments. Determination of water quality (heavy metals, physico-chemistry and microbiology) in Lake Tonga during the breeding season in 2021. The monitoring of the total numbers of this species in this wetland, with the study of the different modalities of occupation and spatial distribution in this body of water. A contribution to the study of the diurnal activity rhythms of this species (monthly and total balance).

Key words: Lake Tonga, White-headed duck, water quality, health impact, eco-ethology, wetland, Algeria

O-65/ICAZ-2024

Avifaunal Diversity of Rasul Barrage, Pakistan

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Abtract

Barrage pakistanThe Rasul Barrage, located on the Jhelum River in Pakistan, is an important ecological zone, particularly for avifaunal diversity. Avifaunal diversity refers to the variety of bird species found in a particular area, playing a crucial role in maintaining the ecological balance. The Rasul Barrage, surrounded by a rich mosaic of wetlands, agricultural lands, and riparian habitats, provides a vital stopover and breeding ground for a diverse range of resident and migratory bird species. This biodiversity hotspot hosts a variety of birds, including waterfowl, waders, raptors, and passerines. Migratory birds, especially from Central Asia, Siberia, and Europe, visit the region during the winter months, making the area part of the broader Central Asian Flyway. Species such as the Northern Pintail, Eurasian Wigeon, and Greater Flamingo are common sightings. Moreover, resident species like the Indian Peafowl, Black Kite, and Red-wattled Lapwing contribute to the ecological richness of the area. Conservation of avifaunal diversity at Rasul Barrage is critical for sustaining both local biodiversity and international migratory routes. strategies. These consist of 105 species of water birds both migratory and resident at the surveyed wetlands. The Shannon-Weiner diversity index showed that transrct point 1(H = 3.44336) had the largest diversity of birds, followed by the transect point 2,3,4 i.e., 2.749653, 2.295367, 0. 228256. The simpson index (1-D) for the transect point 1,2,3,4 was 0.042681, 0.072692, 0.08165, and 0.058961, indicating that Transect Points 2 and 3 had the maximum bird species diversity. Species eveness has varied among transects based on diversity, with values of 1.978323266 (TP1), 2.113402465 (TP2), 1.905956244 (TP 3), 0.145516993 (TP 4) However, human activities, including agriculture, urbanization, and pollution, pose threats to these species and their habitats. Detailed studies and conservation efforts are necessary to maintain the avifaunal diversity and ensure the protection of this important ecological region for future generations. Understanding the avifaunal composition and its dynamics is key for promoting biodiversity and implementing effective conservation strategies

O-66/ICAZ-2024

Wildlife monitoring in Changa Manga Forest and Taunsa Barrage; A conservation status of hog deer and Nilgai

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Abstract

The Hog Deer and Nilgai (Blue Bull) Survey was conducted for the first time across the Changa Manga Forest and Taunsa Barrage from November 16 to November 21, 2021. The objective was to assess the population of



Hog Deer and Nilgai through direct sightings, footprint tracking, and fecal analysis. Data were collected across various blocks in forested areas, providing crucial insights into species distribution. In Changa Manga, observations revealed the presence of male, female, and fawn Hog Deer, with significant evidence from direct sightings, footprints, and fecal matter, indicating a stable population in certain blocks. However, areas like Lashari Forest showed no such signs of Hog Deer, suggesting local extinction or absence in this region. Nilgai, on the other hand, was found to be locally extinct in both Changa Manga and Taunsa Barrage, as no direct or indirect evidence of its presence was detected during the survey. The same method was performed in upcoming year to compare the specie difference. The results showed promising signs in hog deer population at changa manga while decreasing number of observations were recorded at taunsa barrage. The survey provided baseline data on the status of Hog Deer and Nilgai populations, offering vital information for future conservation and management efforts aimed at preserving biodiversity in these regions.

O-67/ICAZ-2024

Assessing the Ecological Role and Conservation Status of House Sparrows (Passer domestics) in Urban Ecosystems

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Abstract

The House Sparrow (Passer domestics), a widely distributed and adaptable bird species, is experiencing population declines in urban areas worldwide. This study investigates the ecological role and conservation status of House Sparrows in Punjab, with a focus on habitat use, diet, breeding behaviour, or population trends. Our research reveals, "key habitat features influencing sparrow abundance" or "dietary shifts in response to urbanization". We discuss the implications of our results for House Sparrow conservation and urban ecosystem management, highlighting the need for specific conservation actions or policies]. This research contributes to the development of effective conservation strategies for urban bird populations and informs evidence-based management practices for maintaining biodiversity in human-dominated landscapes.

O-68/ICAZ-2024

Age and Sex Based Variations in Behavioral Patterns of Chinkara (*Gazella bennettii*) in a Controlled Environment at University of Veterinary and Animal Sciences Lahore, Ravi Campus Pattoki, Pakistan Mohsin Masood¹, Filza Nadeem¹, Ahmad Hassan¹, Ariba Masood¹, Mudasar Hussain¹

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Abstract

The Chinkara population in Pakistan faces significant threats due to habitat loss, poaching, and competition for resources, leading to a sharp decline in numbers. This study was conducted in controlled environment at the University of Veterinary and Animal Sciences, Ravi Campus Pattoki, Pakistan to examine the behavior of five Chinkara (*Gazella bennettii*) including one adult male, two young males, one adult female, and one young female. Their activities, such as feeding, resting, vigilance, grooming, and agonistic behavior, were observed. Behaviors were categorized into 10 parameters; alone, resting, affinitive interaction, vigilance, grooming, agonistic activity, urination, miscellaneous behavior, grouping, and feeding. The results showed that the adult male spent the most time resting, while the young males displayed higher feeding and vigilance. Both the adult and young females showed notable vigilance and feeding. Affinitive interactions and agonistic behavior and provide valuable insights into their adaptive survival strategies in their natural environment. Further behavioral study is essential for the conservation of this species. Keywords: Chinkara, Behavior, Habitat loss, Pouching, Captive environment, Conservation

O-69/ICAZ-2024

Antibacterial Activity of Aqueous and Methanolic Extract of *Mentha piperita* Against Pervasive Bacteria Isolated from Urial the Ovis Vignei

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Abstract



Medicinal plant extracts have great potential against infectious agents and can be used for therapeutic purposes. The stem and leaf extract of peppermint (*Mentha piperita*) possess antibacterial activities. The extract of peppermint stem and leaf was prepared in 70% methanol to check the antibacterial activity against three gram-negative bacteria Escherichia coli (E. coli), Salmonella typhi (S. typhi) and Pseudomonas aeruginosa (P. aeruginosa) and one gram-positive bacteria Styphylococcus aureus (S. aureus). The samples of fresh feacal matter and skin swab were collected from wild sheep from the Wildlife Park Gatwala, Faisalabad. The polythene bags containing the samples with all required information were brought to the laboratory, Department of Zoology Government College University, Faisalabad. The antibacterial activity of the extracts was checked by Agar well diffusion method. Peppermint stem and leaf extracts showed good antibacterial activity against all above bacteria by Soxhlet apparatus method as compared to Conventional method. S. aureus showed greater inhibition zones (17mm, 16mm, 18mm) that's mean extract was more effective against this bacterium. P. aeruginosa and E. coli show inhibition zones average about 16mm and 14mm. MIC for peppermint (stem and leaf) was 0.4mg/ml against all tested bacterial strains. *Keywords:* Wild sheep, Peppermint, Bacteria, Soxhlet method, Conventional method

O-70/ICAZ-2024

Antiparasitic Protocols for Captive Wildlife at Lahore Safari Park

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Abstract

Several wild animals lose their lives, even in captive environments, particularly due to parasitic infection. Parasitic infection in animals can cause diarrhea, depression, weakness, malnutrition, neurological disturbance. This study aimed to see antiparasitic practices of deworming used for wild animals at Safari Park, Lahore, a captive environment versus mortality rate of different animals. The animals treated with antiparasitic treatment in the wild park were categorized into different groups such as carnivores (tigers, lions), herbivores (zebra, deer, antelopes) and various wild birds that were found in aviary. It was noticed that usually two types of treatment Albendazole, and Fenbendazole were given to animals. The antiparasitic treatment was given four times a year in the mid of January, April, July, and October. The dose concentration varied according to species weight, age, and size and directed to animals under the supervision of esteemed and experienced veterinarians. Albendazole was used for herbivores and avians, while Fenbendazole was practiced for treating carnivores. In avians the drug was administered by injection or via oral cavity (via., water drinking or feed),, while, in herbivores it was sprayed over the Black chickpeas. For carnivores Fenbendazole was given in meat. A dose of 1ml Albendazole for three small birds was used while a dose of 1ml / 10 kg was prepared for other animals and big birds like running birds, pheasant etc. It was noticed in Safari Park, Lahore, an effective antiparasitic treatment practices were found, with Albendazole and Fenbendazole administered based on species, weight, and age under proper veterinary supervision as no mortality was noticed during the study period.

O-71/ICAZ-2024

Spatial and temporal distribution of tick infestation and potential reservoir among different livestock species in tehsil Hafizabad, Pakistan

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Sunny, Shan Washi and Nanna Anijad.

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Abstract

Ticks being ectoparasites transmit various disease-causing pathogens to humans as well as livestock. This study investigates the prevalence and abundance of tick species in Tehsil and District Hafizabad, Pakistan. Total of 688 livestock animals were inspected between September 2021 and August 2022. The most prevalent tick species found were Hyalomma anatolicum (26.54%) and Rhipicephalus microplus (23.06%). Infestation rates were highest in cattle (66.66%) followed by buffaloes (55.33%) and goats (36.29%) with females and younger animals more heavily infested. Spatial distribution reveals the wide distribution of tick infestation in the northwestern and southeastern part of the study site in cattle. In buffaloes, the northwestern part had the most abundance while in goats northern, southwestern, and central region showed the most number of infestations. In the case of temporal distribution, the tick infestation rate was high in summer followed by autumn, spring, and winter. Appropriate strategies were required for the control of ticks and better health conditions of the livestock in the study area.





O-72/ICAZ-2024

Poultry Production and role of Extension services in Azad Jammu and Kashmir

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Abstract

The study was conducted to understand the role of livestock extension services provided by the Extension Department for the promotion of backyard poultry production in district Poonch Azad Jammu and Kashmir. Data were collected through interviews from 242 households about the existing backyard poultry production system, various factors affecting this system, and the role of the extension department in promoting backyard poultry production. Results indicated that in the existing poultry production system 71.1% of farmers were rearing desi type of chicken for egg production, 60.3 % of birds were reared in open housing, cages were kept mostly under the shade, the homemade feed was used, preferred route of vaccination was drinking water, 48.3% farmers have hard access to extension services and livestock assistance was preferred source of information. The survey data indicated that in the study area most of the factors that affected the income of poultry producers include increased feed prices, diseases, and predators' issues, decrease in egg prices, and lack of training from the department. While assessing the role of livestock extension services results showed that, the department was successful in the provision of new breeds at subsidized rates but lack of home visits, less provision of extension services and training, and lack of satisfaction in the purpose of buying new breeds from L&DD were considered the main constraints by a majority of farmers. So, it was concluded that easy access to markets, proper farmer's training, and effective and efficient extension services are essential for improving income generation for rural poultry keepers.

Keywords: Backyard poultry, Improving production, Vaccines, Market.

O-73/ICAZ-2024

The First report on the Hematological Variations in Grey francolin (Francolinus pondicerianus) in Pakistan

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Muhammad Hasnain Lateef¹, Talat Sabtain¹, Syeda Alia Bint Riaz¹

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Abstract

The present study was conducted to find out molecular prevalence of endoparasites in Grey Francolin in Punjab Pakistan. For this purpose, 60 grey francolin fecal sample were collected from different localities to determine the microscopic and molecular prevalence of endoparasite. The fecal sample were analyzed through direct and indirect concentration methods and Ascardia (31.66%), Eimeria (25%), Capillaria (23.33%), Echinostoma (16.66%) Strongloides (13.33) Heterakis (13.33%), Isospora (11.66%), Raillietina (10%), Sarcocystis (8.33%), were identified through microscopic study. The overall prevalence of endoparasites were 38%, in which Nematode (69%) followed by Protozoan (40%), Trematode (16.67%) and Cestode (10%). The highest prevalence rate was in male (44.82%) as compared to female (32.25%) and higher in September to October (70%) as compared to December to January (30%). Molecular prevalence of endoparasites was analyzed by using manual DNA Extraction through PCR and gel electrophoresis. The molecular identification was used for only Eimeria and Ascardia which was most prevalent endoparasite and PCR result revealed that Eimeria 25% and Ascardia (34.1%). It was concluded that Grey francolin is a major reservoir of nine parasite species, which may influence on health status, captive management and survival of this species.

Keywords: Endoparasites, Gastrointestinal infection, Grey Francolin, PCR, Eimeria, Ascaridia

O-74/ICAZ-2024

Exploring Biodiversity and Conservation in Tropical Rainforests

Javeria Hasiham

University of Mianwail

Abstract

In this research project, we delve into the rich and diverse ecosystems of tropical rainforests, focusing on biodiversity and conservation efforts. Our study takes us deep into these lush environments to uncover the incredible variety of flora and fauna that call these rainforests home. We explore the intricate web of life that thrives within these ecosystems, from the smallest insects to the largest mammals. Additionally, we investigate the challenges posed by


deforestation, habitat destruction, and climate change to the delicate balance of these environments. Our work highlights the importance of conservation efforts in preserving these invaluable ecosystems, safeguarding countless species, and protecting the global environment

O-75/ICAZ-2024

Enamel Hypoplasia; A Tool to Trace out the Intraspecific Dietary Interactions in European Rabbit (Oryctolagus cuniculus)

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Abstract

This is first ever report on enamel hypoplasia (EH) as a stress indicator in European rabbit (*Oryctolagus cuniculus*). The EH is a dental glitch caused by the indecorous formation of enamel forming cell named as ameloblasts. In this study the intraspecific and inter gender ecological and physiological stability of the two different breeds of the European rabbit is analysed by using linear enamel hypoplasia (LEH, a type of enamel hypoplasia) as a stress marker. The teeth of 48 sexually mature rabbits (12 males and 12 females of each New Zealand as well as American Dutch rabbit breeds) are analysed in this study. All the 1344 teeth (maxillary and mandibular) included in this study are examined trice macroscopically for LEH analysis in both artificial as well as sunlight by using 10X magnifying glass. The Chi square test is applied on the results. The results of the both included breeds indicate that the LEH occurrence is significantly high (p=0.003162< 0.05) in male rabbits (63%) as compared to female rabbits (17%). This indicates a female dominating foraging behaviour in the European rabbits. The ever growing incisors are most affected among all types of the examined teeth. One of the reasons for it is that the development of permanent incisors (intrauterine) complete on 21^{st} day. The developmental period from the 17^{th} day to 21^{st} day of intrauterine rabbit neonates is a crucial phase of tooth development and the mother is likely to be facing more stress during this interval of the rabbit life. The LEH is significantly high (p=0.018215< 0.05) in New Zealand (58%) as compared to American Dutch breed (15%). It indicates that the New Zealand rabbit breed is facing more stress as compare to American Dutch rabbit breed.

O-76/ICAZ-2024

Functional Foods and Nutraceuticals: "Let Food be Your Medicine"

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Recent developments in the field of optimal nutrition have led to an increase in the use of functional foods and nutraceuticals. Nutraceuticals are isolated, concentrated portions of naturally occurring foods that are high in nutrients. They are available in medical forms such as tablets, capsules, and ampules, among others. They have components that aren't usually thought of as nutrients, yet they have advantageous physiological effects that aid in the prevention of chronic illnesses. Different names for nutraceuticals exist in different countries: designer foods, phytochemical-rich foods, functional foods, and natural health supplements.

The physiological and therapeutic health benefits of nutraceuticals are attributed to a wide range of bioactive substances and high-value constituents, such as biopeptides, carotenoids, essential fatty acids, dietary fiber, isothiocyanates, flavonoids, polyols, plant stanols/phytosterols, phytoestrogens, prebiotics/probiotics, soy protein, sulfides/thiols, etc. They prolong life expectancy, maintain the body's structural integrity, improve well-being, slow down the ageing process, prevent chronic illnesses (diabetes, cancer, viral infections, etc.), and control gene expression. Secondary metabolites, or plant-based compounds with medicinal properties, are the main bioactive



ingredients in nutraceuticals. The World Health Organization has acknowledged the potential of nutraceuticals as a safer, more focused, and more successful treatment for a variety of prevalent diseases, such as obesity, hypertension, cancer, diabetes, viral infections, and cardiovascular disorders. Nevertheless, there is an urgent need to explain the molecular mechanisms behind the activities of these beneficial compounds. This talk will focus on the concept, categorization, and potential medicinal and therapeutic applications of a number of commercially available nutraceuticals. It also emphasizes the opportunities, problems, and trends that the nutraceutical industry is currently confronting.

Keywords: Nutraceutical; supplements; phytochemical; functional food; nutrigenomics

O-77/ICAZ-2024

The beni-haroundam as a critical Wintering site for western palearctic Waterfowl: an ecological survey and Inventory, Mila, Northeast Algeria

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Abstract:

The winter period, spanning over seven months, is critically important for waterbirds during their annual cycle. This study, conducted at the Beni-HarounDam in Mila (5328 hectares) from September 2023 to March 2024, aimed to identify, inventory, and count the aquatic avifauna while performing regular ecological monitoring of this artificial wetland. Surveys were organized bi-monthly at three key points across the dam's expanse. As Algeria's largest strategic hydraulic structure, Beni-HarounDam supports a rich avian diversity, including 38 waterfowl species from 16 avian families. The study underscores the dam's significant role as a migratory stopover and wintering site for numerous Western Palearctic waterfowl species. The Anatidae family was the most represented, with eight species observed. Notable species include the Mallard Anas platyrhynchos with 156 individuals, the Northern Shoveler Spatula clypeata with 56, the Ferruginous Duck Aythya nyroca with 32, and the Green-winged Teal Anas crecca crecca with 17. Additional species such as the Eurasian Wigeon Anas penelope and Gadwall Anas strepera, each with 12 individuals, along with the Greater Scaup Aythya ferina and the Ruddy Shelduck Tadorna ferruginea with 11 and 6 individuals respectively, further highlight the wetland's role in supporting avian biodiversity. This study highlights the critical importance of Beni-Haroun Dam in supporting waterfowl diversity during the winter season and emphasizes its role as a key habitat for migratory and wintering species.

Key words: The Beni-Haroun Dam, Biodiversity, Waterbirds, Wintering, Artificial wetland.

O-78/ICAZ-2024

Investigation the biodiversity and Distribution of genus Melolontha from Sindh, Pakistan

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Abstract

More than 30,000 different species of beetles from all over the world are included in the current definition of the family Scarabaeidae. These beetles are frequently referred to as scarabs or scarab beetles. Within the past several years, there has been a significant amount of change in the way that people think about how to classify this family. There is a significant amount of scarabaeid beetles that are a nuisance of both cultivated and natural vegetation. The fauna of beetles in Sindh Province was surveyed and gathered from a wider range of habitats than was previously known. A total of fifty specimens were gathered and categorised into the genus Melolontha Fabricius, 1775, which





belongs to the subfamily Melolonthinae. Two of the species that were obtained were Melolontha indica Hope, 1831 and Melolontha furcicauda Ancey, 1881. In addition, the existence of Melolontha furcicauda in Sindh Province of Pakistan has been documented for the very first time, and a new regional record for M. indica in Pakistan has been established. In addition, digital photographs and a description of the range of the species are provided for the very first time. It is hoped that future research that is interested in this demographic will be able to benefit from the well established foundation that the current study has supplied.

O-79/ICAZ-2024

The Importance of Artificial Wetlands in the Mila Region for the Wintering of Waterbirds - The Case of Sidi Khelifa Dam-

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Abstract

This study provides an overview of the richness and diversity of birds in these artificial wetlands in the Mediterranean basin, recognized as among the most productive areas on our planet, highlighting the Sidi Khelifa dam, which spans 263 hectares. The strategic position of this dam, located north of the high plateaus in eastern Algeria, gives it particular ecological importance during winter for aquatic birds. In this study, we present the results obtained from bi-monthly surveys of aquatic birds conducted from October 2023 to March 2024. The aquatic bird census allowed us to classify them into 9 orders, 12 families, and 29 species, in relation to the maintenance of the frequency of these areas, which ensures the preservation of ecosystem components and strengthens the biological resources of the site while determining its ecological importance.

Keywords: Artificial wetlands, Biological diversity, Aquatic avifauna, Winter, Sidi Khelifa dam

O-80/ICAZ-2024

Expedition of Orthoptera diversity in different Ecological Zones of Pakistan

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Abstract.

Grasshoppers, locusts, crickets, and katydids are all examples of insects that are classified within the order Orthoperta. Many ecosystems depend on grasshoppers and locusts as prey and predators, but their ability to reproduce swiftly and create swarms can trigger agricultural crises that threaten livelihoods and food security. Locusts and grasshoppers are essential herbivores in grasslands worldwide. They aid food chains, plant growth, and nutrient cycling. Grasshopper and locust outbreaks are global issues. They can entirely destroy crops and grasslands and economically damage rangelands and crops. Some grasshopper species are ecological markers of ecosystem health due to their sensitivity to temperature and land use. To collect Orthopteran diversity, thorough field surveys were conducted in diverse ecological zones of Pakistan. Approximately 4,432 specimens were collected between 2020 and 2024. The specimens were categorised into Dericorythidae, Acrididae, Tetrigidae, Pyrgomorphidae, Gryllidae, and Tettigoniidae. The Family Acrididae had the most diversity, followed by Gryllidae and Pyrgomorphidae. The least diverse family was Dericorythidae, followed by Tettigoniidae variety. Family Tettigoniidae was diverse in Khyber Pakhtukhwa and Punjab. Several Orthopteran species were also affected by the quick climate change. Digital photos, line drawings of genitalia, species distribution data, and taxonomic keys for families, genera, and species are also provided. This study should serve as a foundation for Pakistani Orthoptera taxonomy and biodiversity researchers.

O-81/ICAZ-2024

Systematic study of Weevils (Curculionidae) from different ecological zones of district Khairpur, Sindh Pakistan

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Abstract

A large number of insects belong to the order Coleoptera, which includes beetles as one of its members. Those that belong to the family Curculionidae are known as weevils. Among the most frequent types of pests, weevils are known to feed on vegetation that is otherwise in good health. Scale insects and red palm weevils have been the most common pests of date palms in the Khairpur district since 1980. Scale insects are the most common problem. The industry of date palms in Khairpur is extremely important to the economy of the city. In addition, weevils are a frequent pest that can be found in grain storage facilities. These organisms offer a risk to grains that have been stored, such as corn, wheat, and rice. There are still a big number of beetle species that have not been found. For the purpose of utilising management measures to put a stop to the proliferation of these pests, it is required to use molecular differentiation and morphological identification of these pests. Weevil fauna of the Khairpur area of Sindh, Pakistan, will be identified and evaluated as part of this study. Additionally, the morphological and molecular differences between different species of weevils will be investigated. These are the two primary objectives of this research. The research was carried out at the Entomology Laboratory, which is part of the Department of Zoology at Shah Abdul Latif University (SALU), which is located in Khairpur. Ten hundred eighteen specimens belonging to the family Curculionidae were gathered by researchers from a variety of locations around the Khairpur area over the year of 2019–2022. For the purpose of determining the identities of the samples, physical and genetic characteristics were characterised. Rhynchophorus ferrugineus, Sitophilus oryzae Sitophilus zeamais Sitophilus granarius Tanymacus khaipuresnsis sp.nov Pachyrhinus lethierryi Sphenophorus parvulus Phylobius pomaceus and Phylobius ferrugineus were also among the species identified. Three of these species are new to science: Pachyrhinus lethierryi Sphenophorus parvulus and Phylobius pomaceus. Tanymacus khaipuresnsis sp. nov is the name of the species that is being submitted to the scientific community as a new species. Moreover, molecular data not only substantiates the existence of species variation but also suggests the existence of other species.

O-82/ICAZ-2024

Preliminary study on the diversity of Acrididae from Sufi Anwer Shah Safari Park Ghotiki Sindh Pakistan Kaleemullah¹, Waheed Ali Panhwar¹, Naheed Baloch¹

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Abstract

Family Acrididae consists of twenty eigh subfamilies with 1412 genera and 6832 recognized species out of which 2481 have been reported from Asia and 169 species and subspecies from Pakistan. Locusts, or grasshoppers, are the most well-known members of the Acrididae family. They are recognized by the short and thick antennae, and the tympana of the first abdominal segment are located on its side. Around 10,000 of the 11,000 species in the suborder Caelifera belong to the Acrididae family, making them the most abundant family of grasshoppers. They are considered to be major plant pests because of the considerable damage they cause to agricultural crops, forests, vegetables, orchards and wide variety of fruits. The Acrididae grasshoppers were collected from different sites of Sufi Anwer Shah Safari Park Ghotiki Sindh Pakistan. The samples were 113 that were sorted out into family Acrididae, 05 genera and 07 species i-e:Heteracris littoralis (Rambur, 1838) Spathosteronus prasiniferum (Walker 1871), Acrida exaltata (Walker 1859), Acrida gigantea (Herbst, 1786), Truxalis eximia eximia Eichwald, 1830 Anacridium aegyptium (Linnaeus, 1764). Beside this, morphological descriptions along with photographs are provided for the current studied species.

O-83/ICAZ-2024

Study of avifauna diversity in and around valentine park, Illford, London

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Abstract

BetweenDecember 2022 and August 2023, researcher surveyed the bird population in Ilford, London, to learn more about its diversity. It was possible to classify the known 150 bird species into 19 orders and 53 families. Because of this, it boasts the greatest diversity of life forms here. Few methods of collecting samples were used, such as zeroing in on certain regions of interest, doing random samples, and picking out specific ecosystems. Several different streets and parks in Ilford were used as examples. The names and the number of individuals of each species, their habits, and the characteristics of their habitats were documented during the data collection procedure. The study had some





limitations, such as a small sample size and limited geographic coverage, but nonetheless managed to yield important insights into the rich avifauna of London's Ilford. The results showed that metropolitan areas, parks, and natural environments are home to a wide variety of bird species, which is indicative of the region's ecological diversity. More study is needed to fill in the gaps and increase our understanding of the richness of Ilford's avifauna. Long-term monitoring, ecological studies of breeding, better data collection, integration of data with numerous other environmental indicators, conservation awareness and public participation have all been proposed as potential next steps. The results of this study add to our understanding of the variety of bird life in Ilford, London, and provide a foundation for future conservation efforts to save the habitats necessary to ensure the long-term viability of the region's avifauna. Key words: Avifauna, Ilford, Diversity, Metropolitan, Distribution, Integration, Monitoring, Breeding, Environmental Indicators, Conservation, Viability.

O-84/ICAZ-2024

Biodiversity of Acrididae grasshoppers from Hyderabad region Sindh Pakistan Naheed Baloch, Waheed Ali Panhwar

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Abstract

The harmful effects that grasshoppers have on a wide variety of green vegetation give them a major economic significance. Grasshoppers are found in a wide range of ecological systems and have a vast distribution. Throughout the course of this inquiry, a comprehensive survey was carried out in order to determine the extent to which grasshoppers belonging to the family Acrididae are prevalent in Hyderabad and the locations that are next to it. According to the findings, there are 32 different species of grasshoppers, which are classified into 11 different genera and five different sub-families. These sub-families are as follows: Oedipodinae, Acridinae, Hemiacridinae, Gomphocerinae, and Truxalinae. The research highlighted the fact that the Acridinae subfamily is the most prevalent, followed by the Oedipodinae and Gomphocerinae subfamilies. On the other hand, the Truxalinae and Hemiacridinae subfamilies were found to be the least prevalent in the areas that were investigated in Hyderabad and its neighbouring areas. In addition, the material that was obtained from a variety of habitats and sites was subjected to a comprehensive analysis. The material's scientific significance for future references is increased as a result of the acquisition of Acridid fauna from a variety of habitats and host plants. The development of comprehensive identifying keys included the incorporation of easily discernible physical characteristics as well as detailed depictions of anatomical aspects that are concealed. In order to provide a more comprehensive knowledge, these keys cover the many subfamilies, genera, and species that belong to the Acrididae family. Additionally, distribution maps are included.

O-85/ICAZ-2024

Population dynamics of earthworm (clitellata) in grasslands of Gujranwala District Punjab Pakistan

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Abstract

Earthworms are a major component of soil faunal communities. They influence soil chemical, biological, and physical processes and vice versa, their abundance and diversity are influenced by natural characteristics or land management practices. A sampling grid was established at each site of grasslands containing 5 subunits from October 2021 to May 2022. In total, 160 subunits were sampled. Collection of surface-dwelling earthworms was done by simple hand sorting method. Data regarding habitat and other ecological notes such as date time of collection maximum and minimum temperature and moisture was recorded for each sample. The earthworms were collected, which resulted in the identification of 6 species belonging to family Lumbricus terrestris, Lumbricus castaneus, Aporrectodea and Eisenia. Six species viz; Lumbricus rubellus, Lumbricus terrestris, Lumbricus castaneus, Aporrectodea calignosa, Aporrectodea longa and Eisenia fetida, were identified. Lumbricus terrestris was the dominant species as it was represented by the highest (192) number of worms. The second dominant species was Lumbricus rubellus (167). The other species in a descending order were Aporrectodea longa (141), Eisenia fetida (44), Aporrectodea calignosa 14), and Lumbricus castaneus (4). Soil samples were analyzed for the presence of different soil factors such as pH, organic matters, Potassium, Phosphorus in the soil. The relationship between number of earthworm species, population density and biomass with respect to soil physio-chemical parameters i.e. pH, organic



matter, phosphorus potassium and temperature was also examined. Earthworms were present within the range of temperature $11-30^{\circ}$ C, Ph (7.1 - 8.6), organic matter (0.55-1.25%), K (60-320ppm) and P (10.8-16.7ppm). Earthworm abundance showed a significant and highly positive relationship with temperature and organic matter. However the effect of phosphorus and potassium on earthworm abundance was limited. Earthworm species also showed some affinities to the vegetation present in their surroundings. Species richness was found by Margalef species Index DMg (D=S-1/ln(N), which rangedfrom0.95-3.606.

Keywords: Earthworm, abundance, species, soil, vegetation

O-86/ICAZ-2024

Faunistic study on Acrididae (Orthoptera) from Sindh- Pakistan

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Abstract

The family Acrididae is one of the largest families in the Orthoptera, and the subfamily Acridinae, which includes grasshoppers, is commonly referred to as the silent slant-faced grasshoppers. The species is similar to members of the subfamily Gomphocerinae, with whom they share a slanted face. They are also similar in appearance between the two groups. Despite the fact that they are silent, Acridinae are distinct from Gomphocerinae in that they do not have stridulatory pegs on their hind legs. This is because the common name suggests that they are silent. For the purpose of collecting specimens belonging to the family Acrididae, the field investigations were carried out between the months of March 2022 and March 2024. Approximately three thousand specimens were gathered and classified into six different taxa. i-e: Acrida, Duroniella, Gelastorhinus, Gonista, Phlaeoba, Truxalis and 09 species i.e:Acrida exaltata (Walker,1859),Duroniella laticornis (Krauss,1909),Duroniella laeviceps Uvarov1938,Gelastorhin s semipictus (Walker,1870),Gonista rotundata Uvarov,1933,Phlaeoba tenebrosa (Walker,1871),Phlaeoba panteli Bol í,1902,Truxalis eximia Eichwald,1830,and Truxalis fitzgeraldi Dirsh, 1950. Additionally, for the first time, morphological differences, geographic information system maps, and a list of host plants are presented for the species that were investigated. Without a doubt, the current investigation will be of great assistance to the coming generations of scientists who will be working with the Acrididae fauna of this region.

O-87/ICAZ-2024

Biodiversity and taxonomy of long horned grasshoppers and short horned grasshoppers from middle Sindh, Pakistan

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Abstract:

Middle Sindh comprises three districts: Dadu, Shaheed Benazirabad, and Naushero Feroze. These districts have extensive agricultural fields and a favorable climatic conditions for breeding of insects, such as short-horned grasshoppers (family Acrididae) and long-horned grasshoppers (family Tettigoniidae). These insects are economically significant pests of various crops in Middle Sindh, necessitating proper identification and management, particularly because locusts, a notorious member of the Acrididae family, pose a major threat to cash crops. During 2022 and 2023, a total of 462 specimens of long-horned grasshoppers representing six species from the family Tettigoniidae and 5760 specimens of short-horned grasshoppers representing 27 species from the family Acrididae were collected from different localities in Middle Sindh. These localities include villages such as Qazi Arif, Ghulam Hussain Gadhi, Phaka, Muhammad Ibrahim Panhwar, and M. Bachal Bouk in District Dadu; Walidad Zardari, Bux Ali Dahri, Bandhi, Baharo Khan Mari, and Sardar Khan Rind in District Shaheed Benazirabad; and Puran, Hyder Jesar, Aayal Khan Tunio, Halani, and Tharu Shah in District Naushero Feroze. The collected long-horned grasshopper species and their respective percentages are as follows: Trigonocorypha unicolor (Stal 1873) : 17.09%, Phaeneroptera roseata (Walker 1869) : 24.24%, Hexacentrus unicolor(Serville,1931):11.90%, Euconocephalus pallidus (Redtenbacher 1891) : 16.23%, Euconocephalus indicus (Redtenbacher, 1891): 15.80%, Conocephalus muculatus: (Bolivar, 1913)14.71%. The collected short-horned grasshopper species and their respective percentages are as follows: Oxya hyla hyla (Serville 1831): 5.59%, Oxya fuscovittata (Marshal 1836): 5.69%, Oxya bidentata (Willemse, 1925): 5.64%, Hieroglyphus perpolita (Uvarov 1832): 5.20%, Aiolopus thalassinus (Fabricius 1781): 6.96%, Aiolopus thalassinus



tamulus (Fabricius 1798): 6.96%, Aiolopus simulatrix (Walker 1870): 2.32%, Acrotylus insubricus (Scopoli 1786): 4.47%, Acrotylus longipes(Charpentier, 1845): 4.13%, Locusta migratoria (Linnaeus 1758): 4.39%, Sphingnostus savignyi (Saussure 1884): 4.14%, Sphingnotus longipennis (Saussure 1884): 2.04%, Sphingnotus rubescens (Walker 1870): 1.66%, Sphingnotus hussaini(Baloch and Wagan 2000): 1.45%, Trilophidia annulata (Thunberg 1815): 2.17%, Hilethera aeolopoides (Uvarov 1922); 4.16%, Oedaleus senegalensis(Krauss, 1877); 2.56%, Oedaleus roscenscens (Krauss 1877): 2.44%, Oedaleus abruptus (Thunberg, 1815): 3.38%, Truxalis eximia eximia (Eichwald 1830): 2.98%, Traxalis fitzgeraldi (Dirsh 1950): 1.96%, Acrida exaltata (Walker 1859) 4.37%, Gonista rotundata (Uvarov 1933): 3.19%, Anacridium rubrispinum (Bie Benko 1948): 3.52%, Schistocerca gregaria (Forsskal 1775): 3.45%, Heteracris adspersa((Redtenbacher, 1889) : 2.44%, Heteracris littoralis (Rambur, 1838): 2.60% respectively. The total collected specimens of long-horned grasshoppers were categorized into six species belonging to three subfamilies (Phaneropterinae, Conocephalinae, and Hexacentrinae) and five genera. The short-horned grasshoppers were categorized into 27 species belonging to six subfamilies (Oedipodinae, Hemiacridinae, Oxyinae, Cryptacanthacridinae, Acridinae, and Eyprepoenemidinae) and 15 genera. Among the Tettigoniidae, Phaeneroptera roseata showed the highest diversity in Middle Sindh with 24.24%, while Hexacentrus unicolor recorded the lowest at 11.90%. Among the Acrididae, Aiolopus thalassinus and Aiolopus thalassinus tamulus showed the highest diversity with 6.96%, while Sphingnotus hussaini recorded the lowest at 1.45%.

O-88/ICAZ-2024

Effect of soybean meal on growth and hematological parameters of *Labeo rohita* and *Ctenopharyngodon idella* Areeha Fatima¹, Shakeela Parveen^{1*}, Fayyaz Rasool²

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Abstract

This study investigates the potential of soybean meal (SBM) as an alternative protein source in aquafeed, focusing on its effects on the growth and hematological parameters of Rohu (Labeo rohita) and Grass Carp (Ctenopharyngodon idella). The research was conducted at the University of Agriculture Faisalabad. With global demand for fishmeal exceeding supply, alternative protein sources like SBM are increasingly crucial for sustainable aquaculture. The study, spanning two months, involved assigning Rohu and Grass Carp into control (fish meal) and experimental (SBM) groups. Growth parameters including weight, length, Specific Growth Rate (SGR) and survival were monitored, alongside hematological analyses. The fish were fed on experimental diet at feeding level of 2% of body weight. Results indicate comparable growth performance between SBM-fed and fishmeal-fed groups, with SBM potentially enhancing survival rates. Body weight gain and SGR increased significantly (P<0.05) compared to control group fed with FM in Rohu. However, for Grass Carp there is no significant difference in weight gain and SGR values when fed with SBM as compared to FM. For Rohu the hematological studies showed significantly higher red blood cells, hemoglobin, hematocrit, white blood cells and leucocytes. For Grass Carp RBCs, hemoglobin and hematocrit values showed declining tendency with experimental feed, besides that there was a noteworthy rise in White Blood Cell (WBC) count and lymphocytes. Overall, research adds to the growing body of literature on alternative protein sources in aquafeed, highlighting the potential of SBM as a sustainable solution for meeting the protein requirements of fish aquaculture

Keywords

Fish meal, soybean meal, protein source, growth, hematological parameters, Rohu, Grass carp

O-89/ICAZ-2024

Comparative study on the effect of weed plant-based bio-pesticides and pyrethroids on biochemical and histopathological parameters in albino rat

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Abstract

Excessive use of pesticides has been associated with a potential risk to environment and human health. Hence, bio-pesticides from plants are some of the future strategies for the protection of economically important crops. In this regard, leaves extracts of Chenopodium murale and Achyranthes aspera were prepared and used to evaluate biochemical and histopathological effects of weed plants (Chenopodium murale and Achyranthes aspera) extracts,





and to find out the enzyme (Acetylcholinestrase and Alkaline Phosphatase) modulation in Rattus norvegicus. Rats were orally administered with different doses (100, 150 and 250ppm) of plant extracts (methanolic extract) and cypermethrin (mixed in food), and data was collected at every 7, 14, 21 and 28 days. The findings revealed that hepatic enzymes in blood serum (Bilirubin, S.G.O.T, S.G.P.T and Phosphatase) were significantly (P<0.05) altered in cypermethrin treated group as compared to control, while plant extracts showed highly non-significant difference (P>0.05) as compared to control. The activity of enzymes (AChE and AlkP) was also disrupted in dose-dependent manner with cypermethrin; but plant extracts did not show significant difference in enzyme activities as compared to control. Histopathological study of liver and kidney showed that cypermethrin caused high level of tissue damage that was increased significantly (P<0.05) with increasing concentration of treatment. Both plant extracts did not damage the tissues of liver and kidney at all concentrations similar to control group. It was concluded that the both weed plant extracts did not show any toxicity to rat, which indicates that these weeds would be safe to mammals and human if future biopesticide based on these weed extracts is produced. Keywords: Rattus norvegicus, Liver, kidney, Biopesticides, Chenopodium murale, Achyranthes aspera, Cypermethrin, Biochemical, Histopathology.

O-90/ICAZ-2024

Studies on insect Pollinators from different agricultural zones of Ghotiki Sindh Pakistan

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Abstract

Pollinators are closely related to human welfare through sustainable use of food, the conservation of balanced ecosystem, crop production, and propagation of wild plants. Generally, pollinators are insects, such as bees, butterflies, moths, wasps, flies and beetles. Apart from this, species of bird and bat also provide pollination service to plants. Many insect groups, providing pollination services to agricultural and wild plant, are mostly associated with the orders Hymenoptera, Coleoptera, Diptera, Lepidoptera, Odonata, Hemiptera, Thysanoptera and Neuroptera. During the present study 02 talukas of district Ghotiki were surveyed: Taluka Ghotiki and Taluka Mirpur Mathelo to collect the pollinators from different fields. About 165 specimens were collected and taken to Advanced Entomology Laboratory Department of Zoology and identified into 03 orders viz: Hymenoptera, Delta pyriforme, Eupeodes luniger, Eristalinus sepulchrali, Eupeodes sp., Protosticta hearseyi, and Syritta sp. The visitation rate of Apis florea and Eristalinus sepulchrali was relatively higher on the different crops than other species. Besides this, morphological characteristics of species and digital images are given.

O-91/ICAZ-2024

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Abstract

Apis mellifera is one of the most beneficial insects in the world. Several factors are producing stress in this pollinating insect. Among these, Varroa destructor infestation in honeybee colonies is the most devastating reason. Conventional acaricides need an alternative control method due to the development of resistance in mites and residue buildup. Essential oils provide a favorable solution for managing mites in bee hives. This study focused on the acaricidal and insecticidal activity of three different essential oils Indian rennet (Withania coagulans), Guggal (Commiphora wightii), and Celery (Apium graveolens) against V. destructor and A. mellifera. In fumigation bioassay, five different concentrations (1%, 3%, 5%, 10% and 15%) of each oil were applied to A. mellifera and V. destructor, placed in different plastic petri dishes. The mortality of mites as well as bees was recorded after 1, 4 and 8 hours. Values for LC50 and selectivity ratio (SR) were counted after 8h. Essential oil of C. wightii proved to have great potential against V. destructor (LC50 = 12.7 ± 5.78 , 95% confidence limit (CL) = -16.87-29.75 mg/L) followed by A. graveolens (LC50 = 18.02 ± 5.33 , 95% confidence limit (CL) = 3.53 - 40.41 mg/L). The lowest acaricidal potential was shown by the essential oil of W. coagulans (LC50 = 25.67 ± 7.66 , 95% confidence limit (CL) = 1.49 - 53.65mg/L). The lowest insecticidal activity against A. mellifera showed by essential oil of A. graveolens (LC50 = $77.31 \pm$ 23.18, 95% confidence limit (CL) = 27.46 - 232.03 mg/L) among all the three oils. The results proved that the best acaricidal oil is A. graveolens (with SR > 4.29) followed by C. wightii (with SR > 1.36) and W. coagulans (with SR> 1.19). However, the efficacy of these essential oils has yet to be evaluated in apiary.

O-92/ICAZ-2024





Preliminar studies on morphology and bioacoustics of gryllidae species

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Abstract

Crickets belonging to family Gryllidae show close resemblance with the katydid (Long horned grasshoppers). Crickets are mostly nocturnal in habitat with 3-segmented tarsi and hind legs modified for quick jumping. Nearly 900 species of crickets have been reported. They are regarded as harmless for the human but cause massive loses to agriculture and house goods. They have a relatively flattened shape and are smaller in size. Vertex fastigium is often rounded. Smaller and triangular in shape are ocelli. Subquadrate pronotum. Long spines and light hairs on the hind femora, needle-like ovipositor. Cerci grew somewhat cylindrically longer. Field crickets have an omnivorous diet. Some of them are herbivorous in nature and eat fruit, young leaves, and flowering plants. The crickets that live in gardens eat grasses, leaves, plant shoots, and seeds. A total of 132 specimens were collected, and sorted out into 03 genera and 03 species, namely Acheta domestics (Linnaeus, 1758), Gryllus bimaculatus De Geer, 1773 and Gryllodes siggilatus (Walker, 1869). Morphological description of species with digital photographs are provided in present seminar. The analysis of sounds produced by these species are given. Hopefully, this study will form a base line for future researchers dealing with acoustics behavior and identification of Gryllidae species of Pakistan.

O-93/ICAZ-2024

PCR bases SCAR primer development using RAPD primers for Chrysolina oricalcia (order; Coleoptera) Sadia Maalik, Zainab Sarfraz, Sajida Mushtaq, Moazama Batool, Naheed Bano, Ayesha Hafeez

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Abstract:

The use of agrochemical is the common practice to control the pests but due to harmful effects of these chemicals, there is dire need to setup biological control measures. In these regards, members of order Coleoptera have significant role in suppressing the polyphagous pest species. Due to high diversity of coleopteran member, the morphological identification may not be precise so present study aimed to develop SCAR marker for accurate molecular based identification. For this purpose the DNA of selected species of Coleoptera was extract by Doyle and Doyle method. RAPD primers of OPA series were used to amplify the polymorphic DNA fragments. From all polymorphic DNA fragments, a fragment of 258 base pairs amplified by OPA 3 in Chrysolina oricalcia was excised, eluted and subjected to the sequencing. From the sequence two SCAR primers (forward and reverse primer of 18 mer) were developed and tested on all templates of DNA. Developed SCAR primers give attachment only in C. oricalcia at same position. This specific amplification of C. oricalcia by developed SCAR marker can be used as a primer for precise species identification. This kind of study is helpful to contrive pest control measure against specific species. Key words: SCAR marker, pest control, DNA extraction, PCR, Amplification

O-94/ICAZ-2024

Toxicity and repellency of silver nano-formulated phytoextracts against rice weevil Sitophilus oryzae (L.) (Coleoptera: Curculionidae)

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Abstract

Rice weevil, Sitophilus oryzae (L.) (Coleoptera: Curculionidae), is one of the most widely distributed and destructive insect pests of stored grains. This study aimed to evaluate some effective nano-formulated plant extracts against adult S. oryzae. Extracts of neem (Azadirachta indica A. Juss.), guava (Psidium guajava L.), black pepper (Piper nigrum L.), mint (Mentha piperita L.), eucalyptus (Eucalyptus globulus Labill), dharaik (Melia azedarach L.) and tobacco (Nicotiana tabacum L.) were screened against adult weevils using the grain treatment and filter paper disc treatment bioassay methods. Results indicated that all nano-formulated plants extracts showed significant mortality of exposed weevil individuals and this mortality response was directly proportional to extract concentration and exposure time. Nano-formulated neem extract showed highest mortality (98.7%) followed by dharaik (97%), tobacco (96%) and guava (84%) after 96 h of exposure. Probit analysis indicated LC50 for neem (0.71%), guava (0.62%), tobacco

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(0.66%) and dharaik (0.92%) after 96 h of time interval. In case of repellency, nano-formulated tobacco exhibited highest repellency (54%) followed by dharaik (48%) and guava (28%), while neem exhibited lowest (11%) repellency at 10% concentration after 24 hr. It is concluded that due to their efficient killing properties against S. oryzae. Overall study results demonstrated the effectiveness of nano-formulated plant extracts against S. oryzae.

