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ICAZ-2021 (24TH -25TH November 2021)

4th International Conference on Applied Zoology-2021



Welcome Remarks by AZSP Chairman



Prof. Dr. Muhammad Ali
Chairman AZSP

Dear Friends and Colleagues,

It is a great pleasure to welcome you all to the 4th International Conference on Applied Zoology-2021 (ICAZ-2021), to be held from 24th to 25th November, 2021 under the shelter of The Applied Zoological Society of Pakistan in collaboration with Quaid-i-Azam University Islamabad. In 2021, due to unfavorable circumstances, we have learned to do many things differently – such as our work in education and research – and this includes our annual scientific conference (ICAZ-2021)!

We will all join this new type of conference hybrid mode on 24th to 25th November, 2021. Our AZSP central organizing committee, Prof. Dr. Farhat Jabeen, Prof. Dr. Tayyaba Sultana, Prof. Dr. Salma Sultana and Dr. Azhar Rasul, in collaboration with local organizing committee from QAU, Islamabad has been working hard to adapt the program for hybrid mode experience. They have managed to organize an exciting scientific program with multiple sessions for you to join in according to your interests. There will be opportunities to present your work and interact with other participants. This global meeting will feature highly respected internationally renowned speakers who will share, discuss, debate, and dissect significant new developments and scientific advancements that will impact the future of Applied Zoological Sciences, and related fields. We hope that more people will be able to join this conference. I look forward to seeing you all at the conference.

Prof. Dr. Muhammad Ali (TI)

Chairman, AZSP/Patron in Chief, ICAZ-2021

VC, QAU, Islamabad

ICAZ-2021 (24TH -25TH November 2021)

4th International Conference on Applied Zoology-2021

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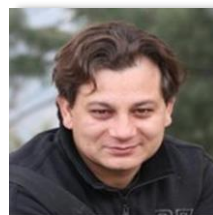
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4th International Conference on Applied Zoology-2021

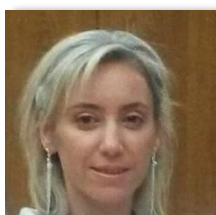
Keynote Speakers (International)



Prof. Dr. Abdul Shakoor Chaudhry
Senior Lecturer, New Castle University,
United Kingdom



Prof. Dr. Hasan Huseyain Attar
Dean, Faculty of Agriculture, Ankara
University of Ankara, Turkey



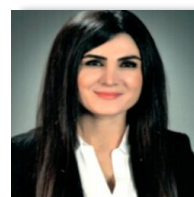
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Professor / Chairperson
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Prof. Dr. Alan Talevi
Laboratorio de Investigación y Desarrollo de
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Dr. Ilknur Ucak
Faculty of Agricultural Sciences and Technologies,
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ICAZ-2021 (24TH -25TH November 2021)

4th International Conference on Applied Zoology-2021

Keynote Speakers (International)



Dr. Fatima Kies

Department of Earth and Environmental Sciences
University of Milano-Bicocca, Italy



Dr. Muhammad Asghar

Department of Medicine
Karolinska Institute, Sweden



Dr. Khaterah Khorsandi

Department of Photodynamic
Institute of ACECR, TUMS branch, Tehran,
Iran



Prof. Dr. Toktassyn Yerubayev

Department of Public Health Protection
Ministry of Health
Republic of Kazakhstan



Professor Yusuf TUTAR

Biochemistry Division, Faculty of Pharmacy
University of Health Sciences Istanbul-TURKEY



Prof. Dr. Milen I. Georgiev

Institute of Microbiology, Bulgarian
Academy of Sciences, Bulgaria

ICAZ-2021 (24TH -25TH November 2021)

4th International Conference on Applied Zoology-2021

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Quaid-i-Azam University, Islamabad



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Department of Biotechnology
Quaid-i-Azam University, Islamabad



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4th International Conference on Applied Zoology-2021



Our Collaborators/Sponsored





Oral Presentations of Keynote Speakers

K-01/ICAZ-2021

Climate changes and fisheries

Hasan Hüseyin ATAR

Ankara University, Faculty of Agriculture
Fisheries and Aquaculture Dept.

Abstract

Most of the natural resources (river basins, catchment areas, flood plains) and socio-economic systems (agriculture, tourism, urban structures) that are likely to be affected by climate change in the coming decades are unique to specific local and/or regional areas. Natural resource decision makers are challenged to adapt management to a changing climate while balancing short-term management goals with long-term changes in aquatic systems. Climate change affects fisheries and aquaculture via acidification, changes in sea temperatures and circulation patterns, the frequency and severity of extreme events, and sea-level rise and associated ecological changes. Both direct and indirect impacts include impacts on targeted populations' range and productivity, habitats and food webs as well as impacts on fishery and aquaculture costs and productivity and fishing community livelihoods and safety.

K-02/ICAZ-2021

Sustainable Fish Production & Food Security

Abdul Shakoor Chaudhry

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Abstract

Although human population is increasing, the living standards are also changing rapidly. This means that more food is needed to cope with those challenges, which can be met by enhanced food production from both terrestrial and aquatic systems. Despite numerous issues of water quality, fish production can provide high quality meat enriched with protein and essential oils. While the scale of using fish meat in human diets varies with cultures and resources, its significance in providing essential amino acids and desirable fatty acids to support human health is well recognised. Thus, it is essential to focus more on increasing the supply of fish meat as a sustainable source of healthy nutrients. Thus, concerted efforts are needed to secure the supply of more water, which is an essential component of all biological systems including aquatic animals. However, the supply of safe and sufficient water may be hampered due to the changing climate and environmental issues. Moreover, unregulated fishing may cause shrinking fish stocks in natural ecosystems. Nevertheless, aquaculture may be able to compensate for the declining fish stocks. Indeed, the success of a sustainable aquaculture-based fish production depends upon the use of affordable plant-based diets. The question is, can this approach help to promote food security? This presentation will explore challenges and solutions that may exist in developing strategies to produce safe, affordable, and nutritious fish meat for the growing human population.

Keywords: Fish, Food Security Sustainable Diets, Water



Oral Presentations of Keynote Speakers

K-03/ICAZ-2021

The Enhanced Heterologous Vaccines as the Immuno-Boosters against to Covid-19

Zeliha Selamoglu

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Abstract

The coronavirus disease 2019 (COVID-19) pandemic is the largest health problem worldwide. Unfortunately, the lack of an effective and clear treatment causes it to be a major health problem. There are currently no effective antiviral drugs and treatments. The symptoms and course of the disease differ individually. Symptoms varies from asymptomatic to intensive care even death. The individual variation of this symptom pattern is related to viral load, individual's current comorbid conditions, age, gender and most importantly, immune status. Considering the course differences of the disease in all these individual, familial and demographic distributions, it suggests that genetic and environmental factors play an important role. There is a systemic inflammatory response in COVID-19. High levels of chemokine and proinflammatory cytokines are detected in patients. Therefore, the vaccination is one of the most important factors to be healthy. With booster of the immune system via the vaccination, people can be protected from COVID-19 and make the process easy when suffering from disease.

Key words: Covid-19, heterologous vaccination, Pfizer (mRNA), Sinopharm (inactivated Virus Vaccine)

K-04/ICAZ-2021

Metabolomics: Just another OMICS or an Ideal Platform for Accelerated Lead Finding?

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² *Center of Plant Systems Biology and Biotechnology, Plovdiv, Bulgaria*

Abstract

Since time immemorial plants have long had a central role in the treatment and management of a wide variety of disorders, hence continuously supporting the health of humans. Nowadays, in excess of quarter of modern medicines are derived, either directly or indirectly, from plants. Artemisinin (antimalarial), paclitaxel (antineoplastic), codeine and morphine (analgesic), and galanthamine (reversible cholinesterase inhibitor) are remarkable examples in this direction and amongst the best-selling drugs worldwide. At the same time the development of new drugs is rather costly, laborious and time-consuming, hence platforms for accelerated lead finding/drug discovery, quality control assessment and mode of action of healing herbs, and their sustainable production are continuously sought [1-3, and the literature cited therein]. Metabolomics represents a comprehensive holistic approach, comprising of systematic identification and quantification of all metabolites in an organism, at given conditions. Since the rise of the OMICS age several platforms for high throughput analyses of targeted metabolites have been developed accordingly. Nuclear magnetic resonance (NMR) appears very suitable and adequate platform to carry out metabolomics analyses, as it allows simultaneous detection of diverse range of abundant (primary and secondary) metabolites, which opens novel avenues to fully explore the total biochemical machinery of plants. A great advantage of NMR-spectrometry over the other analytical platforms is the possibility for quantification and hence the direct comparison of concentrations of molecules, present in the sample. Here an overview of the metabolomics and pharmacological (*in vitro* and *in vivo* studies) aspects of research on selected medicinal plants towards accelerated lead finding will be given and discussed.



Oral Presentations of Keynote Speakers

K-05/ICAZ-2021

Computer-aided drug repositioning for tropical infectious diseases

Alan Talevi

Abstract

Neglected tropical diseases are a group of infectious diseases that historically affect low-income populations with insufficient access to health services. For this reason, historically speaking they have not received enough attention from the private pharmaceutical sector, and much of the efforts in new therapeutic solutions are concentrated in the public sector and non-profit organizations. It is therefore essential to implement efficient strategies, in terms of time and resources invested, for the development of new therapies. Drug repositioning consists in developing new therapeutic indications for already known drugs, including drugs that are approved, discontinued, and in advanced stages of development. By consolidating the new indication based on the information already available from the previous ones, the repositioning process reduces the time and resources associated with the development of a new drug, and substantially increases the probability of passing clinical studies. The UNLP Bioactive Research and Development Laboratory team has been implementing computer-guided drug repositioning campaigns. Successful cases linked to Chagas disease, malaria and echinococcosis are presented.

K-06/ICAZ-2021

Antimalarial against *Plasmodium falciparum* protein kinase: What are the strategies?

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Abstract

The establishment of fraction library of crude extracts of several actinomycetes strains isolated from Malaysia and Japan. we identified several known compounds which targeted at *Plasmodium falciparum*. The IC₅₀ of the purified compounds/RIKEN compound library was determined. Compounds from UMS strains showed moderate antimalarial activity. We confirmed the mode of action of few compounds, and some require further confirmation for future works. The approaches can be divided into the enzymatic assay, resistant clone generation, and a specially designed experiment based on compound known activity. *In silico* study was completed, and it shows that the acquired data from the computational study may not be helpful as to support experimental data. Finally, the cytotoxic study of crude extracts, active fractions, and active compounds was completed. None of the samples showed significant cytotoxic effects against human cell lines or other biological activities such as antimicrobial and antifungal. Hence, compounds identified in this study showed a promising potential for antimalarial drug development. Some significant findings/knowledge were acquired that provide an interesting plan for future studies in antimalarial drug development or diagnostics purpose.

Keyword: *Plasmodium falciparum*, antimalarial, diagnostics, active compounds, *in silico*



Oral Presentations of Keynote Speakers

K-07/ICAZ-2021

Biodegradable packaging materials from marine by-products

İlknur Uçak

Nigde Omer Halisdemir University, Faculty of Agricultural Sciences and Technologies, Nigde, Turkey

Abstract

In the food industry packaging is an important concern for preservation of food. Traditionally plastic packaging was used but now it is alarming due to enhanced environmental pollution by plastic waste. Nowadays scientists have main concern to use biodegradable packaging material to reduce atmospheric pollution and to get good quality of food. Biopolymers which can be used for the packaging purpose can be obtained from plants, animals and from marine by-products. In this review marine by-products which have rich valuable components that are suitable as packaging material is discussed. Marine by-products produced from seafood processing has become a worldwide economic concern. Seafood wastes involved damaged fish, small size fish and those fish species which have less commercial value. In seafood industry during processing of fish, many other by-products which includes bones, skin, head, viscera and scales are produced as a waste. These by-products contain extent of collagen that can be changed into gelatin. Rich amount of chitin also can be produced from the by-products of mollusks and crustaceans. If these by-products are dispose of, can be harmful for environment because of excretion of carbon dioxide and carbon monoxide during their decomposition. So they can be castoff in food industry as biodegradable packaging material. Those valuable products which are useful for food packaging can be obtained from seafood by-products such as proteins (gelatins and peptides), fats (fatty acids and docosahexaenoic acid), polysides (chitosan, polysaccharide), oligo elements (nitrogen, phosphorus, magnesium and calcium) and pigments. Proteins obtained from fish have great ability of cross linking to produce biopolymers, a good property for the formation of packaging materials. Proteins, lipids and polysaccharides can be used individually or in combined form for the formation of edible films and coatings. These components are also suitable for film forming material because of their good cross linking and transparent properties. In conclusion, with the increasing consumer awareness in food safety, the demands for plastic packaging materials made from synthetic materials are gradually decreasing and the use of biodegradable packaging materials is gaining importance both in daily life and in industrial terms.

Keywords: Biodegradable, Food Packaging, Biopolymer, Edible films, Polysaccharide

K-08/ICAZ-2021

Smart Tuna Aquaculture

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³*Departamento de Ciencias Biológicas y Químicas, Facultad de Recursos Naturales, Universidad Católica de Temuco, Casilla 15-D, Temuco, Chile.*

Abstract

Tuna export and import as raw fish and processed foods are very important. But separating tuna manually is very stressful for the workers. This research aims to propose an automated system for classifying tuna species according to their images by artificial intelligence (AI), comparing it with statistical analysis (SPSS) using artificial



Oral Presentations of Keynote Speakers

neural networks (ANN). The results were 97.32% more precise in the methods of classification, monitoring, and collection in terms of precision and classification of tuna. The results of the comparison with the statistical analysis were close to 5% and were technically acceptable.

Keywords: Tuna aquaculture; Tuna fisheries, ANN, AI, tuna predicting.

K-10/ICAZ-2021

Senolytic Perimidine-Pyrazole Derivative Heat Shock Protein Inhibitor Leads Apoptosis of Senescent Cells in Lung Cancer Cells

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Background: Cancer cell metabolism is higher and requires properly folded proteins for biochemical functionality. Cancer cells overexpress HSPs to assist oncogene protein folding, modification and transport. HSPs are essential for tumor cell survival in regulating substrate protein homeostasis. HSP70 and HSP90 regulates non-small lung cancer-NSCLC growth. During development cells can undergo acute senescence where senescent cells are permanently withdrawn from the cell cycle called the senescence-associated secretory phenotype. Acute senescence cells suppress tumorigenesis and immune system clear these cells. However, perturbation of immune system may not kill senescent cells and this may contribute to tumorigenesis. Further, senescence in tumor cells may not be secure mechanisms for restricted proliferative capacity and survival. Therefore, to fully understand the chemotherapeutic effect role of senescence should be evaluated in the presence of distinct agents.

Methods: A set of Perimidine-Pyrazole derivatives effect was tested over A549-NSCLC cell line. The outcome on signalling pathway analyzed by RT-qPCR and flow cytometry. *In silico* methods were employed for HSP-perimidine-pyrazole agent interactions.

K-12/ICAZ-2021

An Overview on Photodynamic Therapy Applications

Khatereh Khorsandi

Department of Photodynamic, Medical Laser Research Center, Yara Institute, ACECR, Tehran, Iran

Abstract

Photodynamic methods are based on the overproduction of light-induced reactive oxygen species by photosensitizer mediators to remove harmful or unwanted cells / pathogens. With various applications approved by different health agencies in most industrial countries, Photodynamic Therapy (PDT) can use for treatment of age-related macular degeneration and is realized as minimally invasive therapeutic approach to treat skin, lung, head and neck, esophageal, and bladder cancers with high survival rates, low side effects, and great cosmetic outcome. Being motivated by the success of PDT in management of various human diseases, new applications of this method are



Oral Presentations of Keynote Speakers

being detected by the PDT research community. For example, Photodynamic Inactivation of microorganisms (PDI) has the potential to stop the serious threat of enhanced antimicrobial resistance. Recently PDT was shown good effect in wound healing process especially when use at low dose. The development of new photosensitizers with properties optimized for PDT applications is important for the improvement of the therapeutic outcome. Despite the promising findings from PDT in clinical trials, considerable more work is required to bring this new modality into modern clinic.

Keywords: Photodynamic Therapy, Photodynamic Inactivation, Cancer, Antimicrobial resistance, wound healing

K-13/ICAZ-2021

A Joint Venture of Botany and Zoology Leads to Sustainable Research Development for Industries

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Abstract

In the spectrum of Biological Sciences, the botany and Zoology seem to be entirely closely related fields from basic to applied level. The present study was aimed to elaborate the joint ventures of research of both Botanical and Zoological Sciences. Various case studies were undertaken. It was noted that both botany and zoology are interdependent disciplines including various interrelated approaches in Wildlife, Melissopalynology, Biodiversity, Nutrition, Natural Products, Toxicology, Pathology, Biochemistry, Genetics, Molecular Biology, Physiology for successful drug discovery deployment. It was strongly observed that experts from Botany provides the extensive information on collection methods, plant field surveys, correct plant identification, taxonomic authentication of original crude drugs and originality of extracts for effective In vivo studies and further clinical trials. In Pakistan, both Botanical and Zoological sciences may be further enhanced by developing mutual research projects, student sharing and experimental designs for further development of Biological Sciences

K-15/ICAZ-2021

Characterization of Sinusitis isolates by Raman Spectroscopy and its inhibition by natural product against the consortium of sinusitis

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Abstract

Sinusitis is worldwide spreading disease and one of the most frequently diagnosed disease in the USA. Different approaches were applied for the analysis of sinusitis analyses. Raman spectrophotometer is more effective in determination and analysis of sinus isolates. Raman spectrum provides full information about rotational and vibrational spectrum. Raman spectrophotometer is attracting the attention of researchers as it is adventitious as compared to other techniques because it has more resolved spectral lines and has low sensitivity for water. sinusitis isolates Staphylococcus aureus, Enterococcus faecalis and Klabsialal pneumonia wwere analyzed charateized. SERS spectra was examined by using colloidal solution. Nano particle were used in order to get spectra from Raman spectrophotometer. Single microscopic crystal would be acquired by virtue of Raman microspectrophotometer. Sinusitis bacteria in it are highly resistant to antibiotics and scientists are looking for medicinal plants as potent



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biofilm inhibitory agents. Antibacterial activity of ethanolic extract was remarkable followed by water extract against all tested strains (*Escherichia coli*, *Klebsiella pneumonia*, *Proteus mirabilis*, *Staphylococcus aureus*, *Enterococcus faecalis*) and consortium from human volunteer. Biofilm inhibition study have shown that maximum biofilm inhibition was observed in case of n-hexane extracts and ethanol extracts. Ames assay and DNA damage protection assay was performed and revealed that these extracts are non-mutagenic as well as non-toxic. Water decoction was also tested on human volunteer having sinusitis problem. SinuCure product drains sinusitis quickly and patient feels comfortable within 6 hours. Results of this study have shown that product developed is safe for human use.

K-16/ICAZ-2021

Effect of different therapeutic agents in COVID-19 patients admitted in High Dependency Unit (HDU).

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Abstract

COVID-19 has affected all the countries of world with over 252 million cases and 5 million deaths. Pakistan has faced four different waves of COVID-19 with over 28,000 deaths. Fauji Foundation Hospital, Rawalpindi, is a large, tertiary care hospital, which established COVID-19 High Dependency Unit (HDU) at the start of pandemic. Our HDU is fully equipped with all the necessary advanced facilities, all investigational therapies and availability of investigational pharmacological agents for management of severe to critical Covid-19 patients admitting in HDU. In this study we analyzed the effect of Plasmapheresis, Anti-coagulants, Steroids and Remdesivir used in HDU for the treatment of COVID-19 patients. Patients admitted in HDU showed moderate and severe COVID-19 disease. Patients with severe COVID-19 disease had median age of more than 50 years and 52.4% has different comorbidities. Diabetes and hypertension were present in 52.4% and 42.5% of patients with severe COVID-19 disease. Patients administered with anticoagulants showed a survival rate of 84.6% compared with 54% survival in non-anticoagulant group. Patients are treated with three different doses of steroids in HDU. Patient group which received Dexamethasone 6 mg / day showed best results with only 3% mortality rate, high median time from hospital admission to death and lowest dependence on respiratory support after 10 days of steroid administration. Plasmapheresis also improved the survival rate but administered to only limited patients. Patients with different comorbidities showed high mortality rate in HDU. Different therapeutic agents improved the survival rates of patients admitted in HDU of a tertiary care hospital in Pakistan.

K-17/ICAZ-2021

Leishmaniasis: An emerging disease in Pakistan, Awareness, and control measures

Naveeda Akhtar Qureshi

Abstract

Cutaneous leishmaniasis (CL) is a neglected tropical disease worldwide especially in the various rural areas of Pakistan including Azad Jammu and Kashmir (AJK). The leishmaniasis is prevalent in 102 countries/areas and effected 350 million people worldwide. *Leishmania* identification on species level is imperative to determine the clinical prognosis and to choose the most suitable therapeutic regimen. The chemotherapy has been used for *Leishmania* infection including amphotericin B, amphotericin, pentavalent antimonials. However, several these are reported to have side effects, painful and costly for financially compromised people. The bioactive



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phytochemicals present in the plant derivatives can be a good source for discovering new antileishmanial medicines. In the current study, we conducted two active surveys in 2018 and 2019 to investigate the molecular epidemiology of CL infection and *Leishmania* spp. Identification in AJK. The most prevalent species *L. tropica* was cultured for evaluation of antileishmanial activity. For this purpose, we have conducted a survey for the leaves collection of medicinal important plants (*Pyrus pashia* (Rosaceae), *Malus pumila* (Rosaceae), *Prunus persica* (Rosaceae), *Pyrus communis* (Rosaceae), *Prunus armeniaca* (Rosaceae), *Ficus glomerata* (Moraceae), and *Diospyros lotus* (Ebenaceae) from AJK. The ethanolic crude leaves extract of experimented plants was used for phytochemical screening, cytotoxicity bioassays, and in-vitro antileishmanial activity against *L. tropica*. The most bioactive plant extract was subjected to column chromatography and thin layer chromatography for fraction isolation. All isolated fractions were subjected for antileishmanial activity of promastigotes and amastigotes of *L. tropica* and cytotoxicity. The most effective fraction was characterized by UV-Vis spectroscopy, FTIR, and GC-MS analysis. Subsequently, all (n=9) identified compounds were analyzed for their bioactivity by *in-silico* molecular docking study.

The current study revealed that more cases of CL were observed in summer as compared to other seasons. Males with age between 1-20 years of age were more likely infected than others (21-40 and 41-60 years old). Three species (*L. tropica*, *L. major*, and *L. infantum*) of *Leishmania* parasite were identified in 2019 survey. Among all seven plants ethanolic extracts *P. armeniaca* showed highest Total Phenolic Content ($279.62 \pm 5.40 \mu\text{gGAE}/\text{mgDW}$) and Total Flavonoid Content ($205.70 \pm 2.41 \mu\text{gQA}/\text{mg DW}$), along with highest antioxidant activities ($120.37 \pm 4.90 \mu\text{gAAE}/\text{mgDW}$) and Ferric Reducing Power values ($278.71 \pm 1.03 \mu\text{gAAE}/\text{mgDW}$). All plant extracts showed cytotoxicity in the safety range $>1000 \mu\text{g}/\text{ml}$ except *F. glomerata* having LC_{50} values of $454.34 \mu\text{g}/\text{ml}$. The ethanolic leaves extract of *P. armeniaca* showed significant antileishmanial activity (IC_{50} $16.18 \mu\text{g}/\text{ml}$) against promastigotes of *L. tropica*. Being the most effective crude extract, 142 fractions of *P. armeniaca* were isolated chromatography and then further 12 fractions were obtained by TLC. Out of all fraction extracts (F2-F12), fraction (F7) showed significantly the highest anti-promastigotes and anti-amastigotes activity. The FTIR spectra revealed the presence of alkane, aldehyde, carboxylic acid, thiols, alkynes, and carbonyls compounds from fraction F7. The GC-MS analysis of ethanolic fraction (F7) showed the presence of 9 compounds i.e (1) benzeneethanol, alpha, beta dimethyl, (2) carbazic acid, 3-(1 propyl butylidene)-, ethyl ester, (3) 1, 2-benzenedicarboxylic acid, diisooctyl ester, (4) benzene ethan amine a-methyl, (5) 2aminononadecane, (6) 2-heptanamine-5-methyl, (7) cyclobutanol, (8) cyclopropyl carbene, and (9) nitric acid, nonyl ester. Subsequently, all (n=9) identified compounds were analyzed for their bioactivity by *in-silico* molecular docking study. Among all compounds, the 1, 2-benzenedicarboxylic acid, diisooctyl ester bound well to the PTR1 receptor. The fraction (F7) showed acceptable results with no cytotoxicity. It can be used for curing skin lesions of CL caused by *L. tropica*. However, *in-vivo* and *in-vitro* studies of the compound i.e. 1, 2-benzenedicarboxylic acid, diisooctyl ester required in the future. The antibacterial activity of 1, 2-benzenedicarboxylic acid, diisooctyl ester compound reported previously (Ajoke *et al.*, 2014). Moreover, *P. armeniaca* is effortlessly accessible in different areas of Pakistan along with AJK, and inexpensive. Current findings can aid to constitute an effective alternative to side free drugs. The compound 1, 2-benzenedicarboxylic acid, diisooctyl ester is commercially available could be used in the treatment of skin lesions of CL caused by *L. tropica*.