O-95/ICAZ-2024

Feeding preferences and development of Tribolium castaneum on different flours

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Abstract

The red flour beetle, Tribolium castaneum (Coleoptera: Tenebrionidae), is an important pest of different stored products in tropical and subtropical areas. The red flour beetle can cause unfavorable losses on different cereals during storage period. The present study aimed to study the feeding preferences and development of Tribolium castaneum on six different cereals i.e. wheat flour, rice flour, corn flour, cowpea flour, sorghum flour and barley flour collected from two different sources i.e. Flour mills (Source-I) and Grocery stores (Source-II). In addition, it was found that the highest proportion was found in wheat flour and the lowest in cowpea flour, from egg to adult. The results showed that Tribolium castaneum was more preferred in wheat flour than other flours. Similarly, during the development of Tribolium castaneum, the highest number of eggs, larvae, pupae, and adults emerged on wheat flour, i.e., 25% eggs, 27% larvae, 30% pupae, and 65% adults, respectively. Moreover, the lowest was observed on cow-pea flour, i.e., 10% eggs, 13% larvae, 20% pupae, and 30% adults, respectively. The development time from egg to adult (50% and 90% hatch) remains fastest on wheat flour, slowest on cow-pea flour, and average on barley flour. However, there are some nutritional factors that have a significant impact on growth and development, i.e., higher sodium content results in fewer eggs being laid each flour on Source II, while higher fiber and protein content results in more eggs being laid on Source I. In Source I, more progeny emerged when the carbohydrate content was higher. Present study helps in understanding the preferences and developmental patterns of this pest can help in developing effective pest management strategies that are targeted and efficient.

Keywords: Tribolium castaneum; stored grain pest; life stages; Tenebroinidae; post-harvest, preference.

O-96/ICAZ-2024

Effect of zinc oxide nanoparticles synthesized from ocimum basilicum (basil) leave extract on sugarcane pests

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Abstract

Improper use of pesticides can lead to a range of ecological and environmental safety concerns, thereby impeding the sustainable progress of contemporary agriculture. The significant advancements in the field of nanotechnology have facilitated the ongoing evolution of approaches for safeguarding plants. The process of nanonization and delivery of pesticides presents numerous benefits, such as enhanced absorption and conduction by plants, heightened effectiveness, decreased dosage, postponed resistance, minimized residues, and safeguarding against natural predators and advantageous insects. The objective of this investigation was to assess the insecticidal properties of Zinc oxide nanoparticles synthesized through Ocimum basilicum (basil) leave extract against Diatraea saccaralis, Spodoptera frugiperda and Cavelerius excavates that afflict sugarcane crops. The insects were collected from the Ayub Agriculture Research Institute sugarcane production area and subjected to residual bioassay in zoology laboratory at the University of Education Lahore, Faisalabad Campus. Various concentrations of Zinc oxide nanoparticles possess the capability to function as efficient pest control agents and can be utilized as advantageous resources in the execution of pest management strategies in sugarcane farming. Additional investigation is necessary to comprehend the ecological ramifications of employing ZnO nanoparticles as insecticides.

O-97/ICAZ-2024

Utilizing Beauveria bassiana (EPF) for Optimal Pest Control in Bahawalpur Santosh Kumar^{* 1} and Riffat Sultana ²

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Abstract

Grasshoppers are significant agricultural pests globally, including in Pakistan and India. Being polyphagous, they cause severe damage to crop such as rice, sugarcane, wheat, maize, and fodder crops in Pakistan, prompting farmers to spend millions of rupees annually to control these pests when their populations surge. Many grasshopper species exhibit migratory and gregarious behavior, leading to the formation of spectacular swarms. Various species of grasshoppers have been controlled using insecticides and pesticides such as Dieldrin, Chlordane, DDT, Parathion, Malathion, Dimetilan, and Sevin, resulting in billions of rupees being spent indiscriminately on these products. However, these chemicals pose health risks and have hazardous effects on living creatures and the environment. Therefore, a suitable, beneficial, and cost-effective alternative to these chemicals is needed. Biological control, being cheap and safe for all organisms and the environment, is one of the oldest and most effective means of achieving insect pest control. In this regard, entomopathogenic fungi are regarded as bio-pesticides and are expected to play a significant and increasing role in the control of locusts and grasshoppers worldwide, including in Pakistan. This project aims to apply myco-insecticides to reduce pest populations and assess their efficacy on important agricultural pests, determining how, when, and where they would be most effective. We believe this study will lay the foundation for the use of entomopathogenic fungi in Pakistan.

Keywords: Beauveria bassiana, agriculture, pest, biological control, EPF, Pakistan

O-98/ICAZ-2024

Isolation and characterization of secondary metabolites (Strychnine from Strychnos nux-vomica)

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Abstract

The toxicity of extracted Strychnine phytochemical from Strychnos nux vomica were examine against Albino rats, pest of multiple commodities by using invivo and invitro tests to inspect overall efficiency against its growth stages. Strychnine extraction from dried samples of Strychnos nux vomica (Kuchla) has been studied. The separation of strychnine was conducted through soxhlet and rotary evaporating method. Characterization of strychnine from Nux vomica soxhlet sample was evaluated through phytochemical analysis where orange ring in test tubes was indicated the successful extraction of strychnine. Anti-feedent index% of adult Albino in response to formulated biorodenticides bait after 24hr at 1000ppm were; 1.41, at 2000ppm were; 2.62 and at 3000ppm were; 2.91. After 48hr at 1000ppm were; 2.12, at 2000ppm were; 2.52 and at 3000ppm were; 3.12. Toxicity of strychnine against adult Albinos through IV technique the regression evaluated as; R2= 0.8406.

O-99/ICAZ-2024

Bioactive Metabolites of Kocuria oceani exhibited antibacterial, antioxidant and antidiabetic activities

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Abstract

The bioactive secondary metabolites (BSMs) produced by Kocuria oceani have potent biological activities. In current work BSMs from K. oceani were extracted using plate scrape extraction method, with methanol as an extracting solvent. A well diffusion assay was performed to investigate antibacterial potential of BSMs against selected pathogenic bacteria (Escherichia coli, Staphylococcus aureus, Serratia marcescens, and Bacillus cereus). These metabolites exhibited strong antibacterial action against S. aureus, E. coli, B. cereus and S. marcescens with mean inhibition of 24 ± 0.57 mm, 30.66 ± 0.33 mm, 30 ± 0.58 mm, and 31.33 ± 0.33 mm respectively. Further the results revealed potent in vitro antioxidant, anti-inflammatory, anti-diabetic, and anti-lipidemic activity of BSMs in dose dependent manner (25, 50, 100, 150, 300, and 600 µg/mL). Electrospray ionization mass spectrometry (ESI-MS/MS) analysis of BSMs depicted the presence of Succinic acid, Meglutol, Glutamic acid, and Caffeic acid in negative mode. Of these meglutol is a cholesterol lowering agent and reported as anticholesteremic drug. Besides, a profile of 15 fatty acids present in K. oceani BSMs was identified by Gas chromatography-mass spectrometry (GC-MS). These analyses depicted that the production of secondary metabolites in K. oceani are collectively responsible for pharmacological and biological activities.

Keywords: Kocuria oceani, BSMs, ESI-MS/MS, Meglutol, GC-MS, anticholesteremic drug



O-100/ICAZ-2024

Antibacterial Activities of n-Hexane and Chloroform Fractions of Periploca Aphylla Decne

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Abstract:

Purpose: Antibiotic resistance is ancient and the "resistome" is a dynamic and rising problem. The plants provide potentially valuable structures to develop novel chemotherapeutic agents. In order to achieve this target, in vitro antibacterial assay is a first step. Periploca aphylla Decne. belongs to the family Asclepiadoideae. In folk medicine, P. aphylla is used for emetic purposes, laxative, expectorant and wart removal. In the present investigation, the antibacterial potential of n-hexane and chloroform fractions of crude methanolic extract of P. aphylla were tested against five strains of bacterial test organisms using agar well diffusion method. Methodology: The antibacterial activities of the extracts were assessed quantitatively by determining minimum inhibitory concentration (MIC) values. Results: n-hexane fraction exhibited the activity against M. luteus. While chloroform fraction did not show any inhibition against M. luteus. Both fractions showed activity against K. pneumonia. n-Hexane, and chloroform fractions did not show any activity against P. aeruginosa, B. bronchiseptica and E. aerogenes. Conclusion: Hence, it can be concluded from these results that P. aphylla possess antibacterial potential which can be further utilized for the isolation and characterization of the active compounds.

Keywords: Periploca aphylla, Antibacterial, Asclepiadoideae

O-101/ICAZ-2024

Effects of 17 α-methyltestosterone and Common Carp testes (CCT) on Digestive Enzymes Activity and hematology of Oreochromis niloticus

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Maimoona Mehmood, and Itrat Fatima

Department of Zoology, Government College University, Faisalabad

Abstract

This study compared the effectiveness of 17α -methyltestosterone (MT), and Common Carp Testes (CCT) in tilapia (O. niloticus) in terms of hematological parameters and enzymatic activity. A 90-day trial was conducted with 560 tilapia fry (2-3 days old) distributed into one control and four treatment aquaria, each with triplicates. Fries were fed with a control diet (T0) and four experimental diets (T1: 17α MT 60mg/kg, T2: 17α MT 70mg/kg, T3:CCT1 70%, T4: CCT2 80% for 30 days, followed by the control diet for 60. Tested diet T4 significantly (P < 0.05) improved liver and gut protease activity as compared to other treatments. MT-treated groups showed the highest liver and gut amylase activity. RBCs, hemoglobin, and hematocrit highest values were observed in the same treatment T4 fed with common carp testes. Whereas WBC's highest value was observed in control group T0. Common carp testes are biodegradable, locally available, and eco-friendly alternatives to synthetic hormones that improve fish hematology and digestive enzyme activity.

Keywords: Sex reversal, gonadal histology, hematology, enzymatic activity, Oreochromis niloticus, Carica papaya, testes powder

O-102/ICAZ-2024

Protective effect of green tea extract on chlorpyrifos induced toxicity in liver of male mice Hafiza Hira Rubab, Naila Riaz, Faiza Zubair

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Abstract:

Pesticides are considered as most common toxicants to humans. Chlorpyrifos is organophosphate insecticide used worldwide but its use is a matter of debate. It is also recognized as hepatotoxicant. Goal of current research was to examine the protecting effect of green tea extract against CPF induced alterations in serum and liver of male mice. Experimental protocol lasted for 28 days and included 4 groups. Group I was designated as control, Group II received 20mg/kg sole GT extract, Group III was given 25mg/kg CPF dose via gavage. Group IV received CPF followed by GT with 2hour gap. All mice were anatomized after 28 days and liver and blood sample were collected. Our results



revealed that CPF lead to reduced body weight (P<0.05) whereas weight of liver was increased (P<0.01) as compared to control. Histological findings revealed significant increase (P<0.05) in mean count of binucleated hepatocytes, loosening of hepatic tissues, and highly significant increase (P<0.001) in cellular and nuclear diameter of mononucleated hepatocytes. Moreover, increase in mean serum level of Alanine Aminotransferase, Alkaline Phosphatase (P<0.01) and reduction in mean serum Albumin (P<0.05), Globulin and Total Protein were also observed in CPF group as compared to control group. In CPF+GT group, GT restored liver weight, total hepatocytes count and regenerating zones were also seen in cellular and nuclear diameter of hepatocytes. Similarly, improvements were also noticed in mean serum liver enzymes and proteins. The histological and serological findings confirmed the rescuing potential of green tea against CPF induced hepatotoxicity.

O-103/ICAZ-2024

Evaluation of essential and toxic elemental levels in tumor and non-tumor tissues with risk of colorectal cancer

Muhammad Abdul Qayyum

Department of Chemistry, Division of Science & Technology, University of Education, Lahore, Pakistan Abstract

Colorectal tumor is a major cause of cancer morbidity and mortality both in Pakistan and around the globe. Exposure to environmental toxicants such as toxic trace elements has been implicated in colorectal malignancy. However, data linking them to this cancer are generally lacking. Accordingly, the current study was to investigate the distribution, correlation and chemometric assessment of 20 elements (Ca, Na, Mg, K, Zn, Fe, Ag, Co, Pb, Sn, Ni, Cr, Sr, Mn, Li, Se, Cd, Cu, Hg and As) in the tumor tissues and adjacent non tumor tissues of same colorectal patients which were analyzed by flame atomic absorption spectrophometry employing nitric acid-perchloric acid based wet digestion method. On the average, Zn, Ag, Pb, Ni, Cr and Cd showed significantly higher levels in the tumor tissues compared with the non-tumor tissues of patients, whereas mean levels of Ca, Na, Mg, Fe, Sn and Se were significantly elevated in the non-tumor tissues than the tissues of tumor patients. Most of the elements revealed markedly disparities in their elemental levels based on food (vegetarian/nonvegetarian) habits and smoking (smoker/nonsmoker) habits of donor groups. The correlation study and multivariate statistical analyses demonstrated some significantly divergent associations and apportionment of the elements in the tumor tissues and non-tumor tissues of donors. Noticeably, variations in the elemental levels were also noted for colorectal tumor types (lymphoma, carcinoids tumor and adenocarcinoma) and stages (I, II, III, & IV) in patients. Overall, the study revealed that disproportions in essential and toxic elemental concentrations in the tissues are involved in pathogenesis of the malignancy. These findings provide the data base that helps to oncologist for diagnosis and prognosis of colorectal malignant patients. Keywords: Tissue Colorectal Tumor, Elements Chemometric analyses AAS

O-104/ICAZ-2024

Toxicological Effect of Herbicides on Human Health: A Comprehensive Analysis

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Abstract

In agricultural areas, herbicides are applied to lessen the damage caused by weeds. Herbicides have the ability to completely destroy certain weeds while reducing the development of others. Rivers, lakes, seas, and oceans have all been affected by these chemicals. Pesticides are by nature toxic to humans and other animals, therefore they must be used with caution and disposed of properly. Dichlorodiphenyltrichloroethane (DDT) and lindane are two older pesticides that could persist longer in soil and water. They disrupt the ecology by accumulating in different areas of the food chain. The several negative effects of herbicide exposure are reviewed in this article, including the effects on the nervous system, the respiratory system, the endocrine system, the skin, and the gastrointestinal tract. Herbicides are associated with a number of neurological side effects, including headaches and seizures. Additionally, inhaling herbicide can also interfere with endocrine processes, which can cause issues with development and reproduction. Herbicide contact on the skin frequently causes irritation and rashes, and consuming contaminated food or water can lead to digestive issues. In order to reduce these health hazards, this review emphasizes how crucial it is to handle objects properly and use safety precautions. To fully comprehend the long-term impacts of herbicide exposure and to create safer alternatives, more research is recommended.



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Protective effects of guibourtinidol against doxorubicin-induced pulmonary toxicity in rats

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Abstract

Doxorubicin (DOX) is one of the most extensively prescribed, potent anti-cancer drug, however, its clinical administration is restricted due to its serious organotoxic potential especially pulmonotoxicity. Guibourtinidol is a biflavonoid that shows antioxidant, anti-inflammatory, anti-cancer, and anti-apoptotic properties. Therefore, the current research was performed to evaluate the curative potential of guibourtinidol on DOX -induced lung damage in rats. 20 male albino rats were separated into 4 groups. The first group served as a control group. The second group was provided with an oral dose of DOX (3 mgkg–1). The third group was co-administrated with DOX and guibourtinidol (3 mg/kg of DOX and 30 mg/kg of guibourtinidol). The fourth group was treated orally with guibourtinidol (30 mg/kg). DOX exposure reduced the activities of antioxidant enzyme i.e., catalase (CAT), superoxide dismutase (SOD), glutathione peroxidase (GPx), glutathione (GSH), glutathione reductase GSR and glutathione S transferases (GST), whereas increased the levels of inflammatory markers (TNF-α, NF-κB, IL-1β, IL-6 and COX-2) and lungs specific markers, (eosinophil, neutrophil, macrophage, BALF). Nonetheless, DOX remarkably decreased Bcl-2 levels, coupled with an escalation in Caspase-9, Caspase-3 and Bax levels. Furthermore, DOX exposure also induced histopathological anomalies in the lung of rats. However, guibourtinidol supplementation recovered all the damages induced by DOX.

Keywords: Doxorubicin, Lung toxicity, Antioxidants, Guibourtinidol, Biflavonoid

O-106/ICAZ-2024

Toxicity Analysis in Mice Exposed to Copper and Lead Through Food Chain

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Abstract

During the last few decades industrialization have grown to enormous rate to meet the growing demand of rapidly increasing population. There is tremendous release of different types of heavy metals in the water bodies from waste water of printing, paper, textile, tanneries etc. sections. These heave metals enter the bodies of aquatic life and ultimately became part of our food chain. This study was designed to evaluate its genotoxicity via food chain in Swiss albino mice. For execution of this plan, we took 200 fishes which were equally divided into four groups. First group was not given any treatment while other three groups were treated with 200 mg of copper, 200mg of lead and 100mg each of copper and lead in aquaria for 15 days. Following that, fish was dried in oven at 105°C and was used as protein source to formulate different diets for subsequent administration to four mice groups with 20 in each for a period of four weeks. After that period, 4 mice were dissected from each group, their blood was withdrawn. Remaining 16 mice were further split up into four groups, 1 st group was not given any specific treatment and remaining three were treated with Vitamin A and C, Zinc, Zinc plus Vitamin A and C. After recovery period of 2 weeks same procedure was adopted. Comet Assay was performed to check genotoxic effects. Copper and lead cause significant genotoxicity whereas Zinc and Vitamins have curative effects and aid in DNA repair. This study concluded that lead and copper caused significant genotoxic effects in liver, spleen and kidneys while administration of vitamins and zinc aided in DNA repairing.

O-107/ICAZ-2024

Dose and time dependent toxicological studies of organic uv filters in major carps Kaynat Aslam, Sajid Abdullah, Mina Jamil

University of Agriculture, Faisalabad

Abstract

UV filter are widely applied in sunscreen because of photo protective properties. These substances are continuously drained into the aquatic environment and contaminate it. Such contaminants pose serious threat to aquatic biota. The present study determined the histopathological effects of UV filters in Labeo rohita and Catla catla. Fish samples were collected from fish farm, University of Agriculture Faisalabad, and acclimatized. To measure the LC50, and lethal concentrations UV filter doses were administered to the fish. LC50 was recorded as $582.400\pm38.76 \ \mu g/L$ and $1000.026\pm66.345 \ \mu g/L$ for L. rohita, and C. catla respectively. In chronic phase samples were dissected, the





targeted organs were isolated, and tissue slide were used to measure the histopathological variations. Statistically, data was recorded by using statistix8.1 software. The LC50 and lethal concentration was assessed using the probit analysis. The Physio-chemical parameter of the control and treatment medium, were also checked. Correlation between physiochemical parameters and UV filters concentration were used to assess the significant differences between treatment types and controls. Results revealed that L. rohita was most sensitive then C. catla Exposure to UV filters caused a significant change in histopathological alternation in different fish organs in the following order liver>gills >kidney of fish with the increase in exposure duration.

O-108/ICAZ-2024 lver Nanoparticles

Unleashing the Therapeutic Potential of Nigella sativa Extract-Funtionalized Silver Nanoparticles Against Lead Induced Hepatorenal Toxicity in Albino Mice

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² Department of Chemistry, University of Sargodha

Abstract

Lead is one of the naturally occurring toxic heavy metal found in the Earth's crust. Its extensive use has led to substantial environmental contamination, human exposures and adverse health impacts across many regions worldwide. Lead is extremely toxic, particularly in children, causing learning, developmental, and behavioral problems. It enters the body through different sources like contaminated water, lead-based paint etc. The study focuses on the lethal effects of lead exposure on the liver (hepatotoxicity) and kidney (nephrotoxicity) in mice, as well as the potential protective effects of Nigella sativa (black cumin) and its green synthesized silver nanoparticles. The research revealed noteworthy variations in hematological parameters between negative control and lead-exposed groups, including changes in the haemoglobin, red and white blood cell types. Furthermore, the histopathological analysis revealed that the lead exposure caused major damage to the kidney architecture, including the expansion of glomerulus, deterioration of Bowman's capsule, and enlargement, and degeneration of hepatocyte. Moreover, the groups which received doses of extract and silver nanoparticles of Nigella sativa showed amelioration against the lead induced nephrotoxicity and hepatotoxicity. As a result, it was concluded that the plant Nigella sativa and the derived nanoparticles have strong hepato-protective and nephro-protective effects against lead induced toxicity. *Keywords: Nigella sativa*, Silver nanoparticles, Lead intoxication, Kidney damage, Liver damage, Histopathology.

O-109/ICAZ-2024

Therapeutic Potential of Vitamin C and Zinc against Furan Induced Reproductive Toxicity in Rats

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Abstract

Furan is colorless toxic liquid found in many foods including processed food, is cytotoxic and carcinogenic for rats and humans. Vitamin C is an antioxidant and scavenger for reactive oxygen species while; Zinc is used widely in different biological activities. In current study, 25 adult female Sprague Dawley (SD) rats were distributed into 5 groups, each group having 5 rats. Doses were given via oral gavage for consecutive 30 days; control group (corn oil), Furan treated group (10mg/kg), Furan+Vit C treated group (10mg/kg+25mg/kg), Furan+Zinc treated group (10mg/kg+25mg/kg), and Furan+Vit C+Zinc treated group (10mg/kg+25mg/kg+25mg/kg respectively). At the end of treatment, animals were sacrificed (blood and reproductive organs) for further analysis. Results showed that the body weight was reduced while, TBARS, ROS values were increased. Histological alterations in ovaries were noticed including reduced proportion of cysts and follicular atresia in furan treated groups (furan+vit C, Furan+Zinc and Furan+vit C+Zinc) restores the cyclicity upto normal. It was concluded that although Vit C and Zn both treated furan induced toxicity but more prominent results were noticed in Co-treated group.

Keywords: Furan, Biological Activities, carcinogenic, Anti-oxidant enzymes, and Female reproductive toxicity.

O-110/ICAZ-2024

Assessment of nanoplastics contamination in fish of Sukkur barrage, Sindh, Pakistan Nouman Saeed¹, Sidra Abbas*², Abdul Majid Khan³, Sana Aziz⁴, Ghazanfer Ali⁵ and Tariq Irshad⁶ ^{1,2,4,6} Department of Zoology, University of Jhang, Jhang, Pakistan



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Abstract

This study investigates the contamination of fish in Sukkur Barrage, highlighting a pressing environmental issue. By conducting comprehensive sampling across distinct feeding categories, herbivores, omnivores, and carnivores, the study carefully examines the presence of nanoplastics in the gastrointestinal tract (GIT) of these fishes. Fish sampling was done by using different fishing gears. Thirty fish samples were collected from the studied site. The samples were prepared with standard protocols for IR spectra to detect nanoplastics. Chemical digestion was done with all samples. The advanced spectroscopic method ensures the precision of the findings. Analysis of the data revealed varying degrees of nanoplastics pollution, with nylon constituting 73% and polystyrene comprising 20%, and 7% of nitrile. Herbivorous fish show a higher variety of nanoplastics than omnivorous and carnivorous. The feeding habit shows significance with the no. of NPs detected in different feeding groups. Gut weight showed a correlation with detected nanoplastics other body parameters including body weight, and body length did not show a correlation with detected NPs in GIT. It highlights the necessity of efforts to elucidate nanoplastics sources, standardize quantification methodologies, and devise effective strategies for mitigation.

Keywords: Fourier-Transform Infrared Spectroscopy, Gastrointestinal tract, Nylon, Nanoplastics, Polystyrene

O-111/ICAZ-2024

Identification of Novel Natural Inhibitors to Human 3-Phosphoglycerate Dehydrogenase (PHGDH) for Cancer Treatment

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Abstract

Targeting the serine biosynthesis pathway enzymes has turned up as a novel strategy for anti-cancer therapeutics. 3- Phosphoglycerate dehydrogenase (PHGDH) is the rate-limiting enzyme that catalyzes the conversion of 3-Phosphoglyceric acid (3-PG) into 3-Phosphohydroxy pyruvate (3-PPyr) in the first step of serine synthesis pathway and perform a critical role in cancer progression. PHGDH has been reported to be overexpressed in different types of cancers and emerged as a novel target for cancer therapeutics. During this study, virtual screening tools were used for the identification of inhibitors of PHGDH. A library of phenolic compounds was docked against two binding sites of PHGDH using Molegro Virtual Docker (MVD) software. Out of 169 virtually tested compounds, Salvianolic acid C and Schizotenuin F possess good binding potential to co-factor binding site of PHGDH while Salvianolic acid I and Chicoric acid were identified as the best binding compounds toward the substrate binding site of PHGDH. The top selected compounds were evaluated for different physiochemical and ADMET properties, the obtained results showed that none of these hit compounds violated the Pfizer Rule and they possess acceptable ADMET profiles. Further, a commercially available hit compound, Chicoric acid, was evaluated for its anti-cancer potential against PHGDH-expressing gastric cancer cell lines (MGC-803 and SGC-7901) as well as cell lines with low expression of PHGDH (MCF-7 and MDA-MB2-31), which demonstrated that Chicoric acid possesses selective cytotoxicity toward PHGDH expressing cancer cell lines. Thus, this study has unveiled the potential of phenolic compounds, which could serve as novel candidates for the development of PHGDH inhibitors as anti-cancer agents.

Keywords: PHGDH; in silico analyses; molecular docking; phytochemicals; tumor metabolism.

O-112/ICAZ-2024

Toxicity and determination of microplastics in carnivorous fish species of river Chenab and river

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Abstract

The study was planned to determine the presence and toxic effects of microplastics in fish of river Chenab and river Ravi, as increasing plastic pollution can pose severe environmental threats to the aquatic fauna. Samples were collected from designated sites over four months. Various types of microplastics, including polyethylene (PE), polyethylene terephthalate (PET), polypropylene (PP), and polystyrene (PS), were detected in riverine fish and water samples through FTIR analysis. Fish in both rivers were found to have ingested these microplastics, with PS levels notably higher in Channa striata collected from river Ravi. The highest Super Oxide Dismutase (SOD) activity was

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observed in liver of Wallago attu and Channa striata collected from river Ravi. The SOD activity was observed in liver of Wallago attu and Channa striata collected from river Chenab with mean values 52.08 ± 2.02 and 45.61 ± 2.02 , respectively. The Wallago attu collected from river Ravi showed greater frequency of abnormal nuclei as micronuclei, notched, blebbed, polynucleated, binucleated as compared to normal cells ($26.16\pm3.17\%$). The Channa striata collected from Thokar Niaz Baig with mean values $24.15\pm2.30\%$, $24.27\pm0.84\%$ and $25.07\pm2.34\%$, respectively. The Wallago attu collected from Sawah Wallu Shah and Pattan Mohal. Higher frequency of micronuclei ($16.01\pm1.05\%$) was observed in Channa striata collected from Jheel Koray Wala.

Keywords: Microplastics, Channa striata, Wallago attu, antioxidant enzyme activity, micronuclear assay

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Histopathology of heart and spleen as a result of chromium exposure in mice

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Abstract

Potassium dichromate (K2CR2O7) contains hexavalent chromium that was tested for cardiac and splenic histopathology and micro anatomical and morphometric analysis at sub-toxic chronic exposure in drinking water in mice at 50 ppm, 100 ppm and 200ppm concentration. Its duration of exposure was 30 days. The fourty animals were divided into 4 groups as Group I was designated as Control (Ctl) received free normal drinking water, other groups (Group II-IV) were Cr (VI)50ppm, Cr(VI)100ppm, Cr(VI)200ppm received 50, 100 and 200ppm chromium in drinking water respectively. The animals were sacrificed after 30 days of exposure to obtain the heart and spleen for histological preparation. The digital photographs obtained from selected slides were analyzed histo-anatomically. Considerable decrease in red pulp of spleen was observed in Cr(VI)50ppm (8.07±0.76), Cr(VI)100ppm (7.74±0.30) and Cr(VI)200ppm (7.35±0.65) in a dose dependent manner as compared to Ctl (8.24±0.86). Relative cell abundance in red pulp of Cr(VI)50ppm (0.81±0.13), Cr(VI)100ppm (0.65±0.16) and Cr(VI)200ppm (0.6±0.1) was decreasing as compared to Ctl group (1.47±0.20). However, interestingly white pulp of spleen was increased in Cr (VI)50ppm (1.31±0.15), Cr(VI)100ppm (1.47±0.10) and Cr(VI)200ppm (1.72±0.15) in dose dependent manner as compared to Ctl (1.55±0.15). While heart tissue indicate variation in the mean cross sectional area (CSA) of the cardiac fibers along with damaged to end plates, merger of the adjacent fibers necrosis followed by fibrosis in the myocardial myometrium. The results shows clear impression that persistent low concentration (50ppm) chromium exposure in drinking water can be dangerous to myometrium leading to congestive heart problems, cardiac failure, brady cardia along with many hematological implications.

Catalase activity in different tissues of oreochromis niloticus captured from indus river as influenced by

heavy metals

Sajida Iqbal

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Abstract

The current study was carried out to monitor the catalase activity in different tissues of Oreochromis niloticus captured from Indus Rver as influenced by heavy metals. For this purpose, fish samples were captured from the two selected sites of Indus River (Chashma and Taunsa Barrage) and pond of fisheries Research Farm, UAF. Muscles, Liver, Gills and Heart were extracted from Fish specimen. These organs were brought to the Aquaculture Biotechnology Lab, UAF. Half of the organs were used for enzyme activity essay and half for the estimation of metal concentration in respective organs. Fish organs were homogenized and centrifuged for the purpose of enzyme assay. The enzymatic activity was measured by using spectrophotometer at wavelength 240nm. The result of the present study showed higher catalase activity in liver (209 ± 6.59) , heart (143 ± 6.43) and gills (171 ± 6.28) of O. niloticus captured from Taunsa Barrage as compared to the other experimental sites. By using Atomic Absorption



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Spectrophotometer, the metal concentrations were estimated in different organs of study fish and water samples collected from three experimental sites. Results showed the highest concentration of Cu and Cr in muscles and liver of fish captured from Taunsa barrage. The concentration of heavy metals in water samples was also determined these found in order Cr>Zn >Cu>Pb. Results indicated a significant difference $p \le 0.05$ in the catalase activity in heart, gills and liver of O. niloticus captured from the sites. The inferences of present study would be helpful in understanding of fish can be used in biomonitoring of metal pollution in aquatic environment.

O-115/ICAZ-2024

Assessing the Prevalence, Risk Factors, and Outcomes of Anemia in Pregnant Women in Sargodha, Pakistan.

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Abstract

Anemia is a public health problem especially among pregnant women. In developing countries, anemia affects the 2/3 of the population of pregnant women and leads to maternal morbidity and mortality. Anemia during pregnancy is associated with poor pregnancy outcomes including low birth weight, Intra uterine growth retardation, and postpartum hemorrhage. This study aimed to investigate the prevalence of anemia in pregnant women and its association with pregnancy outcomes in Sargodha, Pakistan. This study included the detail case study of 429 pregnant women in Sargodha enrolled in different hospitals including their medical histories, socioeconomic conditions, pregnancy histories, dietary intake before and during pregnancy and pregnancy outcomes. Out of the 429 women under study, 20.9% (90 women) were evaluated as non-anemic. The prevalence of mild anemia (Hb 9.0-10.0 g/dL) was 45.5%, moderate anemia (Hb 8.0-9.0 g/dL) was 25.9% and severe anemia (Hb <7.0 g/dL) was 7.7% in the sample. The final analysis showed that, intake of more tea, ingestion of less meat and chicken before pregnancy, consumption of clay or dirt were led to low concentration of Hb and significantly associated with anemia in pregnancy. Moreover, anemic women had poor pregnancy outcomes such as low birth weight, postpartum hemorrhage and renal failure. Anemia in pregnancy is a significant health issue in Sargodha, Pakistan. Nutrition education programs, improved dietary habits, and regular prenatal care can help mitigate this problem.

Keywords: Anemia, postpartum hemorrhage, renal failure, socioeconomic conditions, mortality, morbidity.

O-116/ICAZ-2024

Neurotoxic and Nephrotoxic Effects of Heavy Metals Burden in Black Kites: A Profound Insight into Urban Pollution in Faisalabad, Pakistan

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Abstract

Urbanization has caused substantial contamination, mainly through heavy metals release into ecosystems. The study aimed to investigate bioaccumulation of heavy metals and toxicological impacts in urban raptors, Black Kites (Milvus migrans), collected from polluted areas of Faisalabad, Punjab, Pakistan. After dissection, brain and kidney samples were chemically digested. Then Atomic Absorption Spectrophotometer was used for sample analysis. Higher mean concentrations of Lead in brain of Black Kites (3.4 mg/kg) were linked to neurotoxicity, affecting motor coordination and behavioral changes. Excessive Zinc levels (37.3 mg/kg) showed nephrotoxic effects as tubular damage and impaired kidney function, while Manganese exposure in brain (5.9 mg/kg) suggested potential oxidative stress and within kidney (4.6 mg/kg) as renal inflammation. Mean±SEM values (mg/kg) followed trend as Zn>Mn>Pb, varied in kidney and brain samples from Ghulam Muhammad Abad (37.3 ± 1.03 and 19.6 ± 0.84) as well as from Jaranwala road, Faisalabad (35.1 ± 0.96 and 22.4 ± 0.50) respectively, which proved elevated Zn level than other metals. ANOVA revealed significant variations (p<0.05) for Zn, Mn and Pb concentrations within kidney and brain tissues of Black Kites among polluted sites. These findings emphasized urgency of environmental regulatory measures to mitigate detrimental effects of heavy metals.

O-117/ICAZ-2024

Microplastic contamination in fish of Sukkur barrage, Sindh, Pakistan

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⁵Department of Zoology, Institute of Molecular Biology and Biotechnology, The University of Lahore, Lahore Abstract

Microplastics (MPs) are the plastics of less than 5 mm in size. The focus of the study was to detect the presence of microplastics in gastrointestinal tract (GIT) of four common freshwater fish species (Labeo rohita, Wallago attu, Cirrhinus mrigala and Rita rita) of Sukkur Barrage and to investigate the types of MPs, season wise accumulation of MPs, specie specific accumulation of MPs and relationships between weight of the gastrointestinal tract, body weight, total length and MPs/individual. After digestion of GIT in KOH base solution MPs were visualized in stereo microscope. Fourier Transform Infrared Spectroscopy (FTIR) was used to assess the chemical composition of MPs. The results showed an average of 0.86±0.32 MPs/individual. Half of the examined samples (25/50) were found to possess microplastics, with respect to shape total 43 particles of MPs were detected, comprising 62.79% of fibers and 37.21% fragments. Fourier Transform Infrared Spectroscopy (FTIR) analysis showed the presence of different types of MPs on the basis of polymer composition, order of their abundance is Ethylene Vinyl Acetate>Nylon>Polypropylene>Polystyrene>Polyethylene. Detected concentration of MPs as per seasonal capturing S1 showed 0.65±0.46 while S2 showed 1.0±0.45 concentrations of MPs/individual. The proportion of MPs in GIT of different fish species found the order: Labeo rohita>Wallago attu>Rita rita>Cirrhinus mrigala. The results revealed that there existed statistically significant and positive correlation between MPs/individual and weight of GIT while non-significant with body weight and total length. Keywords: Microplastic, plastic contamination, Sukkur barrage, freshwater fish

O-118/ICAZ-2024

Assessing histopathological alterations in Black Kites (Milvus migrans) exposed to copper and lead contaminated environments, with a focus on implications for cellular viability and potential human health risks

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Abstract

Industrialization has made our animals and humans life at a great risk. The exposure of heavy metals like lead and copper can cause histopathological changes and diseases in animals as well as humans. We captured 12 Black Kites (Milvus migrans) from rural and urban areas of Faisalabad; an industrial hub of Pakistan. After wet digestion, heavy metals were assessed by Atomic Absorption Spectrophotometer. The average amount of lead was 5.1mg/g from rural area in both organs and 13.67mg/kg from urban area. Average copper concentration also showed significant variation between rural (6.2 mg/kg in lungs, 31.77mg/kg in liver) and urban areas (10.17mg/kg in lungs, 20.97mg/kg in liver). Comparison indicated elevated level from urban area. Lead and copper toxicity led to liver cirrhosis, necrosis, pulmonary fibrosis and even abnormal growth of hepatocytes and pneumocytes (cancer). This investigation opens doors to further diagnose the impact on human health as lead can cause hypertension, delayed nerve conduction, infertility and in severe cases, encephalopathy or mortality. Similarly, copper toxicity may cause hemolysis, nephrotoxic and hepatotoxic effects.

O-119/ICAZ-2024

Understanding The Invasion and Impacts of Invasive Plants On Urban Ecosystems

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Abstract

Non-native and invasive species of plants and animals represent a major threat to global biodiversity and associated ecosystem services. The global decline in biodiversity as a result of urbanization remains poorly understood. The objective of this research is to examine the ecosystem effects of invaded plants in towns and cities and investigate the mechanisms governing them. The urban environment has special characteristics that can help exotic species to flourish, including contaminated soils, dispersed ecosystems, variations in climate, and excessive consumption of resources. Native flora frequently gets displaced by these plants, which further decrease the number of species and affect the food chain cycles. Additionally, the purity of water, soil health, and carbon absorption processes can all be adversely affected by invasive plants. Moreover, their presence in urban green spaces can hinder ecosystem services, such as air purification, stormwater management, and recreational opportunities. We reviewed key case studies of invasive plant species in urban areas and examined their management strategies. Findings highlight



that successful management requires early detection, public awareness, and a combination of mechanical, chemical, and biological control measures. Understanding the pathways of introduction and spread is critical for developing preventive strategies. This research underscores the need for integrated, long-term management plans that consider the socio-ecological dynamics of urban ecosystems to mitigate the adverse effects of invasive plants.

O-120/ICAZ-2024

Phytoremediation: a sustainable environmental technique for air pollution resulting in climate change

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Abstract

Air is an important component of the environment which is necessary for existence and survival of every living organism on the earth. Air pollution is an undesirable change in biological, chemical & physical characteristics of an important component of the environment i.e. air that may harmfully affect all living organisms. It is an alarming issue in today's world that has resulted in climate change & loss of habitat. Anthropogenic activities are destroying the environment to compete with their needs like population explosion, urbanization, industrialization, transportation, deforestation etc. Such increasing human activities are the main causes of environmental pollution directly which are resulting in climate change and loss of habitat. This literature review annotates the current level of air pollution, its causes, impacts, and consequences resulting in climate change which ultimately results in loss of habitat. A good air is the essence of life. It helps in keeping the natural environmental and climatic conditions favorable for the survival, growth and development of all organisms on the earth. These findings can guide decision-makers & environmental experts in formulating effective conservation strategies to protect and sustainably utilize the environment and benefits from natural resources i.e. air in the face of global climate change.

Keywords: Environment, Organisms, Pollution, Protection, Solution.

O-121/ICAZ-2024

Protective effect of Nigella Sativa oil in treatment of hypothyroidism induced nephrotoxicity

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Abstract

An underactive thyroid gland is the hallmark of an important endocrine condition known as hypothyroidism. It leads to alteration in renal structure and function. Nigella sativum essential oil possesses bioactive ingredient (thymoquinone) that make it useful for the treatment of hypothyroidism. In the present study, the role of Nigella sativa essential oil in managing the multifaceted consequences of hypothyroidism, particularly in preserving renal function was determined. Carbimazole (1.35mg/kg) was administered orally for eight weeks to induce hypothyroidism. The histological and biochemical parameters (TSH, T4, urea, creatinine) were used to diagnose hypothyroidism and their related renal abnormalities. Nigella sativa oil (2ml/kg/BW) and levothyroxine (10µg/kg) as treatment were orally administered for 4 weeks. Histological studies revealed that hypothyroid group showed significantly distorted bowman capsules, glomeruli configuration, and enlarged proximal and distal tubules as compared to control group. Treatment groups showed regeneration of these regions. Serum creatinine, urea and TSH level were significantly increased and T4 level was significantly decreased in diseased group as compared to control and treatment groups. The study demonstrates that the Nigella Sativa oil has a protective effect on the renal tissue thus it can be used in treatment of hypothyroidism.

O-122/ICAZ-2024

Impact of FTO and APOE gene expression on diabetic nephropathy Mehak Mehmood, Saima Sharif, Fozia Bibi, Saira Rafaqat, Shagufta Naz

Abstract

Diabetic Nephropathy (DN), a chronic complication of diabetes and leading cause of end-stage renal disease, is linked to the FTO and APOE genes located on chromosomes 16 and 19, respectively. These genes are involved in adiposity, insulin resistance, and regulation of cholesterol and triglyceride-rich lipoproteins, contributing to





O-123/ICAZ-2024

Hepatoprotective effect of NSO (Nigella sativa oil) on hypothyroidism induced histopathological alterations in liver of male mice.

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Abstract

Thyroid hormones are important for controlling growth, metabolism and numerous other body functions. Thyroxine or tetraiodothyronine (T4) are major hormones of thyroid gland. Hypothyroidism is characterized by when thyroid gland is unable to produce sufficient thyroid hormones to fulfil the metabolic need of body. Hypothyroidism was induced in hypothyroid group by giving carbimazole orally with the dose of 1.15mg\kg. After hypothyroidism induction, animals were treated with N. sativa and levothyroxine orally with dose of 400mg\kg and 10µg/100gm respectively for one month. At the end of experiment, mice were dissected to obtain blood and liver. Blood serum was processed for liver functioning tests and tissues were processed for histological staining. N. sativa levothyroxine increased serum T4 and decreased serum T5H concentration. So, it can be concluded that N. sativa has many benefits for thyroid abnormality due to its antioxidant properties. So, hypothyroidism is treated with natural source of Nigella sativa along with synthetic levothyroxine.

O-124/ICAZ-2024

Protective Effects of Ajwa Dates on Testosterone Enanthate-induced Nephrotoxicity in Albino Mice Zarnab Fatima, Muhammad Arshad, Farzana Siddique, Zoresha Khan, Maryam Sana, Nida Aziz, Farah Khan Department of Zoology, University of Sargodha

Abstract

Abusive use of Androgenic-anabolic steroids (ASS) leads to renal abnormalities. Ajwa dates possess various bioactive components (flavonoids, phenolic acid). They have different therapeutic properties like antioxidant, anti-inflammatory, antidiabetic, nephroprotective, hepatoprotective and cardioprotective effects. The present study investigated the nephroprotective potential of Ajwa dates against Testosterone Enanthate induced renal toxicity in female albino mice. Nephrotoxicity induced by Testosterone enanthate (20mg/kg BW), for 3 days/week. Treatment with Ajwa date extract 2g/kg and 1g/kg of Ajwa seed was given for 28 days. Renal histological and biochemical parameters (RFT) were assessed. The results show that serum levels of urea and creatinine were significantly increased in the diseased group as compared to the Ajwa-treated groups. Kidney histological parameters of testosterone enanthate treated groups showed ruptured bowman's capsule, enlarged glomerulus, distortion, and swelling in the epithelium lining of kidney tubules. Ajwa date extract administration effectively improved all these alterations. Current study results suggest that Ajwa dates can be used to treat renal toxicity after further evaluation of its mode of action.

O-125/ICAZ-2024

The anti-diabetic impact of Moringa oleifera (sohanjna) aqueous leaf extract in albino mice (Mus Musculus)

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Abstract

Diabetes is a regressive disease caused by a lack of insulin-producing cells in the pancreatic beta islets or



inadequate insulin. It can lead to loss of body weight, hyperglycemia, glycosuria, coma, and even death. The medicinal plant Moringa olifera is a storehouse of various phenols and flavonoids, which can be used for diabetic treatment. Diabetes was induced in albino mice by alloxan monohydrate intraperitoneally at 200 mg/kg b.w. A fasting blood glucose test was performed for confirmation of induction of diabetes. For the experiment, four groups of twenty-four mice were treated with 500 mg/kg aqueous extract of M. oleifera leaf and 0.4 mg/kg glibenclamide for 28 days. Blood sera were analyzed for the Liver Function Test (LFT) and Renal Function Test (RFT). A significant decrease in LFT (such as AST, ALT and alkaline phosphatase) and RFT (creatinine and urea) parameters was measured. The results suggest that M. oleifera aqueous leaf extract lowers the blood glucose level in diabetic albino mice and can potentially cure diabetes.

O-126/ICAZ-2024

Pomegranate Peel Extract as 6-Phosphogluconate Dehydrogenase (6PGD) Inhibitor for Treatment of Breast Cancer

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Abstract

Targeting the enzymes of Pentose Phosphate Pathway (PPP) has been emerged as a novel strategy for treatment of cancer. 6-phosphogluconate dehydrogenase (6PGD) is third enzyme of PPP and converts 6phosphogluconate (6-PG) into ribulose 5-phosphate (R-5-P) and produces NADPH. The overexpression of 6PGD has been reported in many human cancers especially in breast cancer and is emerged as the potential anti-cancer drug target. The current study is focused to screen an already established library of plant extracts against 6PGD, among which Pomegranate peel extract showed significant 6PGD inhibitory activity with IC50 value = 0.090 μ g/mL. Pomegranate peel competitively inhibited NADP+ and 6-phosphogluconate to 6PGD enzyme having Ki constant value = 12.72 ± 5.54 ng/mL. Moreover, anti-breast cancer activity against MCF-7 cells determined Pomegranate peel as the potent inhibitor of cancerous cells with IC50 value = $3.138 \ \mu g/mL$. Toxicity profiling of pomegranate peel extract (2000mg/kg) did not show any adverse effect on mice. Moreover, Ont the base of literature a library of known compounds of pomegranate was prepared and established and screened against 6PGD for the identification of actual responsible phytochemicals of 6PGD activity by using molecular docking. Computational tools were used to evaluate selected potent hits. Out of 26 compounds, three potent phytochemicals (Procyanidin, Delphinidin and Cyanidin) exhibited the best binding affinities with 6PGD. In addition, these phytochemicals displayed the best favorable hydrogen bonding, binding energy, and protein-ligand interactions as compare to 3PG. Molecular dynamics simulation suggested that these hits form a stable binding complex with the active site of 6PGD. These findings suggest that Pomegranate peel and its secondary metabolites as the potent inhibitors of 6PGD and the best drug candidate for treatment of breast cancer.

Keywords: 6PGD; Breast cancer; Enzymatic assay; Molecular docking; Pomegranate Peel extract; Tumor metabolism. 0-127/ICAZ-2024

Haplotype and Gene Model Analysis of PIK3CA gene in Head and Neck Cancer patients in Punjab, Pakistan

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Abstract

This case control study was done to investigate the single nucleotide polymorphisms (SNPs) in the PIK3CA gene, haplotype and gene model analysis in a cohort of Head and Neck Cancer (HNC) patients from Punjab, Pakistan. A total of 640 individuals, comprising of 320 cases and 320 controls were included in the study. Three SNPs (rs7621329, rs6443624, and rs7640662) of PIK3CA were genotyped using tetra ARMS-PCR. The findings revealed that genotype of all three SNPs, rs7621329, rs6443624 and rs7640662) showed significant allelic association with HNC (p-value <0.001). Furthermore, gene model analysis revealed highly

gene models. Haplotype analysis showed CAG was related to an increased risk of HNC (OR=6.35, 95% CI [0.73-55.44], P=0.025). Deviation from HWE showed association between rs7621329 and HNC with (p<0.001). *Keywords:* Head and Neck Cancer, SNPs, Gene model, Haplotype analysis, HWE, Tetra ARMS PCR,



O-128/ICAZ-2024

Synthesis and Characterization of Biomolecules based Polyurethane Nano-composites for Biomedical Applications

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Abstract

Versatile range of products can be manufactured by utilization of tailor able characteristic of Polyurethanes (PUs) and can be managed in a number of ways to obtain widespread range of valuable products in medical field e.g. medical implants, sutures, artificial veins, arteries, wound dressing, dentistry, drug delivery and scaffolds. Polyurethane chemistry compromises of great degree of combination of functional groups which can be used to modify properties of PU. In the present study, biomolecules based polyurethanes nano-composites with potential of biomedical applications were synthesized by the reaction of hydroxyl terminated polybutadiene (HTPB) and hexamethylene diisocyanate (HMDI), extended with different mole ratios of cellulose, Starch, alginate, 1,4-butanediol and incorporation of titanium dioxide (TiO2) nano particles for the synthesis of nanocomposites. The molecular characterization of synthesized samples were done by using FT-IR and NMR spectroscopy. Synthesized materials were further characterized by Xray diffraction (XRD), scanning electron microscope (SEM), thermo gravimetric analysis (TGA) and differential scanning calorimetery (DSC). The surface properties such as water absorption (%), degree of swelling and contact angle was also studied. Biocompatibility of the synthesized samples was evaluated using cell culture method. Hemolytic studies were also performed. The results of various analytical parameters were statistically analyzed. Biocompatibility, biodegradability, less hemolytic effect, high thermal stability, low hydrophobicity and mechanical properties boosted with increased content of biomolecules. Thus synthesized novel materials have great potential for biomedical applications such as transplants, degradable sutures and control drug delivery.

Keywords: polyurethane, nano-composites; Biomolecules; biomedical; Starc

O-129/ICAZ-2024

Association of LOC105377871 gene SNP rs17530068 with breast cancer risk

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Abstract

Breast cancer is a heterogeneous disease, in which uncontrolled growth of malignant breast cells occurs. It is the second highest among cancer related deaths in females. In 2022, 2.3 million Breast Cancer patients were newly diagnosed all over the world. In Pakistan, approximately 51.7/100,000 cases have been reported annually. Breast cancer is classified into three main groups on the basis of its presence or absence of molecular markers for ER or PR and HER2. The current study aims to investigate the effect of the LOC105377871 polymorphism in Pakistani population. Study population consisted of 190 subjects, including 100 breast cancer patients and 90 controls from MINAR, Nishtar Hospital, Multan. Blood was obtained from patients and controls. DNA was isolated from the whole blood and tetra-arms PCR was done. The Chi-square test for proportions and p-value was performed to study the association of demographic factors and genotypic frequency in breast cancer patients. Minimum age of patients and controls was 20 and maximum was 85. In this study different risk factors were studied like family history of cancer, history of any disease, marital status, BMI, parity and area of residence. Marital status (p-value <0.001), body mass index (p- value 0.011), parity (p- value 0.01) and history of any disease other than cancer (p- value <0.001) showed



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significant results in association with breast cancer while family history of any cancer (p- value 0.095) and area of residence (p- value 0.074) was not significantly associated with breast cancer. Among clinical factors, the ER, PR and HER2 status were also studied with 52% ER-positive, 47% PR-positive were 61% HER2-negative cases. Statistical analysis of genotype showed a p-value 0.286 which showed that SNP 17530068- LOC105377871 is not associated with breast cancer in the Pakistani population.

Keywords: Breast cancer, LOC105377871, rs17530068, Estrogen Receptor (ER), Progesterone Receptor (PR), Human epidermal growth factor 2 (HER2)

O-130/ICAZ-2024

Raphanus sativus conjugated silver nanoparticles: a promising anticancer agent in diethylnitrosamine induced hepatocellular carcinoma in mice

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Abstract

Originating in the liver, often linked to chronic disease, liver cancer poses a substantial global health threat. The primary form, hepatocellular carcinoma (HCC), accounts for 90% of cases. However, available treatments like transplantation, chemotherapy, and radiotherapy have limitations in terms of efficacy, cost, and side effects. Cruciferous vegetables like Raphanus sativus (red radish) possess antitumor properties due to their bioactive components. Particularly, R. sativus conjugated silver nanoparticles (AgNPs) exhibit cytotoxic effect against cancers in vitro. Current study was designed to evaluate its anticancer potential against HCC in vivo. Diethylnitrosamine (DEN) was employed for HCC induction in mice. R. sativus conjugated AgNPs were synthesized using green synthesis method and characterized using UV-Vis spectrophotometry and FTIR Analysis. Swiss albino mice were divided in 11 groups (n=5 in each group) and treated with saline, DEN, Cisplatin (Treatment), R. sativus extract (Treatment), R. sativus conjugated AgNPs (Treatment), Cisplatin, R. sativus extract, R. sativus conjugated AgNPs, DEN+Cisplatin (Prevention), DEN+R.sativus extract (Prevention) and DEN+R.sativus conjugated AgNPs (Prevention) respectively. The biochemical parameters were evaluated to analyze the HCC status in mice. The histopathology of liver was also examined. The outcomes of the present study highlight that the application of the treatment resulted in significant amelioration in levels of serum biomarkers and an elevation in antioxidant levels in contrast to the DEN-treated group. R. sativus conjugated AgNPs (150mg/kg) showed the most significant results as follows: AFP (47.8±1.5), AST (284.6±6.0), ALT (126.2±5.2), LDH (522.6±7.9), ALP (225.0±6.7), MDA (5.2±0.1), GGT (30.0±1.2), bilirubin (5.7±0.1), GSH (2.8±0.1) and CAT (139.0±3.2). The histopathological study of liver tissues showed alteration in liver architecture in the DEN-treated group but restoration in the treatment groups. In conclusion, the anticancer potential of R. sativus conjugated AgNPs was demonstrated by their ability to reinstate the normal liver structure, serum biomarker and oxidative marker levels and hence could be used as an effective treatment against HCC.

Keywords: Hepatocellular carcinoma, Raphanus sativus, Silver nanoparticles.

O-131/ICAZ-2024

Unveiling the power of gold nanoparticle in vaccine development against cancer and infectious diseases Urwa Javed, Mujahid Hussain, Muhammad Ali, Majeeda Rasheed*

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Abstract

The human immunodeficiency virus (HIV), malaria, and tuberculosis are three infectious illnesses that continue to be highly debilitating worldwide despite the vaccines' remarkable success in preventing them. Recently, there has been a lot of interest in targeted cancer therapy tactics due to the devastating impact that cancer has on public health as well as the adverse effects of cancer treatments. Radiation treatment effectiveness can be markedly enhanced by the use of gold nanoparticles (GNPs) in conjunction with both ionizing and non-ionizing radiations. Nanotechnology-based methods are being developed to help create new vaccinations against these illnesses and to make it easier for them to be implemented globally. A pathogen's ability to pose hurdles for vaccine creation varies depending on its co-evolutionary history with humans, however there are some shared issues that nanotechnology is starting to aid with. These constraints have been addressed using a variety of tactics. Impurity-based gold nanoparticles



(GNPs) loaded with immunomodulators are a straightforward and efficient method. Gold nanoparticles (GNPs) can be injected intravenously, enhancing the permeability and retention duration of cancer cells, because gold is an extremely biocompatible material. Effective applications of gold nanoplatforms in cancer immunotherapy have been reported for nanospheres, nanoshells, nanorods, nanocages, and nanostars. The peculiar star-shaped geometry of gold nanostars (GNS) gives them a high photon-to-heat conversion efficiency through the plasmonic effect and greatly improves light absorption, making them one of the most promising GNP platforms. Because of their high multivalentity and potential for increasing immune system engagement, nanomaterials also offer options for directing the trafficking and distribution of vaccine components to important immune cells and lymphoid organs. With a focus on HIV/AIDS, malaria, tuberculosis and cancer in particular, this chapter will address these issues as well as recent developments in nanomaterials toward the development of vaccines against infectious diseases and cancer. Keywords: Infectious Diseases, cancer, Immune system, Nanotechnology, Vaccines, Gold Nanoparticle

O-132/ICAZ-2024

Bergenia ciliata and silk fibroin nanoparticles: A novel approach to targeting breast cancer in mice

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Abstract

Breast cancer is the most common fatal disease among women. The conventional treatments raised concerns about reduced bioavailability, poor cellular uptake, emerging resistance, and unwanted toxicity. Bergenia ciliata has drawn increasing attention in the treatment of carcinoma due to its remarkable pharmacological activities. In this research, Bergenia ciliata-loaded silk fibroin nanoparticles were developed for controlled drug delivery to overcome drug resistance and toxicity. Silk fibroin, due to its distinct attributes such as biodegradability, biocompatibility, and exceptional mechanical properties, is a promising vehicle for delivering therapeutic drugs. In this study, breast cancer was induced by cadmium chloride (25 mg/kg) in mice. After breast cancer induction, the groups were treated with Tamoxifen (25 mg/kg), Bergenia ciliata (200 mg/kg), FNP (25 mg/kg), and BCFNP (25 mg/kg) for 1 month. At the end of the trial, the serum levels of various pro-inflammatory cytokines, such as TNF- α , IL-6, and IL-10, and various metabolic enzymes, namely LDH, ASAT, ALAT, GSH, ALP, and MDA, were analyzed from the blood serum of all groups. However, the best result was exhibited by the group treated with Bergenia ciliata loaded fibroin nanoparticles (BCFNP) exhibiting the minimum level of pro-inflammatory cytokines, i.e., TNF- α (31.7 ± 1.4 pg/ml), IL-6 (20.2 0.9 pg/ml), and IL-10 (25.4 \pm 1.9 pg/ml), as compared to the CdCl2-treated group, i.e., TNF- α (57.0 \pm 2.8 pg/ml), IL-6 $(39.8 \pm 1.6 \text{ pg/ml})$, and IL-10 (63.0 $\pm 2.8 \text{ pg/ml})$. Moreover, the BCFNPs treated group also showed favourable enzymatic level results, close to the control group. Histological analysis of BCFNPs treated group revealed normal mammary tissue structure. The UV spectra of FNPS and BCFNPs showed maximum absorption at 252nm and 292 nm, respectively. In conclusion, Bergenia ciliata loaded fibroin nanoparticles exhibit effective potential to treat tumors through controlled drug delivery.

Keywords: Breast cancer, Bergenia ciliata, Bergenia ciliata loaded fibroin nanoparticles

O-133/ICAZ-2024

Mesquitol mitigates aflatoxin b1 induced testicular damage in rats through Nrf2/Keap1 pathway activation, reducing oxidative stress, inflammation, and apoptosis

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Abstract

Aflatoxin B1 (AFB1) is a highly toxic mycotoxin that adversely affects the male reproductive system due to its potential to induce oxidative stress. Mesquitol is a flavonoid derived from the heartwood of Prosopis juliflora that demonstrates potent antioxidant, free-radical scavenging, and α -glucosidase inhibitory properties. Therefore, this study was performed to evaluate the ameliorative effects of mesquitol against AFB1-induced testicular toxicity. Fortyeight male albino rats were divided into four groups including control, AFB1 (50 µg/kg), AFB1 + Mesquitol (50 µg/kg + 50 mg/kg), and Mesquitol (50 mg/kg) only treated group. Our findings elucidated that AFB1 exposure induced adverse effects on the Nrf2/Keap1 pathway and reduced the expressions and activities of superoxide dismutase (SOD), catalase (CAT), glutathione reductase (GSR) and glutathione peroxidase (GPx). Additionally, it increased the levels of reactive oxygen species (ROS), and malondialdehyde (MDA). Furthermore, AFB1 intoxication upregulated the



expressions of steroidogenic enzymes such as 3β-HSD, 17β-HSD, and StAR. Moreover, sperm anomalies were increased following the exposure to AFB1. Besides, AFB1 exposure decreased the levels of plasma testosterone, luteinizing hormone (LH), and follicle stimulating hormone (FSH) while increasing the levels of interleukin-6 (IL-6), tumor necrosis factor-alpha (TNF- α), nuclear factor-kappa B (NF- κ B), interleukin-1beta (IL-1 β), and cyclooxygenase-2 (COX-2). Moreover, it adversely affected the apoptotic profile by up-regulating the expressions of Bax and Caspase-3, while down-regulating the Bcl2 expression. Besides, AFB1 significantly damaged testicular tissues of rats. However, mesquitol significantly abrogated AFB1-induced damages in the testicular tissues of rats. In conclusion, the results of the study indicate that mesquitol can effectively alleviate the AFB1-prompted testicular damages due to its antioxidant and free radical scavenging properties.

Keywords: Aflatoxin B1, Mesquitol, Antioxidant, Testicular toxicity, Inflammation

O-134/ICAZ-2024

An attempt to extract DNA from formalin-fixed parafin-embedded (FFPE) lung tissues of mice

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Abstract

Formalin-fixed paraffin-embedded tissue samples are excellent sources for preserving genetic material for a long time. DNA is essential for studying genetic diseases to diagnosis and drug development. It is also essential for carry out forensic science, sequencing genomes, detecting bacteria and viruses in the environment and for determining paternity. In the current work, an attempt was made to extract DNA from already preserved FFPE tissue samples lungs of albino mice (Mus musculus) by using simple kitchen ingredients. These samples of FFPE tissues were retrieved from the laboratory of Department of Zoology, University of Okara (UO). DNA was isolated after many attempts from identical replicates of five years old FFPE lung tissues samples. The results were analyzed by using the Nanodrop. The highest concentration obtained were 13.45µg/ml, 5.50µg/ml, 7.034µg/ml and purity ratio were 1.993nm, 1.683nm, 1.892nm at A280 from different FFPE lungs tissues respectively.

Keywords: FFPE, DNA extraction, Deparaffinization

O-135/ICAZ-2024

Ameliorative role of aromadendrin against paraquat induced pulmonary toxicity in male albino rats

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Department of Zoology, Wildlife and Fisheries, University of Agriculture, Faisalabad 38040, Pakistan Abstract

Paraquat (PQ) poisoning is a serious health concern globally, especially in developing countries. The herbicide paraquat instigates pulmonary toxicity by induction of xanthine oxidase, production of free radicals and inflammation. Aromadendrin, a flavonol, has been reported to possess a variety of biological properties, including antioxidant, anti-inflammatory, and radical scavenging activities. Therefore, the present study was planned to appraise the potential protective effects of aromadendrin against paraquat instigated pulmonary toxicity in male albino rats. 48 rats were distributed into four groups: control group, PQ-administered group (5 mg/kg), PQ + Aromadendrin coadministered group (5 mg/kg + 20 mg/kg) and Aromadendrin (20 mg/kg) administered group. Our outcomes revealed that PQ administration substantially decreased the activities of antioxidant enzymes i.e., catalase (CAT), superoxide dismutase (SOD), glutathione reductase (GSR), glutathione peroxide (GPx), glutathione-S-transferase (GST) activities and glutathione (GSH) contents, while increasing the levels of reactive oxygen species (ROS) and malondialdehyde (MDA). Moreover, the results of our study exposed that PQ remarkably elevated the levels of inflammatory markers such as nuclear factor kappa-B (NF- κ B), tumor necrosis factor- α (TNF- α), interleukin-1 beta (IL-1β), interleukin-6 (IL-6), and cyclooxygenase-2 (COX-2) activity. Furthermore, PQ treatment considerably increased the expressions pro-apoptotic markers i.e., Bax, Caspase-3, Caspase-9 while lowering antiapoptotic protein Bcl-2 expressions. PQ intoxication also induced histopathological anomalies in pulmonary tissues. However, aromadendrin supplementation recovered all the pulmonary damages induced by PQ in the rats due to its pharmacological properties.

Keywords: Aromadendrin, Paraquat, Pulmonary toxicity, Antioxidant, Inflammation

O-136/ICAZ-2024



DNA barcoding of grey partridges of Mianwali, Pakistan Ghanwa Fatima Department of Zoology, University of Sargodha

Abstract

Diverse ecosystems with distinct avifauna are present in Pakistan. Grey partridge is a medium-sized bird. Populations of grey partridges have declined over time mainly due to excessive hunting and habitat destruction. Literature has very scant inherited data about the Francolinus genus. This study focuses on the genetic variation in grey partridges in district Mianwali using CO1. Genomic data was extracted from blood samples of 8 grey partridges. Amplified CO1 primer was used. Maximum Parsimony, Maximum likelihood, Neighbor-joining, and Minimum Evolution analysis were utilized to determine the phylogenetic relationship by MEGA X. Minimum Evolution and UPGMA trees showed a total of 1611 positions in the final dataset. Average codons are found to be 315 in Codon usage bias. Results showed that Cytosine occurred more frequently with a frequency of 32.02, Thyamine 27.13, Adenine 25.39, and Guanine with the lowest frequency rate of 15.46. Results showed that the CO1 gene is the most reliable to find genetic variation in grey partridge and there is genetic variation in grey partridges in Mianwali. 99% similarity Index through BLAST showed that the species that is present in this area is Francolinus Pondicerianus. *Keywords:* Grey partridge, Pakistan, CO1, DNA, phylogenetic relationship, Blast, Genetic variation, Mianwali.

O-137/ICAZ-2024

Pharmacotherapeutic potential of Syringic acid against cadmium induced hepatotoxicity in rats

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Abstract

In the modern world, indiscriminate human activities impelled environmental toxicity through heavy metals such as cadmium (Cd) that poses significant health hazards to the flora and fauna. Syringic acid (SA), a phenolic compound found in fruits of edible plants and mushrooms, exhibits anti-inflammatory, anticancer, antioxidant, and antiviral properties. Therefore, the current investigated was designed to estimate the therapeutic effects of SA against Cd induced hepatotoxicity. 48 Sprague Dawley rats were divided into four groups: a control, a Cd (5 mg/kg), a Cd + SA group (5 mg/kg + 20 mg/kg), and a SA group (20 mg/kg) that received supplementation for 30 days. Our results revealed that Cd treatment increased the level of liver function enzymes namely alanine transaminase (ALT), aspartate aminotransferase (AST) and alkaline phosphatase (ALP). Additionally, Cd exposure reduced the activities of catalase (CAT), superoxide dismutase (SOD), glutathione peroxidase (GPx), glutathione reductase (GSR), glutathione-Stransferase (GST), and glutathione (GSH), whereas elevated the levels of malondialdehyde (MDA) and reactive oxygen species (ROS). Furthermore, Cd administration escalated the levels of inflammatory indices such as nuclear factor-kappa B (NF- κ B), tumor necrosis factor-alpha (TNF- α), interleukin-1 beta (IL-1 β) and interleukin-6 (IL-6) and cyclooxygenase-2 (COX-2) activity. Besides, Cd intoxication up-regulated the expressions of Bax, and caspase-3 while down-regulating Bcl-2 expressions. Cd treatment also caused significant hepatic tissue damage in rats. However, SA co-treatment improved all the Cd-induced disruptions in rats. Overall results indicated that SA possess potent pharmacological properties, which mitigated Cd instigated hepatic damage in rats. Keywords: Hepatotoxicity, Antioxidant, Cadmium, Syringic acid

O-138/ICAZ-2024

Molecular Prevalence of Endoparasites in Grey Francolin (Francolinus Pondicerianus) in Punjab, Pakistan

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Abstract

The present study was conducted to find out molecular prevalence of endoparasites in Grey Francolin in Punjab Pakistan. For this purpose, 60 grey francolin fecal sample were collected from different localities to determine the microscopic and molecular prevalence of endoparasite. The fecal sample were analyzed through direct and indirect concentration methods and Ascardia (31.66%), Eimeria (25%), Capillaria (23.33%), Echinostoma (16.66%) Strongloides (13.33) Heterakis (13.33%), Isospora (11.66%), Raillietina (10%), Sarcocystis (8.33%), were identified through microscopic study. The overall prevalence of endopparasites were 38%, in which Nematode (69%) followed by Protozoan (40%), Trematode (16.67%) and Cestode (10%). The highest prevalence rate was in male (44.82%) as





compared to female (32.25%) and higher in September to October (70%) as compared to December to January (30%). Molecular prevalence of endoparasites was analyzed by using manual DNA Extraction through PCR and gel electrophoresis. The molecular identification was used for only Eimeria and Ascardia which was most prevalent endoparasite and PCR result revealed that Eimeria 25% and Ascardia (34.1%). It was concluded that Grey francolin is a major reservoir of nine parasite species, which may influence on health status, captive management and survival of this species.

Keywords: Endoparasites, Gastrointestinal infection, Grey Francolin, PCR, Eimeria, Ascaridia

O-139/ICAZ-2024

Prevalence of Diabetic Nephropathy in Type 1 Diabetic Patients and its Association with Major Risk Factors

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Abstract

Diabetic nephropathy (DNp) is a major microvascular complication of Type 1 diabetes that enhances the risk of end-stage renal failure. The objective of this research is to investigate the prevalence of diabetic nephropathy in individuals with Type 1 diabetes and to analyze the correlation between significant risk factors, including smoking, glycemic control, hypertension, family history, and the onset of diabetic nephropathy, with the aim of improving care and preventive measures. A cross-sectional study involved 125 patients diagnosed with diabetic nephropathy, consisting of 70 (44%) males and 45 (56%) females. Out of 125 DNp patients, 50 (40%) had a positive family history of diabetes, whereas 75 (60%) had a negative family history. One important aspect was glycemic control: only 35 patients (28%) had good glycemic control (HbA1c <7%), while 90 patients (72%), had poor glycemic control (HbA1c >7%). The majority of DNp patients (80%) showing high blood pressure (BP >145/95 mmHg). Among the 70 male DNp patients, 55 (78.6%) were smokers, highlighting smoking as another significant risk factor. *Keywords:* Diabetic Nephropathy, Type 1 Diabetes, Risk Factors, Hypertension, Glycemic Control, Smoking, Family History

O-140/ICAZ-2024

Assessment of anti-arthritis effects of Moringa oleifera (sohanjna) leaf extract in albino mice

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Abstract

Rheumatoid arthritis is a systemic disease that affects joints, connective tissues, muscles, tendons, and fibrous tissues. Moringa oleifera is enriched with various phytochemicals (such as kaempferol, quercetin, and gallic acid) that make it beneficial for treating diseases like arthritis. It is renowned for its remarkable, anti-diabetic, anti-inflammatory, antioxidant, antimicrobial, cardioprotective, and other health benefits. Rheumatoid arthritis was induced by injecting 50µl of 2% formaldehyde in mice's left hind paw. For the experiment, 24 mice were randomly divided into four different treatment groups. Rheumatoid arthritis-induced mice were fed orally with aqueous extract (500 mg/kg) of Moringa oleifera for 10 days. Variations in body weight, foot diameter, and hematological parameters were measured. Results showed a significant decrease in paw diameter, Hb, RBC, TLC, ESR, and platelet level. An increase in body weight was observed as compared to the arthritis group. The result suggested that Moringa oleifera has the potential to cure rheumatoid arthritis.

O-141/ICAZ-2024

Bombax ceiba extract and its metabolites as α-glucosidase inhibitors for diabetes

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Abstract

Alpha-glucosidase inhibitors characterize a major class of Type II antidiabetic drugs and play a significant role in lowering postprandial <u>hyperglycemia</u>. Currently, the market offers a limited number of synthetic inhibitors, highlighting the necessity for the discovery of new and potent compounds with enhanced efficacy in this area. For this purpose, an already established library of 51 plant extracts was screened against α -glucosidase, among which Bombax <u>ceiba</u> extract exhibits significant α -glucosidase inhibitory activity (IC50; 1.95 ± 0.29 µg/mL) as





 $3.14 \pm 0.49 \ \mu g/mL$). to acarbose (IC50; Moreover, order compared in to investigate the specific phytochemicals responsible for this activity, a literature-based library of 78 compounds from B. ceiba were curated and subsequently screened against α -glucosidase using molecular docking. The selection of hit compounds was evaluated on the base of computational tools. Out of these 78 compounds, nine potent compounds (Pelargonin, Simalin B. Linarin, Rutin, Nicotiflorin, Simalin A. Mangiferin, Ouercetin and Apigenin) exhibited best binding affinities with α -glucosidase. These phytochemicals exhibited favorable binding energy, hydrogen bonding, and protein-ligand interactions as compared to <u>acarbose</u>. These results were further validated by in vitro α -glucosidase inhibition assay of commercially available phytochemicals. To the best of our knowledge, this report unveils B. ceiba as a highly effective inhibitor of α -glucosidase. The findings suggest that B. ceiba and its metabolites exhibit promising characteristics for the development of leading drugs in the field of anti α -glucosidase medications, which could play a crucial role in the management of diabetes.

O-142/ICAZ-2024

In vitro ameliorative properties of Nigella sativa oil

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Abstract

Various cardiovascular diseases occur due to alterations in endothelial cells. Many physiological shifts like vasodilation and platelet aggregation etc contribute to malfunctioning of endothelial cells. Different products based on plants are now gained importance in order to prevent different diseases as these products have no side effects and low cost. Nigella sativa is a miraculous herb known for its great power of healing as this shows anti inflammatory and anti oxidative effects. Recent study was revealed the in vitro ameliorative potential of Nigella sativa oil (NSO) in human umbilical vein endothelial cells (HUVECs). For this, oxidized low density lipoprotein (oxLDL) is used to induce dysfunctioning in endothelial cells and then these altered endothelial cells were treated with NSO. oxLDL exposed endothelial cells showed increased expression of adhesion molecule like I-CAM and decreased level of Nitric oxide (NO). At different doses, NSO treated endothelial cells significantly decreased the level of I-CAM and elevate the NO bioavailability in endothelial cells at three time points (4 hours, 8 hours and 12 hours). Our study suggests the effectiveness of NSO in preventing this impairment in ECs.

O-143/ICAZ-2024

Molecular detection of Babesia in cattle and impact of cumin (*Cuminum cyminum*), milk, and jetepar against babesiosis in exotic bovine breeds

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Abstract

Bovine babesiosis is a tick-borne disease, poses a significant threat to the cattle worldwide. Ticks of the genera Hyalomma, Rhipicephalus, and Amblyomma serve as vector for Babesia. Ticks are abundant in warmer areas of the world]. The present research work was designed and conduct to detect Babesia species in cattle blood at the molecular level and to assess the efficacy of conventional antibabesial drugs and additives (cumin, milk and Jetepar) against babesiosis. Blood samples from apparently affected and healthy cattle were collected and analyzed using microscope and Polymerase Chain Reaction. DNA extracted with the kit method and PCR analysis were performed using specific primers for Babesia bovis and Babesia bigemina. The study also investigated risk factors associated with babesiosis infection. The results revealed overall prevalence of Babesia is 30% through microscopic examination and further also detect by PCR. The risk factor such as age, breed, and dung pile location, use of acaricides, health status, tick infestation and housing type are significantly associated with Babesia infection. Imidocarb dipropionate treatment has an efficacy of 60%, while addition of additives rises efficacy to 90%. It was concluded that cattle recover quickly when liver health improves and oxidative stress is reduced.

Keywords: Bovine babesiosis, molecular detection, PCR, antibabesial drugs, additives, ticks, Cattle

O-144/ICAZ-2024

Protective effects of mesquitol on cadmium induced brain damage in male albino rats Aqila Manzoor^{1*}, Muhammad Umar Ijaz¹, Ghulam Mustafa¹, Muhammad Faisal Hayat¹



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Cadmium (Cd) is one of the potent occupational and environmental toxicants, which induces oxidative stress to the multiple organs of the body, including brain. Mesquitol (Mq) is a naturally occurring flavonoid that is obtained from several plants and shows multiple therapeutic properties. Therefore, the present study was designed to assess the alleviative effects of Mq against Cd induced brain damage in rats. Twenty-four male albino rats were divided into four groups of rats. The first group was a control group. The second group was orally administered with Cd (5 mg/kg). The third group was co-treated with Cd and Mq (5 mg/kg of Cd and 50 mg/kg of Mq). The fourth group was supplemented with Mq (50 mg/kg) only. The experiment was conducted for thirty days. The results showed that the exposure to PQ decreased the activities of antioxidant enzymes (CAT, SOD, GSH, GSR, GPx and GST), whereas increased the levels of malondialdehyde (MDA) and reactive oxygen species (ROS) in the brain tissues of rats. Moreover, PQ intoxication increased the levels of inflammatory markers (TNF- α , NF- κ B, IL-1 β , IL-6 and COX-2). Furthermore, Cd exposure also induced histopathological damage in the brain of rats. However, the supplementation of Mq recovered all the Cd induced brain damages due to its antioxidant, antiinflammatory and neuroprotective potentials.

Keywords: Cadmium, Mesquitol, Brain damage, Inflammation, Oxidative Stress

O-145/ICAZ-2024

Synergetic effects of *Lactobacillus rhamnosus* and *Saccharomyces boulardii* against thioacetamide-induced hepatotoxicity in mice

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Abstract

Hepatotoxicity is an intricate process, particularly in the context of liver diseases, often aggravated by gut microbiota dysbiosis. The gut-liver axis has been regarded as a key idea in liver health. It indicates that changes in gut flora caused by various hepatotoxicants can affect the balance of the guts microflora, which may lead to increased dysbiosis and intestinal permeability. As a result, bacterial endotoxins would eventually enter the bloodstream and liver, causing hepatotoxicity and inducing inflammatory reactions. Many treatments, including liver transplantation and modern drugs, can be used to address these issues. However, because of the many side effects of these approaches, scientists and medical experts are still hoping for a therapeutic approach with fewer side effects and more positive results. The current work examined the hepatoprotective potential of two probiotic strains, Lactobacillus rhamnosus+ Saccharomyces boulardii, against hepatotoxicity in mice induced by thioacetamide. Mice (60) were divided into 08 groups. Group III, IV and V are positive control groups, which were given Silymarin, Lactobacillus rhamnosus + Saccharomyces boulardii, Silymarin+ Lactobacillus rhamnosus + Saccharomyces boulardii respectively. Group II was administrated with thioacetamide (TAA) for two weeks to induce hepatotoxicity and then after two weeks, mice (20) were further divided into four subgroups IIA, IIB, IIIC and IID, treated with TAA, Silymarin, Lactobacillus rhamnosus + Saccharomyces boulardii, Silymarin+ Lactobacillus rhamnosus+Saccharomyces boulardii respectively. The biochemical analysis showed a higher level of biomarkers i.e., ALAT (256.4 \pm 4.7 U/L), ASAT (538.4 \pm 7.0 U/L), AFP $(93.0 \pm 3.2 \text{ ng/ml})$, ALP (414.0± 6.0 U/L), LDH (1013.4 ± 5.2 U/L), GGT (51.0±2.0 U/L), Total bilirubin (9.20 ± 0.1 L), LDH (1013.4 ± 5.2 U/L), GGT (51.0±2.0 U/L)), Total bilirubin (9.20 ± 0.1 L)) mg/dL), MDA (11.0 \pm 0.2 mmol/l), TNF- α (48.6 \pm 2.1 pg/ml), IL-6 (33.2 \pm 1.20 pg/ml), TGF- β 1 (33.2 \pm 1.6 ng/ml) and low levels GSH (2.6± 0.1 umol/l), Catalase (99.2± 3.1 mmol/l), GPx (102.0± 2.2U/L) and SOD (107.0± 4.8 U/ml), was seen in the group that received TAA, indicating that the mice had developed hepatotoxicity. But lower biomarker levels i.e., ALAT (141.20±5.20 U/L), ASAT (538.4±7.0 U/L), AFP (57.82±1.51 ng/ml), ALP (245.0±6.7 U/L), LDH (557.6±7.9 U/L), GGT (33.0±1.21 U/L), Total bilirubin (6.7±0.1 mg/dL), MDA (6.2±0.1 mmol/l), TNF-α (33.0±1.0 pg/ml), IL-6 (20.4±0.9 pg/ml), TGF-β1 (19.6±1.2 ng/ml) and higher level GSH (4.8±0.1umol/l), Catalase (154.0±3.2 mmol/l), GPx (145.4±3.7 U/L) and SOD (130.6±4.4 U/ml), were observed in the in treatment group with Silymarin+ Lactobacillus rhamnosus+Saccharomyces boulardii The liver from the TAA-treated groups histological examination revealed hyperplasia of Kupffer cells, a damaged central vein, and persistent inflammation. But in the treatment group Silymarin+ Lactobacillus rhamnosus+Saccharomyces boulardii, almost normal features of liver with normal central vein and normal hepatocytes was observed. It is concluded that Silymarin+ Lactobacillus rhamnosus+Saccharomyces



boulardii has great hepatoprotective potential in the prevention and treatment of hepatotoxicity. *Keywords:* Hepatotoxicity, Silymarin, Thioacetamide (TAA), Probiotics, Lactobacillus

O-146/ICAZ-2024

Xanthohumol attenuates cisplatin induced cardiac toxicity in rats via regulating oxidative stress, inflammation and apoptosis

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Abstract

Cisplatin is an efficacious anticancerous chemotherapeutic agent that is used to cure multiple types of malignancies. However, it has several hazardous effects on multiple organs, particularly heart. Xanthohumol (XN) is a biflavonoid isolated from the female inflorescences of the hop plant that shows antioxidant, anti-inflammatory and anti-apoptotic potentials. Therefore, the current investigation was conducted to assess the impact of XN on CP-induced cardiac toxicity in rats. 24 male albino rats were separated into 4 equal groups i.e., control, CP-treated (10 mg/kg), CP + XN (10 mg/kg of CP and 25 mg/kg of XN), co-treated and XN (25 mg/kg), supplemented group. After 30 days of treatment, it was observed that CP significantly reduced the activities of antioxidant enzymes such as superoxide dismutase (SOD), catalase (CAT), glutathione reductase (GSH), glutathione peroxidase (GPx), glutathione disulfide reductase (GSR) and glutathione S-transferase (GST), whereas levels of reactive oxygen species (ROS) and malondialdehyde (MDA) were escalated. Furthermore, administration of Cd significantly escalated the levels of lactate dehydrogenase (LDH) and creatinine phosphokinase (CPK). Furthermore, there was an increased in the levels of the inflammatory markers i.e., tumor necrosis factor alpha (TNF- α), nuclear factor-kappa B (NF- κ B), interleukin-6 (IL-6), interleukin-1 beta (IL-1β) and cyclooxygenase-2 (COX-2). The administration of CP substantially upregulated the gene expression of apoptotic markers (Caspase-3 and Bax), while downregulated the gene expression of anti-apoptotic markers (Bcl-2). However, XN supplementation significantly ameliorated the all the CP induced damages due to its anti-apoptotic, antioxidant, and anti-inflammatory properties.

Keywords: Cisplatin, Antioxidant, Heart damage, Inflammation, Apoptosis, Xanthohumol

O-147/ICAZ-2024

Ameliorative effect of Nigella sativa silver mediated silver nanoparticles against hexavalent chromium induced testicular toxicity in mice

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Abstract

The present study was planned to find harmful effects on the reproductive system caused by Cr (VI) and the ameliorative effect of Nigella sativa and Nigella sativa mediated AgNP on male mice (Mus musculus). In the study of known infertility medicine, clomiphene citrate is also used as a positive control. The main objective of the present study was to assess the ameliorative potential of oral administration of a dose of 50 mg/Kg B.W clomiphene citrate (control), AgNP via chemical synthesis, Nigella sativa seed extract, and Nigella sativa mediated AgNP against the Cr (VI) at the dose of 1.5 mg/Kg B.W from K 2 Cr 2 O 7 orally induced toxicity over eight weeks on the reproductive performance of male albino mice. Nigella sativa mediated AgNPs were characterized by UV, SEM, FTIR, and XRD. The histological analysis, smear study, antioxidant capacity test, and hormone analysis were conducted by blood samples of albino mice. Cr exposed groups showed a significant decrease in sperm size, LH, testosterone, SOD, CAT, GSH, and no of spermatogonia and spermatocytes. However, administration of Nigella sativa and Nigella sativa mediated AgNPs reduced the toxicity.

O-148/ICAZ-2024

Guibourtinidol attenuates bisphenol A-induced renal toxicity by reducing oxidative stress and inflammation

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Abstract



Bisphenol A (BPA) is one of the widely produced synthetic compounds across the world. It is a toxic compound which can damage various organs of the body, including kidney. Guibourtinidol (GBTD) is a natural flavonoid with strong anti-inflammatory and anti-oxidant potentials. The present study was planned to ascertain the attenuative effect of GBTD against BPA induced renal damage in rats. Forty-eight rats were distributed into four groups: control group, BPA-administered group (10 mg/kg), BPA + GBTD co-administered group (10 mg/kg and 30 mg/kg) and GBTD administered group (30 mg/kg). BPA administration considerably decreased the activities of anti-oxidant enzymes i.e., catalase (CAT), glutathione reductase (GSR), superoxide dismutase (SOD), glutathione peroxide (GPx), glutathione-S-transferase (GST) activities and glutathione (GSH) contents, while increasing reactive oxygen species (ROS) and malondialdehyde (MDA) contents. BPA treatment markedly augmented the levels of creatinine, urobilinogen, urea, KIM-1 and NGAL, while significantly decreased albumin protein as well as creatinine clearance. Moreover, the findings of our experiment revealed that BPA notably escalated inflammatory indices i.e., interleukin-1 β (IL-1 β), nuclear factor kappa-B (NF- κ B), interleukin-6 (IL-6), tumor necrosis factor- α (TNF- α) level and cyclooxygenase-2 (COX-2) activity. Furthermore, BPA intoxication significantly increased Bax, Caspase-3 as well as Caspase-9 level and lowered Bcl-2 level. Furthermore, BPA inebriation also induced histopathological anomalies in kidneys. However, GBTD + BPA co-treatment efficiently averted all the BPA-induced renal damages in the rats. The current study indicates that GBTD can be used to treat BPA-instigated renal toxicity due to its antioxidant and anti-inflammatory properties.

Keywords: Bisphenol-A, Guibourtinidol, Renal damage, Anti-oxidant, Anti-inflammatory

O-149/ICAZ-2024

Genetic epidemiology of poly cystic ovarian syndrome in district Sargodha

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Abstract

Reproductive disease Poly cystic ovarian syndrome (PCOS) is a metabolic abnormality as well as endocrinological disease aeffecting women in their reproductive years. Hyperandrogenaemia, oligo-anovulation is characterized by this heterogeneous disorder and is linked to morphologically abnormal ovaries having small follicular cysts. It causes unwanted changes and if it is not treated onver time its may lead to serious health problems in the females. In Pakistan, the f 38.5% frequency of PCOS is found in females. PCOS is the sSecond most common cause of female- related infertility is PCOS. The presented research work was conducted on the epidemiological studies of PCOS in Ddistricts Sargodha and Tehsil Bhalwal, Punjab, Pakistan. and dData was collected in the forrom of datasheet which includes hyperandrogenism, oligomenorrhea, type of diet, socioeconomic status, area, education, marital status, family history of diabetes, family history of PCOS, age of patients, BMI, and infertility of patients, from the different hospitals of Districts Sargodha and Tehsil Bhalwal. hospitals during study period. The data was taken from different hospitals of Sargodha to check the prevalence of PCOS there. Data was also analyzed to check the prevalence of PCOS and the risk factors associated with it.of PCOS. The data was statistically evaluated which was includinges percentages, means, standard deviations, chi-square test and ANOVA (p<0.05). Married women with 55.3% frequency rate were mostly affected with PCOS like 55.3% as compared to unmarried women. Patients with age group of 20-30 were suffering more from PCOS (42.3%) with PCOS like (γ 2= 96.293 and d.f. 3 p>0.05). Higher frequency numbers of patients of PCOS wasere observed in Gujjars (12.7%). The results revealed that PCOS was more found in rural population (54 %) than the urban population (46%). It was conclude that High prevalence of PCOS was in patients who were married to age group of 20-30, belonging to rural areas withand Gujjar surname having with low income.

O-150/ICAZ-2024

Therapeutic potential of guibourtinidol against doxorubicin instigated cardiac toxicity in rats

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Abstract

Doxorubicin (DOX) is a highly effective, commonly prescribed, potent anti-neoplastic drug however, its clinical administration is restricted due to its serious organotoxic potential especially hepatotoxicity. Guibourtinidol is a plant-based flavonoid with conspicuous pharmacological properties. This experiment was executed to evaluate





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the palliative actions of guibourtinidol on DOX prompted cardiac toxicity in rats. Twenty-four rats were apportioned into 4 equal groups which were designated as control, DOX treated group (3 mgkg⁻¹), Co-treated (DOX 3 mgkg⁻¹ + guibourtinidol 30 mgkg⁻¹) and guibourtinidol (30 mgkg⁻¹) treated group. After 30 days of treatment, DOX intoxication resulted in a remarkable reduction in antioxidant enzymes activities including, glutathione reductase (GSH), glutathione S-transferase (GST), catalase (CAT), glutathione peroxidase (GPx), superoxide dismutase (SOD), and glutathione disulfide reductase (GSR), whereas an elevation was observed in reactive oxygen species (ROS), & malondialdehyde (MDA) contents. Furthermore, concentrations of cardiac injury markers, creatinine phosphokinase (CPK), creatine kinase-myoglobin binding (CK-MB), & lactate dehydrogenase (LDH), as well as troponin I were increased in response to DOX treatment. Moreover, inflammatory cytokines such as tumour necrosis factor alpha (TNF- α), nuclear factor-kappa B (NF- κ B), and interleukin-6 (IL-6), interleukin-1 beta (IL-1 β), and cyclooxygenase-2 (COX-2) levels were augmented in DOX intoxicated group. DOX exposure reduced the expression Bcl-2, while elevating the expressions of caspase-9, caspase-3 and Bax. Histopathological damages were also observed in toxicant (DOX) exposed group. However, the administration of guibourtinidol significantly palliated DOX induced toxicity. Therefore, guibourtinidol can be a promising agent to cure DOX induced cardiac damage.