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O-2/ICAZ-2021

Date palm mucilage encapsulated with silver nano particles for colonic drug delivery

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Abstract:

Compressed tablet formation from granular drug require binder with Cohesiveness property. Plants mucilage as pharmaceutical excipients are available. In this study, biocompatible date palm mucilage was encapsulated with silver nano particles for sustained drug release to provoke an immune response. Nano formulated mucilage was characterized by UV/VIS, FTIR, XRD, SEM/EDX spectrophotometry. UV/VIS spectra revealed an intense surface plasmon resonance peak at 406 nm for spherical mono dispersed silver nano formulated mucilage resulted from efficient reduction of silver ions to AgNPs. Zeta sizer disclosed the emergence of single peak at 139.7 nm with 100 % intensity. Crude mucilage exhibited number of peaks in the region of 4000-500cm⁻¹ by FT-IR spectroscopy whereas purified as well as nano formulated samples showed somewhat different pattern of peaks in addition to peaks of crude sample. XRD spectra of crude mucilage revealed somewhat regular pattern while purified and modified mucilage displayed irregular structure. In SEM analysis, crude mucilage was appeared as granular that turned into porous network with entangled tiny silver nano spheres. A controlled release of drug levofloxacin hemihydrate was evaluated using crude/ nano formulated mucilage as excipient. Nano formulated mucilage delayed the onset exposure of drug in gastric medium giving recommendations as value added bio binder for drug to the target organ.

O-3/ICAZ-2021

Partial Replacement of Fish Meal with Locally Available Black Seeds (*Nigella sativa*) for rohu (*Labeo rohita*) Fingerlings

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Abstract

The effect of black seed meal based diet was investigated on the growth performance, nutrient digestibility, mineral absorption and hematological parameters of *Labeo rohita* fingerlings over the time period of ninety days. Six experimental diets were formulated by using black seed meal (0, 10, 20, 30, 40 & 50% by replacing fish meal) and feed pellets were formed. Fingerlings were given their respective diets two times in 24 hours at 4% level of body weight and feces sample was taken and preserved. According to results of present research, it was revealed that rohu fingerlings showed significant improvement when black seed meal was incorporated in fish diet at the level of 10 and 20%. Maximum weight gain (17.21g), weight gain percent (241%), specific growth rate (1.36) and best feed conversion ratio (1.31) were observed in fish fed on 20% of BSM. In the same way, highest digestibility of nutrients (crude fat, 72%; crude protein, 73% & gross energy, 69.51 kcal/g) and hematological parameters i.e. RBC (2.72×10⁶mm⁻³), Ht (35%) and Hb (8.10g/100ml) had their maximum values at 20% of BSM. Maximum level of mineral absorption of K (75%), Ca (71%), P (73%) and Na (73%) were also recorded at experimental diet III (20% of BSM). On the basis of these results, it was concluded that maximum of nutrients and minerals were absorbed in



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fish body at 20% of BSM improving growth and overall performance of fingerlings by decreasing discharge into water that will ultimately decrease water pollution.

O-6/ICAZ-2021

Structural Characterization of Maize Bran Arabinoxylans in Relation to its End Use Quality

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Abstract

The current research was conducted to explore structural properties of arabinoxylans in relation to its end use quality. In 1st phase, arabinoxylans was extracted from different varieties of maize bran using enzymatic method. AXs were characterized for their structural attributes using Fourier Transform Infrared Spectroscopy (FTIR) and Scanning Electron Microscopy (SEM) techniques. Furthermore, monosaccharides were performed. In 2nd phase, rheological characteristics were determined with the addition of AXs at different levels (2 & 4%). Moreover, bread was prepared (with the addition of AXs) and explored for physiochemical, textural and sensorial properties. Results showed that arabinoxylans contents in different varieties (Buffalo MB-13500 and Pearl-11) of maize bran were 22.52 ± 0.36 and $20.83 \pm 0.21\%$, respectively. Monosaccharides especially; arabinose, xylose, galactose were abundantly present in AXs. FTIR spectra showed high absorption bands at different wavelength which is the result of stretching of functional groups. SEM results showed that arabinoxylans is a typically fibrous and striated. Moreover, AXs enriched-flour having high water absorption and water retaining potential up to 8%–12% as compared to wheat flour. Furthermore, mold growth was delayed with increasing AXs levels (as compared with control), owing to the presence of ferulic acid.

Keywords: Maize bran, Arabinoxylans, Rheology properties, Textural properties

O-7/ICAZ-2021

Climatic and Dietary Niche of Family Cervidae from The Plio-Pleistocene Siwaliks (Pakistan): Does Coeval Occurrence of Species Leads to Niche Partitioning?

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Abstract

Biogeochemistry is crucial to reconstruct climate, diet, and habitats of extinct animals. The Siwalik sediments of Pakistan exhibit an excellent record of faunal elements, providing an opportunity to explore palaeohabitats of diverse mammalian communities that existed in the Siwaliks. This study is the first to investigate the dietary niche and climatic context of the Siwalik cervids from ~5 Ma to ~2 Ma (early Pliocene to Early Pleistocene). Tooth enamel of 25 fossil samples belonging to four different species (*R. simplicidens*, *C. sivalensis*, *C. triplidens* and *C. rewati*) were subjected to carbon ($\delta^{13}C$) and oxygen ($\delta^{18}O$) isotope analysis. Family Cervidae shows significantly different average $\delta^{13}C$ values of -12.2‰, -9.9‰ and 1.0‰ for Early Pliocene (~5 Ma), late Pliocene (~3 Ma), and early Pleistocene (~2.2 Ma) time spans, respectively. $\delta^{13}C$ enamel values indicate that cervids preferred a close habitat and preferably browsed on C3 vegetation in forested parts of the fan during early Pliocene,



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with the gradual shift towards increasing C4 vegetation in diet and more open habitat over time. By the early Pleistocene, Siwalik cervids fed completely on C4 vegetation in open grassland settings. Such change in the diet seems to be synchronous with increased complexity (increased enamel thickness and hypsodonty) in dentition over time. $\delta^{18}\text{O}$ enamel reveals a significant shift through time with values of -10.0‰, -5.9‰ and 3.7‰ from the early Pliocene, late Pliocene, and early Pleistocene, respectively. Many species of family Cervidae were coeval and diachronous, which possibly be justified by the niche partitioning hypothesis.

Key Words: Carbon Isotopes, Oxygen Isotopes, Cervids, Tatrot

O-8/ICAZ-2021

Production of gallic acid under solid state fermentation by utilizing waste from food processing industries

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Abstract

Gallic acid (3,4,5-trihydroxybenzoic acid) is an industrially important organic acid that is found in plants as secondary metabolite. It possesses wide range of applications in healthcare, food and pharmaceutical industry, in manufacturing inks, paints, dyes and also in cinematography. The annual consumption of gallic acid in Pakistan is 8000 tons which is mainly met by importing this item from developed countries. This study was planned to assess the potential of various tannin rich bio-wastes [e.g., peels (banana, pomegranate, apple, and mango) and seeds (black plum, mango, apple, and tamarind)] from fruit processing industries to produce gallic acid by using *Aspergillus niger* via solid state fermentation. Different physical and chemical parameters were optimized to get the optimum yield of gallic acid. Among all bio-wastes, black plum seed powder gave highest yield of gallic acid i.e. 13.31 mg/g of substrate; the parameters being: substrate water ratio of 1:3, 72 h of incubation period, 2 mL of inoculum, pH 5 and temperature of 30 °C. Carbon source supplementation i.e., glucose increased the synthesis of gallic acid to 14.5 mg/g of substrate while addition of nitrogen sources had negative effect. Extraction of gallic acid was done by using Soxhlet extraction apparatus while FTIR was used for characterization. The solid state fermentation protocol for the production of gallic acid from tannin rich biowastes has been developed and proved to be cost-effective method. The results presented can be optimized further on large scale for industrial production of gallic acid.

Keywords Gallic acid · Tannin rich · Fruit waste · Black plum seed · *Aspergillus niger* · Solid state fermentation

O-9/ICAZ-2021

Effect of Nickel Exposure on Hematology and Antioxidant Enzymes Activity in *Ctenopharyngodon idella*

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Abstract

Nickel is a heavy metal and its excess presence effects the growth, survival, reproduction and behavior of fish. Therefore, to assess the potential effects of Nickel (Ni) on the fish, *Ctenopharyngodon idella*, fingerlings were exposed for 96 hours to four different concentrations of Ni (6, 9, 12, and 15ppm), and their hematological indices: Red Blood Cells (RBCs), White Blood Cells (WBCs), and Hemoglobin (Hb) as well as Biochemical parameters: catalase (CAT) and peroxidase (POD) in different tissues of fish were analyzed. During the trial, significant



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behavioral alterations were observed in Ni treated fish. Decline in RBCs, WBCs, and Hb were observed in fish treated with 12 and 15 ppm Ni concentration indicating an anemic condition. Antioxidant enzyme activity revealed substantial increase ($p < 0.05$) in the peroxidase enzyme in various organs of the Ni treated fish when compared to the control fish. The POD activity in organ of fish followed the order: Liver>Gills>Muscles. Catalase activity in liver substantially reduced at higher concentrations, which may indicate that antioxidant responses can be employed as biomarkers of oxidative stress. The haematological and biochemical changes led to the conclusion that the heavy metal (Ni) is hazardous to the *C. idella* species and that its presence in the environment could threaten health status of fish.

Key words: Nickel, Hematology, Antioxidant Enzymes, *Ctenopharyngodon idella*.

O-10/ICAZ-2021

Oxidative stress in different size groups of *labeo rohita* exposed to chromium

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Abstract

Chromium is included among the toxic heavy metals existing in different oxidation states. Chromium creates toxicity as it enters into water bodies in excess amounts and produces reactive oxygen species, which induce oxidative stress and tissue damages. The objectives of this research work were to determine the LC₅₀ and lethal concentration of chromium and its effects on the activity of antioxidant biomarkers in gills, kidney, muscle, liver, and intestine in different size groups I, II, and III (7.67, 11.7 and 19cm respectively) of *Labeo rohita*. The 96- hr LC₅₀ and lethal concentration of chromium of each size group was calculated by using probit analysis separately with 95% confidence interval. The order of acute toxicity among fish size groups was as I > II > III. The activity of catalase (CAT) in three fish size groups was significantly decreased in the following order of I < II < III when compared to their control groups which indicated that CAT activity was decreased with increasing concentration of chromium. The activity of superoxide dismutase (SOD) was significantly ($p < 0.01$) increased in three size groups in the order as III > II > I. The activity of SOD was increased with the increasing concentration of chromium. This study demonstrated the importance of usage of fish having different sizes for the evaluation of antioxidant biomarkers and the bio-monitoring of the aquatic environment.

Keywords: Chromium, Catalase, Chromium, Superoxide dismutase, *Labeo rohita*

O-11/ICAZ-2021

Toxic effects of Malathion on developmental stages of rohu *Labeo rohita*

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Abstract

Organophosphate insecticides are a broad class of compounds with a wide range of physicochemical features as well as important toxicological activities and outcomes. These pesticides are widely used to control insects in a wide range of food and non-food. Malathion is one of the organophosphate insecticides that is used for controlling of insects in agriculture. Malathion is an essential and frequently used pesticide, although little is known about its hazardous effects on fish. As a result, this study looked at the effects of malathion on morphological and



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biochemical indices in rohu (*Labeo rohita*) throughout its early developmental stages. The newly fertilized eggs were incubated in plastic tanks with an elegant intake and outflow water system in the presence of different concentrations of malathion (20% of LC50, i.e., 7.79 ml L1). As the exposure time was increased the mortality were also found to be increased in the malathion treated groups. Different malformations were detected in the malathion treated group in different stages, such as erosion in yolk and borders, elongation of yolk, short tailed larvae, aberrant eyes and larvae with a zigzag movement. The level of glucose in the malathion-treated groups was increased considerably from 24 to 96 hours. The activity of antioxidant enzymes such as Catalase (CAT) and Peroxidase (POD) were shown to be decreased in the malathion-treated groups from 24 to 96 hours. The current findings suggest that malathion at low concentrations, has an unfavorable effect on *L.rohita* early developmental stages and increases mortality. According to the current results, malathion may have an impact on wild fish Populations by invoking oxidative stress and modulating stress responses during early developmental stages.

O-13/ICAZ-2021

A novel Distachionate treats inflammations by modulation COX-2 and inflammatory cytokinase in rat liver tissue 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 *Breynia distachia*. 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 ± 0.55 and 132.9 ± 0.33 $\mu\text{g}/\text{mL}$.

Keywords: Antioxidant; Distachionate; Lipoxygenase; Cytotoxic; Anti-inflammatory.

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O-14/ICAZ-2021

Synthesis, Antibacterial and Hemolytic activity of *N*-[4-(4-morpholinyl)phenyl]-2-[(5-aryl/aralkyl substituted-1,3,4-oxadiazol-2-yl)thio]acetamides

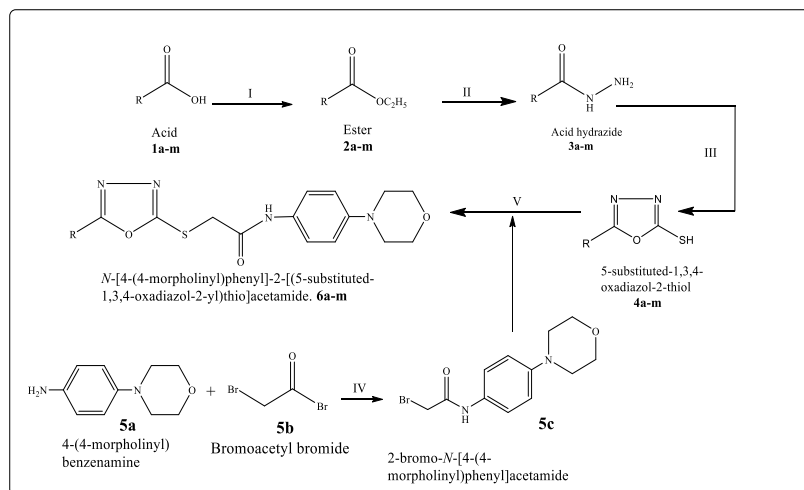
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Abstract

2,5-Disubstituted 1,3,4-oxadiazole compounds are one of the most attractive classes for researchers due to their pharmacological activities. In the current research, a new series of 2-[[5-alkyl/aralkyl-1,3,4-oxadiazol-2-yl]thio]-*N*-[4-(4-morpholinyl)phenyl]acetamides (6a–m) were prepared by converting different aryl/aralkyl organic acids (1a–m) successively into corresponding esters (2a–m), hydrazides (3a–m) and 5-aryl/aralkyl-1,3,4-oxadiazol-2-thiols (4a–m). Finally, the target compounds 6a–m were synthesized by stirring 5-aryl/aralkyl-1,3,4-oxadiazol-2-thiols (4a–m) with 2-bromo-*N*-[4-(4-morpholinyl)phenyl]acetamide (5) in the presence of *N,N*-dimethylformamide (DMF) and sodium hydride (NaH). The structures of the synthesized compounds were elucidated through IR, ¹H-NMR, ¹³C-NMR and mass spectral data. The compounds were also screened for antimicrobial and hemolytic activity and most of them were found to be active against the selected microbial species at variable extent relative to reference standards. The compounds, 6d and 6f were active against the selected panel of microbes and the former was the most potent one.





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O-16/ICAZ-2021

Fishmeal replacement with *Moringa oleifera* leaf meal and its impacts on growth performance, nutrients absorption and minerals availability in *Labeo rohita* fingerlings

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Abstract

A 90-day feeding trial was conducted. In which, six fingerlings diets were formulated with the addition of MOLM by replacing fishmeal at levels i.e., 0%, 10%, 20%, 30%, 40% and 50%. Cr₂O₃ inclusion level was 1% in all diets. Fifteen fingerlings having an initial average weight (6.54±0.02g) were stocked in triplicate tanks. Diets were fed to the fingerlings at feeding level (5%) of total biomass twice a day. Analysis was done to estimate nutrient digestibility parameters and found increased values such as 70.74%, 79.12% and 61.07% for CP, CF and GE, respectively at 10% MOLM replacement level when compared to control diet and other MOLM replacement diets. The maximum WG (251%), minimum FCR (1.35) and SGR 1.39 values were also found at 10% MOLM replacement level and showed that fish was in more healthy condition in comparison with control and other test diets. The majority of minerals like Ca, Na, K, P, Fe and Al from MOLM based diet were found significantly higher ($p < 0.05$) in fish body at 10% replacement level than the control diet and other test diets. It was concluded that the 10% replacement level of fishmeal with MOLM is optimum which release adequate amount of chelated nutrients for maximum growth performance of *L. rohita* fingerlings.

O-17/ICAZ-2021

Investigation of Antimicrobial, Antioxidant and Anti-Lung Cancer (A549 Cells) Efficacy of *Rhus Coriaria* Sp. Using Green Extraction Approach

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Abstract

Plants have been used in traditional medicines since prehistoric time because they possess numerous bioactive compounds. *Rhus coriaria*, belongs to Anacardiaceae family, is commonly called Sumac. Present study was designed to explore therapeutic potential of *Rhus coriaria* through green extraction. The extract was obtained using microwave-assisted extraction. Phytochemical analysis was done by using standard protocol. Antimicrobial potential was assessed through well diffusion method. DPPH assay was performed to determine the antioxidant potential. Cytotoxic potential was examined against lung cancer cell line (A549 cells) via MTT assay. The results of present study confirmed the presence of alkaloids, tannins, steroids, saponins and flavonoids. *R. coriaria* was found highly antimicrobial against *Pasteurella multocida* (23.83mm ±0.17) and least susceptible against *Fusarium brachyigibossum* (11.76 ±0.22). It exhibited significant free radicle scavenging activity with IC₅₀ 17.513 µg/ml. It also inhibited the 70% growth of A549 cancer cells at the final concentration of 200µg/ml. Overall results suggested that *Rhus coriaria* have antimicrobial, antioxidant and anticancer potential.



Oral Presentations

O-18/ICAZ-2021

Biochemical Characterization of Multidrug Resistant Bacteria in Refrigerated Fish

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Abstract

Fish play important role in economy of a country due to their higher nutritive value containing high protein content, carbohydrates and Omega 3 fatty acids. Refrigerated fish are exposed to high risks of contamination during long chain of catching, transportation and freezing from different sources. Therefore, the current study is aimed to identify major bacterial contaminants present in refrigerated fish through the characterization of the MDR bacteria. Refrigerated fish were collected from different retailer shops at main markets of district Kohat for bacteria isolation and identification. Fish were dissected to isolate the bacteria from five different organs as skin, gills, liver, muscle, and intestine through serial dilution method. The bacteria were identified on the basis of biochemical tests. Four different bacterial species identified as Salmonella, Staphylococcus aureus, E. coli and Pseudomonas aeruginosa. Antibioassay were performed using disc diffusion method. The bacterial isolates were found resistant to Ampicillin (100%), Vancomycin (100%), Ceftriaxone (100%) and Nezikil (100%) antibiotics. Hence regular monitoring of sources of antimicrobial resistance is necessary especially in developing countries like Pakistan that have inadequate data in terms of frequency of bacterial pathogens and antimicrobial resistance.

Key words: Refrigerated fish, Bacteria species, MDRs Bacteria, Antibiotics

O-19/ICAZ-2021

Effect of selected pyrethroids on feeding behavior of *Cyrtophora citricola*

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Abstract:

Present research was conducted to investigate the effect of selected pyrethroids i.e., bifenthrin and Lambda Cyhalothrin on feeding behavior of spider (*Cyrtophora citricola*). Spiders were fed on *Drosophila melanogaster* till satiation level then starved for 2 days and maintained in laboratory conditions. Treated groups were exposed to insecticides (field dose) dipped filter paper while, control groups were exposed with water for one hour. Then five fruit flies were provided to each spider. The number of flies were recorded after regular intervals that are 4, 8, 12, 16, 20, 24 and 48 hours. Bifenthrin effected spider feeding after 20 hours, but in case of lambda Cyhalothrin, effect was observed in Starting hours of treatment but not lethal to spiders. It is concluded from present work that selected pyrethroids have short term effects on natural predators i.e., *Cyrtophora citricola* and then recover again. It is suggested for future studies to check out different concentration of pyrethroids on activities of spiders. It will help out to design field dose which will harmful for pest but not for predators.

Keywords: *Cyrtophora citricola*, *Drosophila melanogaster*, Pyrethroids, feeding behavior.



Oral Presentations

O-20/ICAZ-2021

Effect of polyphenol-rich marigold tea on obesity and oxidative stress in rats fed a high-fat-sugar diet

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Abstract

This work aims to appraise the potential of polyphenol-rich marigold-petal-tea (MPT) on the oxidative stress, obesity and related biochemical parameters in high-fat-diet-induced obesity rat model. MPT was prepared and the yields were calculated. The RP-HPLC analysis revealed the presence of gallic acid, 4-hydroxy benzoic acid, chlorogenic acid, caffeic acid, syringic acid, vanillic acid, p-coumeric acid, salicylic acid, sinapic acid, ferulic acid, cinamic acid, catechin and rutin in MPT. Total phenolic and total flavonoid contents of Marigold petal tea were 5.53 and 7.73 mg/g of dry plant material, respectively. 10 µg/ml of MPT exhibited 57.2% DPPH radical scavenging activity. The anti-obesity potential of MPT at 250 and 500 mg/kg BW was evaluated in vivo using high-fat-diet-induced obese rat's model. Body weight, BMI, kidney and liver indexes, BT, AST, ALT, Ap and SC of rats of all groups were measures. Data showed that higher dose of MPT significantly reduced the rat's body weight and BMI are compared to high-fat-diet group. The kidney and liver indexes, BT, AST, ALT, Ap and SC of rats showed that MPT-500 showed significant anti-obesity and antioxidant potentials. It can be concluded that MPT-500 exhibited protective effects against obesity and comparable with the orlistat drug.

O-21/ICAZ-2021

Antibacterial Activity of *Cyrtophora citricola* (Araneae: Araneidae) Silk

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Abstract

Bacteria are responsible for causing serious threats to human health and are becoming resistant day by day. To combat these challenges, it is an urgent need to explore new antibacterial compounds with better efficacy. Many researchers have reported that antibacterial compounds obtained from natural sources are more potent and are with less chances to develop resistance by bacteria against them. In the present work antibacterial activity of *Cyrtophora citricola* Silk was assessed against selected bacterial species i.e., *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeruginosa* and *Klebsiella pneumoniae* via Disc Diffusion Method. Silk dissolved in 10% NaOH solution was used as treatment. Amoxicillin was applied as positive control while 10% NaOH solution was used as negative control. Prominent inhibition zones were observed around the treatment discs for all bacterial species. It is concluded from present study that spider (*Cyrtophora citricola*) silk has antibacterial activity. Keywords: *Cyrtophora citricola*, Silk, Antibacterial Activity. Theme: Microbiology

O-22/ICAZ-2021

Redesigning the Conservation Efforts for Endangered Mammals in Pakistan Considering Climate Change

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Oral Presentations

Abstract:

Mammals in Pakistan are threatened with a pronounced climate change and global warming. Many ongoing projects for the conservation of mammals and even the past projects have not taken the increased and complex impacts of climate change into consideration. Major threats to the survival of mammals under climate change, that has affected the biodiversity in a unique and important way, include habitat loss, fragmentation and shrinkage. Some of them are suffering decreased capabilities to reproduce and migrate. This article has reviewed funded projects documents, research articles, commonly used adaptation strategies and country reports for the conservation of mammals in Pakistan through an iterative process and has formulated strategies to be incorporated in them to conserve such endangered mammals under changed climatic scenario. Identification of major threats under climate change is followed by hypothesis of change and then adaptation strategy is devised to each of the reviewed project. Three types of adaptation strategies Resistance (Protecting refugia, creating corridors), Resilience (Compensating for changes, rebuilding habitat) and Transformation (changes in ecosystem types, proactively translocating species) with appropriate measures are provided. Understanding and awareness regarding this complex interaction of climate change with those of mammal species is a dire need of the hour to help such species survive and maintain healthy ecosystem.