Keywords: Guibourtinidol, Doxorubicin, Cardiac damage, Pharmacological properties, Histopathological damages O-151 ICAZ/2024

Investigating the wound healing properties of Psidium guajava and Ocimum sanctum conjugated silver nanoparticles in diabetic mice

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Abstract

Natural products have been used for centuries in treating various ailments, including wound healing. In the current study, alloxan monohydrate was used to induce diabetes in Swiss albino mice. Subsequently, excision wounds were created using a 6 mm biopsy puncture. Diabetic wounds were treated with 5% Psidium guajava (PG) and 7% Ocimum sanctum (OS) leaf extract individually and in combinations (5% PG + 7% OS) along with their nanoparticles individually (PGNP and OSNP) and combined form (PGNP+OSNP). Parameters like wound contraction, healing duration, and histological analysis were evaluated. Serum levels of MMPs (MMP2, MMP7, MMP9), proinflammatory cytokines (TNF-α, IL-6, IL-8), and TIMPs were analyzed. PGNP+OSNP displayed the most favorable outcome, achieving complete wound healing in 12 days with $100.0\pm0.0\%$ contraction. %. In contrast, wounds in the positive control (polyfax) and diabetic control (saline) groups showed contractions of $96.3\pm1.5\%$ and $95.8\pm1.4\%$, respectively, by the 16th and 18th day. Histological analysis highlighted increased keratinocytes, fibroblasts, collagen fiber growth, blood vessels, and reduced inflammation in the PGNP+OSNP group. The combination also normalized disrupted blood serum biomarkers. The combination (PGNP+OSNP) significantly reduced serum levels of matrix metalloproteinases, including MMP2 (284.4±5.1pg/ml), MMP7 (268.0±3.4pg/ml), and MMP9 (180.8±7.1pg/ml), (MMP2=591.0±11.9pg/ml, compared to the Diabetic Control group MMP7=508.8±6.9pg/ml, MMP9=415.6 \pm 5.1pg/ml) (P<0.001). The serum level of pro-inflammatory cytokines i.e., TNF- α (20.0 \pm 1.1pg/ml), IL-6 (14.4 ± 0.7 pg/ml), and IL-8 (26.2 ± 1.0 pg/ml) in the same group were significantly lower than those in the Diabetic Control group (TNF- α =55.0±3.0pg/ml, IL-6=39.8±1.6pg/ml, IL-8=70.8±2.8pg/ml) (P<0.001). The serum level of TIMPS (209.6±8.4pg/ml) in this combination group considerably increased compared to the diabetic control (74.2±5.0pg/ml) (P<0.001). In conclusion, these nanoparticles synergistically enhance healing potential, offering a promising therapeutic approach for chronic wound healing in non-diabetic and diabetic individuals. Keywords: Diabetes, Psidium guajava, Ocimum sanctum, Pro-inflammatory cytokines

O-152/ICAZ-2024

Attenuative effects of mesquitol against arsenic-induced pulmonary toxicity in rats

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Abstract

Arsenic (As) is one of the most hazardous environmental contaminants, which adversely affects multiple organs including the lungs. Mesquitol (MQL) is a phenolic compound reported in leaves of Mesquite tree, that exhibits multiple pharmacological properties i.e., anti-oxidative, anti-cancer, anti-apoptotic & anti-inflammation. Therefore,



this research was intended to evaluate the palliative role of MQL against As-prompted pulmonary dysfunctions in rats. In the experiment, 24 rats were separated into 4 groups viz. control, As (10 mgkg⁻¹) treated, As + MQL (10 mgkg⁻¹ + 50 mgkg⁻¹) co-treated, and only MQL (50 mgkg⁻¹) treated group. As treatment instigated a notable decrease in antioxidants activity i.e., glutathione S-transferase (GST), superoxide dismutase (SOD), glutathione (GSH), glutathione peroxidase (GPx), glutathione reductase (GSR) & catalase (CAT), whereas increased reactive oxygen species (ROS) & MDA levels. Moreover, As treatment noticeably elevated (p<0.05) the inflammatory indicators i.e., interleukin-1 β (IL-1 β), tumor necrosis factor- α (TNF- α), interleukin-6 (IL-6), nuclear factor kappa-B (NF- κ B) & cyclooxygenase-2 (COX-2) activity. Furthermore, Caspase-3, Caspase-9 & Bax expressions were increased while Bcl-2 expression was decreased after As exposure. Additionally, the histopathological examination revealed notable pulmonary tissue damage in As treated group. Besides, MQL treatment substantially (p<0.05) recovered As induced damages & histopathological impairments. Consequently, it can be deduced that MQL may be a possible therapeutic candidate to mitigate As induced pulmonary dysfunctions.

Keywords: Arsenic, Mesquitol, Lungs, Oxidation, Inflammation, Apoptosis, Histopathology

O-153/ICAZ-2024

Therapeutic effect of syringic acid against cadmium-induced kidney damage in rats: a histological and biochemical assessment

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Abstract

Cadmium (Cd) is a noxious and non-biodegradable heavy metal which instigates various organ toxicities such as chronic damage to the kidneys. Syringic acid (SA) is a natural dietary flavonoid possessing diverse pharmacological potential. The present investigation was planned to evaluate the protective role of SA against cadmium-prompted renal toxicity in rats. 24 male rats were divided into 4 groups i.e., control, Cd-induced group (2 mg/kg), Cd + SA-treated group (2 mg/kg + 20 mg/kg), and SA-treated group (20 mg/kg). Our results revealed that treatment of Cd reduced the activity of catalase (CAT), glutathione peroxidase (GPx), superoxide dismutase (SOD), glutathione-disulfide reductase (GSR), glutathione S-transferase (GST) as well as glutathione (GSH) while elevating ROS and MDA levels. Cd administration raised the level of urea, creatinine, KIM-1 along with NGAL while significantly reduced in creatinine clearance. Additionally, Cd treatment substantially elevated the level of caspase-3, caspase- 9 and Bcl-2 associated X protein (Bax) while reducing the level of B cell lymphoma protein 2 (Bcl-2). Cd administration significantly elevated the concentration of nuclear factor kappa-B (NF- κ B), interleukin 6 (IL-6), interleukin 1 beta (IL-1 β) as well as tumor necrosis factor α (TNF- α) and instigated histopathological damages in renal tissues. However, Co-treatment of Cd + SA showed palliative effects against Cd-induced renal impairments. The current study manifested that SA is a potential flavonoid that could be used as a therapeutic drug to ameliorate renal damages instigated Cd.

Keywords: Cadmium, Syringic acid, Oxidative stress, Inflammation, Apoptosis, Kidney damage.

O-154/ICAZ-2024

Evaluation of Bergenia ciliata conjugated silver nanoparticles for treating diabetic foot ulcers in mice Warda Ali, Shaukat Ali * and Muhammad Summer

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Abstract

Diabetes, a serious metabolic disorder holds many complications specifically impaired healing of chronic wounds like diabetic foot ulcer. In current research, Swiss albino mice were injected with alloxan monohydrate for diabetes induction. Wounds were formed in rectangular shape at dorsal surface of mice foot. These diabetic wounds were treated with Bergenia ciliata extract in two different combinations (5% and 10%) and with their conjugated silver nanoparticles (5% and 10%). The healing effect of these biomaterials was analyzed by determination of healing time, percent wound contraction and histological analysis. Serum level of various blood biomarkers i.e., TNF- α , IL-6, IL-8, MMP2, MMP7, MMP9 and TIMPs was also evaluated. The excellent healing was observed in group treated with 10% BCAgNPs. This group was healed in 12 days with wound contraction up to 93±0.9 %. While the diabetic control group and positive control group (polyfax) were healed in 20 days (67.23±1.2 %) and 18 days (84.25±2.40 %) respectively. The histological analysis also showed best healing in same group as this group was observed having



proper formation of epidermis, dermis, subcutaneous layer, large number of sebaceous glands and hair follicles, collagen fibers, fibroblasts, enhanced angiogenesis and reduced ulceration. The BCAgNPs 10% extract also alleviated the serum level of TNF- α (19.4±1.5 pg/ml), IL-6 (13.8±0.6pg/ml), IL-8 (24.8±1.2pg/ml) with respect to diabatic control group i.e., TNF- α (55.0±3.0 pg/ml), IL-6 (39.8±1.6 pg/ml), IL-8 (70.8±2.8 pg/ml) (P<0.001). Serum level of MMP2 (268.8±3.9pg/ml), MMP7 (266.0±4.4 pg/ml), MMP9 (180.8±7.1 pg/ml) (P<0.001) was significantly reduced in 10% BCAgNPs group as compare to diabetic control (MMP2=591.0±11.9 pg/ml, MMP7=508.8±6.9pg/ml, MMP9=415.6±5.1pg/ml)(P<0.001). The serum level of TIMPs(200.8±5.5 pg/ml) was seen elevated in BCAgNPs 10% group in contrast of diabetic control (74.2±5.0 pg/ml) (P<0.001).In conclusion, BCAgNPs enhanced the healing potential and can be used as promising treatment for chronic wounds like DFU in normal as well as in diabetic patients.

Keywords: Diabetes, Diabetic foot ulcer, Alloxan monohydrate, Bergenia ciliata, silver

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Ameliorative effects of aromadendrin against cisplatin induced hepatotoxicity in male Sprague-Dawley rats

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Abstract

Cisplatin (CP) is an effective chemotherapeutic agent that is used to cure multiple types of malignancies. However, it has several hazardous effects on multiple organs, particularly liver. Aromadendrin (ARD) is a naturally occurring flavonoid with versatile therapeutic and pharmacological properties. In this research, the potential therapeutic properties of aroma against cisplatin-triggered oxidative stress in hepatic tissues of were investigated. 48 male Sprague Dawley rats were separated into 4 groups: control, CP (10 mg/kg), CP + ARD (10 mg/kg + 20 mg/kg), and ARD (20 mg/kg). The trial executed for one month. The biochemical, inflammatory, histopathological and liver markers were evaluated. The results revealed that, CP treatment remarkably lowered the activities of glutathione (GSH), superoxide dismutase (SOD), glutathione reductase (GSR), glutathione S-transferase (GST), glutathione peroxidase (GPx) as well as catalase (CAT) while escalated malondialdehyde (MDA) and reactive oxygen species (ROS) levels. CP-administered rats exhibited significantly higher aspartate aminotransferase (AST), alanine aminotransferase (ALT) as well as alkaline phosphatase (ALP) levels. Furthermore, CP intoxication significantly elevated the inflammatory indicators i.e., interleukin-1 β (IL-1 β), tumor necrosis factor- α (TNF- α), interleukin-6 (IL-1 β) 6) as well as nuclear factor Kappa-B (NF-kB) and cyclooxygenase-2 (COX-2) activity along with histopathological impairments. Conversely, co-administration with ARD effectively reversed the CP-triggered impairments and abnormalities in the hepatic tissue of rats. The current investigation demonstrated that ARD lowered CP-induced hepatotoxicity owing to its antioxidant, reactive oxygen species scavenging activities and anti-inflammatory effects. Keywords: Cisplatin, Aromadendrin, Liver toxicity, Histopathology, Inflammation

O-156/ICAZ-2024

Analysis of wound healing potential of UV spectrophotometric, FTIR, SEM, and XRD observed Bergenia ciliata loaded Salvia hispanica hydrogel in diabetic mice

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Abstract

The current study assessed the wound healing potential of Bergenia ciliata (BC) extract and BC- loaded Salvia hispanica hydrogel (CH-BC) using In-vitro and In-vivo studies. The prepared hydrogel and its components were analyzed using UV-visible spectrophotometry (UV-Vis), Fourier transform infrared spectrometry (FT-IR), Scanning electron microscopy (SEM), and X-Ray diffraction (XRD). Peaks and peak shifts at 450-460nm, 250-260nm, and 270-280nm in UV-Vis and FT-IR (500-4000cm -1) confirmed extract loaded and various functional groups presence while SEM assessed average size of hydrogel-loaded Bergenia ciliata mediated nanoparticles (CH-BC AgNPs) ranging from 2-22.3nm and XRD peaks at various 2 Θ (10-70) confirmed topographical and crystalline and porous nature of materials. Bergenia ciliata extract showed higher radical scavenging potential (74.19%±1.84) and iron chelation activity (93.70±2.20) at 50µg/ml 25µg/ml respectively while CH-BC AgNPs produced the lowest (48.97%±3.0) at 25µg/ml and 75µg/ml (54.35±3.24). Moreover, Chia hydrogel (CH) synergistically enhanced (1.30%)



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DPPH scavenging. Wound contraction percentage augmented the CH-BC AgNPs as the potent candidate for wound healing (14 th day). These findings were further supported by significant (P<0.001) restoration of levels of MMP2 (184.6±11.7pg/ml), TIMPs (184.8±15.7pg/ml), GPx (153.4±11.5pg/ml) and IL-6 (10±1pg/ml) than diabetic negative control. The normal reepithelization, angiogenesis, and maturation of wounds in treatment groups after histological analysis further strengthened the supposed rationale that CH along with BC extract and CH-BC AgNPs can act synergistically to improve therapeutic results. Hence, CH- BC appeared as a sustainable, biocompatible, and non-toxic agent for wound healing and paved the way for futuristic biomedical investigations. *Keywords:* Hydrogel; Characterization; CH-BC AgNPs; Antioxidant; Wound healing

O-157/ICAZ-2024

Remedial effects of Mesquitol against Arsenic-induced hepatic injury by modulating oxidative stress, apoptosis and inflammation

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Abstract

Arsenic (As) is a toxic contaminant that exhibits adverse effects on human health by damaging various organs, especially the liver. Mesquitol (MQ) is a polymethoxy flavone isolated from the heartwood of Prosopis juliflora plant while having significant therapeutic potentials. The current study was designed to assess the potential effects of MQ on As-induced hepatic damage. For this, 24 male albino rats were separated into four groups.1st group was designed as control group; 2nd group was administrated with As (10 mg/kg). 3rd group was cotreated with As + MQ (10 mg/kg + 50 mg/kg). Whereas the 4th group was treated with MQ (50 mg/kg). The results showed that, Asintoxication significantly reduced the activities of glutathione reductase (GSR), catalase (CAT), superoxide dismutase (SOD) and glutathione peroxidase (GPx), while elevated the malondialdehyde (MDA) and reactive oxygen species (ROS) levels. Moreover, arsenic augmented the hepatic serum markers including alkaline phosphatase (ALP), aspartate aminotransferase (AST) and alanine transaminase (ALT) levels. Furthermore, As-exposure increased the level of apoptotic markers (Bax and Caspase-3) and inflammatory markers i.e., nuclear factor kappa B (NF-kB), tumor necrosis factor- α (TNF- α), interleukin-6 (IL-6), interleukin 1 beta (IL-1 β), & cyclo-oxygenase-2 (COX-2) activity. Additionally, the As-intoxication decreased the level of anti-apoptotic protein (Bcl-2). On the other hand, MQ supplementation reversed all of the hepatic damages due to its anti-oxidant, anti-apoptotic and anti-inflammatory properties. Therefore, it is revealed that MQ may prove to be a promising therapeutic agent to treat hepatic damage instigated by As.

Keywords: Arsenic, Mesquitol, Hepatotoxicity, Oxidative stress, Apoptosis, Inflammation.

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Pharmacotherapeutic potential of Xanthohumol against Bisphenol A-instigated Neurotoxicity in Rats

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Abstract

Bisphenol A (BPA) is a harmful endocrine disrupting chemical that poses significant risks to human health by inducing neurotoxic effects that includes oxidative stress, inflammation, and apoptosis. Xanthohumol (XN) is a prenylated flavonoid found in Humulus lupulus plant, has been reported to exhibit neuroprotective properties. This study aimed to investigate the protective effects of XN against BPA-induced neurotoxicity in rats. For this, experiment was executed for 30 days. Twenty-four male albino rats were divided into four groups: control, BPA-treated (50 mg/kg), BPA+XN-treated (50 mg/kg+25 mg/kg) and XN-treated (25 mg/kg) group. BPA exposure significantly increased oxidative stress markers such as malondialdehyde (MDA) and Reactive oxygen species (ROS), proinflammatory cytokines i.e., Tumor necrosis factor- α (TNF- α), interleukin 1 beta (IL-1 β), nuclear factor kappa B (NF-kB), interleukin-6 (IL-6) and cyclooxygenase 2 (COX-2), and apoptotic markers (Bax and Caspase-3) in brain tissue, while decreasing antioxidant enzymes like; superoxide dismutase (SOD), glutathione reductase (GSR), catalase (CAT), & glutathione peroxidase (GPx), and anti-apoptotic protein (Bcl-2). Moreover, BPA also induced histopathological damage in rat's brain tissues. However, XN supplementation reversed these changes, indicating its neuroprotective effects against BPA-induced brain toxicity. Our findings suggest that XN may be a potential therapeutic mediator for mitigating BPA-induced brain damage.

Keywords: Bisphenol-A, Xanthohumol, Brain damage, Oxidative stress, Inflammation


O-159/ICAZ-2024

Therapeutic potential of aromadendrin against cyclosporin instigated cardiac toxicity in rats

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Abstract

Cyclosporin is a key immunosuppressant drug used in medical transplantation, but its use is often limited by the induction of nephrotoxicity, neurotoxicity, hepatotoxicity and cardiotoxicity. Aromadendrin is a plant-based flavonoid with conspicuous pharmacological properties. This experiment was executed to evaluate the palliative actions of aromadendrin on cyclosporin prompted cardiac toxicity in rats. Twenty-four rats were apportioned into 4 equal groups which were designated as control, cyclosporin treated group (25 mgkg-1), co-treated (cyclosporin 25 mgkg-1 + aromadendrin 20 mgkg-1) and aromadendrin (20 mgkg-1) treated group. After 30 days of treatment, cyclosporin intoxication resulted in a remarkable reduction in antioxidant enzymes activities i.e., glutathione reductase (GSH), glutathione S-transferase (GST), catalase (CAT), glutathione peroxidase (GPx), superoxide dismutase (SOD), and glutathione disulfide reductase (GSR), whereas an elevation was observed in reactive oxygen species (ROS), & malondialdehyde (MDA) contents. Furthermore, concentrations of cardiac injury markers, creatinine phosphokinase (CPK), creatine kinase-myoglobin binding (CK-MB), & lactate dehydrogenase (LDH), as well as troponin I were increased in response to cyclosporin treatment. Moreover, inflammatory cytokines such as tumour necrosis factor alpha (TNF- α), nuclear factor-kappa B (NF- κ B), and interleukin-6 (IL-6), interleukin-1 beta (IL-1 β), and cyclooxygenase-2 (COX-2) levels were augmented in cyclosporin intoxicated group. Cyclosporin exposure reduced the gene expression of cardiac anti-apoptotic markers (Bcl-2), but the gene expression of apoptotic markers (caspase-9, caspase-3 and Bax) were increased. Histopathological damages were also observed in cyclosporin exposed group. However, the administration of aromadendrin significantly palliated cyclosporin induced aforementioned disruptions. Therefore, aromadendrin can be a promising bioactive compound that may be used as a curative agent against cyclosporin instigated cardiac damage.

Keywords: Cyclosporin, Aromadendrin, Cardiac toxicity, Anti-apoptotic, Inflammation

O-160/ICAZ-2024

Protective role of syringic acid against pulmonary damage induced by perflourooctane sulfonate in male albino rats

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Abstract

Perfluorooctane sulfonate (PFOS) is a widespread environmental contaminant that is detected in the lung of mammals. Syringic acid (SA) is a phenolic compound of natural origin, possessing diverse antioxidant, anti-inflammatory and anti-apoptotic properties. Therefore, the current study was designed to determine the mitigative role of SA against PFOS induced pulmonary damage. 24 adult male albino rats were randomly separated into four groups: control, PFOS (10 mgkg-1), PFOS + SA (10 mgkg-1 + 20 mgkg-1) and SA (20 mgkg-1) treated groups. The findings of this study revealed that PFOS exposure decreased the activities of antioxidant enzymes i.e., catalase (CAT), glutathione reductase (GSR), superoxide dismutase (SOD), glutathione S-transferase (GST), and glutathione (GSH), while escalated the levels reactive oxygen species (ROS) and malondialdehyde (MDA). Moreover, PFOS treatment noticeably increased the levels of inflammatory markers, including tumor necrosis factor-a (TNF-a), interleukin-6 (IL-6), interleukin-1b (IL-1 β), nuclear factor kappa-B (NF-kB), and cyclooxygenase-2 (COX-2) activity. PFOS intoxication diminished the level of the anti-apoptotic protein (Bcl-2) while increasing the levels of apoptotic markers (Bax, caspase-3 and caspase-9). Furthermore, PFOS treatment also caused considerable histological damage in pulmonary tissues of rats. However, SA treatment potently alleviated all the aforementioned impairments in lungs. Conclusively, our results demonstrate the promising free-radical scavenging activity of SA, a novel candidate against the PFOS instigated pulmonary toxicity.

Keywords: Perfluorooctane sulfonate, Syringic Acid, Pulmonary damage, Apoptosis, Inflammation

O-161/ICAZ-2024

Ameliorative effects of xanthohumol against arsenic-induced renal damage in rats

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Abstract

Arsenic (As) is one of the most hazardous environmental contaminants, which adversely affects the dynamics of renal system. Xanthohumol (XN) is a naturally occurring polyphenolic compound possessing diverse pharmacological properties. Therefore, the present research was conducted to evaluate the mitigative potential of XN against As prompted renal toxicity in albino rats. Forty-eight albino rats were randomly divided into 4 groups, such as control group, As treated group (8 mgkg-1), As + XN co-treated group (8 mgkg-1 and 20 mgkg-1 respectively) and only XN treated group (20 mgkg-1). After 30 days of treatment, it was revealed that the exposure of As significantly reduced anti-oxidant enzymes levels such as, glutathione peroxidase (GPx), glutathione reductase (GSR), catalase (CAT), glutathione-S-transferase (GST), superoxide dismutase (SOD) and glutathione (GSH). However, in As treated rats malondialdehyde (MDA) and reactive oxygen species (ROS) contents were significantly elevated. As exposure also increased the serum level of urea, and creatinine while reducing creatinine clearance levels. Furthermore, KIM-1 and NGAL levels were also increased in As intoxicated rats. Moreover, inflammatory indices i.e., nuclear factor kappa-B (NF- κ B), interleukin-6 (IL-6), tumor necrosis factor- α (TNF- α) interleukin-1 β (IL-1 β) and cyclooxygenase-2 (COX-2) activity was increased in As treated rats. Additionally, it also escalated the expression of pro-apoptotic indices (Bax and Caspase-3) while decreasing the expression of antiapoptotic marker (Bcl-2). The exposure of As also instigated significant histopathological damages in renal tissues. Nonetheless, XN supplementation recovered all these damages due to its anti-apoptotic, anti-oxidant and anti-inflammatory nature.

Keywords: Arsenic, Xanthohumol, Renal damage, Anti-apoptotic, Anti-oxidant

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Evaluation of ameliorative potential of guibourtinidol on arsenic prompted neural damage in rats Zainab Bibi, Muhammad Umar Ijaz, Qandeel Fatima*, Muhammad Zaid Salar, Quratulann Sattar

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Abstract

Arsenic (As) is a toxic contaminant present in organic and inorganic forms in the environment, which has potential to cause systematic poisoning. As intoxication is known to be linked with multiple clinical anomalies including brain injury. Guibourtinidol is an important flavonoid that shows versatile therapeutic potentials. Therefore, the present study was designed to evaluate the alleviative effects of guibourtinidol against As-prompted damage in the brain of rats. 24 albino rats were distributed into four groups such as control group, As-treated group (8mg/kg), As (8 mg/kg) + guibourtinidol (30mg/kg) exposed group and guibourtinidol (30mg/kg) only supplemented group. The experiment was conducted for thirty days. The activities of anti-oxidants such as, catalase (CAT), glutathione reductase (GSR), superoxide dismutase (SOD), glutathione (GSH) and glutathione peroxidase (GPx) were reduced, besides malondialdehyde (MDA) and reactive oxygen species (ROS) contents were increased significantly following the As exposure. As significantly elevated inflammatory biomarkers levels such as tumor necrosis- α (TNF- α), nuclear factor- κ B (NF- κ B), interleukin-6 (IL-6), interleukin 1beta (IL- 1 β) and cyclo-oxygenase-2 (COX-2) activity. As exposure also induced significant histopathological damages in the neural tissues. Nevertheless, guibourtinidol supplementation significantly attenuate As-instigated OS and neurotoxicity, due to its anti-oxidant. Kevwords: Arsenic, Guibourtinidol, Neurotoxicity, Anti-oxidant, Histopathology

O-163/ICAZ-2024

Protective effects of mesquitol on cadmium-induced cardiac damage in albino rats

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Abstract

Cadmium (Cd) is a highly toxic heavy metal that can be found everywhere in the environment that possesses harmful effects on both human and animal health. Mesquitol (MES) is a naturally occurring, flavonoid compound that shows anti-inflammatory, and antioxidant properties. The purpose of this study was to determine the curative effect of MES on Cd-induced heart damage in rats. 48 male albino rats were randomly distributed into 4 groups i.e., control, Cd group (5mg/kg), MES and Cd co-treated group (50 mg/kg + 5 mg/kg) and MES only (50 mg/kg) treated group. After 30 days of treatment, Cd intoxication resulted in a remarkable reduction in antioxidant enzymes activities which include, glutathione reductase (GSH), glutathione S-transferase (GST), catalase (CAT), glutathione peroxidase (GPx), superoxide dismutase (SOD), and glutathione disulfide reductase (GSR), whereas an elevation was observed in



reactive oxygen species (ROS), & malondialdehyde (MDA) as well as hydrogen peroxide (H2O2) level. Furthermore, concentrations of cardiac injury markers, creatinine phosphokinase (CPK), creatine kinase-myoglobin binding (CK-MB), & lactate dehydrogenase (LDH), as well as troponin I were increased in response to Cd treatment. Moreover, inflammatory cytokines such as tumour necrosis factor alpha (TNF- α), nuclear factor-kappa B (NF- κ B), and interleukin-6 (IL-6), interleukin-1 beta (IL-1B), and cvclooxygenase-2 (COX-2) levels were augmented in Cd intoxicated group. Cd exposure reduced the expression of Bcl-2, but the caspase-3 and Bax were increased. Histopathological damages were also observed in Cd exposed group. However, the administration of MES significantly palliated Cd induced disruptions. Thus, MES can be used as a curative agent against Cd instigated cardiac damages.

Keywords: Cadmium, Mesquitol, Cardiac toxicity, Apoptosis, Histopathological damages

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Palliative role of xanthohumol against cisplatin prompted liver damages in rats

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Abstract

Cisplatin (CP) is an effective chemotherapeutic agent, yet its use is limited by several adverse drug reactions, known as CP-induced toxicities. CP is a chemotherapeutic drug which demonstrated various sorts of deleterious effects that counteracted its intended benefits. Xanthohumol (XAN) is a plant-based flavonoid which exhibits different biological as well as pharmacological potential. The current investigation was conducted to evaluate the therapeutic potential of XAN against CP induced liver damage in albino rats. Twenty-four rats were divided into 4 groups such as control, CP (10mg/kg) treated, CP (10mg/kg) + XAN (25mg/kg) exposed and only XAN (25mg/kg) supplemented group. It was revealed that CP exposure significantly reduced the activities of catalase (CAT), superoxide dismutase (SOD), glutathione peroxidase (GPx), glutathione S-transferase (GST), glutathione reductase (GSR) & glutathione (GSH) contents while escalating the levels of reactive oxygen species (ROS) and malondialdehyde (MDA). Furthermore, administration of CP elevated the levels of alanine transaminase (ALT), aspartate transaminase (AST) & alkaline phosphatase (ALP). Besides, the levels of nuclear factor- κB (NF- κB), tumor necrosis- α (TNF- α), interleukin-6 (IL-6), interleukin 1beta (IL-1β), & cyclo-oxygenase-2 (COX-2) activity were increased in response to CP treatment. Moreover, CP administration instigated various histopathological impairments in hepatic tissues. However, supplementation of XAN substantially restored aforementioned irregularities owing to its antioxidant, antiinflammatory as well as hepatoprotective potential.

Keywords: Oxidative stress, Inflammation, Hepatic damage, Xanthohumol, Cisplatin

O-165/ICAZ-2024

Nephroprotective potential of Aromadendrin against paraquat-provoked renal toxicity in rats

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Abstract

Paraquat (PQ) is one of the most toxic herbicides that possesses the ability to produce harmful effects on the health of animals as well as humans. Aromadendrin is a flavonoid with potential anti-inflammatory, antioxidant and anti-tumor activities. Therefore, the present research was planned to determine the protective effect of aromadendrin against PQ-induced renal damage. Twenty-four albino rats were distributed randomly into 4 equal groups, control, PQ group (5 mg/kg), PQ + aromadendrin group (5 mg/kg + 20 mg/kg) and aromadendrin group (20 mg/kg). After 30 days of treatment, our results revealed that PQ exposure reduced the activities of antioxidant enzymes i.e., glutathione Stransferase (GST), glutathione (GSH), superoxide dismutase (SOD), glutathione reductase (GSR), catalase (CAT), glutathione peroxidase (GPx) and heme oxygenase-1 (HO-1) while increasing the levels of malondialdehyde (MDA) and reactive oxygen species (ROS). Furthermore, PQ intoxication reduced the level of renal biomarkers i.e., creatinine clearance, and increased the levels of creatinine, urea, NGAL and KIM-1. Besides, it also increased the levels of nuclear factor-kappa B (NF-kB), tumor necrosis factor-alpha (TNF-a), interleukin-1beta (IL-1β) and interleukin-6 (IL-6) as well as cyclooxygenase-2 (COX-2) activity. Furthermore, PQ exposure increased the levels of Bax and caspase-3 while reducing the levels of Bcl-2. Additionally, histological analysis showed that PQ-intoxication led to substantial damage in the renal tissues of rats. However, aromadendrin treatment recovered all these renal impairments. Therefore, it is proposed that aromadendrin may be used as a nephroprotective agent against PQ-prompted renal toxicity.



Keywords: Paraquat, Aromadendrin, Renal toxicity, Inflammation, Antioxidants

Protective effect of syringic acid against perflourooctane sulfonate-induced cardiac toxicity in male albino

rats

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Abstract

Perfluorooctane sulfonate (PFOS) is a pervasive organic toxicant that damages body organs, including heart. Syringic acid (SA) is a natural flavonoid found in many vegetables and fruits. The current investigation was conducted to evaluate the potential role of SA to counteract PFOS-induced cardiac damage in rats. Twenty-four albino rats were distributed into four groups, including control, PFOS (10 mg/kg) intoxicated, PFOS + SA (10 mg/kg + 20 mg/kg) treated, and SA (20 mg/kg) alone supplemented group. The trail was conducted for 30 days and the results revealed that PFOS intoxication reduced the activities of glutathione reductase (GSR), superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPx), glutathione S-transferase (GST), and glutathione (GSH) contents while upregulating the levels of reactive oxygen species (ROS) and malondialdehyde (MDA). Besides, PFOS administration upregulated the levels of creatine kinase-MB (CK-MB), troponin I, creatine phosphokinase (CPK), and lactate dehydrogenase (LDH). Moreover, the levels of tumor necrosis factor-alpha (TNF- α), nuclear factor kappa-B (NF- κ B), interleukin-6 (IL-6), and interleukin-1 β (IL-1 β) were increased after PFOS intoxication. Additionally, PFOS exposure downregulated the expression of Bc1-2 while upregulating the expressions of Bax and Caspase-3. Furthermore, PFOS administration disrupted the normal architecture of cardiac tissues. Nonetheless, SA treatment remarkably protected the cardiac tissues via regulating aforementioned dysregulations owing to its antioxidative, anti-inflammatory, and antiapoptotic properties.

Keywords: Perflourooctane sulfonate, Syringic acid, Cardiac toxicity, Anti-inflammatory, Antioxidant

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Xanthohumol ameliorates cisplatin-provoked pulmonary toxicity via restoring biochemical and histological profile in male albino rats

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Abstract

Cisplatin (CP) is an effective anticancerous chemotherapeutic drug that is used to cure multiple types of malignancies. However, it has several hazardous effects on various organs, including lungs. Xanthohumol (XAN) is a prenylated flavonoid with potential antioxidant, anti-inflammatory and other pharmacological activities. This trial was designed to assess the protective ability of XAN to counter CP provoked pulmonary toxicity in rats. Twenty-four rats were divided into four groups i.e., control, CP (10 mg/kg), CP (10 mg/kg) + XAN (25 mg/kg) and XAN (25 mg/kg) only supplemented group. CP exposure led to a notable reduction in the activities of catalase (CAT), superoxide dismutase (SOD), glutathione peroxidase (GPx), glutathione-S-transferase (GST), glutathione reductase (GSR) as well as GSH contents while causing a pronounced elevation in the concentration of malondialdehyde (MDA) and reactive oxygen species (ROS). Furthermore, CP significantly augmented the levels of myeloperoxidase (MPO), macrophages, neutrophils, and lymphocytes in BALF. Moreover, the levels of interleukin-1 β (IL-1 β), tumor necrosis factor- α (TNF- α), nuclear factor-kappa B (NF- κ B), interleukin-6 (IL-6) and cyclooxygenase-2 (COX-2) activities were increased following the CP exposure. Nonetheless CP remarkably decreased Bcl-2 levels, coupled with an escalation in Caspase-3 and Bax levels. Despite this, severe histological alterations were observed in lung tissues after CP provision. Nevertheless, XAN provision markedly protected the lungs via regulating aforementioned dysregulations. This investigation validated the shielding strength of XAN to counteract CP caused pulmonary toxicity.

Keywords: Cisplatin, Xanthohumol, Pulmonary toxicity, Inflammation, Apoptosis

O-168/ICAZ-2024

The gut microbiome of long-tailed macaques: a nexus of environment, diet, and host genetics

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The environment, diet, and host's genetics play a pivotal role in shaping the gut microbiota composition and health of hosts. This study delves into the comparative analysis of gut microbiota between four populations of longtailed macaques (Macaca fascicularis) including two phylogenetically distinct subspecies (M. f. fascicularis and M. f. aurea) inhabiting two habitat types (mangrove forest and island). Employing the full-length16S rRNA gene sequencing on a Nanopore platform, the study investigated the bacterial species richness and evenness between the two subspecies at two habitat types. Two M. f. fascicularis populations that were exposed to anthropogenic food sources exhibited higher bacterial diversity in their gut microbiota compared to their M. f. aurea counterparts living in respective habitats. While Firmicutes and Bacteroidetes emerged as the predominant bacterial phyla within the gut microbiota of both subspecies, however their relative abundances displayed significant differences. M. f. aurea displayed notably higher relative levels of these phyla compared to M. f. fascicularis. Furthermore, the differential species abundance analysis by LEfSe revealed variations in the gut microbiota between M. f. fascicularis and M. f. aurea, indicating dietary differences corresponding to their respective habitats. In conclusion, this study underscores the intricate relationship between environment, diet, host genetics, and gut microbiota in non-human primates. The study contributes to a broader understanding of how host-environment interactions modulate gut microbiota, emphasizing the role of dietary habits in shaping these microbial communities. Keywords: Macaca fascicularis, Gut microbiota, Environment, Diet, 16S rRNA

O-169/ICAZ-2024

High-Speed Atomic Force Microscopy Reveals Post-Translational Modifications Influence Mycobacterial DNA-binding Protein 1 (MDP1)- Induced RNA Condensation

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Nano Life Science Institute, Kanazawa University, Kakumamachi, Kanazawa, Ishikawa 920-1192, Japan Abstract

Mycobacteria, notorious for their ability to become dormant persisters, are major human pathogens that often cause chronic, difficult-to-treat infections. The facilitator of this dormancy is Mycobacterial DNA binding protein 1 (MDP1) which induces DNA compaction during dormancy. While MDP1's involvement in DNA compaction is wellestablished, its potential involvement in RNA condensation remains largely unexplored. Given that MDP1's DNA binding affinity is regulated by post-translational modifications (PTMs) and that MDP1 strains exhibit varying degrees of PTMs, we hypothesized that these modifications might also influence MDP1's ability to induce RNA condensation. We investigated MDP1's interactions with various RNA substrates using high-speed atomic force microscopy. Our results demonstrate that MDP1's RNA condensing activity is significantly influenced by its post-translational modifications (PTMs). MDP1 from M. tuberculosis, with a higher degree of PTMs, exhibited greater efficiency in RNA condensation compared to MDP1 from M. smegmatis. Conversely, MDP1 expressed in E. coli, lacking PTMs, failed to induce RNA condensation. These findings highlight the critical role of PTMs in modulating MDP1's function and suggest that targeting these modifications could be a potential therapeutic strategy for mycobacterial infections.

O-170/ICAZ-2024

Bioremediation of pesticides polluted sites via bacterial biofilms Iram Liaqat

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Abstract

Overuse of pesticides in agricultural soil and industrial wastewater containing dyes contaminate the environment severely and are toxic to animals and humans as well, so their removal from the environment is essential. The present study was focused on the bioremediation of pesticides (Cypermethrin (CYP) and Imidacloprid (IMI)) and dyes (Malachite Green (MG) and Congo Red (CR)) using biofilm of bacteria isolated from pesticides polluted agriculture soil and effluents from the textile industry. From pesticides polluted soil, four bacteria, namely, Bacillus thuringiensis (OP554568), Enterobacter hormaechei (OP723332), Bacillus sp. (OP586601), Bacillus cereus (OP586602) and from dyes polluted soil, three bacteria i.e., L. sphaericus (OP589134), Bacillus sp. (OP589135) and Bacillus sp. (OP589136), were identified based on 16S rDNA analysis. Biofilm of individual and mixed cultures of





indigenous bacterial isolates was developed and tested for their ability to degrade pesticides (CYP and IMI) and dyes (MG and CR). UV-visible and FTIR spectroscopy was used for the confirmation of CYP, IMI, MG and CR degradation. From all, the mixed culture of B. thuringiensis + Bacillus sp. (5A) (g7) showed the highest degradation (46.2%) against CYP (100 μ L) and the mixed culture of B. thuringiensis + E. hormaechei + Bacillus sp. (5A) + B. cereus (g11) highly degraded (70.0%) IMI (100 μ L) within 10 days of incubation at 37 °C. Mixed culture of Bacillus sp. (CF3) + Bacillus sp. (DF4) (g6) showed the highest degradation (86.76%) against MG (100 μ L) and mixed culture of L. sphaericus + Bacillus sp. (CF3) highly degraded (30.78%) CR (100 μ L). UV–Vis spectral analysis revealed the major peak at 224 nm of CYP, 263nm of IMI, 581nm of MG and 436nm of CR, which completely disappeared after biofilm treatment. FTIR analysis showed several major peaks which are completely or partly disappeared and the appearance of many new peaks after biofilm treatment. As a result of this study, it was concluded that the biofilm of these bacteria could be suitable agents for the bioremediation of pesticides and dyes. This study expresses an ecofriendly approach for the bioremediation of harmful contaminants from the environment, like pesticides and dyes. *Keywords:* Biofilm, Bioremediation, Cypermethrin, Imidacloprid, Congo red, Malachite green

O-171/ICAZ-2024

Evaluation of antibacterial activity of arsenic nanoparticles produced by potato (solanum tuberosum) against Staphylococcus aureus

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Abstract

Arsenic dubbed the "king of poisons," has left an enduring mark on human history, surpassing all other elements or harmful substances present in air, food, water, and soil. The goal of this research was to synthesize arsenic nanoparticles (AsNPs) from potato (Solanum tuberosum) peel and to evaluate its antibacterial activity against Staphylococcus aureus. The formation of As-NPs was preliminarily fixed by the visual inspection in the color shift. The characterization of AsNPs was done by using X-ray diffraction, UV-visible and Fourier Transform infrared spectroscopy (FTIR). The antimicrobial Potential of AsNPs was also taken into account against staphylococcus aureus The UV-vis spectrophotometry confirmed the formation of AsNPs showing a maximum absorption spectrum at 230 nm. The synthesized AsNPs were crystal-like and had a size of 35.81 nm. FTIR spectrum confirmed the presence of functional groups in the plant extract which acted as reducing agents in the production of AsNPs. Biogenically-synthesized AsNPs showed an effective potential against S. aureus and this effect was dependent on the concentration of AsNPs. The lowest dose to highest dose showed significant difference p≤0.001 from the reference groups. The MIC calculated was 375 μ g/ml. The results of this research showed that AsNPs can be helpful against staphylococcus aureus. Key Words: Arsenic nanoparticles, staphylococcus aureus

O-172/ICAZ-2024

Comparative Evaluation of Different PCR Based Diagnostic Assays For Detection of Mycoplasma gallisepticum

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Abstract

Mycoplasma gallisepticum is an important pathogen responsible for respiratory tract infections in poultry. Clinical manifestation of disease varies from mild respiratory infection to chronic respiratory disease (CRD) in case of co-infections with other viral or bacterial pathogens. Mycoplasma infections cause huge economic losses due to reduction in hatchability and egg production as well as due to increased morbidity and mortality in a flock. Early and sensitive molecular detection of M. gallisepticum has been of foremost importance to initiate therapeutic management of disease. Validation of insulated isothermal PCR (iiPCR) was conducted in comparison with real-time PCR (qPCR) and conventional PCR (con-PCR). Analytical sensitivity was evaluated by preparing 10-fold diluted concentrations of M. gallisepticum F (live vaccine), and three field isolates in M. gallisepticum broth (100–107 CFU/ml). Diagnostic performance of iiPCR was assessed by using 95 field samples. Analytical and diagnostic performance of assay was evaluated and compared with qPCR as gold standard. Detection limit of iiPCR was found comparable with that of qPCR. Statistical analysis and comparison of reliability of different PCR based techniques for detection of M.





gallisepticum provided almost perfect agreement between all techniques. It was found that iiPCR can be a good, efficient and relatively cost-effective alternative to qPCR. Key words: Mycoplasma gallisepticum, Insulated isothermal PCR, Analytical performance, Diagnostic Performance

O-173/ICAZ-2024

Molecular investigation of Single Nucleotide Polymorphism in Complement Component 5 Gene Sahiwal mastitic Cattle

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Abstract

Pakistan is positioned 4th in production of milk worldwide after India, China and USA. Sahiwal breed is one of the chief breeds of dairy cattle and well recognized globally because of their discrete characteristics. Dairy cattle experience a number of diseases such as mastitis, breeding problems, lameness, birth problems, multiple system problems, gastrointestinal disease, and metabolic/nutritional problems. Mastitis, defined as inflammation of mammary gland, is one of the most common disease categorized by an inflammatory response of mammary gland. Mastitis imposes significant and frequent financial losses on the dairy industry worldwide. This economic burden is due to the extra expenses on mastitis treatment, and to the losses due to numerous issues including reduced milk yield, discarded milk and culling. The objective of the current study was to sequence and analyses the completely coding region of C5 gene in Sahiwal cattle, to detect single nucleotide polymorphism and to find out the association analysis of C5 gene as an indicator of mastitis in dairy animals. Sequence analysis of C5 gene aid as a molecular marker for mastitis resistance and subsequently to be used in a selection of dairy herds. *Keywords:* Mastitis, Milk, polymorphism, Cattle

O-174/ICAZ-2024

Use of different cost effective animal bt products to replace fish meal, effect on growth performance, nutrients digestibility and hematological indices of major carps Esha Razzaq, Syed Makhdoom Hussain

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Abstract

In recent years, the aquaculture sector has grown swiftly, but the only obstacle to its growth is unsustainability of fishmeal (FM). Thus, researchers are making significant efforts to find new substitutes for FM. Among the several potential alternatives for FM, various animal by-products (ABPs) have not yet been comparatively studied in Cirrhinus mrigala fingerlings. Therefore, this research was done to inspect the impacts of various ABPs diets on the physiological health of C. mrigala fingerlings. Six iso-nitrogenous and iso-lipidic test diets were prepared. As a control diet, FM was used. Other five diets contain poultry by-product meal (PBM), insect meal (IM), meat and bone meal (MBM), blood meal (BM) and feather meal (FeM). Fifteen fingerlings were kept in each triplicate for each test diet under controlled experimental conditions. After 70 days feeding trial, it was confirmed that IM caused maximum increase in weight gain (WG: 12.04g) and specific growth rate (SGR: 1.69%) in C. mrigala fingerlings superior to other groups. Fish fed with PBM also showed improved results in terms of growth rate (WG: 9.82g). No significant differences (p>0.05) were observed in digestibility of lipid, protein and gross energy in fish fed IM, PBM, MBM and control diets. Fish fed IM and PBM showed significant improvement in blood parameters such as RBCs, Hb, WBCs and PLTs while fish fed BM and FeM showed poor results. In conclusion, IM and PBM could be used as better alternatives to FM without compromising fish health.