O-23/ICAZ-2021

Evaluation of Dietary Vitamin C Requirement of *Hypophthalmichthys Molitrix* Fingerlings and its Effects on Growth, Hematology and Serum Enzyme Activities

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Abstract

The main objective of this study is to investigate the optimum dietary vitamin C requirement of *Hypophthalmichthys molitrix* fingerlings. Six isonitrogenous and isocaloric diets were formulated by supplementing ascorbic acid at different concentrations 0, 50, 100, 200, 400 and 800 mg/kg, namely C₀, C₅₀, C₁₀₀, C₂₀₀, C₄₀₀ and C₈₀₀, respectively. Twenty five fish were stocked in each triplicate, fed with test diets for 60 days and physico-chemical parameters were kept constant throughout the trial. The results showed that the growth performance, proximate composition and hematology were improved significantly up to 200 mg/kg vitamin C, and then became rather steady. The liver vitamin C content, antioxidant enzymes and alkaline phosphatase activity were significantly increased, while alanine aminotransferase, aspartate aminotransferase, and thiobarbituric acid reactive substances were significantly decreased by increasing vitamin C supplementation in the diet. After 60 days, 15 fish from each treatment were challenged with *Aeromonas hydrophilla* for 10 days and survival rate was observed. The survival rate of supplemented groups was significantly higher than the control group. Based on the broken-line regression model of weight gain%, 250.25 mg/kg vitamin C was estimated to be optimum for silver carp fingerlings.

Key words: Ascorbic acid; *Hypophthalmichthys molitrix*; Enzyme activities; *Aeromonas Hydrophilla*.



Oral Presentations

O-25/ICAZ-2021

Effects of *Aloe vera* supplemented canola meal based diet on growth performance and body composition of *Catla catla* fingerlings

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Abstract

The purpose of this particular study was to evaluate and determine the effect of *Aloe vera* supplementation on growth performance and body composition of *Catla catla* fed with canola meal based diets. For this purpose, six canola meal based diets were prepared including one control diet (without out *A. vera* supplementation) and five other diets containing 1%, 2%, 3%, 4% and 5% *A. vera* supplementation. In this study, three replicates of each treatment were used and number of fingerlings was 15 in each replicate and was fed at the rate of 5% of their live wet weight. The results revealed that supplementation of *A. vera* in canola meal based diets significantly ($p < 0.05$) improved growth performance and body composition. Most optimum values of growth performance parameters were noted at 3% *A. vera* supplemented diet. *C. catla* fingerlings fed canola meal based diet supplemented with 3% level of *A. vera* indicated significant ($p < 0.05$) improvements in crude protein (19.46%) crude fat (6.63%). From these results, it was concluded that 3% *A. vera* supplementation in canola meal based diet is optimum for improving growth performance and body composition of *C. catla* fingerlings.

O-26/ICAZ-2021

(Ecological modelling of Red Vented Bulbul (*Pycnonotus cafer*) by GIS application in district Mianwali, Punjab, Pakistan)

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Abstract

Ecological modelling is very useful tool to evaluate the spatial distribution and breeding biology of Red Vented Bulbul in 8 different regions (Chikrala, Abba Khel, Chidru, Namal Lake, Musa Khel, Sawans, Bittian, and Gulmeri) of the district Mianwali with GIS application. GIS mapping prove to be very useful while studying population of Red Vented Bulbul. In current study spatial distribution of specie and their nests structures, total eggs and hatching rate was thoroughly study during survey. Results revealed that mostly this specie was found in continuous circulations around all sites except Gulmeri. Population density was recorded higher from the month of March to July and then starts decreasing. Breeding time started from late February to late July. 42 nests have been investigated in different study sites. For nest construction the specie used different plant species, including *Psidium guajava*, *Zizyphus nummularia*, *Dodonea viscosa*, *Dalbergia sissoo*, *Phoenix dactylifera*, *Berberis lyceum*, *Vitis vinifera*, and *Morus alba*. The incubation time of the eggs of specie range between 11-14 days. The incubating and fledgeling success in the current study is 82% and 87%. The study shows that the Red Vented Bulbul is widely distributed throughout the targeted regions of the district Mianwali.



Oral Presentations

O-27/ICAZ-2021

Efficacy of Lycopene supplementation on growth and antioxidant activity of Labeo rohita fingerlings fed canola meal based test diets

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Abstract

This research was designed to check the effects of lycopene supplementation on growth performance and antioxidant activity of Labeo rohita fingerlings fed on canola meal based test diets. Increase in oxidation of muscles in fish, lead to rancidity and off flavor that result in reduced market value of fish that made it necessary to search for such control agents which helped in inhibition of oxidation of poly unsaturated fatty acids in the body of fish. Seven test diets were formulated having all the required nutrients at their adequate level for improving the fish growth. 1% of chromic oxides was added to feed as an indigestible biomarker. 0, 10, 20, 30, 40, 50 and 60 mg/kg of lycopene were added to test the efficiency of canola meal-based diet for growth performance and antioxidant activity of L. rohita fingerlings. During experimental condition, 5% of live wet weight of fingerlings were fed with diet. Results indicated that maximum growth performance, nutrient digestibility, higher nutrient contents (protein, gross energy and fat) of L. rohita fingerlings were noted at 40 gKg⁻¹ level of lycopene supplemented canola based test diets. Effect of each treatment on the feed conversion ratio (FCR) and weight gain was calculated by using standard formulae. It was concluded that lycopene supplementation at 40 gKg⁻¹ level were helpful to develop cost-effective and environmental friendly fish feeds by using oilseeds meal based test diets.

O-28/ICAZ-2021

Effect of selected insecticides and plant extracts against peach fruit fly (*Bactrocera zonata*)

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Abstract

Fruit flies decrease economic yield of Pakistan by damaging variety of fruits & vegetables and reduce agricultural production. Eleven Species of fruit flies are recorded from Pakistan, but three of which *Bactrocera dorsalis*, *Bactrocera cucurbitae* and *Bactrocera zonata* that attack on apple, mango, beer, guava, musk melon, bitter gourd and snake gourd are serious pest species. In this research work Laboratory studies were carried out in Ayub Agriculture Research Institute Faisalabad to check efficacy of different insecticides and plant extracts after the time intervals of 6, 12, 24 and 48 hours against peach fruit fly on guava fruit. Emerging adult flies were used in the



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experiment. Six insecticides viz., Corajin (DU PONT ®/20 EC) Imidacloprid (Crown ®/20 SL) Aceta maprid (Admire ®/20 SL) Steward (DU PONT ®/12.5 EC) Flufenoxuron (Cascade®/05 ES) and NitenPyramid (Capstar®/10 SL) at their recommended doses and two botanical extracts viz ., Neem seed oil and kur-tuma fruit extract were used for peach fruit fly. The order of toxicity on the basis of mortality after 48 hours was recorded as Coragen > Steward > Flufenoxuron > Acetamidrid > Niten pyramid > Imidacloprid > Neem seed oil > Kor-tuma fruit extract.

Keywords: Fruit fly, Comparative toxicity, Botanical extract, Insecticides

O-29/ICAZ-2021

Efficacy of botanical leaf extracts and selective insecticides against wheat aphid in Faisalabad, Pakistan

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Abstract

Wheat aphid is a destructive pest of wheat crop. It causes damage by sucking cell sap, injecting toxin into the plant, eliminating photo assimilates and by spreading the destructive plant viruses. The objective of this study was to determine the efficacy of botanical extracts and synthetic insecticides to manage the wheat aphid. Data regarding the aphid population was recorded on 24, 48, 72 and 168 hours after application of botanical extracts and insecticides. Maximum mortality recorded after 168 hours was, 85.06% & 79.29% by Neem and *Eucalyptus* leaf extract followed by 72 hours 72.29% & 71.69%, 48 hours 63.35% & 62.45% and 24 hours 48.91% & 48.68% respectively. Among the botanical extracts Neem leaf extract was more effective as compared to the *Eucalyptus* leaf extract and significant difference between the treated and control plot was recorded. Carbosulfan and Imidacloprid showed 76.80% & 75.62% mortality followed by 84.40% & 84.08%, 91.35% & 90.53% and 95.39% & 93.85% after 48, 72 and 168 hours respectively. Carbosulfan and Imidacloprid also significantly reduced the aphid population in comparison to control but no significant difference between Carbosulfan and Imidacloprid treated plot was observed. Based on the results, it is stated that botanicals provide cost-effective and ecologically friendly alternatives to wheat aphid control, and that they should be incorporated into an integrated management approach.

Keywords: Wheat aphid, *Eucalyptus* leaf extract, Neem leaf extract, Selective insecticides

O-30/ICAZ-2021

Analyzing the expression levels of transcriptional factors MAFA, NKX6-1 and NEUROD to evaluate the pancreatic regenerative potential of *Nigella sativa* in diabetic rats

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Oral Presentations

Abstract

Diabetes mellitus is a chronic, metabolic, long-term condition which influences body's capacity to utilize the energy found in food. Around the world many people utilize alternative and complementary drugs while there is a high propensity utilization of herbal medicines for the treatment of diabetes. This study is designed to determine the changes in pancreatic histology and levels of transcriptional factors MAFA, NKX6-1 and NEUROD in diabetic rats after treating with *Nigella sativa* oil. Albino rats (N=24) weighing (180-200g) were divided into 4 groups; negative control fed on standard diet, positive control group (Alloxan treated), standard group (Alloxan + Glibenclamide 10mg/kg) and treatment group (Alloxan +*Nigella sativa* oil 5ml/kg). Decapitation was done on 21st day and tissue samples from pancreas were collected for RNA isolation. Gene expression analysis was performed by using quantitative real-time PCR. For histopathological analysis samples of liver and pancreas tissues were collected. After statistical analyses results revealed overexpression of MAFA, Nkx6-1 and NEUROD and down-expression of INS-I and INS-II in alloxan-induced diabetic group. Histopathological findings showed that treatment with *Nigella sativa* oil, reduced the severity of degenerative and necrotic changes in islets of Langerhans

O-31/ICAZ-2021

Comparative Study of Bee Propolis and Bee Pollen on Fish Growth, Biochemical and Hematological Indices of Grass Carp

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Abstract

The aim of this study was analyzing the effects of propolis and honeybee pollen on growth performance, biochemical and hematological parameters of *Ctenopharyngodon idella*, an economically important freshwater fish of Pakistan. Supplemented with 2.5% of propolis or honeybee pollen in diet for 30 days. The results showed that dietary propolis or honeybee pollen significantly improved Specific Growth Rate, Average Daily Gain and Feed Efficiency ratio. Total leukocyte counts and granulocytes values increased treated with propolis and pollen at concentration of 2.5% of the body weight. Hematological analysis showed significant decrease in erythrocytes, hemoglobin, agranulocytes and hematocrit values for fish exposed to propolis and pollen with concentration of 2.5% of the body weight. MCV and MCH values were significantly increased. The biochemical analysis showed significant increase in the levels of gamma glutamyltransferase and lactate dehydrogenase, while show some decrease in the level of aspartate aminotransferase, alanine aminotransferase and alkaline phosphatase. It is concluded that concentration-dependent supplementation of fish diet with either propolis or honeybee pollen is promising can be favorable for fisheries because of its potential improving effect on the growth rate, biochemical and some biochemical indices of Grass carp.

Key words: Bee Pollen, Biochemical, growth performance, Haematological, Propolis, *Ctenopharyngodon Idella*,



Oral Presentations

O-36/ICAZ-2021

Impact of Plant-derived Components on Dairy Products Development

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Abstract

The influence of plant-derived functional components on dairy products has been explored in this communication. Milk is the fundamental component in the manufacturing of dairy products. Its nutritional profile contains carbohydrates (lactose), fat (SAF, PUFA), protein (whey and casein), vitamins (A, E and B complex) and other nutrients (calcium, potassium, zinc and phosphorous). Some changes can occur during the processing or manufacturing of dairy products by various thermal and nonthermal methods. These changes include oxidation in fat and denaturation in protein that affects dairy products' quality and nutrition value. For this purpose, plant-derived components such as phenolic compounds, antioxidants and vitamins are added in the form of extract or as a part (leaf, root, peel and seeds). These biologically active substances in plants can improve digestion and cardiovascular activity and also assist in reducing fat oxidation and protein denaturation, which adds value, enhances the quality and increases self-stability in dairy products. When supplemented with plant extracts, the products can be used as supportive therapy and boost the immune system. So, these products can be used regularly to replace the vital nutritional balance.

Keywords: Dairy product, plant, vitamins, antioxidants

O-37/ICAZ-2021

Efficacy of Moringa oleifera by-products based diets on growth performance and body composition of Catla catla cultured in earthen ponds

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Abstract

Six month experiment was conducted in 12 earthen ponds under semi-intensive rearing system to evaluate the efficacy of Moringa oleifera by-products based diets on growth performance and body composition of Catla catla cultured in earthen ponds. In order to formulate experimental diets, MOLM and MOSM based diets were used as test ingredients. MOLM and MOSM were used to replace fish meal in the diet at varying levels of 0%, 10%, 15%, 20%, 25% and 30%, respectively. So far, six different experimental diets have been tested of each type of feed in current study. Indian major carps were placed in a cemented pond for 15 days under laboratory conditions for acclimatization. Total 540 fishes were distributed in 12 earthen ponds and fifteen fish of each species were divided into each pond. Fishes were fed at the rate of 3% of their biomass. Water quality parameters such as oxygen, temperature and pH were monitored throughout the experimental period. Effect of each treatment on the final weight, weight gain and body composition was calculated by standard formulae. Data of growth and body composition was subjected to one-way Analysis of Variance (ANOVA).



Oral Presentations

O-40/ICAZ-2021

Efficacy of Citric Acid and Phytase Treated Cottonseed Meal Based Diet in *Catla catla* Fingerlings to Improve Mineral Digestibility

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Abstract

The purpose of this study was to see how citric acid (CA) and phytase (PHY) supplementation affected the mineral digestibility of *Catla catla* (*C. catla*) fingerlings fed cottonseed meal (CSM) based diet. A 90-days feeding trial was conducted to check minerals digestibility of *C. catla* fingerlings in order to test the potential of CSM as a fish meal (FM) replacer. The protein proportion of the test diet was fulfilled by substituting CSM for FM at a rate of 0, 25, 50, and 75%. In a completely randomised design with a 3×3 factorial arrangement, sixteen test diets, TD₁ (control), TD₂, TD₃, TD₄, TD₅, TD₆, TD₇, TD₈, TD₉, TD₁₀, TD₁₁, TD₁₂, TD₁₃, TD₁₄, TD₁₅ and TD₁₆ were supplemented with CA (0 and 2.5 %) and PHY (0 and 750 FTU/kg). In order to estimate mineral digestibility, chromic oxide was used as an inert marker in diets. The apparent digestibility coefficient (ADC %) of Ca, Na, K, P, Mg, Cr and Al in fish fed a CA and PHY supplemented diet was significantly higher. In conclusion, both CA and PHY improved significantly ($p < 0.05$) mineral digestibility of *C. catla* fingerlings.

O-41/ICAZ-2021

Pancreatic Regenerative Potential of *Nigella sativa* Evidenced Through Pancreatic Histology and Levels of Transcription Factors PDX-1 and NEUROG-3

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Abstract

Pancreatic β cell neogenesis and proliferation is regarded as an encouraging approach towards diabetes management. *Nigella sativa* regarded as a potent antioxidant and anti-inflammatory agent, found useful in promoting the regeneration process in several organ systems. Through examining the pancreatic histology along with the levels of crucial transcription factors including PDX-1, NEUROG-3, INS-1 and INS-2, we evaluated the potential role of *Nigella sativa* in pancreatic regeneration. The study included 24 rats which were divided into four groups including normal, negative control, positive control, and treatment group. Diabetes was induced through intra peritoneal application of alloxan hydrate. No treatment was given to negative control group while positive control group and treatment group were fed with Glybanclamide and *Nigella sativa* extract respectively for 21 days post diabetes induction. Parameters including biochemical markers, oxidative stress markers, changes in architecture of pancreatic islets, and expression levels of PDX-1, NEUROG-3, INS-1, and INS-2 were assessed. Statistical analysis of results exhibited that *Nigella sativa* plays a significant role in ameliorating the alloxan-induced hyperglycemia, hyperinsulinemia, oxidative stress, necrotic changes in islets and in the up regulation of pivotal transcription factors PDX-1, NEUROG-3, INS-1, and INS-2 suggesting the beneficial role of *Nigella sativa* in pancreatic regeneration and combating diabetes.



Oral Presentations

O-44/ICAZ-2021

Bioevaluation of potentially active *Juglans Regia* against Diabetes and Atherosclerosis

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Abstract

Juglans Regia is one of the medicinal plants used in Mediterranean countries in the treatment of various ailments like rheumatism, constipation, aphrodisiac, [hyperlipidemia](#), ulcers and fever but some scientific evidence supports its antidiabetic and anti-atherosclerotic activity. The antidiabetic and anti-atherosclerotic activity of methanolic extract of *Juglans Regia* bark was evaluated in high fat diet induced [atherosclerosis](#) rats. Male albino rats were divided into four groups, one group was fed on normal diet and other on high fat diet (HFD). Simvastatin and Metformin were given as standard control. Two treatment groups treated with *Juglans Regia* bark extract in doses of 500mg/kg and 250mg/kg were compared with standard control (simvastatin) group. At the end of experimental period lipid profile, body weight and fasting blood glucose level were determined in high fat diet induced atherosclerosis rats. The results suggested that administration of different doses of methanolic extract of *Juglans regia* bark extract showed a significant decrease in body weight, lipid profile and serum glucose level of rats by inhibited damage of liver and kidney. Histopathological examination of liver and kidney tissues showed that total cholesterol, low density lipoprotein and serum glucose levels were significantly decreased as compared to positive and standard controls ($P < 0.05$). In positive control nucleus was shrunk due to several fat vacuoles in cytoplasm of hepatocytes. In extract treated groups fat accumulation and fat degeneration was decreased as compared to positive control. These results can be a base to evaluate the effectiveness of *Juglans regia* bark extract in the management of diabetes and atherosclerosis in human patients.

O-45/ICAZ-2021

Efficacy of probiotics supplementation on growth and nutrient digestibility of *Cirrhinus mrigala* fingerlings fed *Moringa olifera* oilseeds by-products based test diets

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Abstract

This research work was planned to evaluate the efficacy of probiotics supplementation on growth performance and nutrient digestibility of *Cirrhinus mrigala* fingerlings fed oilseeds by-products based test diets. *Moringa olifera* seed meal (MOSM) were used as test ingredients to formulate experimental diets. Each experimental diet was further divided into seven test diets supplemented with different graded (0, 0.5, 1, 1.5, 2, 2.5 and 3 gKg⁻¹) levels of probiotics in fish feed to check growth performance and nutrient digestibility of *C. mrigala* fingerlings. Results indicated that maximum growth performance, nutrient digestibility, higher nutrient contents (protein, gross energy and fat) of *C. mrigala* fingerlings were noted at 2 gKg⁻¹ level of probiotics supplemented MOSM based test diets. It was also observed that probiotics supplementation minimizes discharge of nutrients and



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minerals through feces resulting in decreased water pollution. It was concluded that probiotics supplementation at 2 gKg-1 level were helpful to develop cost-effective and environmental friendly fish feeds by using oilseeds meal based test diets.

O-46/ICAZ-2021

Laboratory and Field Evaluation of Imidacloprid Using Core Analysis against Subterranean Termites (Blattoidea: Rhinotermitidae)

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Abstract

A comprehensive survey of laboratory and field experiments were conducted by using imidacloprid. In this study Imidacloprid, *Populus euramericana* and *Odontotermes obesi* were selected as pesticide, wood species and termite species respectively. In laboratory bioassay, the toxicity and repellency effects of imidacloprid was done by making various concentrations i.e., 0.05%, 0.10%, 0.25%, 0.50%, 0.75% and 1%. LC50 value of imidacloprid was calculated by using Probit analysis. In field, to investigate imidacloprid treated wood consumption and tunnel formation by termites was done by following core analysis method. The whole experiment was run in triplicate for 12 weeks. After that barrier efficacy of imidacloprid was evaluated by using soil cores of various depths (2cm, 4cm, 6cm, 8cm, 10cm, and 12 cm) were dug out and treated with 0.50% Imidacloprid. Toxicity results revealed that 1% concentration significantly ($P < 0.05$) take time less than 8 hour to kill all the termites than all other concentrations. Furthermore, the percentage mortality for subterranean termites in imidacloprid treated soil, within eight hours was, 100%, 97%, 83%, 73%, 60%, 47%, 4 in 1%, 0.75%, 0.50%, 0.25%, 0.10% and 0.05% respectively. The calculated LC50 value of imidacloprid was 715 ppm. The results regarding the repellency of imidacloprid demonstrated that only 1 % concentration was repellent as compared to others. Results of core analysis method showed that maximum feeding was observed in 0.05 % concentrations and minimum feeding was observed in 1 % concentration. So, 1% concentration was significantly ($P < 0.05$) effective to reduce wood consumption by termites. The results regarding barrier efficacy of imidacloprid in different soil depths revealed that wood consumption was increased with an increase in soil depth and vice versa and tunneling ability of termites had significantly decrease with the increase in the concentration of Imidacloprid.

O-47/ICAZ-2021

Molecular epidemiology of *Theileria annulata* in Cattle from two districts in Punjab (Pakistan) with a note on the phylogeny of the pathogen

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Abstract

Bovine theileriosis is a tick borne hemoparasitic disease of livestock due to *Theileria annulata* infection and causes huge economic losses. Present study was designed to report the molecular prevalence of *T. annulata* in cattle blood samples collected from Punjab in Pakistan. A total of 428 cattle blood samples were collected from District Lohdhan ($n = 218$) and Dera Ghazi Khan ($n = 210$) Prevalence of *T. annulata* was determined by the amplification of its cytochrome b gene and parasite prevalence was significantly higher ($P = 0.03$) in blood samples of cattle collected from Dera Ghazi Khan (70/210; 33%) as compared to Lohdhan (52/218; 24%). Presence of *T. annulata* was



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also confirmed by the amplification of their 30KDa gene. Amplified PCR products of both gene were confirmed by DNA sequencing and these partial DNA sequences were submitted to the GenBank (Accession numbers MW354912-15 for cytochrome b gene, and MW412253-55 for 30KDa gene). Phylogenetic analysis revealed that amplified partial gene sequences resembled previously reported *T. annulata* sequences in cattle from India, China, Iran, Tunisia, Turkey and Egypt. Sahiwal breed were found significantly more susceptible ($P = 0.04$) for *T. annulata* infection than other enrolled cattle breed from Dera Ghazi Khan. Female cattle from Lodhran ($P = 0.02$) while males ($P = 0.02$), animal housed in close compounds ($P = 0.04$), animals with tick burden ($P = 0.005$) and farms with only cattle ($P = 0.01$) were found more susceptible to *T. annulata* infection. We recommend that large scale tick and tick borne disease control strategies must be implemented in both Districts under investigation, especially in Dera Ghazi Khan.

Key words: *Theileria annulata*; cytochrome b gene, 30KDa gene, epidemiology; Phylogenetic analysis.

O-48/ICAZ-2021

Cytotoxic Effects of *Oxalis acetosella* and *Bassia indica* on Primary Cancer Cell Lines

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Abstract

Cancer is a major health problem and the second leading cause of death all over the world. According to the World Health Organization, around 18 million new cases of cancer and 9.8 million deaths due to various types of cancer were reported in 2018. There has been a good progress in cancer treatment, but the successful treatment still remains a challenge for the researchers therefore there is a need to develop a drug which are more potent and having less side effects because cancer cells develop resistance to commonly used chemotherapeutic agents. The aim of this work was to find out the cytotoxic effects of *oxalis acetosella* and *bassia indica* on primary cancer cell lines. *Bassia indica* and *Oxalis acetosella* were collected from district Karak and grinded into powder form after drying in shadow and methanol-based extracts were prepared. Anticancer activity of plant extracts was checked through MTT assay on primary cancer cell lines. MTT assay results showed that methanolic extract of *bassia indica* was more effective against primary cancer cell lines than *oxalis acetosella*. It may be concluded from present study that *bassia indica* was more cytotoxic and it can be used for further anticancer activity through in-vivo and in- vitro trials.