Keywords: Fishmeal, Animal by-products, Growth performance, Digestibility, Insect meal

O-175/ICAZ-2024

Exploration of aflatoxin in various branded and non branded spices and its lessening by assorted physical, chemical and biological methods

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Abstract:

Spices are a major component of wholesome and nutrient-dense foods that nature provides for us. From a scientific and health standpoint, these spices are intriguing due to their abundance of bioactive chemicals. Mycotoxins are hazardous secondary metabolites of fungi that cause food contamination, diseases, and significant harm to both



human and animal health. A class of naturally occurring, structurally similar, poisonous, mutagenic and carcinogenic secondary metabolites generated by some Aspergillus species is known as aflatoxin which has harmful effects on the liver. Aflatoxin poisoning of spices is a serious worldwide problem that affects trade to the tune of almost \$3 billion USD. In this investigation, aflatoxins were identified using ELISA and TLC. The positive samples underwent physical, chemical, and biological detoxification using several environmentally acceptable methods. According to this study, 55% of the spice samples had aflatoxin and in 45% samples aflatoxin was not detected. Aflatoxin levels in contaminated samples were found 54% within the permissible limit, while 46% beyond the limit. Additionally, it is determined that the fennel samples had a higher level of aflatoxin contamination (70.50±1.60µg/kg) than other spices. Physical techniques detoxify 42.38±1.40% of the positive samples while the chemical methods alleviated aflatoxin $81.25\pm1.70\%$, and biological methods detoxified aflatoxin up to $79.23\pm1.68\%$. To reduce the danger of aflatoxin intoxication, aflatoxin control requires an integrated strategy that includes monitoring in a "stable to table" manner and the adoption of various techniques. This study also emphasizes the necessity of regulatory allowed limits for aflatoxin contamination in Pakistan.

Keywords: mycotoxins, aflatoxins, spices, detoxification, eco friendly methods

O-176/ICAZ-2024

Process parameters for the Optimization of Endoglucanase Production by Bacillus licheniformis Using Agro-Industrial by Products

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Abstract

Endo-1,4- β -D-glucanase is an industrially important enzyme that breaks down internal beta-1,4-glucosidic bonds in cellulose and other carbohydrates to form shorter oligosaccharides. Utilizing agro-industrial by-products for enzyme production contributes to environmental sustainability. This helps not only to minimize waste but also promotes the circular economy. Twenty-four endoglucanase producing bacteria were isolated from soil, compost samples and agricultural wastes using carboxymethyl cellulose agar medium. Isolate C6 giving maximum zone of hydrolysis on carboxymethyl cellulose agar medium was characterized by morphological, biochemical and molecular means. 16S rRNA analysis showed that isolate gave 99% similarity with Bacillus licheniformis. Solid state fermentation was used for the optimization of endoglucanase production by Bacillus licheniformis C6. Agro-industrial substrates (corn stover, wheat straw, wheat bran, rice straw gave highest endoglucanase activity (1.74 ±0.034 U/mg) when moisten with 10 ml diluent (D4) at temperature 37oC, pH 7.5 after 72 h of incubation with 10% vegetative inoculum.

O-177/ICAZ-2024

Evaluating the Nonsynonymous SNPs of NR3C4 through Molecular Docking Analysis in Human Breast Cancer

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Abstract

The androgen receptor (AR), designated as NR3C4 (nuclear receptor subfamily 3, group C, member 4), is found highly involved in risk of mammary carcinoma. The objectives of this study were to identify non-synonymous SNPs of NR3C4 and their association with breast cancer and to identify the chemotherapeutic responses of phytochemicals against it via in-silico study design. To achieve this objective, a variety of online tools were utilized. In order to identify pathogenic SNPs, tools such as SIFT, Polyphen, Polyphen-2, fuNTRp, and SNAP2 were employed. For the detection of disease-associated SNPs, tools including SNP&GO, PhD-SNP, PredictSNP, MAPP, SNAP, MetaSNP, and PANTHER were utilized. Protein stability was assessed using Mu-Pro, I-Mutant, and CONSURF. Protein-protein interactions were examined through the use of STRING, while molecular docking analyses were conducted using PyRx. Eleven SNPs, identified by their rsIDs (rs376443652, rs137852596, rs137852586,

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rs878853033, rs1266872442, rs137852576, rs137852599, rs866729242, rs1131691625, rs1301632315, rs1057521122), have been observed to exhibit mutations resulting in amino acid changes at positions L575V, G578R, C580F, C602G, D605H, R609K, H690P, I738N, M743K, G751C, and Y835C, respectively. These mutations have been found to be entirely deleterious. In our molecular docking analysis, we utilized robustaflavone, sanguinarine, dioscoroside, marmesin, and protoberberine. We observed significant interactions, with binding energies ranging from -8.3 to -7.9 kcal/mol, between these phytochemical ligands and ESR1 wild type as well as two mutants (H690P and Y835C). Our findings suggest that these identified SNPs within ESR1 play a role in breast cancer development, and the tested phytochemicals exhibit promising potential as chemotherapeutic agents against breast cancer. Further investigations involving in vitro and in vivo studies are recommended to validate and explore these interactions more comprehensively. Keywords: In-silico analysis, Breast cancer, NR3C4, Phytochemicals, Polymorphism, Molecular docking

O-178/ICAZ-2024

A novel Distachinionate treats inflammations by inhibiting Cox2 from Breynia distachia

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Abstract

Breynia distachia is a plant of genus Breynia belonging to family phyllanthaceae. Study was conducted to isolate and examine the anti-inflammatory attributes of roots of Brevnia distachia. Methanol extract from roots were prepared by simple maceration. For phytochemical studies Isolation, purification, structure elucidation, metal analysis, total phenolic content and solubility test was done by chromatographic and spectroscopic techniques. Antioxidant potential was evaluated by DPPH, FRAP, ABTS antioxidants assays, and anti-inflammatory activity by carrageenan paw edema model and cotton pallet edema model. Results shows that copper(Cu), magnesium(Mg), calcium(Ca), iron(Fe), zinc(Zn) and manganese(Mn) with concentrations (ppm) 690, 580, 550, 105, 11 and 5 respectively are found in Breynia distachia. Four phytochemicals quercetin, gallic acid, p-coumaric acid and sinapic acid are found in Breynia distachia, quercetin in relatively large quantity, antioxidant activity by reducing the ferric iron to ferrous iron. Histopathology of liver, spleen, heart and kidney was done. This reveals mild inflammations in spleen and liver, no cytotoxicity in heart and kidney. Orally administered BD.Me shows significantly inhibited effect on carrageenan and cotton pellet induced paw edema in 1st and 2nd hour with (ns = p > 0.05) than control. After 3rd , 4th, 5th and 6th hour, plant extract at dose 100 mg/kg, 200 mg/kg and indomethacin at 10 mg/kg showed inhibition of paw edema in highly significant (*** = p < 0.001) manner as compare to control. In Cotton-pellet edema model distachionate shows %inhibition of 57.3% at the dose level of 5mg/kg. Docking values obtained from distachionate-Cox2 complex suggesting a potent inhibitor evaluated for this protein. The distachionate shows effective anti-inflammatory activity. Methanol extracts of roots showed significant lipoxygenase inhibitory activity with IC50 values of 155.7 \pm 0.55 and $132.9 \pm 0.33 \mu g/mL$. Data from various in vitro and in vivo models suggests that Breynia distachia has strong antioxidant and anti-inflammatory activities; it should be further studied for the exploration of its medicinal potential. Keywords: Breynia distachia; inflammations; distachionate; Cox inhibitor; Antioxidant.

O-179/ICAZ -2024

β-Citronellol: A Potential Anti-Inflammatory and Gastroprotective Agent – Mechanistic Insights into its Modulatory Effects on COX-II, 5-LOX, eNOS and ICAM-1 Pathways through In-Vitro, In-Vivo, In-Silico, and Network Pharmacology Studies

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Abstract

 β - Citronellol is popular for its antioxidant, anti-inflammatory, anti-hypertensive and wound healing properties. Current study aimed to evaluate the anti-inflammatory, anti-oxidant and pronounced gastro protective activities of β - Citronellol using in-vitro, in-vivo assays and in silico approaches. In vitro assays, denaturation of bovine serum albumin, egg protein and human Red Blood Cells (RBCs) membrane stabilization were performed at concentration range 50 to 6,400 µg/mL, using Piroxicam as standard. For in vivo assessment of anti-inflammatory potential of Citronellol (25, 50 and 100 mg/kg p.o), Histamine (0.1 ml from 1% w/v) and Formaldehyde (0.1 ml from





2% v/v) were used to mediate inflammation in rats. In silico molecular docking and network pharmacology were employed to probe the possible target genes mediating Gastroprotective effect of β -Citronellol at 25, 50 and 100 mg/kg, using indomethacin induced (25 mg/kg i.p) gastric ulcer in rats. Omeprazole (30 mg/kg) po was used as standard. Moreover, Gastric tissues were evaluated for morphological, histopathological, biochemical analysis of PGE 2. COX-I, COX-II, 5-LOX, eNOS, ICAM-1, Oxygen free radical scavengers (SOD, CAT) and oxidative stress marker (MDA). β-Citronellol prevented denaturation of proteins and RBCs membrane stabilization with maximum effect observed at 6,400µg/mL. Citronellol significantly (p<0.001) decreased rat's paw edema in Histamine and Formaldehyde- induced inflammation models. Network pharmacology revealed, gastro-protective potential of Citronellol possibly mediated through arachidonic acid pathways by targeting COX-I, COX-II, PGE 2 and 5-LOX, also evident by in-silico molecular docking studies. Administration of Citronellol significantly reduced the ulcer indices, and histopathological changes in rats. Further, β -Citronellol (50 and 100 mg/kg) po significantly (p<0.001) increased gastric PGE 2, COX-1 and eNOS levels; while a significant (p<0.001) suppression in COX-2, 5-LOX and ICAM-1 levels was observed. Furthermore, Citronellol has shown marked (p<0.001) increase in antioxidant enzymes like SOD, CAT and GSH, while; exhibited a marked decrease in MDA levels in isolated rat stomach tissues. The results of in vitro, in vivo, and in silico studies supported the anti-inflammatory, anti-oxidant and pronounced gastroprotective effects of β -Citronellol against indomethacin induced gastric ulcer model in rats through mediating COX-I, COX-II, PGE 2, 5-LOX, eNOS and ICAM-1 inflammatory markers.

O-180 /ICAZ -2024

Coumarin an effective remedy for the treatment of Hypertension

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Abstract

Hypertension is augmented by multiple variables including genetic, socio-demographic, and behavioral factors. Coumarin as 2H-1-benzopyran-2-ones, is a flavonoid in nature with multiple health benefits. This is the pioneer study determining the efficacy of coumarin in Hypertension. Hypertension was induced by intraperitoneal injection of L-NAME (185 umol kg -1 i.p.) in Wistar rats. Coumarin at dose of 30 and 70 mg/kg was administered orally from day 8 to 35 of the study. In vivo antihypertensive activity was assessed by measuring the blood pressure using a PowerLab data system. The effects of coumarin on nitric oxide (NO), cyclic guanosine monophosphate (cGMP), interleukin-6 (IL-6), the tumor necrosis factor (TNF-a), and oxidative stress markers were also assessed using kit methods. Administration of Coumarin has significantly reduced blood pressure at the tested dose of 70 mg/kg. Serum levels of NO and cGMP were found to be significantly increased in coumarin-treated groups when compared with only L-NAME-challenged rats. In addition, a marked decrease was noticed in the serum concentrations of proinflammatory cytokines (IL-6 and TNF-α) in coumarin-treated rats. Moreover, coumarin-treated animals showed a noticeable improvement in antioxidant enzymes levels including catalase, superoxide dismutase, and malonaldehyde, and the oxidant status compared to only L-NAME-induced hypertensive rats. The data of real-time polymerase chain reaction (RT-PCR) experiments supported that the antihypertensive and anti-inflammatory activities of the coumarin are possibly mediated through modulation in the mRAN expression of endothelial nitric oxide synthase (eNOS), angiotensin-converting enzyme (ACE), nuclear factor (NF)-kB, and COX-2 gene. This study shares that coumarin possesses an antihypertensive effect mediated through the modulation of the antioxidant, antiinflammatory, and NO/cGMP pathways, thus providing a rationale to the antihypertensive use of coumarin as a naturally occurring plant metabolite which may be considered potential drug lead in future. Key words: Coumarin; Antihypertensive; Antioxidant; NO/cGMP pathway

O-181 /ICAZ -2024

Novel anti arthritic mechanisms of Azelaic acid against CFA-induced arthritis in rats by modulating pro- and anti-inflammatory cytokines network

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Abstract

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An immunologic system attacking the body's own tissues is a hallmark of Autoimmune disorders, which encompass a wide range of unique conditions. Numerous essential biologic functions, including the regulation of the immune system, inflammation, cell division, and tissue repair, are carried out by cytokines. Natural compounds are an effective treatment for autoimmune illnesses by modulation of inflammatory cytokines and infiltration of leukocytes into the inflamed tissue. Here, anti-arthritic study was carried out using oral administration of Azelaic acid (AzA) for 28 days with doses (20, 40, and 80 mg/kg) in Complete Freund's Adjuvant (CFA) induced arthritis model. AzA ameliorated the adjuvant-induced arthritis by decreasing arthritic score, paw volume, improved body-weight alterations and serum levels of PGE2, 5-LOX and anti-ccp. AzA showed significant down regulation of NF-KB, COX-II, TNF-α, IL-17, IL-1β, IL-6, and up regulation of IL4 and IL10. Hemoglobin and RBCs count remarkably increased and ESR, CRP, platelets, WBCs levels markedly reduced in post treatment. In addition, the weakened SOD (superoxide dismutase), Catalase (CAT), Glutathione (GSH) activity and the increased levels of malondialdehyde (MDA) were all reversed by AzA treatment. And showed improved radiographical and histologic alterations in the structure of the joints. Molecular docking studies targeting COX-II, iNOS, TNF-α, 5-LOX, IL4, IL10, IL-6, and IL-17 establish a correlation between theoretical and experimental results. Results showed that AzA inhibit proinflammatory cytokines (COX-II, TNF-α, 5- LOX, IL-17, NF-κB, IL-1β, and IL-6) and increase anti-inflammatory cytokines, which supported the anti-arthritic and immunomodulatory potential of AzA.

O-182/ICAZ-2024

Comparative study of extraction methods and process parameters of polyphenolic content obtained from Celosia cristata flower for herbal sunscreen

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Abstract

The solar spectrum, particularly ultraviolet (UV) radiation poses significant risks to human skin including DNA damage, photo-aging and immunosuppression. Although the widespread use of chemical and synthetic sunscreens to mitigate these effects concerns with their long-term health and environmental impacts. Alternatively, polyphenol based herbal sunscreen provides UV protection with natural antioxidant compounds offers sustainable alternative for skincare The study examined the potential of Celosia cristata as a natural UV protectant by characterizing and extracting polyphenol-rich compounds from the plant. Various extraction techniques were employed, and the extracts were analyzed for total polyphenolic content, total flavonoid content, antioxidant activity and sun protection factor (SPF). The extraction efficiency was optimized using statistical methods including ANOVA and regression analysis. High-performance liquid chromatography (HPLC) was used to identify phenolic compounds, and antimicrobial activity was assessed by measuring the inhibition zones against six bacterial strains. Ultrasonic extraction (UE) yielded the highest extract concentration (9.04%), total polyphenolic content (112.74 GAE mg/mL) and total flavonoid content (578.53 μ g CE/mL) with an SPF value of 35 at a 5% concentration. The UE extract proved to have higher antioxidant activity, with a 49.03% DPPH radical scavenging effect. HPLC analysis identified 11 distinct phenolic compounds and antimicrobial testing shown a significant inhibition zone (15 mm) at a concentration of 50 mg/mL against S. epidermidis.

Keywords: Celosia cristata, Total Polyphenolic Content, Total Flavonoid Content, Antioxidant Activity, Sun Protection Factor (SPF), Ultrasonic Extraction (UE), Solvent Extraction

O-183/ICAZ-2024

Anthelmintic efficacy of Aloe barbadensis and Artemisia absinthium extracts against Fasciola hepatica

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Abstract

Fasciolosis is an emerging and neglected tropical disease (NTD), caused by Fasciola hepatica and F.



gigantica. The present study aimed to evaluate the in vitro anthelminthic potential of Artemisia absinthium and Aloe barbadensis against Fasciola hepatica. The aqueous-methanolic extract was prepared. Efficacy was assessed against both ova and adult stages. Egg hatch test (EHT) was performed at 50 mg/ml to 1.563 mg/ml concentrations of each A. absinthium, and A. barbadensis extract, whereas synthetic drug, albendazole (50 to 1.563 mg/ml) as the positive control, and phosphate buffer saline (PBS) as negative control in a 24-well microtitration plate. The flukicidal efficacy was determined at concentrations of 10%, 20%, and 40% after 5, 10, 20, 40, 80, 160, and 320 minutes of incubation with both extracts, separately, in comparison with albendazole as positive and normal saline as negative control. Results revealed a dose-dependent response of extracts in terms of egg hatching. The percentage of undeveloped eggs at 50 mg/ml was 82.33%, 73.67%, and 88.00% for A. absinthium, A. barbadensis, and albendazole, respectively. The ovicidal efficacy of A. absinthium was relative to the albendazole, whereas A. barbadensis was significantly different (p<0.05) compared to albendazole. The flukicidal efficacy was dose-and time-dependent. A. absinthium showed significant different (p<0.05) 100% mortality at 10 mg within 45 minutes of incubation, than A. barbadensis which showed 100% mortality after 75 minutes at 10 mg. The results showed that both plant extracts have potential anthelmintic efficacy against F. hepatica. Keywords: Fasciolosis, Fasciola hepatica, anthelmintic, phytotherapy, Artemisia absinthium, Aloe barbadensis

O-184/ICAZ - 2024

Anticoccidial efficacy of Syzygium cumini and Trachyspermum ammi against Eimeria zuernii in cattle

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Abstract

Coccidiosis is caused by Eimeria species, a parasitic protozoan that affects the enteric system of livestock. It affects primarily young calves and leads to diarrhea and even death in severe cases. It causes economic losses of about \$400 million worldwide. The present study aimed to investigate the in vitro anticoccidial activity of aqueous and methanolic extracts of the mixture of Syzygium cumini (Jamun) and Trachyspermum ammi (Ajwain) against E. zuernii. The oocysts were isolated with the help of the floating technique after identification by morphometric analysis, and purification by using the sugar floating technique. The sporulation inhibition (SPI) assay was performed in a 24-well microtitration plate by using various concentrations (500 μ g/ml to 15.625 μ g/ml) of the mixture of both plant extracts with two-fold dilution followed by the oocyst incubation. The same concentration of XP-SCOUR (a synthetic drug) as a positive control was used for comparison, and K2Cr2O7 was used as the negative control. The extracts showed a dose-dependent response in terms of the unsporulation of oocysts. The percentage of inhibition of sporulation at 500 μ g/ml was 81.33%, 74%, and 87% for aqueous extract was relative to the synthetic drug, whereas methanolic extract was significantly different (p<0.05) compared to the XP-SCOUR. The results showed that mixture of S. cumini and T. ammi has potential anticoccidial efficacy against E. zuernii. Keywords: Coccidiosis, Eimeria zuernii, anticoccidial activity, phytotherapy, Syzygium cumini, Trachyspermum ammi

O-185/ICAZ-2024

Phytochemicals efficacy against Ascardia galli infection in poultry production systems

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Abstract

Poultry farming is a crucial source of income for small-scale farmers but Ascaridia galli is major enemy of poultry. Due to emergence of drug resistance by anthelmintic drugs, it is necessary to develop plant-based alternative to cope with this global problem. The objective was to evaluate the anthelmintic efficacy of citrus fruits peels (lemon, sweet lemon and orange), Corcuma longa, Allium sativum and their mixture against A. galli. The plants were dried, grounded into powder and was extracted. In vitro anthelmintic efficacy of aqueous extract was evaluated against A. galli. Infected intestines from slaughter houses were collected for isolation of A. galli worms and eggs. For Egg Development Inhibition (EDI) Test, 10% and 20% concentration of each plant extract was prepared and mixed with



Phosphate Buffer Saline (PBS) in test tubes with A. galli eggs. In the Adult Mortality Test (AMT), 10% and 20% concentrations were used against adult A. galli worms for 24 hours. The results revealed that all plants showed anthelmintic activity against A. galli. The mixture's extract (94%) was highly effective on eggs development compared with other extracts (<90%). Similarly, mixture's extract also showed 100% adult mortality after 15 hours compared with other extracts with mortality reaching after 20 hours. So mixture could be used as feed additives to reduce the A. galli infection in poultry. Keywords: Ascaridia galli, Phytochemicals, Poultry, Mixture, Corcuma longa, Allium sativum

O-186/ICAZ-2024

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Abstract

Freshwater fish stocks are being exposed to increasing threats as a result of fisheries and aquaculture practices. Integrating genetic knowledge into fisheries and aquaculture management is becoming increasingly important in order to ensure the sustainability of species. Here, SSR markers are used to evaluate the pattern of genetic variability in Silver Carp populations. The level of genetic diversity in terms of the average allelic richness (Ar), allelic number (Na), number of effective alleles (Nae) and heterozygosity (H) was observed moderate-to-high in the natural populations of Silver Carp. The highest mean values of Na, Ne, Ar and H were found in the Trimmu Headworks populations in comparison to the Marala Headworks, Qadirabad Headworks, Khanki Barrage and Chiniot Bridge populations. The average values of Na, Ar, Ne, Ho and He were from 5.8, 5.75, 3.4597, 0.6103 and 0.6833, respectively were observed in the natural populations of H. molitrix. The average values of expected heterozygosity (He) were higher as compared to the observed heterozygosity (Ho). The values of inbreeding coefficient (FIS) in natural populations were found approximately near to zero indicating very small inbreeding and some values were negative showing outbreeding. On average, the FIS values ranged from -0.0452 to 0.3658 in the examined natural populations of H. molitrix. Four out of 25 tests in natural populations of H. molitrix were found to deviate from Hardy-Weinberg Equilibrium. The pairwise estimates of FST revealed low-to-moderate genetic differentiation between studied populations. The AMOVA revealed that most of the variations were within individuals in wild populations. Analysis of genetic relatedness among all the examined natural populations was estimated by constructing UPGMA dendrogram and STRUCTURE admixture model which predicted that the populations in the same clusters had a close genetic relationship. Genetic information collected from present study will be helpful in genetic monitoring of exploited fish stocks in future, which is essential for genetic integrity of wild populations.

O-187/ICAZ-2024

Identification of Natural Compounds as Inhibitors of Pyruvate Kinase M2 for Cancer Treatment

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Abstract

The reliance of tumor cells on aerobic glycolysis is one of the emerging hallmarks of cancer. Pyruvate kinase M2 (PKM2), an important enzyme of glycolytic pathway, is highly expressed in a number of cancer cells. Tumor cells heavily depend on PKM2 to fulfill their divergent energetic and biosynthetic requirements, suggesting it as novel drug target for cancer therapies. Based on this context, we performed enzymatic-assay-based screening of the in-house phenolic compounds library for the identification of PKM2 inhibitors. This screening identified silibinin, curcumin, resveratrol, and ellagic acid as potential inhibitors of PKM2 with IC50 values of 0.91 μ M, 1.12 μ M, 3.07 μ M, and 4.20 μ M respectively. For the determination of Ki constants and the inhibition type of hit compounds, Lineweaver-Burk graphs were plotted. Silibinin and ellagic acid performed the competitive inhibition of PKM2 with Ki constants of 0.61 μ M and 5.06 μ M, while curcumin and resveratrol were identified as non-competitive inhibitors of PKM2 with Ki constants of 1.20 μ M and 7.34 μ M. The in silico screening of phenolic compounds against three binding sites of PKM2 provided insight into the binding pattern and functionally important amino residues of PKM2. Further, the evaluation of cytotoxicity via MTT assay demonstrated ellagic acid as potent inhibitors of PKM2 to interrogate metabolic reprogramming in cancer cells. This study has also provided the foundation for further research to validate the potential of identified bioactive entities for PKM2 targeted-cancer therapies.

Keywords: enzymatic assay; phytochemicals; pyruvate kinase M2; tumor metabolism.



O-188/ICAZ-2024

Identification of Macrolepiota procera extract as a novel G6PD inhibitor for the treatment of lung cancer

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Abstract

Tumor metabolism, an emerging hallmark of cancer, is characterized by aberrant expression of enzymes from various metabolic pathways including glycolysis and PPP (pentose phosphate pathway). Glucose 6 phosphate dehydrogenase (G6PD) and 6-phosphogluconate dehydrogenase (6PGD), oxidative carboxylases of PPP, have been reported to accomplish different biosynthetic and energy requirements of cancer cells. G6PD and 6PGD have been proposed as potential therapeutic targets for cancer therapy during recent years due to their overexpression in various cancers. Here, we have employed enzymatic assay based screening using in-house G6PD and 6PGD assay protocols for the identification of mushroom extracts which could inhibit G6PD or 6PGD enzymatic activity for implications in cancer therapy. For the fulfillment of the objectives of present study, nine edible mushrooms were subjected to green extraction for preparation of ethanolic extracts. 6xhis-G6PD and pET-28a-h6PGD plasmids were expressed in BL21-DE3 E. coli cells for the expression and purification of protein of interests. Using purified proteins, in house enzymatic assay protocols were established. The preliminary screening identified two extracts (Macrolepiota procera and Terfezia boudieri) as potent and selective G6PD inhibitors, while no extract was found highly active against 6PGD. Further, evaluation of anticancer potential of mushroom extracts against lung cancer cells revealed Macrolepiota procera as potential inhibitor of cancer cell proliferation with IC50 value of 6.18 µg/ml. Finally, screening of M. procera-derived compounds against G6PD via molecular docking has identified paraben, quercetin and syringic acid as virtual hit compounds possessing good binding affinity with G6PD. The result of present study provides novel findings for possible mechanism of action of M. procera extract against A549 via G6PD inhibition suggesting that M. procera might be of therapeutic interest for lung cancer treatment.

Keywords: Edible mushrooms; Glucose 6-phosphate (G6PD); Lung cancer; Macrolepiota procera.

O-189/ICAZ-2023

Green synthesis of zinc-oxide nanoparticles using Achyranthes aspera leaf extract and their potent action against the poultry Pathogens

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Abstract

Nanotechnology is an emerging field worldwide because of its tremendous properties linked to the high surface area to volume ratio, improved pharmacokinetic profile, and targeted drug delivery. In the current study, zinc oxide nanoparticles (ZnONPs) were synthesized from Achyranthes aspera leaf extract, characterized by UV/Visible spectroscopy, XRD, SEM, FTIR, AFM and evaluated for antibacterial efficacy against poultry pathogenic bacterial strains. UV-visible absorption peak was found at 370 nm. XRD showed hexagonal wurtzite structure of ZnONPs while SEM results indicated an average size less than 100 nm with a minimum and maximum size of 28.63 and 61.42 nm, respectively. Further analysis of synthesized nanoparticles by FTIR showed stretching frequency at 3393.14 cm -1, 2830.99 cm -1, 2285.23 cm -1, and 2108.78 cm -1. The antibacterial activity of newly developed nanoparticles was investigated against common poultry pathogens Salmonella gallinarum and Salmonella enteritidis by the disk diffusion method. It showed zones of inhibition with a diameter of 27.6 and 28.8 mm. The minimum inhibitory concentration was 0.39 and 0.195 mg/mL, respectively, which was quite interesting compared to extract zero activity at this concentration. Characterization with different techniques showed a uniform and stable synthesis of ZnONPs. Furthermore, the findings confirm the higher activity of nanoconjugate in comparison to leaf extract and pure drug against pathogenic bacteria.

Keywords: poultry pathogens, green synthesis, Achyranthes aspera, surface characterization, zinc oxide Nanoparticles. O-190/ICAZ-2024

Identification of Lignan Compounds as New 6-Phosphogluconate Dehydrogenase Inhibitors for Lung Cancer Gul Bushra Khan¹, Muhammad Qasim¹, Azhar Rasul², Usman Ali Ashfaq¹

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Abstract

Targeting pentose phosphate pathway (PPP) enzymes has emerged as a promising strategy to combat cancer. 6-Phosphogluconate dehydrogenase (6-PGD), the third critical enzyme of the PPP, catalyzes oxidative decarboxylation of 6-phosphogluconate (6-PG) to produce ribulose-5-phosphate (Ru-5-P) and CO2. Overexpression of 6-PGD has been reported in multiple cancers and is recognized as a potential anticancer drug target. The current study is focused on the utilization of indispensable virtual screening tools for structure-based drug discovery. During the study, 17,000 natural compounds were screened against the 3-phosphoglycerate (3-PG) binding site of 6-PGD through a molecular operating environment (MOE), which revealed 115 inhibitors with higher selectivity and binding affinity. Out of the 115 best-fit compounds within the 6-PGD binding cavity, 15 compounds were selected and optimized through stringent in silico ADMET assessment models that justified the desirable pharmacokinetic, pharmacodynamic and physicochemical profiles of 5 ligands. Further protein-ligand stability assessment through molecular dynamics (MD) simulation illustrated three potential hits, secoisolariciresinol, syringaresinol and cleomiscosin A, with stable confirmation. Moreover, 6-PGD inhibitor validation was performed by an in vitro enzymatic assay using human erythrocytes purified 6-PGD protein and A549 cell lysate protein. The results of the in vitro assays supported the in silico findings. In order to gain insight into the anticancer activity of the aforementioned compounds, they were subjected to CLC-Pred, an in silico cytotoxicity browsing tool, which proved their anticancer activity against several cancer cell lines at Pa > 0.5. Additionally, a confirmation for in silico cytotoxicity was made by 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay for commercially available hits syringaresinol and cleomiscosin A against lung cancer (A549) cells. The results demonstrated that syringaresinol has an IC50 value of 36.9 µg/mL, while cleomiscosin A has an IC50 value of 133 µg/mL. After MTT, flow cytometry analysis confirmed that compounds induced apoptosis in A549 cells in a dose-dependent manner. This study suggested that the respective lignan compounds can serve as lead candidates for lung cancer therapy via 6-PGD inhibition. Furthermore, in vivo experiments need to be conducted to confirm their efficacy.

Keywords: in silico; docking; 6-PGD; natural inhibitors; enzymatic assay; MD simulation

O-191/ICAZ-2024

New Remains of Suidae from the Dhok Pathan Formation, Hasnot, Punjab, Pakistan. Hassan Raza¹*, Muhammad Akbar Khan¹, Shakir Ali²

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Abstract

Middle Siwalik outcrops were exposed to explore the faunal elements of various species. The specimens described in this study have been collected from the Hasnot deposits from the Dhok Pathan Formation, Punjab, Pakistan. The specimens were collected, observed, identified, studied, and compared with the previous data. These rocks are of Late Miocene Early Pliocene age. The collected specimens were identified Propotamochoerus hysudricus and Hippopotamodon sivalense these are medium-sized extinct mammals, that belong to the Suidae family. The collected specimens consist of the upper and lower dentition, such as the upper molar and root of the premolar, lower molars, and posterior lobes of the third molar. The Upper Dhok Pathan Formation comprises orange-brown sandstones with alternate clays and conglomerates.

Keywords: Propotamochoerus, Hippopotamodon, Siwaliks, Dhok Pathan Formation

O-192/ICAZ-2024

Zooplankton Biodiversity's Role in Nutrient Cycling and Stability in Aquaponics

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⁶ Department of Chemistry, Government College Women University, Faisalabad, 38000, Pakistan Abstract

Zooplankton—especially copepods and rotifers—play a crucial role in sustaining water quality and improving nutrient cycling in aquaponic systems. It is well known that rotifers, including Brachionus plicatilis, effectively break down the organic waste that fish create, increasing the bioavailability of vital nutrients like phosphate and nitrogen. In addition to promoting plant growth, this mechanism helps maintain stable nutrient levels, essential for preserving system equilibrium. Tigriopus japonicus is one of the copepods that regulate phytoplankton populations, which is important for maintaining a balanced microbial environment that promotes plant health and reduces toxic algal blooms. Diverse zooplankton communities have been demonstrated in studies to be an efficient way to reduce ammonia toxicity and improve the overall resistance of aquaponic systems to environmental stressors and disease outbreaks. The nutritional makeup of copepods and rotifers, which are high in proteins and important fatty acids, promotes the growth of young fish and raises aquaculture output. The best management practices for zooplankton populations are still lacking, despite their significance. The development of focused ways to increase zooplankton diversity and functioning in aquaponic systems should be the main focus of future research since these tactics have the potential to greatly increase system productivity and support sustainable food production.

Keywords: zooplankton, sustainable food production, biodiversity, copepods, nutrient cycling, rotifers

O-193/ICAZ-2024

Effects of dietary Threonine and Protein on growth performance and carcass traits of white Pekin duck Uzma Maqbool

The Government Sadiq College Women University BWP

Abstract

A 2×12 factorial experiment using 2 proteins (16.99%, 20.1%) and 12 total dietary threonine levels (0.46%, 0.52%, 0.58%, 0.64%, 0.70% and 0.76% of total Thr in low-protein diet and 0.54%, 0.60%, 0.66%, 0.72%, 0.78% and 0.84% of total Thr in High-protein) was conducted to study the effects of dietary threonine and protein on growth performance and carcass traits of white pekin ducks from 1 to 21 days of age. Six hundred and twenty-four 1-day-old white Pekin male ducklings were randomly allocated to 36 pens with 8 birds per pen according to similar pen weight. There were 12 dietary treatments, consisting of six replicate pens. Weight gain, feed intake, and feed/gain of ducks from each pen were measured every week. At 21 days of age, two ducks were selected randomly from each pen, and slaughtered to evaluate the carcass quality. The results showed that in both the high and low-protein diets the threonine supplementation increased the feed intake, weight gain, and feed conversion ratio. Peak weight gain responses appeared in ducks fed the 0.67% and 0.79% threonine in both low and high-protein diets. Thr supplementation significantly affected feed/gain in the 2-3-week period (P≤0.05) and daily feed intake in the 3 weeks (P). Significant responses from Thr supplementation in both the low and high protein diet were observed for the leg meat, breast meat, and gizzard percentages. The optimal requirement of white Pekin ducks from 1 to 21 days of age was 0.00% for breast meat percentages. The results of our experiment are reported herein. Threonine supplementation has an impact on growth and carcass traits. An increase in dietary threonine had a significant impact on feed intake, weight gain, and feed-to-gain ratio during the 1-3-week period in both low and high-protein diets. Threonine supplementation did not have a significant impact on abdominal fat, liver, heart, spleen, and tibia percentages in both low and high-protein diets. However, there was a notable effect on gizzard percentages.

Keywords: Threonine, White Pekin ducks, Growth performance, Carcass traits

O-194/ICAZ-2024

Hemp seeds and its obesity lowering effects

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Abstract

Hemp seeds that are a great source of certain beneficial phyto-chemicals, belongs to the Cannabaceae family. Hemp seed products such as hemp seed oil and other products have been widely used due to the beneficial effects it has on the human body. Numerous researches have shown that the nutrient content in hemp seeds has the potential to lower the chances of lipid accumulation in the body hence preventing certain diseases such as cardiovascular disorders, fatty liver disorder, Alzheimer's disease. In a research conducted, it was shown that the use of ground hemp seeds had a greater beneficial effect as compared to the oil extracted from hemp seeds. Hemp seeds being rich in poly unsaturated





fatty acids have a great potential in lowering the chances for the development of obesity-related disorders. A research on rats showed that supplementing rats with hemp seeds significantly increased antioxidant status in those rats. Another study concluded that cannabis sativa seed flour can be used as a natural anti- obesity agent. Furthermore, it is concluded that hemp seeds can be as a functional food and a valuable source for the prevention certain diseases.

O-195/ICAZ-2024

Viable count and biochemical bacterial identification of raw chicken sold in Gojra

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Abstract

Meat, particularly chicken, is a nutrient-rich food globally consumed due to its excellent protein profile and essential vitamins. However, its perishable nature and microbial contamination pose significant threats to human health and the economy, especially in tropical countries like Pakistan. This study investigated microbial contamination of chicken meat and identified bacterial isolates. Evaluate microbial contamination of chicken meat in Pakistan. Determine potential health risks. Chicken samples (2kg) underwent serial dilution, culturing on nutrient agar, and incubation. Colonies were isolated, differentiated using Gram's staining, and characterized through biochemical tests (methyl red, catalase, indole, urease, and oxidase tests). Five bacterial isolates were identified: Salmonella typhi, Escherichia coli, Bacillus subtilis, Staphylococcus aureus, and Klebsiella pneumoniae. These pathogens are notorious for causing foodborne illnesses and spoilage, posing significant threats to human health and the economy. Contaminated raw meat is a primary source of foodborne diseases in Pakistan. Proper handling, storage, and preservation techniques are crucial to prevent bacterial growth. Regular monitoring and education on safe handling and cooking practices are recommended. The findings emphasize the importance of addressing microbial contamination in chicken meat to prevent foodborne diseases and ensure food safety in Pakistan. Regular monitoring and education on safe handling practices are vital. Keywords: chicken meat, microbial contamination, bacterial isolates, foodborne illnesses, preservation techniques.

O-196/ICAZ-2024

Effect of PENN-DIABEX, a novel polyherbal formulation, in high fat diet streptozotocin-induced diabetic

rats

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Abstract

Diabetes, a chronic metabolic disorder affecting millions worldwide, presents a significant health challenge characterized by impaired glucose regulation and potential complications. This study examines the antidiabetic effects of a polyherbal formulation (PENN-DIABEX) prepared from five different medicinal plant extracts. The objective is to ascertain its efficacy in managing streptozotocin (STZ) induced diabetes in rats. To accomplish this, six distinct groups of rats were involved five with induced diabetes and one serving as a normal control. Among the diabetic groups, one received no treatment, functioning as the diabetic control group. The remaining three groups were administered PHF in three different doses while the 6th group was given metformin. On the last day of the experiment, all rats were sacrificed, and blood samples were taken in collecting tubes to analyze blood biochemical parameters. Additionally, tissue samples from the liver, kidney, and pancreas were preserved in formalin solution for subsequent histopathological activity. The results of the study revealed that treatment with PHF in diabetic rats led to a significant (P < 0.01) improvement in fasting blood glucose levels (FBG), glycated hemoglobin (HbA1c), and various biochemical markers including LFTs, RFTs, and lipid profiling. Furthermore, the histology of the liver, kidney, and pancreas indicated that the formulation did not induce any metabolic toxicity. Comparative analysis of the antidiabetic effects of PHF with those of metformin, revealed that the PHF showed better results than the standard drug. This suggests its potential utilization as a safer and alternative approach in the treatment of diabetes. Keywords: Diabetes; Histopathology; In vivo; PENN-DIABEX; PHF; STZ.

O-197/ICAZ-2024

Risk assessment and toxic effect of heavy metal contamination in avian tissue: Implications for Environmental Health and Cellular Dysfunction





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Abstract

Heavy metals are prevalent environmental contaminants that may accumulate in animals and pose serious threats to ecosystems and human health. One major concern to the environment is heavy metal pollution. Concentrations of Iron, Zinc, lead, in the tissue (feathers) of Domestic geese (Anser anser domesticus), was investigated by using Atomic Absorption Spectrophotometer after chemical digestion of samples collected from different sites of Faisalabad, Punjab, Pakistan. This region is polluted with a number of heavy metals and their derivatives, which have been linked to genetic alterations, biological process disturbances, and health problems including cancer. Mean±SEM (mg/kg) values varied in the order: Fe > Zn > Pb. Iron Mean±SEM values in feathers of Canal park (3.92 ± 0.17720) and Satiana (0.242 ± 0.02538) revealed that Iron was present in higher concentration as compared to other metals. ANOVA was applied for all heavy metals and for all metals the p-value (0.00) is less than 0.05 (p<0.05) indicated statistically significant differences in concentrations of these heavy metals between two sites species. Elevated levels of pollution were found in the data. This research results demonstrated the necessity for additional caution in monitoring the environmental pollution of heavy metals (Zinc and Iron) in Faisalabad.

O-198/ICAZ-2024

An Overview of Aquaponics Systems: Aquaculture Modules

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Abstract

Aquaponics is an integrated production method that uses recirculating aquaculture systems and hydroponics to grow fish and plants in a closed-loop system that mimics natural ecosystems. Simply said, the fish produce nutrient-rich effluent that fertilizes the plants, while the plants filter the water for the fish. Bacteria turn fish waste from the aquaculture portion of the system into dissolved nutrients that plants use to grow in the hydroponic component. This nitrogen removal not only improves water quality for fish, but it also saves water by reducing the quantity of wastewater emitted. The synergistic relationship between fish and plants has led to a widespread belief in aquaponics' sustainability. The technological parameters focus on the structural and functional components of the aquaponics system, environmental management techniques and economic feasibility. The advances in aquaponics technology contribute to more sustainable food systems. As the world's population rises, new techniques of sustainable and efficient food production must emerge to meet society's growing demand. In this article, we're diving into how aquaponics is revolutionizing sustainable agriculture methods and changing the way we grow our food. Keywords: Aquaponics, aquaculture, hydroponics, beneficial bacteria, and sustainable farming.

O-199/ICAZ-2024

Smilax china root extract as a novel Glucose- 6-phosphate dehydrogenase inhibitor for the treatment of hepatocellular carcinoma

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Abstract

A novel therapeutic strategy for cancer treatment is to target altered tumor metabolism. Glucose- 6-phosphate dehydrogenase (G6PD) has been recently discovered to be implicated in apoptosis and angiogenesis, making it an excellent target in cancer treatment. The current study aimed to screen the plant extracts library to find potent hits against G6PD through enzymatic assay. Protein expression was induced by IPTG and purified using Ni-NTA columns after transformation of the pET-24a-HmG6PD plasmid into E. coli BL21-DE3 strain. An enzymatic assay was established by using purified rG6PD protein, for the screening of G6PD inhibitors. Out of 46 plant extracts screened, the sixteen plant extracts have shown inhibitory activity against the G6PD enzyme. At doses from 1 to 4 μ g/ml, this extract demonstrated concentration-dependent inhibition of G6PD with an IC50 value of I.397 μ g/ml. Moreover, the anticancer activity evaluation against HepG2 cells determined Smilax china as a potent inhibitor of cancer cells (IC50 value of 16.017 μ g/ml). The acute and subacute toxicities were not observed in mice with various concentrations (50, 100, 200 and 2000 mg/kg). Furthermore, to identify the compounds from Smilax china as G6PD inhibitors, a literature-based phytochemical investigation of Smilax china was conducted, and sixty compounds were docked against the





NADP+ and G6P binding sites of G6PD. The results of this study showed that three compounds were Scirpusin A, Smilachinin and Daucosterol with MolDock Score of -156.832, -148.215, and -145.733 respectively, against NADP+ binding site of G6PD. Conclusively, Smilax china root extract could be a safer drug candidate for the treatment of hepatocellular carcinoma.

Keywords: Cancer cell metabolism; G6PD, Glucose-6-phosphate dehydrogenase; Glucose- 6- phosphate dehydrogenase; HCC, Hepatocellular carcinoma; Hepatocellular carcinoma; NADPH, Nicotinamide adenine dinucleotide phosphate; NBT, Nitroblue tetrazolium; PMS, Phenazine methosulphate; PPP, Pentose phosphate pathway; Smilax china.

O-200/ICAZ-2024

Assessing the Impact of Plastic Pollution on the Aquatic Ecosystems and Vertebrate Diversity in Freshwater Lakes of Punjab and Coastal Marine Areas near Karachi

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Abstract

Plastic pollution is an increasing global concern, impacting aquatic ecosystems significantly. Plastics, mainly microplastics, are persistent in water bodies, intimidating the health and diversity of vertebrate species such as fish, amphibians, and other marine mammals. This study examines that how plastic pollution affects the vertebrate biodiversity, focusing on correlation between pollution levels and changes in the species populations. The objective of this research is to assess the impact of plastic pollution on the vertebrate diversity in aquatic ecosystems. Our aim is the quantification of plastic contamination and assessment of its relationship with the vertebrate population health, mainly focusing on species diversity and physiological impacts. The study involved sampling from five different aquatic ecosystems, including three freshwater lakes of Punjab and two coastal marine areas in Karachi, each selected on the basis of varying levels of plastic contamination. Water samples were analyzed for plastic concentration, with microplastic particles ranging from 0.5 - 5 mm recorded with an average concentration of 2,000 particles/m³. Vertebrate species were surveyed using the techniques of capture and observation, with a total of 20,000 individuals representing 50 species recognized. We also conducted necropsies on 180 fish and amphibians to evaluate the presence of plastic particles in their digestive systems. Statistical correlation models were used to compare plastic pollution levels with the health and diversity of vertebrate population. Our research found strong negative correlation between the plastic pollution and vertebrate diversity. In areas with the high plastic concentration, vertebrate species diversity reduced by an average of 35%. Of the 180 necropsies conducted, 40% of fish and amphibians had ingested microplastics, with ingestion rates highest in the benthic species. Moreover, population densities of amphibians in the polluted freshwater systems decreased by 28% over a three-year period, while certain fish species experienced a 23% decline in reproduction rates in the areas with high-pollution. Vertebrates those inhabiting coastal zones showed an overall 35% reduction in species abundance compared to low-pollution areas. These results align with the global trends in literature, confirming that plastic pollution has extensive and harmful effects on aquatic vertebrates. The ingestion of microplastics leads to the physiological stress, malnutrition, and also reproductive failure in several species. The alteration in habitat caused by large plastic debris further worsens the decline in biodiversity. This study highlights the critical need for interventions not only in plastic waste management, but also policies focused at reduction in plastic production and promoting recycling. Keywords: plastic pollution, microplastics, aquatic ecosystems, vertebrate diversity, , environmental impact, biodiversity loss.