Key words: Medicinal plants, Primary cancer cell lines, Anticancer



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Evaluating the cardioprotective role of N-acetyl-cystine and melatonin along with miRNA regulation in stress induced cardiac hypertrophy

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Abstract

Oxidative stress induced cardiomyopathies are the major cause of death worldwide. Previously reported data showed link of miRNA regulation with cardiovascular diseases, mainly cardiac hypertrophy. Our aim was to assess stress linked miRNA regulation and to evaluate the protective role of antioxidants such as NAC and melatonin against stress induced hypertrophy. Endothelin-1 and isoproterenol were used to induce disease which was confirmed by checking the protein expression of GATA-4 and BNP in Et-1 and ISO treated rats. Oxidative profile indicated increased ROS production in hypertrophic rats and decline in the level of antioxidant enzymes. Histological analysis of heart further confirmed the disease. Expression of miR-152 were upregulated while the expression of miR-142 was downregulated in hypertrophic rats. Treatment with NAC and melatonin reduced the oxidative stress and altered the expression of miRNAs. Persistent oxidative stress causes decline in endogenous antioxidants and subsequent imbalance leads to disease progression. Our finding suggested that the antioxidants play a crucial role in disease regression. Further detailed investigation is needed to study role of miRNAs in cardiac hypertrophy progression and also as a therapeutic against cardiac diseases.

O-52/ICAZ-2021

Isolation and Molecular Characterization of Escherichia Coli harboring Colistin Resistance genes from Raw Milk

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Abstract

The current study is designed to isolate and identify Escherichia coli from raw/ unpasteurized milk followed by molecular characterization of colistin resistance gene (mcr-1). For this purpose, raw milk samples (n=60) were collected from different areas/ dairy-farms or milk vending shops of Faisalabad. The milk samples were processed for bacterial isolation by inoculating on MacConkey agar and incubated at 37°C. The growth was observed and was confirmed by re-streaking on Eosin-Methylene blue agar. The molecular identification of E. coli was conducted by the amplification of bacterial DNA by targeting uid A, specific for E. coli. The isolates were also confirmed for the presence of mcr-1 gene followed sequence analysis. Out of 60, 35 samples were positive for bacterial growth including 21 Escherichia coli isolates. The antibiotic susceptibility profiles showed that 4 isolates were resistant to colistin. The isolates were also confirmed for the presence of mcr-1 gene amplification and the sequencing data showed genetic homology among isolates. Altogether, the current study has demonstrated the burden of E. coli harboring colistin resistance genes from raw/ unpasteurized milk in different areas of Faisalabad.



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O-53/ICAZ-2021

Amelioration of Nephrotoxicity and Spleenotoxicity Induced by Nickel with Punica Granatum Extract in Male Mus Musculus

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Abstract

Nickel (Ni) is substantial metal. It is a vital element for certain animal species plants and is found ubiquitously in vegetables, fruits, in dark chocolates and in tea. It is required in small amounts for humans. At higher concentrations, it can cause toxic effects and destroy the living systems. The study was carried out to check the harmful effects of nickel (Ni) on complete Blood Count (CBC) and Renal Function Test (RFT) and therapeutic potential of pomegranate was also taken into account. Eighty mice were used in this study 10 mice were kept in each group. Nickel chloride (NiCl₂) + pomegranate were given for 30 days on daily basis. Control group was untreated group. Three groups were treated only with the NiCl₂. Three groups were given NiCl₂ as a dose + pomegranate as an antidote. One group was treated only with the pomegranate. After 30 days the samples was collected through dissection and examined biochemically and histopathologically. RFT parameters were found to increased significantly ($p < 0.001$) and CBC parameters were found to decreased significantly ($p < 0.001$) due to the exposure of NiCl₂. It was observed by histopathology that NiCl₂ caused Adipocyte Metaplasia (AM), Fibrosis (F), Angiectasis (An) and Atrophy (At) in spleen and Glomerul sclerosis (GS), Vocoulation (V) and Glomerunephritis (GN) were caused by NiCl₂ in kidney. Nickel has the ability to bind with the WBC leucocytes and can weaken the immune system. Nickel can destroy the main target organ kidney and can cause toxicity in the body. Nickel can induced toxic effects in the body and can destroy the body organs. And pomegranate as an antidote is very useful to reduce the toxicity induced by NiCl₂.

Key Words: CBC, RFT, Adipocyte Metaplasia, Fibrosis, Angiectasis, Atrophy, Glomerul sclerosis, Vocoulation, Glomerunephritis.

O-55/ICAZ-2021

Efficacy of plant extracts with combination of entomopathogenic fungi against whitefly (Bemisia tabaci, gennadius) under laboratory conditions

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Abstract

Bemisia tabaci insect infestation is main factor for quantitative and qualitative losses of many field crops and other edible products. Recent research work was conducted to know efficacy of different botanical extracts of Allium sativum (Garlic) and Azadirachta indica (Neem) along with Entomopathogenic fungus (EPF) such as Beauveria bassiana and Metarhizium anisopliae against nymph and adults of whitefly (Bemisia tabaci). The research work was carried in Cotton Insect Pest Management Laboratory, Department of Entomology, University of Agriculture, Faisalabad. Each concentration of EPF (0.4%, 0.5% and 0.6ppm), plant extract of Neem and Garlic (5%, 10% and 15%) was repeated five time by using factorial Design. All type of treatment applied to check their



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toxicity of *Bemisia tabaci* nymph and adult. The mortality was checked after 24, 48, 72 hours and 120 hours. Statistical analysis was done with help of analysis of variance (ANOVA) and concentration means were compared with the help of Turkey's Honest Significant Difference (THSD) test. All treatments showed statistically significant results with increase in concentration. *Metarhizium anisopliae* was most effective at maximum concentration and gave a highest percent mortality (71%) as compared to plant extracts *A. sativum* (52%) and *A. indica* (47%) against nymph of *Bemisia tabaci*. The *Metarhizium anisopliae* was most effective at maximum concentration and gave a highest percent mortality (57%) as compared to plant extracts *A. sativum* (42%) and *A. indica* (37%) against adult of *Bemisia tabaci*. The *Beauveria bassiana* followed the *Metarhizium anisopliae* and showed their toxicity and gave percent mortality against adult (52%) and nymph (64%) of white fly. *Metarhizium anisopliae* had the maximum action against the tested insects compared with the *Beauveria bassiana* and two plant extracts used in this research work. Plant extract is less expensive and harmful to surrounding while EPF most efficiently work to suppress the population of *B. tabaci*.

O-56/ICAZ-2021

Synergistic effects of citric acid and phytase supplemented canola meal based diet on growth performance and nutrient digestibility of *Cyprinus carpio* fingerlings

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Abstract

A 3×3 factorial experiment was conducted to determine the synergistic effects of citric acid (CA) and phytase (PHY) supplemented canola meal (CM) based diet on growth performance and nutrient digestibility of *Cyprinus carpio* fingerlings. Canola meal was used as a main ingredient to prepare diets by replacing fishmeal at graded levels such as: 0%, 25%, 50% and 75%. These diets were further supplemented by different levels of CA (0% and 2.5%) and PHY (0 and 750 FTU kg⁻¹) to formulate a total of 16 test diets. Chromic oxide (Cr₂O₃) was also added as an indigestible marker. Fish were fed at the rate of 5% of their live wet weight. According to the results, the maximum weight gain% (268%), SGR (1.44) and the lowest value of FCR (1.32) were noted when fingerlings were fed on test diet T12 as compared to fish fed on control diet (T1). Similarly, optimum nutrient digestibility values such as crude protein (75%), crude fat (83%) and gross energy (66%) were noted when fish fed on the same diet (T12). It was concluded that fish meal could be optimally replaced with canola meal up to 50%, when supplemented with PHY (750 FTU kg⁻¹) and CA (2.5%).

Key words: *C. carpio*, phytase, citric acid, canola meal, growth, nutrient digestibility



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O-57/ICAZ-2021

Determination of novel protease inhibitors for the treatment of HCV: an *in-silico* approach

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Abstract

Non-structural proteins (NS3/NS4A) having significant role in the interaction of hepatitis C virus (HCV) to the host are an ideal target for peptide-based drug discovery. To design a targeted drug for HCV is a challenge due to high rate of mutation HCV. In the present study, computer-aided drug discovery (CADD) software was used to design more effective peptide-based inhibitors for serine protease NS3/NS4 with high affinity and low toxicity. Methodology was divided into two stages: a) Designing of 50 peptides b) estimation of leading and active site affinity. Molecular docking was performed using molecular operating environment to decide the best ligands that can bind with target active site with highest affinity to form a complex. The binding-strength calculation was done directly in terms of a molecular mechanics potential. Then measured inhibition constant (K_i) values were correlated with the predicted energy. New enzyme-ligand complexes, exhibiting the lowest complexation energies and closest to the computed energy for the reference compounds, was then chose for the next stage manipulation and design. The present study has involved the high-throughput screening, protein structure prediction methods, protein–ligand docking, to make a better drug against HCV.

Keywords: Non-structural proteins; CADD software; K_i ; predicted energy

O-58/ICAZ-2021

Macrophage Targeting of Nitazoxanide-Loaded Transethosomal Gel in Cutaneous Leishmaniasis

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Abstract

In case of cutaneous leishmaniasis (CL), the topical delivery is preferable over systemic delivery because of its easy administration, reduced systemic adverse effects, and low cost. Nitazoxanide (NTZ) has a broad-spectrum activity against various parasites and has the potential to avoid the drug resistance developed by enzymatic-mutations due to its mechanism of action. NTZ is only available in oral formulation, which is being associated with severe dyspepsia and stomach pain. Thus to overcome these problems, the topical delivery of nitazoxanide loaded transethosomes (NTZ-TES) incorporated into the chitosan-based gel system (NTZ-TEG) was investigated.

The thin-film-hydration method was employed for NTZ-TES preparation and Box-Behnken design was used for their statistical optimization. The optimized formulation was then characterized in terms of PS, ZP, PDI, TEM and FTIR and optimized NTZ-TEG was characterized in terms of physical appearance, pH, viscosity and spreadability. In vitro release, ex vivo permeation and skin deposition studies were also performed for the estimation of release and permeation behaviour of developed formulation. The antileishmanial assay and cell uptake study was carried out for NTZ-TES and skin irritation study for NTZ-TEG for determination of potential targeted leishmanicidal activity



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of formulation and topical safety of developed gel. The optimized formulation indicated 176.66 ± 9.95 nm PS, 0.093 ± 0.017 PDI, -26.4 ± 2.88 mV ZP and $86.03 \pm 0.15\%$ entrapment efficiency (EE). The TEM analysis of optimized NTZ-TES showed the spherical and uniform size particles and FTIR analysis indicated no interaction among excipients. Moreover, NTZ-TEG was homogeneous, has optimal pH, desirable viscosity and also showed good spreadability characteristic. The NTZ-TES and NTZ-TEG showed more prolonged release behavior in comparison with the pure drug dispersion. Higher skin penetration and deposition in epidermis/dermis layer of skin was observed in case of. NTZ-TES and NTZ-TEG. As compared to pure drug solution NTZ-TES showed higher percentage inhibition, lower IC50 against promastigotes and higher macrophage uptake. Moreover, in vivo skin irritation and histopathology study indicated the safe and non-irritant behavior of the NTZ-TEG. The obtained findings suggested that the developed NTZ-TEG is capable of providing enhanced skin permeation and improved antileishmanial effect of the incorporated drug. Most importantly the drug carrier may be utilized for potential application against CL.

O-59/ICAZ-2021

Assessment of male reproductive dysfunction induced by oral subchronic exposure to heavy metals in Sprague Dawley rats.

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Abstract

Increase in male factor infertility is a rapidly emerging concern throughout the world. The current study was designed to assess and compare reproductive toxicity of lead (2.25 and 250mg/kg), cadmium (1 and 5mg/kg), and arsenic (2.5 and 40mg/kg) in male rats, using doses simulating both environmental and occupational exposure. The adult male Sprague Dawley rats (n= 35) were divided into seven groups. Testicular tissue and blood samples were taken for histology and biochemical analysis at the 29th day. High dose of each metal caused significant decline in body weight, testicular and epididymal weight, and plasma and intratesticular testosterone concentration. Histomorphological studies showed significant degenerative alterations in rat testes in animals treated with high dose of each metal, but with more pronounced effect in cadmium (5mg/kg) treated rats as compared to low dose groups of each metal, and high dose groups of lead and arsenic. The results of current study indicate that exposure to cadmium produced more prominent effect on rats' testes, even at lower dose, as compared to damage induced by lead and arsenic. It can be precluded that this toxicity might be due to higher cellular toxicity and endocrine disrupting capability of cadmium, mediated through multiple molecular pathways.