O-201/ICAZ-2024

Liver flukes as the potential lead bio accumulators: Contribution towards monitoring environmental health

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Abstract

The current study was conducted to assess the potential of liver flukes as bio-indicators of lead (Pb). A total of 400 liver fluke samples were collected from 40 infested livers of goats and cattle slaughtered at the Government slaughter house, Jhal Chakkian and various butcher shops across the Sargodha district. Flame Atomic Absorption Spectroscopy was used to analyze Pb concentrations inside the liver fluke and liver samples. The results revealed mean Pb concentrations of 0.30 and 0.09 ppm in the liver fluke and liver samples respectively. A significant difference was observed in the Pb concentrations of liver fluke and liver samples computed by Wilcoxon sign ranked test. Liver

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flukes absorbed greater Pb concentrations compared to their respective infected livers. Bio-concentration factor (BCF) value for Pb was found to be greater than one (3.65). The comparison of BCF values between goats (3.83) and cattle (3.47) by Mann-Whitney test demonstrated a significant difference (p < 0.005). The liver fluke samples from the goats showed greater ability to absorb Pb from their surroundings compared to cattle. Thus liver flukes have the extraordinary ability to serve as potential bio-markers of Pb pollution in the environment.

O-202/ICAZ-2024

Freshwater Snails as Lead Pollution Bio-indicators: Potential implications in environmental monitoring Ayesha Tariq, Rana Muhammad Ahsan Sajid, Naunain Mehmood, Aima Irum Batool

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Abstract

A field study was carried out to evaluate the bioaccumulation potential of freshwater snail species in Sargodha. The common freshwater snail species Indoplanorbis exustus and Lymnaea acuminata were collected from different freshwater bodies between September and November, 2023. The lead (Pb) accumulation in snail and water samples was evaluated by atomic absorption spectrometry. The mean Pb concentrations were found to be 0.1572, 0.1487 and 0.0344 ppm in I. exustus, L. acuminata and water samples respectively. One-way ANOVA showed significant differences between the mean Pb concentration of both snails and water samples. Additionally, the posthoc Tukey's Honest Significant Difference analysis indicated the presence of significant differences between mean Pb concentration factor (BCF) values of snails showed that both species were good bio-accumulators of Pb with I. exustus having slightly higher mean BCF value of 4.5692 than L. acuminata with 4.3249 mean BCF. Thus, the studied snail species can serve as potential bio-indicators in the environmental monitoring of freshwaters.

O-203/ICAZ-2024

Prevalence of uterine fibroid co-related with various health factors in women of district Mandi Bahauddin Punjab, Pakistan

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Abstract

Uterine fibroids are non-cancerous tumorous symptomatic or asymptomatic growth in the uterus diagnosed clinically in a large number of women of reproductive age. The present study was designed to evaluate the prevalence of uterine fibroid co-related with various health factors in women of district Mandi Bahauddin, Punjab, Pakistan. A questionnaire was designed that covered different parameters like type, stage, size, and number of fibroids in the uterus, the medical history of the patient, and information about symptoms presented by uterine fibroid patients. The findings of the present study showed that a significantly higher number of uterine fibroid patients (78%) were symptomatic as compared to asymptomatic fibroid patients (22%). The prevalence of intramural uterine fibroid (64%) was higher in comparison with sub-mucosal (20%) and subserosal (16%). The incidence of uterine fibroid pervasiveness was significantly associated with various risk factors like age, BMI, hypertension, age at menarche, and diabetes. Fibroid type was associated with symptoms like menstrual irregularities, back pain, and infertility. Sub-mucosal fibroids, which showed that sub-mucosal fibroids pose a threat to the reproductive health and fertility status of females.

O-204/ICAZ-2024

ABO blood group susceptibility to SARS CoV-2 positive patients of District Jhang

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Abstract

December 2019 brought destructive Novel Corona virus which imposed divesting respiratory disorder is caused by a heterogeneous virus which is novel severe respiratory syndrome coronavirus 2 (SARS CoV-2). This research effort is to reveal COVID-19 prevalence in Jhang District of Pakistan which spreads over an area of 6166 square kilometers and comprises of four tehsils such as Ahmad pur sial, Athara Hazari, Jhang and Shorkot. The Jhang

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District is the district of Faisalabad division in the Punjab province of Pakistan. Determination & Declaring COVID-19 Prevalence among ABO Blood group along Rh factor and which type of Blood group are most susceptible to COVID-19. Data of confirmed patients COVID-19 was collected from the Government Hospital of Pakistan as District Headquarter Hospital of Jhang with the confirmation letter that signed by Chief Execute Officer of Jhang Hospital. Contact with patients through their phone numbers and went there where they were stay for the collection of blood samples with medical syringes and use a Questionnaire for patients. Anti-Serum test for detection of what type or group of blood more susceptible to COVID-19 disease was performed using test kit in the lab Microbiology of Zoology Department, Post Graduate College Gojra. Pateints with B+ blood group were found to be most susceptible, and males were disproportionately affected by COVID-19. Age group of 31-40 years had the highest number of patients (165/652, 25.3%). Moreover, Tehsil Jhang recorded the highest rate of COVID-19 cases among four tehsils. *Keywords:* COVID-19, Human health, heamatology, age group, gender

O-205/ICAZ-2024

Assessing the Burden of Cysticercosis and Coenurosis in Small Ruminant Populations of Sargodha: An Epidemiological Investigation

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Abstract

Taenia hydatigena and Taenia multiceps, cause cysticercosis and coenurosis respectively, in small ruminants and sometimes in humans, which serve as their intermediate hosts or accidental hosts. The current study has been designed to examine the omentum and brain of a total of 557 animals including goats (500) and sheep (57) for 6 months (January 2024-June 2024) to determine the prevalence of these diseases. The epidemiological study revealed a 6% and 1.75% prevalence of cysticercosis while 1.80% and 3.50% prevalence of coenurosis in goats and sheep, respectively. Higher prevalence of cysticercosis in females (6.81% goats and 2.63% sheep) compared to males (4.05% goats and 0% sheep). Likewise, females (1.98% in goats and 5.26% in sheep) showed a greater infection of coenurosis than males (1.35% in goats and 0% in sheep). The age group of 1.6-2.5 years exhibited the greatest prevalences of 6.87% and 1.28% of T. hydatigena and T. multiceps, respectively. In goats infected with cysticercosis both multiple cysts (range > 1 - < 10 cysts, 63.3%) and solitary cysts (36.6%) while in infected sheep only solitary cyst was obtained. Concerning cyst size, 58.16% of cysts belonged to medium size (>3cm diameter) category compared to small cyst size (<3cm diameter; 41.83%). The cysts of T. multiceps obtained from the brain of goats (n=9) and sheep (n=2) were all single with an average diameter of 3.08cm and 3.05cm, respectively. The genetic characterization of the obtained cyst isolates was performed using mitochondrial partial cytochrome oxidase subunit 1 (cox1) gene sequences. The Maximum Likelihood phylogenetic tree was constructed and the results indicated a resemblance of both T. hydatigena and T. multiceps with their respective sequences confirming the presence of these species in small ruminants of Sargodha. Improper disposal of infected meat, availability of livestock carcasses to stray dogs, contamination of grazing fields with infected dogs feces, ineffective veterinary control, and local unawareness among local people are crucial factors in diseases control.

O-206/ICAZ-2024

Analyzing the Potential of Prosopis Cinerariain the Mouse Model of Nerve Injury

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Abstract

Peripheral nerve injury (PNI) is a devastating condition with no effective treatment till today. These injuries are among the difficult medical problems that are still awaiting first-line therapy. A variety of plants and plant-derived phytochemicals have been proposed to have therapeutic benefits against a variety of disorders in general, and neuronaldamage in particular. They can provide an indication of hope to those in need. The purpose of this study was todetermine that Prosopis cinerariamay help speed up functional recovery after a sciatic nerve damage in healthy albino mice. Following acclimatization, mice were randomly assigned to one of two groups "control and treatment". An oral dosage of 200mg/kg of the body weight per day was given to the treatment group from the day of nerve crush till the end of the experiment. Muscular grip strength International Brain and Biomedicines Conference (IBBC-



2023)Page 182of 235and the sciatic functional index were used to examine motor functional recovery, while the pinprick and hot plate tests were performed to assess sensory functioning. The glucose levelin the blood was also measured. While TAC and TOS were used to assess oxidative stress in the blood. Histology was carried out for morphometric analysis. Two-way ANOVA was used to evaluate statistical results. Current study results showed that methanolic extract of ProsopisCinerariaimproves muscle function restoration after a peripheral nerve Injury with a statistically significant difference (p<0.05). Further research is needed to discover and characterize active components. *Keywords:* Prosopis Cineraria, Peripheral Nerve Injury, Functional recovery

O-207/ICAZ-2024 sis of Clinical

Assessment of Intracranial Hemorrhage Using CT Imaging: A Retrospective Analysis of Clinical Presentation and Risk Factors

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Abstract

Any bleeding that occurs inside the intracranial vault, which includes the brain parenchyma and adjacent meningeal spaces, is described to as intracranial hemorrhage. A computerized tomography (CT) analysis is used to produce precise pictures of the inside of the body. Computerized tomography (CT) scan uses X-rays and a computer to create detailed images of the inside of the body. For the baseline examination of management of acute stroke symptoms, CT has been the best practice imaging modality. The possibility to detect out hemorrhage is the key diagnostic effect of CT in the acute clinical phase. Since the administration of clot -busting drugs is restricted by a record of intracerebral hemorrhage, precise timely screening of blood is essential. The goal of this review is to assess how CT is used to evaluate intracerebral hemorrhage. This was a retrospective survey done in the Center of Radio diagnosis on one hundred and ten patients, regardless of age group, who had a patient with suspected of intracerebral hemorrhage. Out of 110 individuals with intracerebral hemorrhage, 67 (61%) had male population and 43 (39%) had female population. The primary clinical features included quick onset of bad headache, nausea, slurred speech, spasms, limb weakening, abnormal mental sensorium, and abrupt unconsciousness. The most prevalent risk factor was hyperglycemia, which was present in 62 (56.3%) individuals and high blood pressure was present in 70 patients (63.6%). In 47 (42.7%) of the patients, the cerebral hemisphere was the site of the intracerebral hemorrhage. The thalamic was affected in 24 (21.8%) of the patients. Today, computed tomography is the primary method of preference and is proven to be highly beneficial in identifying intracranial hemorrhage. It plays a big role in patient safety by identifying the appropriate course of therapy, keywords: Intracranial Hemorrhage, CT scan, neuroimaging

O-208/ICAZ-2024

Effect of maternal health and other socioeconomic factors on infant birth weight in the rural areas of district Mianwali

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Abstract

Low birth weight (LBW) is defined by the WHO as the first weight of an offspring that is less than 2.5 kg, which is considered the most important indicator of child mortality and future health outcomes. This study was designed to evaluate the possible maternal factors that may affect the child's birth weight. From a rural area of district Mianwali, Pakistan, data was collected through a questionnaire from September 2016 to February 2017. The sample was comprised of 140 mothers; 70 were enrolled as control (having a child with a normal birth weight) and 70 as cases (having a birth weight less than 2.5 kg). Statistical analysis revealed that maternal factors such as maternal age, gestational age, nutritional status, maternal education, and maternal anemia were significantly associated with low birth weight. Whereas factors like maternal height, weight, father age, father health status, child gender, loss of pregnancy, maternal residence, family setup, use of tobacco, maternal workload, leucorrhea, premature membrane rupture, pattern of menstruation before pregnancy, mode of delivery, and blood group have no considerable association with infants birth weight. So it can be concluded that teen pregnancy, low nutritional status, illiteracy, anemia, and low gestational age were the main reasons that adversely affected the weight of newborns.

O-209/ICAZ-2024

Evaluation of Frequency of Acinetobacter baumannii from Surgical Site Infections and Assessment of Multiple Antibiotic Resistance (MAR) Index





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Abstract

Acinetobacter baumannii is a clinically significant gram-negative bacterium commonly associated with hospital-acquired infections, posing a serious threat to healthcare settings globally. This research was aimed to investigate the frequency and antimicrobial susceptibility patterns of A. baumannii from surgical site infections (SSI). The study was conducted from February 2022 to August 2022. In total, 165 surgical wound samples were collected, and subjected to microbial analysis. Samples included blood, pus, catheter tip, suction tip, endotracheal tube. Bacterial isolations were made from 33 samples, whereas 132 samples were negative for bacterial culture. Identification of A. baumannii was done by biochemical testing and API 20E/NE. Among 33 bacterial isolates, 09 (27.27%) were identified as A. baumannii. Out of 09 clinical isolates of A. baumannii, 05 (41.6%) were from catheter tip, 01 (8.33%) was isolated from blood, 02(16.66%) from suction tip and 01 (16.66%) was isolated from pus swab. Antibiotic sensitivity and resistance profiling was done, followed by calculation of multiple antibiotic resistance (MAR) index. It was found that 01/09 isolates had shown MAR 01 (resistance to all antibiotics tested) rest of all A. baumannii isolates had MAR index greater than 0.2. Infection control strategies and selective antibiotic use is need of hour to culminate threat of antibiotic resistance organisms.

Keywords: Acinetobacter baumannii, Surgical site infections, Antibiotic resistance, Multiple antibiotic resistance index

O-210/ICAZ-2024

Unleashing the Therapeutic Potential of Nigella sativa Extract-Funtionalized Silver Nanoparticles Against Lead Induced Hepatorenal Toxicity in Albino Mice.

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Abstract:

Lead is one of the naturally occurring toxic heavy metal found in the Earth's crust. Its extensive use has led to substantial environmental contamination, human exposures and adverse health impacts across many regions worldwide. Lead is extremely toxic, particularly in children, causing learning, developmental, and behavioral problems. It enters the body through different sources like contaminated water, lead-based paint etc. The study focuses on the lethal effects of lead exposure on the liver (hepatotoxicity) and kidney (nephrotoxicity) in mice, as well as the potential protective effects of Nigella sativa (black cumin) and its green synthesized silver nanoparticles. The research revealed noteworthy variations in hematological parameters between negative control and lead-exposed groups, including changes in the haemoglobin, red and white blood cell types. Furthermore, the histopathological analysis revealed that the lead exposure caused major damage to the kidney architecture, including the expansion of glomerulus, deterioration of Bowman's capsule, and enlargement of kidney tubules. In the liver, toxic effects of lead caused disorganization of hepatic cords, sinusoidal enlargement, and degeneration of hepatocyte. Moreover, the groups which received doses of extract and silver nanoparticles of Nigella sativa showed amelioration against the lead induced nephrotoxicity and hepatotoxicity. As a result, it was concluded that the plant Nigella sativa and the derived nanoparticles have strong hepato-protective and nephro-protective effects against lead induced toxicity.

Keywords: Nigella sativa, Silver nanoparticles, Lead intoxication, Kidney damage, Liver damage, Histopathology.

O-211/ICAZ-2024

An Extensive Examination of the Warning Signs, Symptoms, Diagnosis, Current understanding for Lumpy Skin Disease

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Abstract

Live stock is a major contributor of every country's GDP, Pakistan's GDP is also based on livestock in agriculture sector, and it contributes almost 60% in the economy of agriculture sector's GDP and 11% in the nations GDP (Pakistan Bureau of Statistics 2024). Pakistan, being an agriculture country, also domesticates animals for

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fulfilling needs of meat, milk and leather. At present, the country has a large livestock population which includes over 60 million cattle, 30 million buffalo, 25 million sheep, 20 million goats and 1.5 million camels. Besides this, animals are always at risk of being infected by any pathogen, Lumpy Skin Disease (LSD) is also such a transboundary disease affecting and infecting both cattle and buffalo in Pakistan, with first case reported in Khyber Pakhtonkhwa in 2021 then spread to Puniab and Sindh. Lumpy Skin Disease Virus is responsible for the disease which belongs to pox family, transmitted through vector, indirect and direct contact with infected animal, nasal and oral secretions, milk, artificial insemination, nodular communication and contaminated water which primarily affects lymphatic system of the cattle. This results in swelling of the lymph nodes, formation of nodular lesions diameter measuring between 2-5 cm. Moreover, lesions may proliferate to various parts of the body including; teats, legs, reproductive parts, head, and neck. Once animals catches this virus, they may counter variety of symptoms; fever, reduction in milk production, increased salivation, loss of appetite, lethargy, weight loss, corneal and nasal discharge. During the study of 15 blood samples, 06 skin scabs and 06 nasal swabs, of LSD suspected cattle and data was obtained through already designed proforma. Susceptible samples were analyzed using PCR and Gel electrophoresis for genomic study. Its findings suggested that LSDV shares phylogenetic relations with Chinese and Russian strains. Two important and successful methods for preventing and managing the disease are immunization and animals restricted movement. Although due care may be taken in the absence of vaccination. The aim of this study was to gather symptomatic, epidemic, effective diagnostic techniques and treatment methods along with prevention of LSD while investigating any potential future approaches and methods. Keywords: Lumpy skin Disease, Lumpy Skin Disease Virus, Vector, Prevention, Vaccination.

O-212/ICAZ-2024

Role of dietary bifidobacteria on gut microbiota and growth performance in *Labeo rohita*

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Abstract

Fish culture effectively uses nutrients to increase fish production per unit area. Present study evaluated role of Bifidobacteria on the gut microbiota and growth performance in Rohu (Labeo rohita) in aquaculture. Changing the intestinal microbiome improve fish health and lower infection rates. The research was conducted for two months. Freshwater pond Rohu split into experimental (T1) and control (T0) groups. The experimental group given 2% dietary bifidobacteria in powdered form according to bodyweight of fish twice a day, while the control group was fed a 40% basal diet at 2% body weight of fish. The gut flora and growth characteristics were observed by using paired t-test. Both the treatment were significantly different. Thus, the results showed maximum number of colonies in experimental group fed with dietary bifidobacteria. Experimental group (T1) was resulted in significantly (p<0.05) higher LG (1.26\pm0.19), WG (0.76\pm0.19) and SGR (10.94\pm7.53) then the control group (T0) which resulted in lower LG (1.15\pm0.15), WG (0.27\pm0.05) and SGR (2.47\pm2.10). It was also observe that T1 was higher in FCR (0.85\pm0.19) then T0 (0.43\pm0.08). Therefore, dietary bifidobacteria proved a potential probiotic feed that yields positive results in improving fish's gut microbiota and growth.

O-213/CAZ-2024

Effect of Green tea extract on reproductive toxicity induced by Chlorpyrifos in male mice

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Abstract

Chlorpyrifos (CPF) is one of the organophosphate pesticides, mainly used in agricultural fields globally. CPF exposed organisms showed inhibition of acetylcholinesterase (AChE) activity, disrupting physiological and biochemical processes, including reproduction. This study aimed to assess CPF-induced reproductive toxicity in male mice and the protective effect of green tea against CPF toxicity. Mice were divided into four groups: Control (I), GT group (II) received 20 mg/kg GT extract, CPF group (III) given 25 mg/kg CPF, and CPF + GT group (IV) received 25 mg/kg CPF followed by 20 mg/kg GT extract (2 hours later) via gavage. Doses were administered for 28 days, after which mice were euthanized, and blood samples or reproductive organs were collected. Results revealed that

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CPF group showed significant reductions in body and organ weight, testosterone levels, sperm count, seminiferous tubules (ST) parameters (average cross sectional area (ACSA), germinal epithelium height, lumen of ST) spermatogenic and Leydig cell counts. Epididymis (caput, corpus and cauda) parameters (ACSA, lumen and epithelial height of epididymal tubules) and vas deferens histology(diameter, lumen, epithelial height, and muscular thickness) were also reduced as compared to the control and GT groups. In CPF + GT group, significant recovery was observed in all reproductive parameters. GT group also showed positive effects across all parameters. The study demonstrated that green tea mitigated CPF toxicity due to its health-promoting properties.

O-214/ICAZ-2024

Changes in Catalase and Superoxide-dismutase Activity in Cirrhinus Mrigala Exposed to Trimethoprim

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Abstract

Aquatic bodies are brutally contaminated due to the excessive use and consequent release of antibiotics in them which severely effects the aquatic fauna specially fish species. This research was performed to determine the changes in antioxidant enzyme activities after exposure to trimethoprim an antibiotic in Cirrhinus mrigala. The trial was conducted in two phases acute and chronic. Different concentrations of trimethoprim was given to fish samples to determine the LC50 and lethal concentrations. LC50 of trimethoprim for C. mrigala was recorded as 65.73 ± 16.26 µgL-1, whereas the lethal concentration of trimethoprim was 120.102±39.78 µgL-1. After determination of LC50 and lethal concentration values the treatment groups were expose to sub lethal concentrations of LC50 for 75 days. Fish samples were taken at regular intervals (15, 30, 45, 60 and 75 days) and variations in the activities of catalase (CAT) and superoxide dismutase (SOD) were observed. Data obtained statistically by using ANOVA was significant. Comparison between means were determined by Tukey's test. The results indicated that during the first fortnight of chronic testing, activity of CAT and SOD was maximum but gradually their activity decrease with the increase in concentration and duration of exposure. In conclusion, antibiotics including trimethoprim are damaging for fish populations.

Keywords: Cirrhinus mrigala, Antibiotics, Trimethoprim, Antioxidant enzyme activities

O-215/ICAZ-2024

Changes in Superoxide-dismutase and Glutathione-s-transferase Activities in Ctenopharygdon idella Exposed to Sulfamethazine

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Abstract

Antibiotics, used for both human and animal disease management, constituted an important class of environmental contaminants. Antibiotics are instantly discharged into aquatic environment and particularly damaging the non-targeted species. In this study, the effects of sulfamethazine (SMZ) on the antioxidant enzymes (Superoxide-dismutase (SOD) and Glutathione-s-transferase (GST)) of Ctenopharengdon idella was analyzed. Fish samples were taken from the Satayana Road Hatchery in Faisalabad and acclimatized in for two weeks. To determine the 96-hr LC50 and lethal concentration value, fish was exposed to different concentrations of SMZ. There were control and treatment groups and each group were further have three replicates. All treatment groups were expose to sub-lethal concentrations of LC50 of SMZ for 75 days. Fish samples were taken at regular intervals for the assessment of antioxidant enzyme activity in different organs. The physio-chemical parameters were also maintained during the whole experiment. The findings revealed a substantial elevation in the liver's SOD and GST activity with the escalation of antibiotic concentration. With the progressive increase in antibiotic concentration, there was a notable decline observed in the levels of SOD and GST in the gills. The peak activity was recorded after 96 hours. Results concluded that exposure of C. idella to various concentrations of antibiotics leads to significant alterations in the activity of antioxidant enzymes. Variations in antioxidant enzyme activity may serve as an appropriate biomarker for the investigation of antibiotics toxic effects.

Keywords: Ctenopharengdon idella, Sulfamethazine, Superoxide-dismutase, Glutathione-s-transferase

O-216/ICAZ-2024

Anti-bacterial potential of bacteriocin isolated from Lactobacillus plantarum against selected bacterial strains





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Abstract

Bacteriocins act as natural food preservatives. Bacteriocins are chemical-free food preservatives. They are present in both bacteria either Gram-positive Gram-negative. Bacteriocin destroy receptors on cell surfaces. For current studies Lactobacillus plantarum was isolated from cheese by serial dilutions and grown on nutri ent agar served as source of bacteriocin. Agar well diffusion assay was used to study antibacterial activity against Escherichia coli, Bacillus subtilis, Bacillus cerus and Staphylococcus aureus. The zone of inhibition was measured to track antibacterial activity. Different range of temperature (400C, 600C, 800C, 1000C and 1200C), pH (3, 5, 7, 9 and 11) and concentrations (25mg/ml, 50mg/ml, 75mg/ml, 100mg/ml) of bacteriocin were investigated in relation to cell free supernatant (CFS) activity. Bacteriocin showed maximum antibacterial effect against B. cerus at 400C which is 2.53±0.15 and against S. aureus at pH 3 as 2.57±0.15 and B. cerus at concentration 100mg/ml which is 2.67±0.06. On the other hand, minimum antibacterial effect was shown by bacteriocin against E. coli at 1200C as 1.87±0.06 and no effect was shown by bacteriocin at pH 11. At 25mg/ml concentration bacteriocin showed minimum antibacterial effect against B. cerus which is 0.93±0.15. Bacteriocin's heat stability makes it possible for the food industry to employ it as preservative of food and to prevent poisoning caused by B. cereus and other pathogenic strains. The action of bacteriocin was compared with antibiotic Amoxil (500mg) as a positive control. Mean values for zone of inhibition for variables under study were compared using one way ANOVA.

Keywords: bacteriocin, gram positive bacteria, gram negative bacteria, ANOVA



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O-217/ICAZ-2024 Exploring the Impact of Mosquito Repellent Coils on Earthworm Burrowing Behaviour and Its Direct Implications for Human Health

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Abstract

This study investigates the effects of mosquito repellent coil smoke, specifically pyrethroids, on the burrowing behavior of earthworms, which play a critical role in maintaining soil health. Using two species, Eisenia fetida (Red wiggler) and Lumbricus terrestris (Common earthworm), we conducted experiments where earthworms were exposed to increasing durations of coil smoke, ranging from 2 to 16 minutes over four days, measuring the time taken for them to burrow into the soil afterward. Results revealed that longer exposure times correlated with slower burrowing rates, larger cast sizes, and reduced slime production, indicating alterations in metabolic activity; however, no significant mortality or severe detrimental effects were observed, suggesting a degree of resilience among the earthworms. The implications for human health are noteworthy, as earthworms share physiological and genetic similarities with humans, raising concerns that if mosquito repellent smoke impacts earthworm behavior, it could also pose risks to human health through similar biochemical pathways. Exposure to pyrethroids is associated with respiratory issues and other health complications, particularly for individuals with pre-existing conditions. Additionally, compromised earthworm activity could lead to soil degradation, affecting nutrient cycling and agricultural productivity, resulting in crops with reduced nutritional value or potential contamination, thereby impacting human diets and health. Overall, this research highlights the need for careful evaluation of mosquito control measures to prevent unintended harm to both non-target organisms and human health.

O-218/ICAZ-2024

Assessment of Allium sativum as a feed supplement on Growth performance of broiler chicken in different

seasons

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Abstract

Poultry industry is flourishing as a largest agro based business in Pakistan and it is making a tremendous contribution in bridging the gap between supply and demand of meat protein. Antibiotics offer benefits against poultry diseases but may inhibit immune systems and harm bird flora. So, in poultry there is need to move towards natural products like garlic due to their antibacterial, antiviral, antifungal, and antiprotozoal properties. The present study is designed to evaluate the impact of garlic supplementation and seasons on broiler chicken growth performance, carcass characteristics, hematological parameters and Antibody Titers. The experimental study was carried out in winter and summer season to see the effect of garlic on the growth of broiler chickens. A one day old 50 broiler chicks were purchased and categorized in five groups for 35 days, with different feeds. Each group comprised of 10 birds. Blood samples were collected to analyze hematological parameters. While, carcass characteristics, and body weight were also monitored. Hematological tests and carcass characteristics were conducted at 35 days. The study revealed that garlic significantly improves broiler chicken growth performance, reducing feed intake and FCR values, improving body weight and carcass characteristics, and reducing blood glucose, cholesterol, LDL, and Triglyceride values. Significant differences were observed in serum parameters between the groups, indicating potential benefits. It was concluded garlic has growth promotion potential particularly in water fed group without producing negative consequences.

Keywords: Poultry, Carcass characteristics, Hematological parameters, Antibody Titers

O-219/ICAZ-2024

Evidence based therapeutic potential of "Ishkeen" for treatment of diabetes using diet based diabetic model in rats

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Abstract

Berberis brandisiana Ahrendt (Ishkeen, Shugloo) belongs to Berberidaceae family is dicotyledonous shrub



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traditionally used in various disorders like diabetes, arthritis, kidney stones, liver problems, wounds, infections, tumors, leucorrhoea, swellings. It is enriched with alkaloids, phenolics and flavonoids like berbamine, berberine, chlorigenic acid, gallic acid, quercetin, p- coumaric acid, ferulic acid, benzoic acid, m- coumaric acid. Its efficacy in preventing high fructose diet-induced diabetes has not yet been assessed. This study aims to investigate potential efficacy of HMEBB by using high fructose diet (HFR-Diet) fed diabetic rats. Male Wister rats were given high fructose diet (60%) for 8 weeks and oral doses of HMEBB (150 and 300 mg/kg) were administered for 6 weeks. After 14th weeks of study, HMEBB (150 and 300 mg/kg) treated groups exhibited significant decrease in FBG level, modified serum albumin, lipid profile and uric acid levels and significantly (p< 0.001) modulated HbA1c, serum insulin, uric acid, eNOS, bilirubin level, lipid profile, electrolytes level as compared to only HFR-Diet exposed diabetic rats. Moreover, HMEBB (150 and 300 mg/kg) treated animals demonstrated cellular architecture preservation by modulation of TNF- α , IL-6, adiponectin, leptin and levels of SOD, CAT and MDA significantly improved. Tissue architecture of pancreas, liver, kidney, heart and aorta was restored in histopathological study. Whereas, HMEBB (150 and 300 mg/kg) revealed up regulation of candidate genes thus exhibited notable results in treatment of diabetes, dyslipidemia and declined inflammation in HFR-Diet fed diabetic rats.

Keywords: Berberis brandisiana, Adipokines, Glucose transporter- 5, Ketohexokinase

ent for hypertension, but their effectiveness and adverse effects call for other treatments. The extract from Ribes orientale is examined in this study as a possible diuretic. Rats loaded with saline and given dosages of 12.5, 25, and 50 mg/kg of Ribes orientale extract and fractions had their acute and sustained diuretic activity assessed. The findings show a strong diuretic impact at 50 mg/kg, similar to furosemide, with minimal kaliuresis and considerable natriuresis. This impact could be attributed to the cholinergic pathway. The safety evaluations of Ribes orientale at 50 mg/kg were validated by haematological, renal function, and histopathology studies. Furthermore, Ribes orientale decreased oxidative stress, raised local bradykinin availability, and downregulated aldosterone. According to this study, Ribes orientale may have significant diuretic effects. Therefore, more research is necessary to determine the precise mechanism of action and clinical usefulness of this plant as a diuretic.

O-221/ICAZ-2024

Investigating the in vitro antibiofilm, antioxidant and photocatalytic potential of iron oxide nanoparticles biofabricated from Bauhinia variegata

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² Department of Bioinformatics and Biotechnology, Government College University, Faisalabad, Pakistan Abstract

Emergence of multidrug resistant (MDR) bacteria is the major challenge of current era in terms of treatment of diseases and infections. Limited treatment options paved the way to develop novel strategies designed to lessen health burden posed by these resistant pathogens. The metal-oxide nanoparticles, synthesized by green route are gaining interests due to their extensive applications and better effectiveness. In the present study, iron oxide (FeO) nanoparticles were synthesized through green approach using aqueous leaf extract of Bauhinia variegata L. and were then characterized through several techniques where UV-Visible spectrophotometry showed absorbance peak at 295 nm. Fourier transform infra-red (FTIR) spectrum revealed the presence of different functional groups. The antibacterial potential was seen against multi drug resistant A. baumannii, E. coli, K. pneumoniae, P. aeruginosa, E. faecium and S. aureus where maximum inhibitory zone $(25 \pm 1.54 \text{ mm})$ was achieved for E. coli while the minimum (22±1.156 mm) was seen for S. aureus. Biofilm formation and slime production was also inhibited and it was found that at the highest tested concentration of nanoparticles, there was 69.77-79 % inhibition of biofilms. In vitro antioxidant activity assays showed the maximum radical scavenging activity of 89.09 ± 2.983 for DPPH, $74.17 \pm 1.29\%$ for ABTS and 78.86 ± 3.06% for H2O2. The photocatalytic activity, determined via Congo red dye degradation, showed 89% of dye degradation for these nanoparticles. FeO nanoparticles revealed a proficient way for their biomedical and environmental applications because of their exceptional antibacterial, antibiofilm, antioxidant and photocatalytic actions.

Keywords: Antibacterial, Antioxidant, Biofilm inhibition, Dye degradation, Iron oxide nanoparticles

O-222/ICAZ-2024

Identification of novel mutations and In-Silico analysis of MCPH1 gene in Pakistani family with microcephaly

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Abstract

Primary microcephaly (MCPH) is a congenital, static, and non-progressive neurodevelopmental disorder associated with reduced head circumference (< 4 standard deviations). About 28 known genes are associated with the MCPH. The study was carried out to probe molecular basis and genetic variants involved with MCPH in an affected Pakistani family to better understand the etiology and prevalence of the disorder. The individuals of the ascertained Pakistani family presented primary microcephaly, along with intellectual disability, speech disorder, and motor delay. By ensuring ethical compliance and patient consent, blood samples were collected from affected individuals. DNA was extracted using the salting out method followed by whole-exome sequencing and Sanger sequencing to identify causative genetic variants or mutations. In silico studies were performed to predict the effect of mutations on the structure of target proteins. Two missense allelic variants (NM_024596.5: c.139G>C and NM_024596.5: c.211G>C) of MCPH1 gene were detected in a Pakistani family. In silico analysis was performed to evaluate the effect of the mutant protein. The mutation in genes affects the activities of proteins NM 024596: p. Val47Leu and NM 024596: p. Val71Leu respectively by disruption in protein structure. The mutations were predicted to have higher pathogenicity scores and have significantly influenced the prevalence of MCPH. We reported two novel genetic variants for the first time from the Pakistani population causing MCPH. Mutations in MCPH1 gene are one of the major causes of MCPH in the populations where consanguine marriages are common. The novel mutations identified in this study will help to understand the etiology of the disorder and the mechanisms of mutated proteins.

Keywords: primary microcephaly, MCPH1, exome mapping, mutation, proteins, in silico.

O-223/ICAZ-2024

Effect of Zinc oxide nanoparticles on the post thaw quality of cryopreserved sperm of Columba livia domestica

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Abstract

Zinc oxide nanoparticles (ZnONPs) improve sperm quality during cryopreservation, enhance post-thaw viability, and boost artificial insemination efficiency. Pigeons (Columba livia domestica), threatened by habitat loss and disease, benefit from ZnONPs, which reduce oxidative damage and preserve sperm functionality. This study evaluated pigeon semen cryopreserved with a Lake extender containing glycerol and varying doses of ZnONPs. Semen from ten male pigeons was pooled, diluted, and divided into groups with ZnO (50, 100, 200 μ g/mL) and ZnONPs (50, 100, 200 μ g/mL), alongside a control without nanoparticles. After freezing and storing for a month, sperm motility, plasma membrane integrity (PMI), and acrosomal integrity were assessed using phase contrast microscopy, the hypo-osmotic swelling test, and Giemsa staining. Statistical analysis showed ZnONP 100 μ g/mL had the highest pre-freeze motility (86.33±1.53%) and post-thaw motility (89±1%). It also exhibited superior PMI and acrosomal integrity both before and after freezing. These results indicate ZnONP 100 μ g/mL significantly improves semen quality during cryopreservation, mitigating cryodamage and oxidative stress, thus enhancing reproductive techniques in pigeons. However, further studies are needed to assess long-term toxicity and optimal concentrations.

O-224/ICAZ-2024

Role of rs1042522G>A/C/T(TP53) in liver cancer

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Abstract

Liver malignancy is a principal cause of tumor-associated deaths international. Genetic factors, particularly polymorphisms in the TP53 tumour Inhibitor gene, play a crucial role in tumor susceptibility. This study investigates the association between TP53 rs1042522 polymorphisms and liver tumor, focusing on demographic variables such as age, gender, and smoking status. A case-control study was conducted with 150 liver tumor patients and 150 healthy



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peoples. Genomic DNA was extracted from blood samples, and TP53 rs1042522 polymorphisms were identified using polymerase chain reaction (PCR) and sequencing. Statistical investigates remained achieved to regulate the association amongst TP53 polymorphisms and liver tumor danger, adjusted for age, gender, and smoking status. The AG genetic constitution of TP53 rs1042522 was significantly associated with an increased danger of liver tumor across various demographic groups. In individuals aged 48 years or younger, the AG genetic constitution presented a more than three-fold increased risk (OR=3.244, 95% CI: 1.776-5.95, p=0.0001). Conversely, the GG genetic constitution was protective in individuals aged 48 years and older (OR=0.363, 95% CI: 0.26-0.86, p=0.0009). Gender-main analysis revealed a significant association between the AG genetic constitution and liver tumor danger in males (OR=2.158, 95% CI: 1.199-3.886, p=0.0103), while no significant association was observed in females. Smokers with the AG genetic constitution had a nearly three-fold increased danger (OR=2.803, 95% CI: 1.576-4.986, p=0.0005), whereas non-smokers with the GG genetic constitution had a reduced danger (OR=0.459, 95% CI: 0.2496-0.8452, p=0.0124). This study highlights the significant role of TP53 rs1042522 polymorphisms in liver tumor susceptibility, influenced by age, gender, and smoking status. The findings emphasize the importance of genetic screening and personalized prevention strategies at high-risk populations. Further research is required to explore the molecular mechanisms fundamental these associations and to develop targeted interventions for liver tumor prevention and management. Keywords: TP53, rs1042522, liver tumor, polymorphism, genetic susceptibility, age, gender, smoking status

O-225/ICAZ-2024

Therapeutic applications of Nigella sativa formulations on arthritis in mice

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Abstract

Rheumatoid arthritis (RA) is multifactorial, chronic, autoimmune disease affecting 0.5–1.0% of the population worldwide. The current research investigates the anti-arthritic potential of Nigella sativa (NS) against FCA induced RA. Swiss albino mice was injected with FCA in sub-plantar region of foot pad. Disease induction was confirmed at day 17 by biochemical (increased level of CRP, RF, Anti-CCP2, TNF-α and decreased level of IL-10 as compared to healthy control group), histological (cartilage and bone erosion, synovitis, matrix and joint destruction in comparison to control group) and radiographic analysis (soft tissue swelling, hyperostosis, edema, periarticular bone erosion in contrast to control group). RA induced groups were furthur treated with Nigella sativa extract (dose 400mg/kg orally), Nigella sativa conjugated silver nanoparticles (NSNP) (dose 400mg/kg) and Methotrexate (0.5mg/kg) for 43 days. At the end of the trial at day 60, anti-arthritic potential was assessed by biochemical, histological and radiographic analysis. NSNP showed most favourable results among all treatment groups by significantly alleviating the levels of RF (7.1±0.2), Anti-CCP2 (16.00±0.71), CRP (5.1±0.3), PGE2 (42.0±1.4), TNF- α (33.0±1.8), IL-6 (16.0±0.7), IL-1 β (299.8±3.7), MDA (5.6±0.2), WBC (6.65±0.17) and platelets (1399.24±8.39) as compared to FCA (disease control) group. Simultaneously, NSNP shows significant increase in the levels of IL-10 (27.2±1.2), CAT (164.00±2.07), SOD (118.2±4.2), GSH (3.16±0.12), RBCs (7.68±0.23) and Haemoglobin (11.7±0.2) as compared to FCA (disease control) group. Histopathological and radiographic analysis also showed alteration in tibiotarsal joint architecture in FCA treated group, which restores most significantly in NSNP treated group among all other groups. Thus, NSNP serves as a promising treatment for RA and enhanced the anti-inflammatory, antioxidant and anti-arthritic potential of Nigella sativa, thus significantly ameliorate RA symptoms effectively.

Keywords: Rheumatoid arthritis, Freunds complete adjuvant, Nigella sativa, Silver nanoparticles, Methotrexate, Biochemical analysis, Histopathology, Radiography.

O-226/ICAZ-2024

Evaluation of Antioxidant, Antimicrobial and in vivo Wound Healing Activities of AgZnO Nanoparticles Synthesized using Citrus limon Peel Extract

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Abstract

Lemon, scientifically known as Citrus limon (Rutaceae), is an important medicinal plant utilized mostly for



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its alkaloids. Citrus flavonoids exhibit strong antibacterial, antidiabetic, antifungal, anticancer and antiviral activities. Flavonoids can alter enzyme activities, restrict cell proliferation, and act as direct antioxidants and free radical scavengers. The present study's objective was to evaluate the antioxidant, antibacterial, and in vivo wound healing properties of AgZnO NPs made using a practical green chemistry technique with Citrus limon extract as a capping agent. The physicochemical characteristics of AgZnO NPs were investigated using UV-vis, FTIR, SEM, EDX, and XRD to ascertain their structural properties. The antioxidant activity was calculated by DPPH free radical scavenging assay and FRAP assay. Ascorbic acid was served as standard for both assays. Results showed that the AgZnO NPs have high antioxidant activity than standard ascorbic acid. To evaluate the antibacterial activity of AgZnO NPs, Ciprofloxacin and Cifixime were employed as positive controls against five different bacterial strains. Among these strains, the highest inhibition zone 13±1.8 mm was observed against Staphylococcus aureus with concentration of 100 µl AgZnO NPs. In vitro cytotoxicity was done to calculate the percentage of viable cells by using the HepG2 cell lines. Results showed that AgZnO NPs displayed 20% viability against cancerous cells. For the evaluation of in vivo wound healing activity, different formulations of nanoparticles loaded carbopol gel were prepared and the evaluation of these formulations was done by physical examination (color, homogeneity, and pH). Additionally, rats were categorized into four groups for in vivo study and six rats were assigned to each group. Results showed that wound healing in rats treated with 1.5% AgZnO NPs gel formulation was significant rather than control. Histopathological investigations were conducted to assess fibrosis progression on the skin of rats on the 10th day, focusing on the observation of fibroblast and macrophage distribution to determine the extent of spread. Bimetallic AgZnO nanoparticles were anticipated to possess antioxidant, antibacterial and wound healing properties. The findings of this study have the potential to contribute to the development of novel therapeutic interventions and provide insights into the application of green chemistry approaches in the production of nanoparticles.

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Ecofriendly Synthesis of Magnetic Composites Loaded on Rice Husks for Acid Blue 25 Decontamination: Adsorption Kinetics, Thermodynamics, and Isotherms

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Abstract

Addressing the growing need for methods for ecofriendly dve removal from aqueous media, this study explores the potential of rice husks coated with iron oxide (Fe2O3@RH composites) for efficient Acid Blue 25 decontamination. The adsorption potential of Acid Blue 25 is analyzed using raw rice husks and Fe2O3 nanoparticles in the literature, but their enhanced removal capacity by means of Fe2O3@RH composites is reported for the first time in this study. Fe2O3@RH composites were analyzed by using analytical techniques such as TGA, SEM, FTIR, BET, and the point of zero charge (pH(PZC)). The Acid Blue 25 adsorption experiment using Fe2O3@RH composites showed maximum adsorption at an initial concentration of Acid Blue 25 of 80 ppm, a contact time of 50 min, a temperature of 313 K, 0.25 g of Fe2O3@RH composites, and a pH of 2. The maximum percentage removal of Acid Blue 25 was found to be 91%. Various linear and nonlinear kinetic and isothermal models were used in this study to emphasize the importance and necessity of the adsorption process. Adsorption isotherms such as the Freundlich, Temkin, Langmuir, and Dubinin-Radushkevich (D-R) models were applied. The results showed that all the isotherms were best fitted on the data, except the linear form of the D-R isotherm. Adsorption kinetics such as the intraparticle kinetic model, the Elovich kinetic model, and the pseudo-first-order and pseudo-second-order models were applied. All the kinetic models were found to be best fitted on the data, except the PSO model (types II, III, and IV). Thermodynamic parameters such as DG° (KJ/mol), DH° (KJ/mol), and DS° (J/K*mol) were studied, and the reaction was found to be exothermic in nature with an increase in the entropy of the system, which supported the adsorption phenomenon. The current study contributes to a comprehensive understanding of the adsorption process and its underlying mechanisms through characterization, the optimization of the conditions, and the application of various models. The findings of the present study suggest practical applications of this method in wastewater treatment and environmental remediation.

Keywords: toxic dye adsorbent; iron oxide; rice husk; Acid Blue 25; Fe2O3@RH composites

O-228/ICAZ-2024

Clinical and Molecular Profiling of Retinitis Pigmentosa in Selected Families from Pakistan



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Abstract

Retinitis Pigmentosa (RP) is a hereditary condition that causes progressive visual loss and blindness. More than 100 genes are linked to its syndromic and non-syndromic forms, impacting 1 in 4,000 people worldwide. This study explores the genetic makeup of RP in Pakistan with a focus on the ABCA4 gene. A total of 27 families with retinal dystrophies were enlisted; of these, 18 had RP diagnoses from Al-Shifa Trust Eye Hospital in Rawalpindi. Clinical information was gathered and DNA was extracted from blood samples. For targeted exome sequencing of 344 IRD-related genes, an aliquot of DNA from each of the five selected RP families was sent to Baylor College of Medicine in the USA. Exome sequencing results revealed two potential disease-associated variants i.e., c.214G>A in exon 3 of the ABCA4 gene and c.827A>G in the CNGA3 gene in one family. The variants were further validated by Sanger sequencing. This study highlights the genetic variety of RP in Pakistan and the necessity of thorough genetic screening. The results necessitate the use of molecular genetic testing for RP diagnosis and enhanced techniques for RP control and tailored therapy for the Pakistani population.

O-229/ICAZ-2024

Isolation of tannase-producing microbiota from the gastrointestinal tract of Rohu (*Labeo rohita*) and Tilapia (*Oreochromis niloticus*)

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Abstract

Labeo rohita and Oreochromis niloticus are widely cultivated due to their omnivorous behaviour, high growth rate, and ability to survive harsh environmental conditions. Both species consume various feedstuffs, including plant-derived anti-nutrients such as tannins. Tannins are anti-nutritional compounds that can form complexes with proteins and other macromolecules, reducing the nutritional value of plant-based feed. This study aimed to investigate the presence of tannase-producing microbiota in the gastrointestinal (GI) tracts of *L. rohita* and *O. niloticus*. For this purpose, 20 samples of each species were collected from earthen ponds, and their gut microbiota were cultured on Tryptic Soy Agar (TSA) and Tannic Acid Agar (TAA). Bacterial growth was observed on TSA, with significant diversity in bacterial populations (p<0.05). However, no bacterial growth was exclusively observed on tannic acid agar, with Aspergillus niger, Candida parapsilosis, and Candida tropicalis identified as the dominant species. Further analysis revealed that some fungal strains exhibited tannase production, highlighting their potential role in tannin metabolism within the fish gut. Both *A. niger* and *C. tropicalis* are known for their ability to produce tannases, enzymes crucial for breaking down tannins, thereby facilitating nutrient absorption and promoting gut health in fish. This study highlights the importance of fungal tannase producers in improving the nutritional value of plant-based feeds for aquaculture.

Keywords: Tannins, Microbiota, Anti-nutrients, Aspergillus niger, Labeo rohita

O-230/ICAZ-2024

Investigation of antimicrobial activities of L- amino acid oxidase isolated from venom of snake (Naja oxiana) Sadia Saeed*, Zaib un Nisa, Farhat Jabeen, Amna Sajjad, Muhammad Siddique, Zainab Saeed, Palwasha Shahzadi, Mehak Shabbir

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Abstract

Natural source have gained attention due to the rise in antibiotic resistance in bacteria. Numerous animal sources, especially snake venoms, have produced a number of antimicrobial peptides that have been identified. In addition to exhibiting direct and indirect hemolytic properties, the venom of Naja oxiana demonstrated antibacterial properties. The ideal pH and temperature for L-amino acid oxidase Nh-LAAO (140 kDa) are 8 and 37 °C. Snake venom was collected from different regions of Pakistan. It was isolated from Naja oxiana venom using a two-step chromatography process. Using the well diffusion method, the potency of pure Nh-LAAO was assessed against a range of bacterial species. Greater susceptibility to Nh-LAAO was demonstrated by gram-negative bacteria, especially E. coli, which also had the biggest inhibitory zone (17.5 \pm 0.7 mm). A considerable inhibition of P. aeruginosa was also observed (15.5 \pm 0.7 mm), the inhibition zone of S. aureus and B. cereus was (18.0 \pm 1.5mm). While Gentamicin



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had no effect on this strain. Nh-LAAO, on the other hand, did not inhibit S. typhi. The susceptibility order for both Gram-negative and Gram-positive bacteria to Nh-LAAO was: E. coli > P. aeruginosa > B. cereus and S. aureus. Our research revealed important biological properties of the L-amino acid oxidase (LAAO) that was isolated from Naja oxiana venom. Nh-LAAO has strong antibacterial properties. These findings are very important because they shed light on how this enzyme affects human pathogenic microorganisms and how its biotechnological use can lead to more creative and effective antibacterial and anticancer treatments.

Keywords: Snake venom, Apoptosis, Bactericidal, Cell cycle arrest, Cytoxicity, L-amino acid oxidase (LAAO)

O-231/ICAZ-2024

Heavy metals (lead and chromium) Bioaccumulation in spray painters of automobiles at Faisalabad

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Abstract

Your study examines the exposure to heavy metals among automobile spray painters, focusing on differences between indoor and outdoor working environments. The objectives were to analyze heavy metals concentration, specifically chromium and lead, in the blood of painters, comparing those in authorized indoor workshops to those in local outdoor workshops, and to assess levels in a control group of unexposed individuals. Blood samples were collected from painters using sterile techniques and stored at 4°C. They were then digested with nitric and per chloric acids for analysis via atomic absorption spectrometry. Results indicated that indoor painters had significantly higher concentration of heavy metals. The mean maximum chromium concentration was 9.2 μ g/ml for indoor painters with normal blood levels being 2.9 μ g/ml. Similarly, lead concentrations were 7 μ g/ml for indoor painters and 4.55 μ g/ml for outdoor workers. These findings suggest that indoor painters face greater exposure due to limited ventilation, while outdoor painters experience higher rates of dilution due to better air circulation. Overall, this study highlights the health risks associated with heavy metals exposure in the automotive painting industry. It emphasizes the need for regular health monitoring and the implementation of improved safety measures, such as enhanced ventilation and protective gear, to mitigate risks for indoor workers. By addressing these occupational hazards, the industry can better protect the health and well-being of its workersBottom of Form Keywords: Heavy metals, paint, blood, per chloric acid, nitric acid, spectrometer

O-232/ICAZ-2024

Prevalence of Autism in Faisalabad

O-233/ICAZ-2024

New record of Chama gryphoides (Linnaeus 1785) (family: Chamidae) from Buleji and Manora rocky shores of Pakistan.

Umm E Amen Sher Muhammad, Ghazala Siddiqui, Shahnaz Rashid Centre of Excellence in Marine Biology University of Karachi

Abstract

The family Chamidae belong to the class Bivalvia. A new record of Chama gryphoides Linnaeus, 1785 has been identified from Buleji and Manora rocky shore of Pakistan. It has been evaluated that the Chama species are in abundance at the rocky ledges of Buleji and Manora. However, the new data is limited regarding Chamidae family related to Pakistani coast. The transposition of Chama shell into left and right valve attachment are different features of the genera. These Chamids are termed as Jewel-Boxes due to high variability in coloration pattern and morphology of the shell in various waters. The specimens were evaluated by the conchological study and morphometric characters of shell mentioning to preceding literature. The main objective of the study was to recognize the members of Chamidae family for the first time in Pakistan. Consequently, Chama gryphoides was found on two different parts of coastal belt. Manora was considered as the polluted site in comparison to Buleji. This study also accomplishes that the new record of Chama gryphoides provides an addition to the assets of marine bivalve fauna of Pakistan. Though, additional study is required regarding commercially important sessile chamids bivalve as the relevant information is limited. *Keywords:* rocky ledges, conchological, morphometric, Chamidae, Pakistani coast,

O-234/ICAZ-2024 Health Risk Assessment of Polycyclic Aromatic Hydrocarbons (PAHs) in the Common Fish Catch from



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Clifton, Karachi

Alia Bano Munshi¹, Hina Ahsan Siddiqui², Tahira Akram¹, Hasseb-ul-Rehman³, Ghulam Abbas¹ and Shahnaz Rashid¹

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³ Marine Fisheries Department - 75620, Pakistan.

Abstract

Polycyclic Aromatic Hydrocarbons (PAHs) were evaluated in the fish species of the family Sciaenidae (Johnius carouna & Otolithes ruber) obtained from the fishermen's catch from Clifton Beach, Karachi. The study aims to provide insight into the ecosystem assessment and biomagnification of PAHs within the food chain and in the local community. The analysis had been done on GC-FID and concentrations of 16 PAHs chartered in international environmental protection agencies were evaluated. The average concentrations of PAHs were correlated with the mean length, weight, and lipid content of each specie. The human health risk assessment, lifetime cancer risk, and hazard quotients were estimated by daily dietary intake. The mean concentration and risk assessment values in Johnius carouna were found to be higher than Otolithes ruber and exceeded the maximum permissible limits. The results implicated that a high concentration of PAHs in fish samples may be probably hazardous to the local community. *Keywords:* Polycyclic Aromatic Hydrocarbons, Clifton, Fish, Carcinogenicity, Lipid, Ecotoxicity.

O-235/ICAZ-2024

Climate change and environmental effect on production of palla (tenualosa ilisha) from indus river

Punhal khan Lashari

University of Sindh, Jamshoro

Abstract

It is reported that the production of Palla is greatly impacted by changes in water temperature. Moreover, changes in water temperature can affect pH and DO (dissolved oxygen) levels, two crucial factors in breeding. Palla's journey starts from Kharo Chhan, one of 17 creeks of the Indus delta. It can travel 60 to 70km in a day and enters the Indus River from the sea during the monsoon season, around May or June. After breeding and spawning till January and March, it returns to the ocean. Different research studies have recommended that, for optimal migratory and prebreeding congregation of Palla fish, salinity should be kept 0.1 ppm and also the depth of water ought to be above 10 m. To determine the relationship between climate change variables such salinity, temperature, dissolved oxygen, and the fish supply, there aren't any time series data or prior studies available. Further investigation into these issues is highly encouraged.

O-236/ICAZ-2024

Analysis of Byssal Threads (family: Mytilidae) Structure and Function of Green Mussel (Perna Viridis). Shamama Tul Amber*, Shahnaz Rashid, Ghulam Abbas, Iqra Tariq, Sindhu Pirzada, Shahzaib Kareem, Wajiha Ghfar, Imran Rafiq, Muhammad Jawwad

Centre of Excellence in Marine Biology University of Karachi

Abstract:

Perna viridis also known as Asian green mussel is a bivalve mussel native to the Asia-Pacific region where it is widely distributed. Perna viridis is a potential ecosystem engine ability of P. viridis to bioaccumulate pollutants has led to its use as an indicator of biopollution of heavy metals, organochlorines, and petroleum hydrocarbons; it is regarded as one of the best mussel species to use as a bio-indicator to test environmental pollution. It is found in rocky cum muddy habitat, where the shell is attached with rocks with the help of byssal threads and a glue that provides stickiness called spat. In this study we tried to estimate the tensile strength of byssal threads that holds the shell firm in such harsh conditions, to use these fibers as the bio-alternative for the industrial, construction, manufacturing, pharmaceutical and environmental sciences. We have observed six live specimens that were taken from the natural habitat and kept in highly controlled environment. During the study period observed that three types of byssal threads were grow out for 15 days i.e. primary, secondary and tertiary and their color changes from dusky white to brown as thread grows and attain maximum size. The results shows incredible tendency of a thread to stretch and withhold against the force acting upon it. With these results we have concluded that by mimicking these fibers we can develop advanced adhesives high performance fibers, corrosion resistant coatings, bio-inspired structural materials and sustainable alternatives to synthetic materials. Although it's preliminary study that could provide basis for further research in the future.



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O-237/ICAZ-2024

Null models for understand intertidal decapods communities in North Patagonian beach (Pelluhuin, 41°S, Chile).

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Climático y Medio Ambiente – UCCMA, Temuco, Chile

Abstract

The intertidal decapods in continental Chile are characterized by its species sharing with Peruvian coast along practically all coast, being coexisting species that has not studied with details its interspecific interactions. The aim of the present study is applying null models for understand if the intertidal decapod community is random or not random. The results revealed that species associations were random, due probably to many species repeated in samples, and the niche sharing results revealed that species reported do not share niche, and in consequence there is not interspecific competition. The obtained results partially agree with other similar observations for Chilean coast, and it would be explained due the oceanographic conditions.

Keywords: intertidal decapods, null models, northern Patagonia, rocky shore.

O-239/ICAZ-2024

Renal toxicity is induced by a single high dose of Alloxan in adult Wister rats.

Iman Khalid, Taiba Tabassum, Shahzad Irfan Department of Physiology, G.C. University Faisalabad

Abstract

Kidneys filter out excess plasma glucose. Renal glucose transporters (GLUT) present in the proximal tubules of the nephrons are employed for the uptake of glucose. Alloxan, a beta cell cytotoxic chemical is commonly used to induce hyperglycemia in rodent models. Alloxan enters beta cells via GLUT. Alloxan might be absorbed by the proximal tubules of the nephrons via GLUT. The present study was designed to study the impact of a single high dose of alloxan on kidneys. A single intraperitoneal inj. of alloxan @ 180 mg/kg b.w. was given to adult rats. Animals were sacrificed on multiple time points post alloxan treatment i.e. 12, 24, and 36 hours. The blood samples were assessed for CBC, serum creatinine, and blood urea nitrogen (BUN). The kidney and pancreas were also collected and fixed in PFA for histological analysis. Increased blood urea nitrogen (BUN) and serum creatinine levels were observed in the alloxan-treated rats. Microscopic examination reveals glomerular hypertrophy, increased extracellular matrix deposition, and tubular dilation. The current study reveals that high-dose alloxan induces acute glomerular hyperfiltration, tubular toxicity and inflammation which are independent of hyperglycemia.

O-240/ICAZ-2024

Repeated low-dose Alloxan treatment fails to induce tubular damage in adult Wister rats.

Kainat Arshad, Aiza Javed, Shahzad Irfan

Department of Physiology, G.C. University Faisalabad

Abstract

Kidneys filter out excess plasma glucose. Renal glucose transporters (GLUT) present in the proximal tubules of the nephrons are employed for the uptake of glucose. Alloxan, a beta cell cytotoxic chemical is commonly used to induce hyperglycemia in rodent models. Alloxan enters beta cells via GLUT, so alloxan might be absorbed by the proximal tubules of the nephrons via GLUT. The present study was designed to study the impact of a multiple repeated low dose of alloxan on kidneys. Alloxan was administered intraperitoneally daily @ 20 mg/kg. b.w. for 04 consecutive days in adult rats. Animals were sacrificed on multiple time points post alloxan treatment i.e. 12, 24, and 36 hours. The blood samples were assessed for CBC, serum creatinine, and blood urea nitrogen (BUN). The kidney and pancreas were also collected and fixed in PFA for histological analysis. Blood urea nitrogen (BUN) and serum creatinine levels



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were comparable between the treated group and the control group. Microscopic examination reveals no signs of tubular or glomerular damage. The current study reveals that repeated low-dose alloxan induces does not impact the kidneys. O-241/ICAZ-2024

Minimal renal impact of repeated low dose Streptozotocin in adult Wister rats.

Zeenat Nasir, Ayesha Shafqat, Shahzad Irfan Department of Physiology, G.C. University Faisalabad

Abstract

Kidneys filter out excess plasma glucose. Renal glucose transporters (GLUT) present in the proximal tubules of the nephrons are employed for the uptake of glucose. Streptozotocin (STZ), a beta cell cytotoxic chemical is commonly used to induce hyperglycemia in rodent models. STZ enters beta cells via GLUT, so STZ might be absorbed by the proximal tubules of the nephrons via GLUT. The present study was designed to study the impact of a multiple repeated low dose of STZ on kidneys. STZ was administered intraperitoneally daily @ 35mg/kg. b.w. for 04 consecutive days in adult rats. Animals were sacrificed on multiple time points post alloxan treatment i.e. 12, 24, and 36 hours. The blood samples were assessed for CBC, serum creatinine, and blood urea nitrogen (BUN). The kidney and pancreas were also collected and fixed in PFA for histological analysis. Blood urea nitrogen (BUN) and serum creatinine levels were comparable between the treated group and the control group. Microscopic examination reveals no signs of tubular or glomerular damage. The current study reveals that repeated low-dose STZ induces does not impact the kidneys.

O-242/ ICAZ-2024

Impacts of ZnO-Nanoparticles supplemented canola meal based diets on growth, nutrient digestibility and carcass composition of Grass carp (Ctenopharyngodon idella) fingerlings.

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²Department of Zoology, Government College University, Faisalabad, 38000, Pakistan

Abstract

The proposed study was executed to assess the beneficial effects of Zinc oxide nanoparticles (ZnO-NPs) supplemented Canola meal diet on the growth, nutrient digestibility and carcass composition of Grass carp (Ctenopharyngodon idella) fingerlings under lab conditions.ZnO-NPs were integrated in the diet at the levels of 0, 7, 14, 21, 28 and 35 mg/kg of diet. So there were six experimental diets to be used in the trial. The fingerlings were divided into six groups, each consisting of five fingerlings. They were placed in experimental tanks for 60 days, with each group having three replicates. Fingerlings fed at the rate of 4% of their biomass twice a day (morning and evening). Standard protocols were used to assess the effect of each treatment on the various parameters of fish. After 60 days, fish fed a diet supplemented with 35 mg/kg ZnO-NPs showed the best improvement in growth and nutrient digestibility. Total protein and ash increased in the whole body while fat showed on inverse trend. Data from the various research parameters was analyzed using one-way analysis of variance (ANOVA). **Keywords:** ZnO-NPs, Grass carp, Growth, Nutrient digestibility, Carcass

O-243/ ICAZ-2024

Protective effects of Pyridoxine (Vitamin B6) against lead induced reproductive toxicity in male mice

Maryam Waqar, Iram Inayat, Muhammad Ali Kanwal, Aima Iram Batool, Rimsha Zafar, Bushra Sajid Department of Zoology, University of Sargodha

Abstract:

Heavy metals are an important factor in reproductive toxicology that affects the reproductive system directly or indirectly. These are present in our environment and when enter the body cause toxic effects on different organs. The most frequent heavy metals that cause human poisonings are lead, arsenic, mercury. Lead is a toxic metal that creates many health problems around the world. This study focuses on protective effects of pyridoxine against lead induced reproductive toxicity in male mice. Results have shown different abnormalities in the group exposed to lead: there were noticeable changes in size and shape of seminiferous tubules (913.6 \pm 86.2 μ m²) compared to the Control group (566.8 \pm 92.9 μ m²), as well as debris and apoptosis in the tubules. Additionally, various abnormalities are observed in epididymis including reduced luminal space, deformed cells, and presence of debris. Protective agent, that was vitamin B6, provided some barrier against the toxic effects of lead. Vitamin B6 exhibited protective effects against lead toxicity in the testes, restoring normal seminiferous tubule arrangement, spermatogonia mitosis, and interstitial tissue. Additionally, Vitamin B6 treatment improved epididymal health by reducing debris, restoring luminal space,


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and normalizing cell morphology. In conclusion, these findings suggest that exposure to lead caused toxic effects on the reproductive system while vitamin B6 overcame these toxic effects. **Keywords:** Pyridoxine; vitamin B6; lead; reproductive toxicity; male mice.

Integrating Applied Zoological Sciences for Climate Resilience and Sustainable Food Systems Development

Hafsa Fatima¹, Talha Riaz²

¹Department of Food Science and Technology, Faculty of Food and Home Sciences, MNS-University of Agriculture, Multan, Pakistan.

²College of Food Science and Technology, Huzahong Agricultural University, Wuhan, China.

Abstract

The growing importance of sustainable practices in many different sectors has been highlighted by the problems posed by both climate change and food security. In the field of food science and technology, this study investigates how applied zoological sciences might be integrated to support sustainable development and a green environment. We can strengthen agricultural systems, increase biodiversity, and lessen the negative environmental effects of food production by utilizing the ecological roles that fauna play. Important strategies include using insects to recycle nutrients and manage waste, adding animals to regenerative agriculture to improve soil health, and protecting pollinators to increase crop yields. Furthermore, it is investigated how managing fisheries resources and promoting sustainable aquaculture are essential to preserving ecological balance and ensuring food security. By maintaining biodiversity, lowering greenhouse gas emissions, and enhancing the resilience of food systems, these zoological initiatives help. This study illustrates the potential of applied zoological sciences to support sustainable development, environmental protection, and food security through interdisciplinary research. According to the research, incorporating animal-based methods into food science technology not only meets short-term dietary requirements but also clears the path for long-term ecological sustainability.

Keywords: Sustainable Practices, Climate Change, Food Security, Applied Zoological Sciences, Agricultural Systems, Biodiversity, Food Production, Ecological roles, Food Security, Environmental Protection.

O-245/ ICAZ-2024

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Ameliorative potentials of Methylcobalamin (Vit B12) against lead induced reproductive toxicity in male mice

Mahnoor¹, Iram Inayat¹, Muhammad Ali Kanwal¹, Aima Iram Batool, ¹ Hafsa Saleem¹, Khadija Akbar¹, Khawaja

Raees Ahmad², Syeda Nadia ahmad² ¹Department of Zoology, University of Sargodha ²University of Chakwal

Abstract

Heavy metals are pollutants that have high rate of global annual emission and pose substantial health risks. The primary health risks of heavy metals contamination have been linked to exposure of Cd, Pb and Hg, which are currently the most pervasive environmental contaminants and also exhibit high levels of toxicity toward living organisms. This study focuses on protective effect of Methylcobalamin (Vit B12) against lead induced reproductive toxicity in male mice. Result have shown various abnormalities in the groups exposed to lead: Lead exposure causes significant testicular ($885.7\pm85.3 \mu 2$) damage by inducing apoptosis in Sertoli, spermatocytes, and Leydig cells, leading to impaired spermatogenesis and reduced sperm count as compared to control group ($851.9\pm103.2 \mu 2$). This results in testicular tissue deterioration and decreased fertility. Vitamin B12 mitigates the damaging effects of lead, promoting moderate recovery in seminiferous tubule ($593.8\pm59.5\mu 2$) group organization and restoring spermatogonia population. However, spermatocytes and spermatids still show a mixed, rather than optimal, organization. *Keywords:* Methylcobalamin; Vit B12; lead; reproductive toxicity; male mice

O-246/ ICAZ-2024

Variation in Mitochondrial Cytochrome-B Gene Across Different Snake Species Inhabiting Sargodha

Asad munir

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Abstract

This study aimed to identify snake species based on variations in the cytochrome b gene. Pakistan is a home species of snakes. Natural snake predators play a vital role in rodent control, protecting crops from severe damage. The killing of snakes disrupts ecosystems and significantly affects the predator-prey balance. However, limited



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comprehensive molecular data on snake species in Pakistan exists. Molecular identification techniques provide a promising solution for accurate species identification, even in cases where samples are highly degraded. In this study, snake carcasses were randomly collected from District Sargodha and phenotypically identified as Cobra, Krait, and Rat snakes. Molecular techniques using the cytochrome b (CYTb) gene as a marker were then employed for further identification. Genomic DNA was extracted from tissue samples, which were subsequently amplified using conventional PCR. After successful amplification, the targeted gene regions were sequenced and analyzed using BLAST tools available at NCBI. The samples were identified as Naja naja, Spalerosophis diadema, Bungarus candidus, and Amphiesma stolatum. Based on NCBI data, phylogenetic trees were constructed using MEGAX software, helping to understand the relationships between the identified species. This study confirms the utility of the cytochrome b gene as an effective molecular marker for snake species identification.

O-247/ ICAZ-2024

Surveillance of Guava orchard to control the attack of fruit fly in the district Faisalabad. Tehseen javed¹, Waseem Akram², Esha Nadeem³and Misbah batool⁴

^{1,3,4}Department of Zoology, Wild life and Fisheries, University of Agriculture, Faisalabad, Pakistan ²Department of Entomology, University of Agriculture, Faisalabad, Pakistan

Abstract

Bactrocera dorsalis(Diptera:Tephritidae) is well known for its damaging effects on Horticulture crops. The fly is mostly attracted to ripe and decayed guava fruits posing a trade barrier for farmers in foreign markets. Mass trapping of this pest by suitable selection of trapping sites is necessary for its management by male annihilation technique(MAT). Experiment was conducted in selected district of Punjab, i.e., Faisalabad, at Botanical Garden of University of Agriculture Faisalabad Punjab Pakistan. Three orchards were selected having an area of one acre each. six pet bottle traps(PBT) with methyl eugenol were placed per acre. Multiple linear regression equations and correlations were computed on the mean population data for all traps. April, May, and June were fruit fly peak activity periods in the district of Faisalabad. Temperature exerted a highly significant, but showed positive relationship with per unit population fluctuation. Rainfall was also not significent but showed a negative relationship with per unit population fluctuation. Maximum activity of Fruit fly were recorded from April to June. The PBT gave maximum adult catches than any other trap. (i.e round trap or jar trap) with minimum cost which is suitable for farmer's community to be used as pest management technique for further control of fruit fly attack on economically valueable horticulture crops. Key words: Fruit fly, Pet bottle Trap, Regression, Correlation, mean population.

O-248/ ICAZ-2024

In Vitro Assessment of Antioxidant, Antimicrobial, and Anti hepatic Cancer Potential of Selected Plants of

Cucurbitaceae Family Ijaz Hussain1, Azhar Rasul1, Saba Riaz1, Faiza Mahmood1 Department of Zoology, GC University Faisalabad, Pakistan

Abstract

The Cucurbitaceae family, comprising edible fruits and vegetables, has been a significant source of natural products for drug discovery. While the fruits and vegetables themselves have been widely studied, the peels often discarded as waste have received less attention. This study aims to investigate the potential therapeutic properties of Cucurbitaceae family peel extracts. Extracts from the peels of Mormordica charantia, Citrullus lanatus, Cucumus sativum, Citriallus colocythis, and Cucurbita maxima were prepared using the Soxhlet extraction method. Phytochemical analysis identify the presence of bioactive compounds like steroids, alkaloids, polyphenols, tannins, and flavonoids. The extracts were then be evaluated for their antioxidant, antimicrobial, and cytotoxic activities. Antioxidant capacity were assessed using the DPPH assay. Antimicrobial activity were determined against both Grampositive (Bacillus cereus, Staphylococcus aureus) and Gram-negative (Escherichia coli, Pseudomonas aeruginosa) bacteria, as well as fungal strains (Candida albicans, Aspergillus niger) using the well diffusion and microdilution methods. Cytotoxicity were be evaluated against hepatic cancer cells using the MTT assay. Citrullus lanatus, Cucumus sativum and Cucurbita pepo showed best antibacterial and antifungal activities. This study further demonstrated that Cucurbitaceae peel extracts possess significant anticancer activities. Further research will suggests the pharmacological potential of Cucurbitaceae peel extracts and identification of novel bioactive compounds with therapeutic applications.

Keywords: Cucurbits Plants, Antibacterial Assay, Antioxidant potential, Plants extracts

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In Vitro Assessment of Antioxidant, Antimicrobial, and Anti-hepatic Cancer Potential of Selected Plants of Cucurbitaceae Family

Ijaz Hussain, Azhar Rasul, Saba Riaz, Faiza Mahmood Department of Zoology, GC University Faisalabad, Pakistan

Abstract

The Cucurbitaceae family, comprising edible fruits and vegetables, has been a significant source of natural products for drug discovery. While the fruits and vegetables themselves have been widely studied, the peels often discarded as waste have received less attention. This study aims to investigate the potential therapeutic properties of Cucurbitaceae family peel extracts. Extracts from the peels of Mormordica charantia, Citrullus lanatus, Cucumus sativum, Citriallus colocythis, and Cucurbita maxima were prepared using the Soxhlet extraction method. Phytochemical analysis identify the presence of bioactive compounds like steroids, alkaloids, polyphenols, tannins, and flavonoids. The extracts were then be evaluated for their antioxidant, antimicrobial, and cytotoxic activities. Antioxidant capacity were assessed using the DPPH assay. Antimicrobial activity were determined against both Grampositive (Bacillus cereus, Staphylococcus aureus) and Gram-negative (Escherichia coli, Pseudomonas aeruginosa) bacteria, as well as fungal strains (Candida albicans, Aspergillus niger) using the well diffusion and microdilution methods. Cytotoxicity were be evaluated against hepatic cancer cells using the MTT assay. Citrullus lanatus, Cucumus sativum and Cucurbita pepo showed best antibacterial and antifungal activities. This study further demonstrated that Cucurbitaceae peel extracts possess significant anticancer activities. Further research will suggests the pharmacological potential of Cucurbitaceae peel extracts and identification of novel bioactive compounds with therapeutic applications.

Keywords: Cucurbits Plants, Antibacterial Assay, Antioxidant potential, Plants extracts

O-249/ ICAZ-2024

Reuse of drinking water bottles and associated risk assessment in humans at Faisalabad

Tehreem Government CollegE University Faisalabad

Abstract

Polyethylene terephthalate (PET) is predominantly appropriate for foodstuff wrapping materials, particularly used for drinking water. Recycled PET water bottles may be a means of an unfamiliar chemical compound as well as acetaldehyde, formaldehyde, and Sb presence in the bottled water. Recently it has been investigated that some metals also migrate from PET into foodstuffs such as Cr, Ni, and Pb. However, several studies have exposed other compounds in bottled water, sometimes in nonnegligible concentration. However, research that has been conducted to investigate the sources and health impacts of these chemical compounds on human beings is limited in Pakistan. The objective of this study was to find out the health risks due to PET plastic bottles and to create awareness among people so that they could properly use plastic bottles. 150 questionnaires were filled and 90 blood samples and 12 water samples were collected from the volunteers of different classes. Water and blood samples were digested by using aid and then analyzed for heavy metals detection using AAS while carbonyl compounds were analyzed by HPLC. Data were statistically analyzed. Ni (4.10- 13.30µg/L), Cr (1.00- 6.50µg/L), Sb (4.50- 13.80µg/L), Pb (9.90- 3.80µg/L), formaldehyde (0.10-28.30µg/L) and acetaldehyde (16-58.90µg/L) were present in maximum concentrations in blood samples. The concentration of Ni (5.20- 14.90µg/L), Cr (5.00- 13.80µg/L), Sb (5.00-15.00µg/L), Pb (5.20-13.60µg/L) and formaldehyde (7.30- 0.10µg/L) in the PET bottled water were compared with the values standardized by W.H.O in portable water which are 70 µg/L, 50 µg/L, 20 µg/L, 10 µg/L and 900 µg/L respectively. There is no specific standard value for acetaldehyde. However, it should be kept in low concentrations. Nickle (5.20-14.90) was the only chemical component that exceeds the guideline value of W.H.O. These findings suggest that the concentration and health impacts of different chemical components while manufacturing the water bottles should be kept in consideration. Public health educators should make efforts to the awareness of the masses in this regard.

Keywords: Polyethylene terephthalate, carcinogenic chemicals, metals migration, HPLC, AAS, Risk assessment, Non-Intentionally Added Substances.

O-250/ ICAZ-2024

Efficacy Studies of Moringa Oleifera Leaf Extract Fortified Apple Juice among Gout Patients Farzana Siddique, zoha Ali, sidra zafar, Muhammad Arshad, Afsheen Ghazala University of Sargodha

Abstract



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Gout, a chronic condition marked by hyperuricemia and joint pain, affects approximately 1% of Pakistan's population. This study aimed to develop a natural product containing Moringa Oleifera leaf extract (MOLE) to improve gout symptoms and reduce uric acid levels. The research was conducted in two phases: product development and efficacy testing. In the first phase, debittered MOLE was incorporated into apple juice, and physicochemical properties were performed during storage such as total phenolic and flavonoid content, antioxidant activity, and mineral content were analyzed. Based on storage trials, a 25% MOLE-fortified juice (T5) was selected for further testing. In the second phase, a randomized controlled trial with 400 participants, including both healthy individuals and gout patients, was conducted. Patients were divided into three groups: placebo, juice-only, and juice combined with medication. Results indicated that the 25% MOLE-fortified juice reduced serum uric acid levels by 10% without medication and by 23% when combined with anti-hyperuricemic drugs. Liver and kidney function tests confirmed the safety of the treatment. These findings suggest that MOLE-fortified apple juice is a promising natural remedy for managing gout, and further large-scale studies are recommended to validate its therapeutic potential. *Key words:* Moringa Oleifera, Gout, Fortified apple juice, Functional beverage, Hyperuricemia

0-251/ ICAZ-2024

Phytochemical Profiling and Antibacterial Efficacy of Whole Fruit, Pit, and Flesh Extracts of Aseel Date (Phoenix dactylifera L.)

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¹ Department of Allied Health Sciences, Superior University Lahore, Sargodha Campus, Sargodha-40100, Pakistan1 ² Institute of Food Science and Nutrition, University of Sargodha, Sargodha-40100, Pakistan2 ³Department of Zoology, University of Sargodha, Sargodha-40100, Pakistan2

Abstract

In recent years, scientists have increasingly turned their attention to plant-based therapies for treating gastrointestinal disorders, aiming to reduce the adverse effects associated with synthetic medications. This study investigates the antibacterial activity of different parts of the Aseel date, using both aqueous and ethanol-based extracts, against selected pathogenic bacteria. The disc diffusion method revealed that all extracts demonstrated antibacterial activity, but Bacillus subtilis was more sensitive towards the date extracts. Among the various extracts, the 60% ethanol fraction exhibited the higher inhibitory zone (14.44 mm) against B. subtilis, while the whole fruit extract demonstrated an even stronger inhibition (17.56 mm) against the Gram-positive bacteria B. subtilis. Phytochemical screening showed the occurrence of flavonoids, glycosides, phenols and terpenoids in date parts extracts. The findings suggest that Aseel date fruit extract holds significant antibacterial potential. Warranting further investigation into the specific phytochemical compounds responsible for these effects. Future studies are currently underway to explore these compounds in detail.

O-252/ ICAZ-2024

Do morphologically distinguishable stocks of European anchovy and Mediterranean horse mackerel exist in the Marmara and Black Seas?

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²Republic of Türkiye Ministry of Agriculture and Forestry, Varto Directorate of District Agriculture and Forestry, Department of Fisheries, Varto, Muş, Türkiye

Abstract

The European anchovy (Engraulis encrasicolus) and Mediterranean horse mackerel (Trachurus mediterraneus) are vital commercial pelagic fish species, widely distributed throughout Turkish marine waters: the Black Sea, Sea of Marmara, Aegean Sea, and Mediterranean Sea. Traditionally managed as single stocks in the Black Sea and adjacent regions, their stock structure has been a topic of ongoing debate, necessitating further investigation. This study employed geometric morphometrics to analyze body shape and elliptical Fourier analysis for otolith morphology, with samples collected from the Eastern and Middle Black Sea as well as the Sea of Marmara. The data were analyzed using multivariate and univariate analyses of variance, along with discriminant function and principal component analyses. Results demonstrated significant regional differences in body and otolith morphology, supporting the hypothesis of distinct subpopulations and suggesting the need for revised management strategies for



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these species in the examined regions.

Keywords: Geometric morphometric, Elliptic Fourier analysis, Geometric morphometrics, Subpopulation

O-253/ ICAZ-2024

Wintering of the ardeidae family in the Mila region (case of the Beni Haroun dam)

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Abstract

Algeria is rich in wetlands, which are among the most valuable resources in terms of biological diversity and natural reproductively. These environments play an important role in vital processes, maintaining hydrological cycles and also constitute a privileged habitat for important flora and fauna. Water birds can provide indicators of the characteristics of wetlands at different levels of biological organisation. The life cycle of birds comprises 2 periods: the wintering period and the breeding period. Dams, which are defined as engineering structures placed across a watercourse, designed to retain and store water or to divert it. Among these artificial wetlands is the Béni Haroun dam in the north-east of Algeria, in the wilaya of Mila, which is the largest surface water reservoir in Algeria. This work is based on monitoring the dynamics of the numbers of wintering ardeidae at the Béni Haroun dam in Mila from September to the end of April.

Key words: Artificial wetlands, Wintering, Béni Haroun dam, Mila, Ardeidae

O-254/ ICAZ-2024 Genetic and Molecular Pathology of Polycystic Ovary Syndrome: Insight from Next-Generation Sequencing (NGS)

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Abstract

This study investigates how genetic variants are associated with PCOS symptoms in 60 women (aged 18 to 40 years) comprising 40 patients with PCOS and 20 healthy controls from the outpatient hospital of Bibi Fatima (R.A) Maternity Home, GIMS Gambat Sindh , Pakistan. We measured hormone levels, including androgen and insulin, and assessed insulin resistance using the Homeostasis Model Assessment of Insulin Resistance (HOMA-IR). Using targeted NGS, we uncovered genetic variations linked to PCOS. Statistical methods were applied, including t-tests, chi-square tests, and logistic regression, to dig into the data. The findings revealed that women with PCOS had significantly higher average androgen hormone levels (77.50 ng/dL) and HOMA-IR scores (4.54) compared to healthy controls (43.33 ng/dL androgen hormone, 1.73 HOMA-IR), with 1.8-fold and 2.6-fold increases, respectively. These differences were highly significant (p < 0.001). Furthermore, we found significant associations between PCOS and specific genetic variants in the FSHR and INSR genes, with p-values of 0.01 and 0.005, respectively. The logistic regression analysis showed that specific variants in the FSHR and INSR genes increased the chances of being diagnosed with PCOS by 2.5 and 3.0 times, respectively. This study underscores genetic factors importance in PCOS pathophysiology, identifying significant associations with FSHR and INSR gene variants. Keywords: PCOS, Genetic factors, Next-Generation Sequencing, Hormonal Imbalance, Insulin Resistance, FSHR, INSR.

O-255/ ICAZ-2024

Molecular characterization of Labeo dyocheilus and Botia lohachata found in Ranikot stream water

Wakeela Gul Mughal University of Sindh

O-256/ ICAZ-2024

Elucidation of Antidepressant Properties of Ocimum basilicum Extract Using Swiss Albino Mice Ayesha Batool¹, Hareem Noor¹, Muhammad Muzammil Nazir¹, Tayyaba Ali², Iqra Farzeen¹, Asma Ashraf^{1*} ¹ Department of Zoology, Government College University Faisalabad





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Abstract

Ocimum basilicum seeds are applied in traditional medicines in some countries, primarily as tonic to rejuvenate body after a demanding episode. However, there is paucity of scientific evidence to support this usage. Therefore, research aimed to reveal the anxiolytic and anti-depressant potential of ethanolic extract of ocimum basilicum seeds (EEOBS) in Swiss albino mice. The central nervous system inhibitory effect determined by Open field maze test using line crossing, grooming, rearing, time spent in center and anxiolytic effect investigated by using Hole cross test, Hole board test and elevated plus maze test and Thiopental sodium-induced sleeping time test at the 100, 200, and 400 mg/kg body weight sequentially. The EEOBS antidepressant effects showed significant improvements in anxiety and lowered depression as the dose increased to 100, 200, and 400 mg/kg body weight. These findings indicate the safety of the extracts at doses 100, 200 and 400mg/kg mg/kg. The antidepressant effects of Ocimum basilicum seeds increase significantly at higher doses, suggesting a dose-dependent relationship. This indicates that the bioactive compounds present in these plants exhibit greater antidepressant activity at every concentration, making them potent candidates for therapeutic applications in anti-depression.

Keywords: Ocimum basilicum , CNS (Central Nervous System) activity, Antidepressants, Hole Cross Test , Open field test

O-257/ ICAZ-2024

Evaluation of anti-inflammatory potential of Lavendula stoechas ethanolic extract; in-vitro and in-vivo approach

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Abstract

Lavendula stoechas (ustukhuddoos) has medicinal value in traditional medicines. In this study, Lavendula stoechas flower ethanolic extract (EELSF) was prepared by soxhlet extraction. Furthermore, GC-MS analysis, in-vitro and in-vivo anti-inflammatory potential was carried out. GC-MS analysis of EELSF contained 9,12,15 Octadecatrienoic acid, (Z, Z, Z), n-Hexadecanoic acid, Camphor and Coumarin with high percentage. In-vitro and in-vivo anti-inflammatory activity was evaluated by Bovine serum albumin assay and carrageenan induced rat paw edema model respectively. In-vitro assay, EELSF showed maximum inhibition of 65.56 ± 1.56 protein denaturation as compared to Diclofenac sodium ($67.97\pm1.78\%$) at 1000ug/ml concentration. In carrageenan induced rat paw edema model, standard group (10mg/kg, p.o) have significant reduction in edema (p < 0.05) as compared to extract dose (100,200,400mg/kg, p.o) In gross morphology and histopathological studies restoration of keratin and epithelium layer were observed. The results provide evidence for anti-inflammatory activity of ethanolic extract of L. stoechas flowers thus supporting its traditional use in painful inflammatory conditions.

Keywords: Lavendula stoechas, anti-inflammatory, GC-MS, BSA, Protein denaturation, Carrageenan, swiss albino rats, Histopathology.

O-258/ ICAZ-2024

Single high-dose Streptozotocin treatment severely damages kidneys in adult Wister rats.

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Abstract

Kidneys filter out excess plasma glucose. Renal glucose transporters (GLUT) present in the proximal tubules of the nephrons are employed for the uptake of glucose. Streptozotocin (STZ), a beta cell cytotoxic chemical is commonly used to induce hyperglycemia in rodent models. STZ enters beta cells via GLUT, so STZ might be absorbed by the proximal tubules of the nephrons via GLUT. The present study was designed to study the impact of a single high dose of STZ on kidneys. A single intraperitoneal inj. of STZ @ 200 mg/kg b.w. was given to adult rats. Animals were sacrificed on multiple time points post alloxan treatment i.e. 12, 24, and 36 hours. The blood samples were assessed for CBC, serum creatinine, and blood urea nitrogen (BUN). The kidney and pancreas were also collected and fixed in PFA for histological analysis. Increased blood urea nitrogen (BUN) and serum creatinine levels were observed in the alloxan-treated rats. Microscopic examination reveals glomerular hypertrophy, increased extracellular matrix deposition, and tubular dilation. The current study reveals that high-dose STZ induces acute glomerulopathy, tubulopathy, interstitial inflammation, and fibrosis which are independent of hyperglycemia.





O-259/ ICAZ-2024

Effect of Green Tea Extract on Reproductive Toxicity Induced by Chlorpyrifos in Female Mice

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Abstract

Chlorpyrifos (CPF) is a widely used organophosphate insecticide in both agricultural and household applications. The potential for reproductive harm of the organic pesticide chlorpyrifos was assessed in female mice. Chlorpyrifos (CPF) can cause reproductive dysfunction and ovarian damage. Antioxidants like the green tea compounds can reverse this. This study sought to look at the effects of CPF's toxicity on mice ovaries and how well Green tea protects against those effects. 24 adult female albino mice were divided into four equal groups by random selection: the control group, the Green tea group, CPF, and the double dose (CPF+Green tea) treated group. Mice were treated by gavage with chlorpyrifos 25mg/kg CPF dissolved in corn oil (0.2ml) for 28 days. After four weeks, the relative ovarian weight and the mice's body weight were calculated, and blood samples were taken to measure the levels of reproductive hormone (RH). To evaluate histopathologic alterations, ovarian sections were evaluated using the hematoxylin and eosin stain. Mice treated with CPF had significantly increased the follicle diameter but their quantity decreased, and the cellular growth in ovarian Graafian follicles was markedly inhibited. Hormone level was significantly reduced by CPF when administered alone, but the above effect was improved in the CPF and Green tea group. In the Green tea group, ECCG, an antioxidant in green tea has a good effect on the female reproductive system. The findings suggest that prolonged exposure to CPF leads to oxidative stress and adverse effects on the reproductive organs of female mice. These results could indicate the early stages of cancer development. Exposure to CPF has harmful effects on the development of follicles. On the other hand, administering a green tea extract showed positive effects in mitigating the toxicological and physiological impacts caused by this insecticide. Therefore, green tea extract could be a potential therapeutic solution for reproductive toxicity without any adverse effects.

O-260/ ICAZ-2024

Comparison of plant extracts, conventional insecticides and nanoparticles against mustard aphid

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Abstract

Brassica (Brassica napus L.) is one of the major cash crop and source of cooking oil in Pakistan. Canola has 10% fiber, 8% fat, and 33% protein. Pakistan's canola crop was grown area of 31,161 h, yielding 49,000 tons of seed overall. Pakistan produced about 0.46 million tons of edible oil domestically, which was approximately 23% of the country's entire requirement, while 2.754 million tons were imported. Brassica is attacked by many insect pests but aphid is the most destructive pest. Aphid causes severe damage to the plants by sucking plant sap from the tender shoots and flowers of the plant in the beginning and later sucks the sap from tender pods. The present study regarding comparison of nanoparticles, plant extracts and conventional insecticides against mustard aphid was conducted in the laboratory of Entomological Research Institute, Ayub Agricultural Research Institute (AARI), Faisalabad Pakistan. The objective of the current study was assessment of botanical extracts, selective synthetic insecticides and nanoparticles against mustard aphid and also define out most effective and environment friendly management of mustard aphid. Plant extracts of Neem (A. indica), Eucalyptus (E. globulus), Tobacco (N. tabacum), Black pepper (P. nigrum) and Garlic (A. sativum) were used against brassica aphid under laboratory condition to evaluate their efficacy. The data was collected at 24, 48, 72 hours. A. indica and N. tabacum emerged as the most effective, with A. indica achieving up to 73.33% mortality and N. tabacum achieving up to 60.17% mortality after 72 hours. Moreover, nanoparticles (silver and zinc) and insecticides (carbosulfan and imidacloprid) were also evaluated for their effectiveness. Silver caused 84% mortality and Carbosulfan caused 94% mortality after 72 hours. Analysis of Variance (ANOVA) indicate a significant difference in mustard aphid mortality between plant extracts, nanoparticles, insecticides and control group.

Keywords: Brassica crop, Plant extract, Nanoparticles, Insecticides, Brassica aphid.



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Catalase activity in different organs of *Labeo rohita* from river ravi as influenced by metal pollution Shamsa Ikram¹, Khalid Abbas¹", Shabana Mateen¹, Tahmina Gulzar¹, Anchal Romaan¹, Rabia Maqsood¹, Sibgha

Jamil¹, Sumra Naz¹ and Bushra¹

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Abstract

Aquatic reservoirs are receiving indiscriminate waste disposal from industries leading to metal pollution. Heavy metals above permissible concentrations produce reactive oxygen species in fish body. In response to ROS, antioxidants are produced that are the first defensive barriers to intervene the oxidative stress. The current research was conducted to assess the antioxidant activity of catalase in different organs of Labeo rohita captured from three sampling points of River Ravi. For this purpose, fish were sacrificed to extract the organs i.e. gills, muscles, liver heart and kidney at the sampling points and packed in zippered polyethylene bags. The organs were further kept in ice boxes for preservation and shifted to the laboratory for toxicological and biochemical analysis. After that, organs were categorized into two proportions for metal detection and enzyme assay. For enzyme assay, organs were homogenized by adding phosphate buffer and centrifuged for 15 minutes at 10000rpm. Furthermore, supernatant was analysed with the help of UV-visible spectrophotometer at 240nm using substrate hydrogen peroxide. For metals (Cr, Ni, Cu, Pb and Co) detection, organs were digested on the hot plate and observed under atomic absorption spectrophotometer. The result of current study showed highest CAT activity in the liver ($335U/ml \pm 2.5$), kidney ($268 U/ml \pm 4.7$), heart(95U/ml ±3) and muscles (129 U/ml ±2.5) of L. rohita sampled from the Head Balloki while gills (192 U/ml ±3) of L. rohita sampled from the Shahdara Bridge showed highest CAT activity due to redox metals Cu and Cr. The water samples were also taken for the correlation of physico-chemical parameters. Overall, Cu was found highest in the water samples from River Ravi. The results of current study indicated that CAT activity was significantly different in various sampling points of River Ravi. The inference of the current study would be helpful for the determination of ecological status of the River Ravi by using the biomarkers.



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P-01/ICAZ-2024 Comparison of two different Insecticides (Gamma cyhalothrin and Chlorfenapyr) against Mites and Thrips of Onion

Hanan Khalid*, Bilal Saeed Khan & Muhammad Aneeb Shahzad Department of Entomology, University of Agriculture Faisalabad, Pakistan

Abstract

The onion (Allium cepa L.) is a significant vegetable commonly grown to add unique flavor and diversity to cuisines worldwide. Insecticides are widely used to control the onion thrips population and prevent the development of viral infections. Chlorfenapyr and Gamma cyhalothrin are popular insecticides that are considered to manage onion thrips and two-spotted mites. The study was conducted under a Randomized Complete Block Design (RCBD) with three replications and a control group. The area was divided into three blocks. Treatments were applied using a hand spray machine with a hollow nozzle. The data was recorded by randomly selecting five plants in each block. A percent reduction in the population of thrips and mites was recorded. The recorded data was subjected to one-way ANOVA and post hoc test under Statistix 8.1 to check the significance level where $\alpha = 0.05$. Results have displayed that Chlorfenapyr showed the highest reduction (82.51%, 74.55% and 87.113%) against onion thrips (Thrips tabaci) while (92.88%, 93.403% and 91.547%) reduction against two-spotted spider mites (Tetranychus urticae) after all three applications of treatments under field conditions. These findings suggest that Chlorfenapyr is highly effective in controlling both onion thrips and two-spotted spider mites, making it a valuable tool for managing these pests and minimizing the damage they cause to onion crops.

P-02/ICAZ-2024

Preparation of Arabinoxylan Based Hydrogel for Antidiarrheal Drug Delivery Device

Fouzia Naseem, Hasnain Haider, Atka Rubab, Azhar Rasul, Amna Sajjad Department of Zoology, Government College University Faisalabad

Abstract

Psyllium (Plantago Ovata), whose common name is isabghol, has been explored for many years for nutritional and therapeutic purposes. Consumption of Psyllium husk has also been shown to provide measurable clinical benefits in other conditions such as ulcerative colitis, irritable bowel syndrome, diarrhoea caused by enteral feeding, chronic constipation, chronic diarrhoea, haemorrhoids, and type 2 diabetes. We aim to develop Plantago Ovata (PO) based hydrogels through the copolymerization of biopolymers for use as drug delivery carriers. Injectable hydrogels based on Psyllium, Chitosan, and Polyvinyl Alcohol (PVA) loaded with or without Imodium will be prepared to check the potential of safe and efficient antidiarrheal treatment in Swiss albino rat model. The structural characterization of the hydrogel, surface morphology, and roughness will be observed by FTIR, AFM, and cryo-SEM, along with evaluation of swelling studies in different conditions, hemocopactibility, degradation, wetting analysis, moisture loss, and drug loading and release. The antimicrobial assay will be performed to check the inhibition of bacterial growth. The release of Imodium from biopolymeric hydrogel also will be checked. Psyllium-based hydrogel loaded with imodium possessing exceptional properties could be used as a drug carrier for diarrheal treatment. Twentyfour albino rats will be divided into six groups, with doses of 100, 200, and 400 mg/kg of biopolymeric hydrogel administer to three separate groups. The antidiarrheal potential of arabinoxylan hydrogel will be assessed by monitoring changes in stool water content, body weight, followed by a histopathological examination of colon tissues. Statistical analysis will be performed by using one-way ANOVA via GraphPad® Prism software to determine the significance of the results, with a p-value of < 0.05 will be considered statistically significant.

Keywords: Psyllium hydrogel; antidiarrheal activity; hemocompatible; Imodium; localized drug delivery

P-03/ICAZ-2024

Biodiversity of Spiders (Araneae) From District Loralai, Baluchistan, Pakistan Abdul Rahman*, Bilal Saeed Khan & Muhammad Aneeb Shahzad Department of Entomology, University of Agriculture, Faisalabad, Pakistan



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Abstract

Spiders are one of the outstanding and admired bio-control agents that belong to order Araneae. The current study has quantified the diversity of spiders, including abundance, richness, and evenness in different crops, uncultivated areas and deserts. Random sampling was done under a Randomized Complete Block Design with three replications in four distinct areas (Kach Aamagai, Kil Sagar, Killi Zingwaal and Barmeenai) of District Loralai, Baluchistan. Spiders were collected using different methods, such as pitfall traps, hand picking, and aerial netting. The identification of spiders was made through taxonomic keys and online literature. Results indicated that Lycosidae family had highest species diversity and was evenly distributed in studied areas with 650 individuals out of a total of 1532 collected specimens, belonging to 7 genera and 10 species. Alpha diversity indices showed that the Lycosidae family had highest species abundance, richness and evenness (Simpson_1-D = 0.8247, Shannon_H = 1.765, Evenness_e^H/S = 0.9732). The Oxyopidae family followed with Simpson1-D = 0.8176, Shannon_H = 1.746 and Evenness_e^H/S = 0.9554. Conversely, the Pholicidae family showed the lowest species diversification (Simpson_1-D = 0.7648, Shannon_H = 1.589, Evenness_e^H/S = 0.8163). These findings highlighted the significant variation in spider diversity and distribution across different environments in Baluchistan. Keywords: Spider diversity, Araneae, Species richness, Species abundance, Species evenness, Baluchistan

P-04/ICAZ-2024

Nutritional Value of Mushroom Intake and Its Impacts on Human Health Linked with Biochemistry

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Abstract:

In this study, we discuss the mushrooms that we can eat. These are macroscopic, and we can see them with our eyes easily. We are able to easily recognize them and pick them up by hand. In this study, we tried to recognize the benefits of mushrooms for our health and to calculate the types of species with respect to biochemistry. There are different types of mushrooms we have in our country and all over the world. People specially cultivate them and do their imports and exports. Methodology: For cultivation purposes, we use different methods to cultivate them and get a good number of mushrooms from the land. In different areas, specialists collect samples of different types of mushrooms and perform experiments on them. They collect samples to check out the value of food, the type of chemical compounds they have, and their use as medicines in different areas. Mushrooms have lots of benefits and play an important role in our health. They have a huge amount of carbohydrates, nucleic acids, minerals, proteins, and lipids in them. Mushrooms are one of the selected items that have a high source of nutrition in them. Its nutritional value is very high as compared to other plants or foods. Results: We have seen that mushrooms have a high amount of nutrition in them. We also have different qualities and types of mushrooms with different percentages of nutritional value. It helps solve lots of medical issues related to human health. It helps make our immune system strong. It also has anti-virus agents and solves problems linked to therapies. Conclusion: In this study, we conclude that mushrooms have lots of qualities and abilities to treat our most common medical issues. It protects our body from several harmful effects and diseases because it has a strong nutritional value. The level of protein, vitamins, minerals, lipids, steroids, etc. is very high. So, we can say that mushrooms work as a medicine to treat many harmful diseases, and they're an herbal medicine that also helps treat cancer.

P-05/ICAZ-2024

Insecticidal effect of five essential oils against Tomato Aphid, Myzus persicae, in laboratory Ali Jabran¹, Bilal Saeed Khan¹, Ali Zeshan², Aqsa Abbas²

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Abstract

Tomato aphid is a phloem-feeding insect pest that significantly affects yearly tomato production. The use of chemical pesticides is the best way to keep the aphid population under control but this harmful pest has developed resistance against different chemicals. Studies conducted over the years have revealed that essential oils have lethal and sub-lethal effects on different life stages of aphids. In this experiment, five different essential oils of Neem (Azadirachta indica), Eucalyptus (Eucalyptus globulus), Citronella Java (Cymbopogon winterianus), Clove (Syzygium aromaticum) and Garlic (Allium sativum) were assayed for evaluating insecticidal activity against tomato



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aphids (M. persicae). In contact bioassay, garlic oil had highest mortality of 69% and citronella java oil showed the lowest mortality of 37.89% at 2% concentration after 72 hours. In the repellency test, garlic oil had the highest repellency of 81% and neem oil exhibited a repellency of 37.77% at 0.5% concentration after 2 hours. Lethal concentration (LC50) values showed that garlic oil had the highest lethality at 1.132% and citronella oil exhibited the lowest lethality at 2.494% against aphids. Statistix 8.1 and MiniTab 21 were used for statistical analysis. Despite the phytotoxic effects of essential oils, the application of these oils against the aphid population in IPM programs is still considered feasible. Keywords: Aphids, Essential oils, Bio-insecticides, Myzus persicae, Solanum lycopersicum

P-06/ICAZ-2024

Diabetic wound healing potential of silk sericin protein based hydrogels enriched with plant extracts Samia Zahoor¹, Hafiz Muhammad Tahir¹*, Shaukat Ali¹, Aamir Ali¹, Ayesha Muzamil¹, Zainab Murtaza¹, Nimbra

Zahoor²

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Abstract

The complications associated with diabetic wounds make their healing process prolonged. Hydrogels could be ideal wound dressings therefore present research was conducted to prepare silk sericin (an adhesive protein polymer) based hydrogels in combination with plant extracts and to evaluate its effectiveness against wound healing process in mice with alloxan induced diabetes. Excision wounds were formed via a biopsy puncture (6 mm). Experimental hydrogels were prepared and applied topically on the diabetic wounds. All the hydrogel treatment groups showed significantly higher (P < 0.001) percent wound contraction from day 3 to day 11 as compared to the negative diabetic control group. The serum level of anti-inflammatory cytokine (Interleukin-10) and tissue inhibitor metalloproteinase (TIMP) was significantly higher (P < 0.001), while the level of proinflammatory cytokines (tumor necrosis factor- α , Interleukin-6) and matrix metalloproteinases (MMP-2, MMP9) was significantly lower (P < 0.001) in hydrogels treatment groups as compared to diabetic control group. Although all the hydrogels showed effective results, however the best results were shown by 4 % sericin+4 % banyan+4 % onion based hydrogel. It can be concluded that Sericin based hydrogel enriched with banyan and onion extracts can be used as an effective remedy for the treatment of diabetic wounds due to their high healing and regenerative properties.

P-07/ICAZ-2024

Quality Assessment in Freshwater Fish Species of Punjab, Pakistan

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Abstract

Freshwater fish are a significant source of protein in many regions, including Southern Punjab, Pakistan. However, the microbiological quality of the fish can greatly impact consumer health. This study focuses on the assessment of the microbiological safety of economically important species of Major carps (Indian and Chinese) by examining fish samples from various local markets. Different types of carps' sale at various markets in the South Punjab, Pakistan. Different samples collect from different sites: Multan wholesale market (Site A), Khanewal retailer market (Site B), local supermarkets (Site C), Muzaffargarh (Site D), and Vehari fish market (Site E). Fish samples transport as whole, un-gutted specimens in polythene bags, packed in ice-filled insulated boxes to ensure preservation during transit to the laboratory of the Department of Zoology, Wildlife and Fisheries, Muhammad Nawaz Sharif University of Agriculture, Multan. The study focuses on microbiological analysis of fish skin and muscle tissues, isolating food-borne pathogens such as Salmonella, Escherichia coli, and Listeria, which pose risks to food safety and public health. Assessing the microbiological quality of fish from local markets is essential to ensure food safety and protect public health. The findings contribute to understanding the hygiene practices required in the fish supply chain. Keywords:

Major carps, fish organs, sale markets, microbial quality, food-borne pathogens

P-08/ICAZ-2024

Assessment of Aquatic Insects Abundance and Diversity with Water Quality Parameters in the Arial Khan River, Narsingdi, Dhaka, Bangladesh

Md. Shohag Mia



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Department of Zoology, Faculty of Biological Sciences, Jahangirnagar University, Savar, Dhaka-1342 Abstract

Aquatic insects play a crucial role in maintaining and assessing water quality and contribute significantly to the health and functioning of aquatic ecosystems. The study conducted from July 2023 to June 2024 focused on determining the abundance and diversity of aquatic insects to evaluate the overall water quality of the Arial Khan River. A total of 9,728 aquatic insects were collected, representing 25 genera from 17 families under 5 orders. Hemiptera was the most dominant (49.26%) and the lowest was Ephemeroptera (2.7%). The most abundant family was Belostomatidae (32.94%) and Pleidae (0.9%) was the least. Station NK exhibited the highest percentage of Ephemeroptera (17.87%), Odonata (9.27%), and Hemiptera (10.58%). Coleoptera (11.70%) was the most dominant at station AB. The highest percentage of Diptera (12.42%) was recorded at station JB. The highest (23.6%) relative percentage abundance was shown by Diplonychus rusticus and the lowest (0.9%) was Ischnura sp. Moreover, the highest Simpson diversity index of 2.68 and lowest of 2.18 was documented for stations HB and JLB, respectively. The highest water temperature (32.15±0.13°C) was recorded at station AB, while station CU had the highest dissolved oxygen (6.26±0.05mg/l) and pH (8.14±0.06). Station JLB recorded the highest total dissolved solids (793.341±46.09mg/l) and electrical conductivity (1114.46±80.76 µm/cm), with station CU showing the lowest values for these parameters. This study has provided information on the diversity and abundance of various aquatic insects as well as the water quality of river Arial Khan, emphasizing the need for stringent regulations to control anthropogenic activities at stations JB and JLB to protect the river's ecological health.

Keywords: Aquatic insects, Water quality, Arial Khan River, Narsingdi.

P-09/ICAZ-2024

Catalase activity in different tissues of oreochromis niloticus captured from indus river as influenced by heavy metals

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Abstract

The current study was carried out to monitor the catalase activity in different tissues of Oreochromis niloticus captured from Indus River as influenced by heavy metals. For this purpose, fish samples were captured from the two selected sites of Indus River (Chashma and Taunsa Barrage) and pond of fisheries Research Farm, UAF. Muscles, Liver, Gills and Heart were extracted from Fish specimen. These organs were brought to the Aquaculture Biotechnology Lab, UAF. Half of the organs were used for enzyme activity essay and half for the estimation of metal concentration in respective organs. Fish organs were homogenized and centrifuged for the purpose of enzyme assay. The enzymatic activity was measured by using spectrophotometer at wavelength 240nm. The result of the present study showed higher catalase activity in liver (209 ± 6.59), heart (143 ± 6.43) and gills (171 ± 6.28) of O. niloticus captured from Taunsa Barrage as compared to the other experimental sites. By using Atomic Absorption Spectrophotometer, the metal concentrations were estimated in different organs of study fish and water samples collected from Taunsa barrage. The concentration of heavy metals in water samples was also determined these found in order Cr>Zn >Cu>Pb. Results indicated a significant difference p ≤ 0.05 in the catalase activity in heart, gills and liver of O. niloticus captured from the sites. The inferences of present study would be helpful in understanding of fish can be used in biomonitoring of metal pollution in aquatic environment.

P-10/ICAZ-2024

Body Mass Index Misperception: Comparing self-perceived and measured BMI in Adults.

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Maida Khalil, Dr Durr e Samin Tahir

Abdul Salam School of Sciences, Nusrat Jahan College, Chenab Nagar

Abstract

The body mass index, or BMI, is a commonly used statistic to evaluate health risks associated with obesity. However, research indicates that people's self-perceived BMI frequently differs from their actual measured BMI. This discrepancy calls into doubt the reliability of self-reported BMI and has consequences for public health programs, healthcare use, and health outcomes. A precise measurement of BMI is essential for a trustworthy health risk



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assessment and focused interventions. The purpose of this study is to examine the link between measured and selfperceived BMI, as well as the reasons that lead to disparities and their implications for patient outcomes and healthcare practices. Data from Chenab Nagar's female population (n=350) ranging from 15-60 and above years was gathered and computed for the upcoming study. After the data is analytically examined in SPSS, the outcome shows that the underweight category overexpressed and obese class is under-expressed by self-perceived individuals. Among different age categories, a significant difference has been observed in those who self-reported their body mass status (p < 0.001).

P-11/ICAZ-2024

Seroprevalence and associated risk factors of torch infections among pregnant women of north waziristan

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Abstract

The study was conducted in Waziristan tribal district to find out the seroprevalence and associated risk factors of torch infections. The TORCH comprises of toxoplasmosis, rubella virus, cytomegalovirus and herpes simplex viruses' type-1 and type-2. A total 256 samples were collected from seven major Tehsils of North Waziristan and were screened through ICT by using the commercially available kits. The antibodies IgM and IgG were detected against the pathogens. Out of total 256 samples, 83 (32%) were found reactive and 173 (68%) non-reactive. Among the TORCH pathogens Toxoplasma was found more reactive with 36 (43%), followed by Rubella 19 (23%), CMV 17 (20%) and HSV 11 (13%). The group age 18-23 years was more infected than other with 29 (35%) cases along with 23-28 (25%), 28-33 (20%), 33-38 (13%) and >38 (6%). Among the antibodies IgM (20) for Toxoplasma, and IgG (8) were found for Rubella with highest ratio. The highest ratio of the cases was found with risk factors of cats 26 (31%), Unhygienic food 17 (20%) and cattles 13 (16%). The study revealed that TORCH infections is very prevalent in North Waziristan therefore it is necessary to manage and control the spread of TORCH pathogens and its associated risk factors.

Keywords: TORCH pathogens, risk factors, antibodies, IgG, IgM, North Waziristan

P-12/ICAZ-2024

The Therapeutic Potential of Ribes Orientale in Hypertension: Improving Electrolyte Balance, Enhancing Antioxidant Activity, and Modulating the Muscarinic & Aldosterone Pathway Hafiza Sara Afzal, Ambreen Malik Uttra

University of Sargodha

Abstract

Cardiovascular diseases like hypertension require diuretics, but their effectiveness and side effects limit their use. Alternatives like Ribes orientale extract are being investigated for potential diuretic action.

In acute diuretic action, Ribes orientale extract and fractions was investigated in saline-loaded rats at doses of 12.5, 25, and 50 mg/kg, p.o., while prolonged diuretic activity was also performed by administration of the most potent and significant dose of Ribes orientale for 7 days. The study confirmed the potent diuretic action of Ribes orientale at 50 mg/kg, similar to furosemide. It produced significant natriuresis and insignificant kaliuresis in electrolyte excretion. The cholinergic pathway might be responsible for the diuretic effect. Hematological, renal function tests, and histopathological studies confirmed the safety of Ribes orientale at 50 mg/kg. Ribes orientale downregulated aldosterone, enhanced local bradykinin availability, and reduced oxidative stress. We conclude that the Ribes orientale possesses a considerable diuretic effect. Therefore, more study is needed to identify the exact mechanism of action and the real efficacy of Ribes orientale as diuretic.

P-13/ICAZ-2024

Impact of heavy metals contaminated water on the biological parameters of fishes Soonh Allah Bux University of Sindh Hyderabad

Abstract

Heavy metals contaminated in aquatic environments poses a significant threat to fish health and ecosystem stability. This study investigates the effect of heavy metals contaminated water on various biological parameters of fish including growth, reproductive health and physiological functions. we conduct a series of experiments exposing fish to varying concentration of heavy metals (e.g. lead, Mercury, cadmium) over a six month period. Key biological



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parameters assessed including growth rates, hematological profiles, liver and kidney histopathology and reproductive success. Result indicates a significant decline in growth rates and overall fish condition in contamination environment compared to control groups. Hematological analysis revealed attered blood profiles, including increased levels of stress marked and reduced red blood cells count. Histopathological examination of liver and kidney, tissue showed severe damage, including necrosis and inflammation. Reproductive assessment demonstration a reduction in fecundity and abnormal developmental stages in offspring. These findings highlight the detrimental effects of heavy metals pollution on fish health, emphasis the need for stringing water quality management and pollution control measures to protect aquatic life and ensure sustainable fisheries.

Keywords: heavy metals, fish health, water pollution, growth rates, reproductive success, histopathology, hematological, aquatic environments.

P-14/ICAZ-2024

A Cross-Sectional Analysis of Diabetes Knowledge, Attitude and Practice Among Female Population of Chenab Nagar

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samin Tahir

Abdul Salam School of Scienes Nusrat Jahan College Chenab Nagar

Abstract

Type 2 diabetes is a common health condition where the body's receptors do not respond adequately to insulin, leading to elevated blood glucose levels. Patients often suffer from tiredness, frequent urination, and excessive thirst. A descriptive cross-sectional study was conducted with the purpose of evaluating the current state of knowledge on type 2 diabetes mellitus in order to inform the creation of future health education initiatives and tactics. A KAP questionnaire comprising 30 interrogative statements was designed to analyze the ;Knowledge, Attitude, and Practices; concerning to our topic of interest among the female population of Chenab Nagar. The sample size consisted of 380 females, and the results illustrated a significant positive correlation between the educational status and knowledge level of individuals. Specifically the graduates, M.Phil. and PhD degree holders, demonstrated greater understanding about the symptoms (p =0.001), insulin (p =0.015), and the differences between type 2 diabetes and type 1 diabetes (p =0.004). This group also showed higher participation in educational sessions related to the topic (p=0.016). Moreover, individuals possessing a family history of diabetes exhibited greater understanding of type 2 (p=0.005) and insulin resistance (p =0.04) and were more likely to have undergone diabetes screening in their lifetime (p = 0.019).

P-15/ICAZ-2024

Comparative analysis of catalase and peroxidase activity in different tissues of Cyprinus carpio from river chenab

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Abstract

Present research work was carried out on Cyprinus carpio to evaluate pollution induced oxidative stress by using stress markers catalase and peroxidase. Fish was collected from different sites of River Chenab i.e. Trimmu Barrage, Marala Barrage, Chiniot Bridge, Qaderabad Headworks and semi-intensive pond of Fisheries Research Farms, (UAF) as a reference site. Various physico-chemical parameters i.e. temperature, electrical conductivity, dissolved oxygen, pH of water was recorded on the spot. Selected organs such as liver, gills, heart, muscle and kidney were extracted from C. carpio and brought to Aquaculture Biotechnology Lab. UAF into plastic zipper bags preserved in icebox for further analysis. Catalase and peroxidase activities were measured on spectrophotometer at 240nm and 470 nm respectively. Analysis of variance (ANOVA) was applied on data by using statistix 8.1 software. Variations among different sampling sites, fish organs and antioxidants i.e. catalase and peroxidase were analyzed at the significance of p<0.05. Catalase and peroxidase activities at different sampling sites were observed in following order liver>gills>kidney>muscle>heart and liver>gills>kidney>muscle respectively. Results showed highly significant (p<0.05) increase of catalase (287.62+0.325UmL -1) and peroxidase (210.80+0.06) activities in hepatic tissues of C. carpio at Trimmu Barrage as compared to other sites. Catalase activity was found significantly (p<0.05) higher than peroxidase. The inference of present research work will be helpful to understand how stress markers can be used to evaluate pollution influence on C. carpio.



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P-16/ICAZ-2024

Beyond the White Patches: Understanding Teachers' KAP Towards Vitiligo in Chenab Nagar

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Durr e Samin Tahir

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Abstract

Vitiligo is a chronic autoimmune disorder that causes loss of skin colour and pigment as the immune system attacks and destroys melanocytes. This study evaluates teachers' knowledge, attitude, and practice (KAP) toward vitiligo. A population's perception and attitude regarding vitiligo are linked to the societal acceptability of affected persons, which influences their overall well-being, sense of stigma, and treatment outcomes. Our objective was to assess teachers' KAP towards vitiligo and identify areas of education and awareness. Teachers have a significant impact on society because they are role models and influencers who help shape student's perceptions, which in turn shapes societal norms and attitudes. A descriptive cross-sectional study about Vitiligo evaluated the KAP of teachers in Chenab Nagar, with a focus on both genders. The sample size consisted of 400 teachers, 200 males and 200 females. Data is collected through a structured 25-question KAP questionnaire, and IBM SPSS Statistics v29 was utilized for data analysis, to find the correlation between age group and family history of vitiligo with understanding of the Vitiligo. The results revealed that teachers aged 66 and above have more knowledge about vitiligo and melanin pigment (p = 0.023). Notably, those with a family history of vitiligo had a better comprehension of the condition (p = 0.082) and were more likely to consult a dermatologist in their lifetime (p = 0.029).

P-17/ICAZ-2024

Stage Specific Evaluation of Different Bait Formulations with Chronic Poison for Rodent Management in Wheat Crop

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Abstract

Rodents pose a significant threat to wheat crops, leading to substantial yield losses in agricultural systems. Therefore, there is a need of effective methods for the control of field rats by using chronic poisons. This study aimed to evaluate the preferred bait base at each stage of wheat crop (initial, heading and maturity) and its effectiveness by adding chronic poison. Overall, screening of 4 bait bases (wheat, rice, maize and millet) all in cracked form were carried out in multi-choice feed preference tests. Millet was used as control while (millet + maize), (millet + wheat) and (millet + rice) in 50:50 ratios were used as treatments. Screening of three bait additives (peanut butter, eggshell and cooking oil) was carried out by adding in the top ranked bait base in 4% ratio. Evaluation of poison bait was carried out by adding developed bait of each stage and millet (control) with coumatetralyl racumin (slow poison). Bait base and additives test were carried out at each stage while poison test was carried out at maturity stage of wheat crop. Results showed that millet, wheat and peanut butter found effective for poison baiting at initial stage of wheat crop while millet, rice, peanut butter and racumin are an effective combination for controlling field rats at maturity stage of wheat crop. It is recommended that rodent control strategies should be adapted based on the growth stage of the wheat crop, with bait base preferences shifting from millet and wheat to millet and rice as the crop matures. Keywords: Rodent management, Coumatetralyl, Bait base screening, Crop stages, Feed preference

P-18/ICAZ-2024

Amelioration of water borne Nickel (Ni) toxicity by Coriander (Coriandrum sativum) seed extract supplementation in Grass Carp (Ctenopharyngodon idella)

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Abstract

This study was conducted to explore the beneficial effects of adding dietary coriander (Coriandrum sativum)



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seed extract in mitigating nickel (Ni) toxicity in fish. For this purpose Ctenopharyngodon idella fingerlings were divided into three groups and distributed among 18 tanks. The following were the experimental groups: Fish in the negative control group (NC) were not given any supplements and not exposed to Ni; fish in the positive control group (PC) were given no supplements but were exposed to 3.6 mg/L of Ni; 1% C. sativum supplementation along with 3.6 mg/L Ni exposure; 2% C. sativum supplementation along with 3.6 mg/L Ni exposure; 2% C. sativum supplementation along with 3.6 mg/L Ni exposure; and 4% C. sativum supplementation along with 3.6 mg/L Ni exposure. Over the next 60 days, the trial continued. Waterborne Ni negatively impacted fish growth performance, blood profile, body composition, antioxidant activity, and histopathology C. idella. On the other hand, dietary C. sativum improved fish health and successfully reduced Ni toxic potential. Notably, 1 % C. sativum supplementation enhanced growth performance, increased quality of the carcass, improvement in blood indices, improved antioxidant activity, significant improvement in serum biochemical indices, and mitigated Ni toxicity. To summarize, the results demonstrated that adding 1% of C. sativum to the C. idella diet as a dietary supplement might successfully reduce heavy metal toxicity. Keywords: Nickel toxicity, Ctenopharyngodon idella, Hematology, Growth parameters, Antioxidant activity, Biochemical analysis, Body composition, Coriandrum sativum

P-19/ICAZ-2024

The prevalence of Type 2 Diabetes and its association with Different Demographic Factors among the Female Population of Chenab Nagar.

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Khan

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Abstract

Type 2 diabetes (T2D) is when the body fails to regulate glucose metabolism, mostly because of insulin resistance. Pakistan ranked 3rd in prevalence. The age-standardized global T2D prevalence in females was 5.0% in 2019. In Pakistan according to World Bank, it is 30.8% among those aged 20 to 79. Genetic factors and lifestyle changes, such as a sedentary lifestyle and high-sugar diets contribute to T2D. Risk factors include obesity, hypertension and gestational diabetes. A study in Chenab Nagar conducted by using a structured questionnaire revealed prevalence of T2D 23.9% in non-pregnant women aged \geq 30 (N=576). Rates were found to be rising significantly with age, 8.9% in 30-40 years, 32% in 45-59, and 50% in \geq 60. The cumulative percentage in Low-income localities was 26.8% (p=0.041). The ratio of Allopathy to Homeopathy was found to be 86.2% and 11.4% whereas the tablet-to-insulin ratio was 91% and 4.3% respectively. Lifestyle awareness is crucial to combat the escalating diabetes rates, emphasizing dietary changes and physical activity.

P-20/ICA-2024

Studies on growth responses of Hypophthalmichthys molitrix DURING stress of water temperature

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Abstract:

Fish, like any living creature, have preferred temperature ranges where they thrive. When temperatures rise or fall beyond the ranges, it can stress them out. This stress can reduce growth rates, impacting fish populations and ecosystems. Understanding this relationship between temperature stress and fish growth is vital for managing aquatic environments and ensuring healthy fish populations. For evaluation, the experiment was designed that how fish show an adverse effect on their development due to the continuous variance in water temperature. This trial was done in the Toxicology Laboratory, University of Agriculture, Faisalabad. The trial was conducted for three months, and the Silver Carp fingerlings (Hypophthalmichthys molitrix) were used. Three treated groups, i.e., (Control, T1, and T2) were used, arranged with their replicators. Fish was examined every fortnight during an experimental period. Feed was given to the fish according to the body weight of the fish twice a day, whereas the growth was checked by using the growth parameters every fifteen days. The best results were shown in the T1 treatment group as the fish showed a viable increase in weight and length. Despite the length and the weight, the best FCR and SGR were also recorded in the T1. From the initial body weight and length of the fish, the maximum and the best FCR, SGR, body weight, and length are shown in the T1 which are 2.4, 2.16, 125 g, and 38.7g, respectively. Although T2 also showed quite satisfactory results the mortality rate was seen in the T2 so, we don't consider the results of T2. Whereas, the minimum ratio was seen in the Control one which are 2.1, 2.12, 105 g, and 32.6 g, respectively.



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P-21/ICAZ-2024

Innovative Technologies for Water Quality Assessment: Integrating IoT, GIS, and AI for Sustainable Management

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Abstract

Introduction: Water quality monitoring is critical for protecting human health and managing water resources sustainably. Traditional approaches, on the other hand, frequently encounter issues such as delayed data collecting, expensive expenses, and a limited geographical scope. This study goal is to overcome these constraints by incorporating modern technologies such as the Internet of Things (IoT), Geographic Information Systems (GIS), and Artificial Intelligence (AI) to improve water quality evaluation and management. Methodology: IoT-enabled sensors were used to monitor important water parameters like pH, turbidity, and pollutant levels in real time. The data was spatially visualized using GIS-based mapping techniques, which identified contaminated hotspots. Historical water data was analyzed using AI and machine learning models, which provided predictions for future water quality changes. Remote sensing technology was also used to monitor inaccessible water bodies on a huge scale. Results: The integration of IoT, GIS, and AI increased the accuracy, speed, and efficiency of water quality evaluations. Real-time data enabled proactive decision-making, while predictive modeling identified contamination-risk locations. Remote sensing extended the monitoring reach to previously unreachable areas. Conclusion: This study shows how current technologies may transform water quality monitoring and management, resulting in more sustainable water resource practices and better public health protection. The technique is especially useful for handling population increase, pollution, and climate change. Key words: Water quality, IoT, GIS, AI, remote sensing, real-time monitoring, sustainable water management

P-22/ICAZ-2024

Quality Assessment in Freshwater Fish Species of Punjab, Pakistan

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Abstract

Freshwater fish are a significant source of protein in many regions, including Southern Punjab, Pakistan. However, the microbiological quality of the fish can greatly impact consumer health. This study focuses on the assessment of the microbiological safety of economically important species of Major carps (Indian and Chinese) by examining fish samples from various local markets. Different types of carps' sale at various markets in the South Punjab, Pakistan. Different samples collect from different sites: Multan wholesale market (Site A), Khanewal retailer market (Site B), local supermarkets (Site C), Muzaffargarh (Site D), and Vehari fish market (Site E). Fish samples transport as whole, un-gutted specimens in polythene bags, packed in ice-filled insulated boxes to ensure preservation during transit to the laboratory of the Department of Zoology, Wildlife and Fisheries, Muhammad Nawaz Sharif University of Agriculture, Multan. The study focuses on microbiological analysis of fish skin and muscle tissues, isolating food-borne pathogens such as Salmonella, Escherichia coli, and Listeria, which pose risks to food safety and public health. Assessing the microbiological quality of fish from local markets is essential to ensure food safety and protect public health. The findings contribute to understanding the hygiene practices required in the fish supply chain. Keywords: Major carps, fish organs, sale markets, microbial quality, food-borne pathogens

P-23/ICAZ-2024

Evaluation of the impact of phthalate ester in a comparative study of Drosophila melanogaster and Drosophila takahashi.

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Abstract

Drosophila or the fruit fly is a common laboratory model organism which is also considered as the 'Queen of Genetics'. There are thousands of species discovered worldwide and a wide variety also persists in Pakistan, but the majority are yet to be explored. Phthalate esters (1,2-benzendicarboxylate) are considered, endocrine system disruptors



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in animals. These odourless, colourless, oily liquid 'plasticizers' are used to make plastics more durable. Moreover, they are also present in cleaning agents, insecticides, children's toys etc. A comparative study among the Drosophila melanogaster and Drosophila takahashi species was conducted to address the adverse effects of phthalate esters, including distortion of the male-to-female normal ratio, reduction in the abdominal size of females which might indicate the reduced fecundity in Drosophila takahashi. The same parameters were used to compare the effect of these features in Drosophila melanogaster, the results were analyzed and documented.

P-24/ICAZ-2024

Praparation of Arabinoxylan Nanoparticles of Psyllium husk (Plantago ovata) by Green Synthesis Method to Traet Colon Cancer (HCT-116)

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Abstract

Nanotechnology, which broadly refers to the design, fabrication, and manipulation of particle structures from 1-100 nm. Nanoparticles have been used for drug delivery, especially in the treatment of the medical field. Arabinoxylan (AX) nanoparticles made from Psyllium husk present a viable, environmentally safe Nano platform for colon cancer treatment. The bioactive polymer Arabinoxylan has anti-inflammatory, anti-cancer, and antioxidant qualities. Green synthesis method would be used to prepare Arabinoxylan nanoparticles using Plantago ovata extract. The structural characterization, crystalline material structure and surface morphology of AX NPs would be done by FTIR, XRD, SEM and AFM. Arabinoxylan nanoparticle would be subjected to antimicrobial activity against Gram positive cell culture to check the inhibition of bacterial growth. DPPH assay would be used to indicate the antioxidant activity of Arabinoxylan nanoparticles. Biocompatibility of the prepared AX nanoparticles with human red blood cells would be checked by haemolytic activity. Drug loading and release would be investigated by the laws of dug release kinetics. To fully investigate the clinical potential of these AX nanoparticles for the treatment of colon cancer, MTT assay would be performed against HCT-116 cell line to check the cell viability. SPSS software will be used for one way (ANOVA) to determine significant differences at p < 0.05 between the means of independent groups. Image J software will be used for scale bars.

Keywords: Arabinoxylan, Nanoparticles, Psyllium Husk, Green Synthesis, Colon Cancer Therapy, HCT-116 Cells, Cytotoxicity.

P-25/ICAZ-2024

Investigating Plant Essential Oils as a Sustainable Control Method for the Asian Citrus Psyllid, Diaphorina citri Kuwayama (Hempitera: Liviidae)

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Abstract

The Asian citrus psyllid, Diaphorina citri Kuwayama is the main vector of pathogen, Candidatus Liberibacter asiaticus (Las) that causes huanglongbing or citrus greening disease. Various plant-derived essential oils are known to repel several arthropod species and are being considered as safe and minimum-risk pesticides. We examined the toxicity and repellency of three plant essential oils, mint, *Mentha piperita* (Lamiaceae), lemongrass, *Cymbopogon citratus* (Poaceae), and citrus lime, Citrus × sinensis (Rutaceae) against D. citri. The highest concentration (7.0%) of *M. piperita* showed greater mortality (80.0%) of adult D. citri followed by C. citratus (69.4%) and Citrus × sinensis (62.8%) compared to control (7.8%). After 4 hours, M. piperita oil showed the highest repellency at 7.0% (80.5%), while C. citratus oil had 70.6% at the same concentration. After 5 hours, both oils remained effective at 7.0%, with repellency rates of 61.7% for *M. piperita* and 63.9% for *C. citratus* however, after 24 hours, these rates decreased to 33.3% and 34.4%, respectively but according to classification, both at higher concentrations showed resistant to adult *D. citri*. The development of botanical pesticides could be useful in combating this disease vector, providing valuable options for pest control. Moreover, these natural repellents hold significant potential for organic citrus production, which currently faces limited management tools for addressing D. citri.

P-27/ICAZ-2024

Mealworm frass as a potential biofertilizer; Impact on maize growth and fall armyworm, Spodoptera frugiperda (J.E. Smith) feeding

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Abstract

Insect frass and vermicompost show promise as fertilizers due to their capacity to enhance plant resilience in adverse environmental conditions and boost resistance to insect pests and diseases. This study investigated the impacts of fertilization by mealworm frass and vermicompost in comparison to conventional fertilization on the cultivation of maize and Spodoptera frugiperda (J.E. Smith) (Lepidoptera: Noctuidae) infestation. After one month of data collection, the maximum plant height observed was 131.7 cm with the application of mealworm frass, significantly exceeding the control height of 87.9 cm. The number of unfolded leaves was also highest at 8.05 leaves per plant in the mealworm frass treatment. Additionally, the total leaf count per plant increased to 9.05 leaves with mealworm frass application. Leaf length reached an impressive 44.6 cm with mealworm frass, compared to just 24.5 cm in the control group. Furthermore, leaf consumption by S. frugiperda was significantly reduced to 40.0 cm on plants treated with mealworm frass, in contrast to 66.2 cm on control plants. The mortality rate of S. frugiperda larvae was markedly higher at 55.3% with mealworm frass treatment, followed by 48.8% with vermicompost, while NPK fertilizer resulted in a mortality rate of only 15.4%. Our findings suggest that the frass produced by mealworm has the potential to be used as a biofertilizer in organic farming. However, this potential varies significantly depending on the insect's diet. Further studies are needed to determine the optimal timing and quantity of application for various target plants.

P-28/ICAZ-2024

Mealworms frass as a potential biofertilizer: Impact on maize growth and fall armyworm, Spodoptera frugiperda (J.E. Smith)

P-29/ICAZ-2024

Formulation and evaluation of silk sericin xanthan gum based injectable hydrogel for the treatment of burn wound

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Abstract

This research study aimed to develop silk sericin-based injectable hydrogels incorporating the extract of Withania coagulans and to evaluate their effectiveness in treating burn wounds in mice. A hot metal rod was used to create burn wounds on the dorsal side of mice (6mm in diameter). The wounds were then treated with various formulations of injectable hydrogels: 4% silk sericin, 0.5% W. coagulans, 1% W. coagulans, 2% W.coagulans, 4% silk sericin combined with 0.5% W.coagulans, 4% silk sericin combined with 1% W. coagulans, and 4% silk sericin combined with 2% W.coagulans. The hydrogels were injected around the periphery of the wounds every two days. The effectiveness of these treatments was assessed by measuring wound healing time, percent wound contraction, and conducting histological analysis. Additionally, serum levels of various biochemical parameters were measured, including pro-inflammatory cytokines, the anti-inflammatory cytokine, tissue inhibitor of metalloproteinases, and matrix metalloproteinases. All hydrogel treatment groups showed efficacy, but the formulation containing 4% silk sericin and 2% W. coagulans produced the best results. This combination achieved nearly complete wound healing by day 17, with a 91.77% wound contraction. Furthermore, this group demonstrated the lowest levels of proinflammatory cytokines (tumor necrosis factor-α, Interleukin-6) and matrix metalloproteinases (MMP-2, MMP-9), along with the highest levels of anti-inflammatory cytokines (Interleukin-10) and tissue inhibitor metalloproteinases. In conclusion, injectable hydrogels infused with silk sericin and W. coagulans extract exhibit significant potential for burn wound treatment due to their superior healing and regenerative properties, surpassing the effectiveness of commercially available ointments such as Quench (Positive Control).

P-30/ICAZ-2024

Development of larvicidal nanoliposomes containing essential oils of Salvia rosmarinus and Citrus limon against Culex quinquefasciatus

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Abstract



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Culex quinquefasciatus, primary vector of lymphatic filariasis, poses significant health risk worldwide. Traditional control relying on synthetic larvicides has led to residual concerns and resistance development, necessitating eco-friendly alternatives. This study explores the larvicidal potential of essential oils (EOs) from Salvia rosmarinus and Citrus limon as well as their nanoliposomes, aiming to improve stability and larvicidal efficacy. Essential oils were extracted through hydro-distillation method using Clevenger apparatus while nanoliposomes were synthesized by using ethanol injection method. Essential oils were subjected to GC-MS for the composition profile of EOs. Nanoliposomes were characterized by using dynamic light scattering (DLS), Zeta analyzer, ATR-FTIR and UV spectrophotometer analyses. The results showed a significant difference in larval mortality across different concentrations (F4, 16 = 979.64; P < 0.001) and various formulations used (F4, 16 = 834.04; P < 0.001). Both essential oils, exhibited strong larvicidal activity against sewer strain C. quinquefasciatus larvae with LC50/LC90 value 155.73/200.23ppm for S. rosmarinus and 80.07/120.42ppm for C. limon. Nanoliposomes containing S. rosmarinus EO and C. limon EO, with mean particle size 801nm and 887nm, showed larvicidal effects with LC50/LC90 value 118.17/185.73ppm and 105.65/157.64ppm, respectively. We concluded that S. rosmarinus and C. limon EOs loaded nanoliposomes offer promising and effective green larvicides against sewer strain larvae of C. quinquefasciatus.

P-31/ICAZ-2024

Evaluation of Locally Isolated Bacillus thuringiensis as a Biocatalyst for Polyethylene Degradation

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Abstract

Plastic Pollution is the leading source of aquatic and soil pollution affecting both animals and humans. There is a need to limit plastic pollution by physical, chemical and biological means. The most effective and non-toxicative method to reduce already present plastic in the ecosystem is to biodegrade it. Bacteria are found to degrade conventional plastic effective. This study was aimed to find out the efficacy of Locally isolated well characterised Bacillus thuringiensis, an ecofriendly microbe, to degrade polyethylene plastic. The isolates were grown in minimam salt media along with 30 mg plastic with a control group. The weight reduction was seen in Bacillus thuringiensis D4.2 (MN 180844) isolates which showed 16.6% plastic degradation respectively which were screened using PCR based cry gene amplification. Moreover, the scanning electron microscopy revealed the physical change occurred in degraded plastic and FTIR analysis further confirms the degradation. GCMS analysis showed toxic metabolites produced by Bt after degrading plastic.

P-32/ICAZ-2024

Development of larvicidal nanoliposomes containing essential oils of Salvia rosmarinus and Citrus limon against Culex quinquefasciatus

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Abstract

Culex quinquefasciatus, primary vector of lymphatic filariasis, poses significant health risk worldwide. Traditional control relying on synthetic larvicides has led to residual concerns and resistance development, necessitating eco-friendly alternatives. This study explores the larvicidal potential of essential oils (EOs) from Salvia rosmarinus and Citrus limon as well as their nanoliposomes, aiming to improve stability and larvicidal efficacy. Essential oils were extracted through hydro-distillation method using Clevenger apparatus while nanoliposomes were synthesized by using ethanol injection method. Essential oils were subjected to GC-MS for the composition profile of EOs. Nanoliposomes were characterized by using dynamic light scattering (DLS), Zeta analyzer, ATR-FTIR and UV spectrophotometer analyses. The results showed a significant difference in larval mortality across different concentrations (F4, 16 = 979.64; P < 0.001) and various formulations used (F4, 16 = 834.04; P < 0.001). Both essential oils, exhibited strong larvicidal activity against sewer strain C. quinquefasciatus larvae with LC50/LC90 value 155.73/200.23ppm for S. rosmarinus and 80.07/120.42ppm for C. limon. Nanoliposomes containing S. rosmarinus EO and C. limon EO, with mean particle size 801nm and 887nm, showed larvicidal effects with LC50/LC90 value 118.17/185.73ppm and 105.65/157.64ppm, respectively. We concluded that S. rosmarinus and C. limon EOs loaded nanoliposomes offer promising and effective green larvicides against sewer strain larvae of C. quinquefasciatus.