O-60/ICAZ-2021

Antibacterial and Antifungal Activity of Traditional Medicinal Plants against Some Important Pathogens in District Mianwali

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Abstract

Appearance of antibiotic resistance is a grave concern across the globe. Therefore, need of the hour is to look for more effective and economical options of treatment. Natural compounds in plants have antimicrobial properties established through both in vitro and in vivo studies. A remarkable number of medicinal plants are used in making of various drugs and other conventional medicines. Aim of this study was to assess in vitro antibacterial and antifungal activities of three commonly found medicinal plants in district Mianwali, Punjab, Pakistan viz *Achyranthes aspera* (Ludhari), *Acacia modesta* (Phulaie) and *Solanum surattense* (Mohakeri) leaves extracts against lethal human pathogens (*Escherichia coli*, *Salmonella* and *Malassezia* species). Bioactive components were extracted using 70 % methanol and ethanol. Antibacterial and antifungal activities of leaves extracts were evaluated by agar-well diffusion method. Inhibitory zones were recorded in millimeters. Bioassay studies of the crude extracts were undertaken at three different concentrations i.e 30.0, 40.0 and 50.0 mg/ml. Ethanolic extracts of *Achyranthes aspera* leaves had shown highest growth inhibitory effect at a concentration of 50.0 mg/ml with inhibition zone of 13.2 mm against *E.coli*. While ethanolic and methanolic leave extracts of *Solanum surattense* had shown highest inhibition effects at a concentration of 50.0 mg/ml with maximum zone of inhibition ranging of 12.5 mm against *Salmonella* and 12.08 mm against *Malassezia globosa* species respectively. This study provides scientific basis for traditionally used medicinal plants which are commonly found in Mianwali district. However for proper therapeutic application, establishment of antifungal and antibacterial components is required.

O-61/ICAZ-2021

A Comparative Study on the Accumulation of Copper and Cadmium in different tissues (Gills, Liver, Kidney, Spleen and Muscle) of *Labeo rohita*

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Abstract

Water pollution due to heavy metals poses a main threat to water organisms particularly fish due to their ability to change physiological, metabolic, biochemical and structural organization. Consequently, the present experiment was conducted to determine the accumulation of water-borne copper and cadmium in different body organs of *Labeo rohita*. The fish fingerlings were exposed to metals i.e., copper and cadmium for 60-days. Tests were performed separately at constant water pH (7.0), temperature (30°C), and total hardness (200 milligrams per liter) with three replicates for each metal. The metal-exposed fish were collected after a 15-days period and dissected to get the organs, i.e. liver, gills, kidney, muscle tissue and spleen. These organs were used to examine the accumulation of metals. The accumulation patterns of both metals showed dose and time dependent relationship. Maximum and minimum concentrations of both metals were measured in all the organs of 90 and 15-days exposed fish, respectively. The overall pattern of Cu accumulation in the fish tissues followed the order: liver > gills > kidney > spleen > muscles whereas, Cd accumulation in the fish followed the order: liver > kidney > gills > spleen > muscle.

Keywords: Fish; copper; cadmium; tissues; accumulation.



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O-62/ICAZ-2021

Development of a Fast Residue Method for the Determination of Pesticide (Chlorpyrifos) in Local Varieties of Dry Samples (Onion) Using Quechers Based Method and GC-MSD

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Abstract

The Intensive agriculture activities, Pesticide percentage purity, and its residues in onion are becoming a major concern. A high-performance liquid chromatography (HPLC) was used to assess percentage purity and a generalized approach to multi-residue methodology adapting selected ion monitoring mode GC-MSD/SIM the following extrication with the QuEChERS technique, which has been formulated for the volumetric analysis of organophosphate pesticide (chlorpyrifos). Five local varieties of onion Chiltan-89, Gulnar, Nasarpori, Phulkara, and Trichmir were selected, grown, and treated with three equal concentrations of chlorpyrifos at different intervals in the agriculture field, Sariab Quetta, Pakistan. In this study, the percentage purity of the branded pesticide was found to be similar as claimed by the manufacturer and obtaining no recovery of chlorpyrifos residue in treated onion samples. Thus the present findings suggest that if onion treated with chlorpyrifos with the recommended dose possesses no side effect on human health.

Keywords: Chlorpyrifos, GC-MSD/SIM, HPLC, Onion, Quetta, Residues.

O-63/ICAZ-2021

Assessment of placental hypoxia and antiangiogenic factor in susceptibility to preeclampsia and its effect on histopathology of amniotic membrane.

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Abstract

Preeclampsia (PE) is described as pregnancy associated multisystem disorder, characterized by new onset of hypertension and proteinuria diagnosed after 20th week of gestation. PE is responsible for large number of maternal and fetal mortalities worldwide. The current study described the demographic, clinical, biochemical, histological and hormonal data analysis of PE Pakistani women. The study recruited 200 pregnant females (PE=100, Control=100) from which medical history and tissue samples were gathered after obtaining their informed consent. Blood, urine, placenta and amniotic fetal membrane samples were collected for measuring soluble Endoglin (sEng) levels, protein concentrations, oxidants/antioxidants levels and histological alterations. The results showed a significant urine proteinuria content ($p < 0.001$) in PE group. Significant elevations in reactive oxygen species ($p < 0.001$) and thiobarbituric acid ($p < 0.001$), whereas remarkable decrease in catalase ($p < 0.05$) and superoxide dismutase ($p < 0.05$) levels were evident in placental tissue. The histological sections of amniotic fetal membrane in PE women displayed complex decidual vasculopathy. Significant elevations were seen in plasma ($p < 0.05$) and placental sEng levels ($p < 0.01$) in PE subjects than control. The present study concluded that that abnormal trophoblast invasion, impaired spiral artery remodeling, placental hypoxia and imbalance of angiogenic factors are major contributors in pathogenesis of PE.



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O-65/ICAZ-2021

Ecological impact of benzophenone type UV filter on the catalase and peroxidase activity in the Grass carp (Ctenopharyngodon idella)

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Abstract

Benzophenone (BP) is a class of organic chemical UV filter that is used to protect the skin from the harmful effects of UV rays. Benzophenone is an emergent pollutant of concern in aquatic ecosystem due to its widespread use in the pharmaceutical and cosmetics industries. The research work was planned to study the changes in antioxidant enzyme activity after the acute exposure of Benzophenone-2 in different organs of Grass carp (*Ctenopharyngodon idella*). Fish were exposed to sub lethal concentrations (1/7th LC50, 1/5th LC50 and 1/2nd LC50) of BP-2 for 4-days. The mean calculated LC50 of BP-2 was estimated as 5.193±0.808 mgL⁻¹ for Grass carp. Different physiochemical parameters were recorded and temperature and pH were maintained during the trial period. Fish were dissected after the acute exposure and the gills, liver, kidney, muscles and heart were isolated to measure catalase and peroxidase activities. In exposed fish, concentrations catalase and peroxidase activity increased in the following order: 96hours>72hours>48hours>24hours. The over all pattern of catalase and peroxidase activity in all sampled organs of fish followed the order: liver<gill<kidney<muscles<heart. Highly significant difference (P<0.01) between catalase and peroxidase activities of control and treated group were observed.

Keywords: Catalase; Peroxidase; BP-2; Acute; Fish, UV filters.

O-66/ICAZ-2021

Histopathological Effects of *Lactuca Serriola* on Vaccine Stimulated Immunity against Newcastle Disease Virus in Chicken

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Abstract

Poultry industry has been facing many socio-economic crises due to viral poultry diseases with every passing year like Newcastle disease (ND). ND, caused by Newcastle Disease Virus (NDV), is a serious threat to the global poultry industry due to its high mortality rate. Most of medicinal plants have been used for treatment of bacterial, fungal, and viral diseases. For this purpose a study was established to check efficacy of herbal plant extract against NDV. One-day old chicks were acclimatized for 1 week. At the 8th day, chicks were vaccinated with Lasota strain. Two days after vaccination, chicks were treated with 50 and 100mg/kg body weight of methanolic extract of *L. serriola* in drinking water for 4 successive days. At the 14th day, the challenge strain of NDV was given to all groups expect negative control. Tissue samples were collected from trachea, lungs and cecal tonsils of the experimentally infected chicks. Results revealed that herbal extract has no adverse effect on growth e.g., body weight, and feed conversion ratio (FCR) as well as histopathological parameters (histopathological lesion in trachea, lungs, and cecal tonsils) in birds. Results revealed that using extract of *L. serriola* for NDV in poultry has the potential to significantly reduce the clinical and subsequent histopathologic aspects associated with the disease. Whereas the pathologic lesion scores in birds infected with NDV groups without plant extract had statistically higher significant ($p < 0.05$) values as compared to group given with plant extract. It may conclude that using extract



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of *L. Serriola* for NDV in poultry has the potential to significantly reduce the clinical and subsequent histopathologic aspects associated with the disease, hence decreasing the economic losses associated with it.

Keywords: Newcastle disease virus, *Lactuca serriola*, Histopathology

O-67/ICAZ-2021

Alloxan and streptozotocin pretreatment down regulates insulin gene transcription in beta cells and up regulate antioxidant response element pathway in hepatocytes in rats.

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Abstract

Alloxan and streptozotocin are the two main diabetogenic agents used to generate type1 and type2 diabetic rodent models. These agents cause beta cell specific chemical toxicity and results in beta cell apoptosis in islets of langerhans. Present study assessed the impact of a single individual dose of these chemicals on the regulation of insulin gene in the context of insulin gene regulatory transcription factors (Pdx1, MafA, NEUROD, Pax6). Secondary objective was to assess the hepatic redox homeostatic and antioxidant response element pathway in the context of transcription factors (Nrf2, NF-kB, FoxO1, FoxA2). 36 Adult rats (Wt \geq 200g) were divided into two equal groups (n=18). Each group was pretreated with single dose of Alloxan and Streptozotocin. Glucose levels were monitored. Animals (n=2) were sacrificed from both groups on 0, 1, 3, 5, 7, 9, 11, 13, 15th day of pretreatments. Pancreas and liver tissue were collected in RNAlater for expression analysis and 4% formalin for histological evaluation. Rt-PCR was performed for selected genes. Results reveals an significant down regulation of Ins1, Ins2, Pdx1, MafA, Pax6 in pancreas and up regulation of Nrf2, NF-kB, FoxO1, FoxA2 in the liver on day 0, 1, 3, 5, 7. From 9th day onwards the non significant up or down regulation was observed.

O-68/ICAZ-2021

Locally Characterized Recombinant Enzymatic Mixture: A Step for Uplift of Poultry Feed Industry of Pakistan

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Abstract

Poultry sector is one of the major established industry of Pakistan that is committed to provide valuable meat to our community. Phytases, cellulases and xylanases are major enzymes being added in the poultry feed. The supplementation of poultry feed with these enzymes put positive impact on the growth of poultry bird. In the absence of these enzymes phytate, cellulose and xylan are not being digested by the poultry bird and these components of feed simply pass through the digestive track and are removed from the body with manure and contribute in environmental pollution. Recombinant DNA Technology is a good tool for the production of industrially important enzymes. In the current study the phytase, cellulase and xylanase genes from hyper-thermophilic bacterium were amplified by PCR, cloned in pTZ57R/T and recombinant vectors were utilized for the transformation of E. coli DH5 α cells. The expression of phytase, cellulase and xylanase genes were analyzed in E.coli BL21 cells using pET-21a as expression vector. Purified recombinant proteins were characterized and their impact was examined on growth of poultry birds. The supplementation of poultry feed with locally characterized



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enzymes showed significant growth enhancing effect on poultry birds and improved the feed uptake and feed conversion ratio.

O-69/ICAZ-2021

A Cross-sectional study on the nutritional status of school going children from urban and rural populations of Pakistan

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Abstract

Malnutrition affects number of school children influencing their health, growth, development and academic performance in Pakistan. The tenet of the current cohort study was to assess the nutritional biomarkers of school going children of age 12-15 years resulting in stunting, underweight, overweight, bone deformities and other health disparities in nutritionally deprived urban and rural populations of Pakistan. A sample size comprising of 180 school going children was stipulated from the targeted urban and rural populations. The experimental subjects were evaluated by hematological assessment through laboratory standard procedures. The outcomes of investigation unveiled that both rural and urban populations were experiencing nutritional challenges however; on account of awareness paucity the rustic population was nutritionally more compromised. Hematological tests elucidated 16.7% and 7.8% cases for high glucose level, 35.6% and 27.8% cases for low hemoglobin levels, 87.8% and 97.8% cases for normal erythrocyte sedimentation rate (ESR), 14.4% and 15.6% cases for low calcium indices, 12.2% and 4.4% high white blood cell count (WBC), 20% and 14.4% low red blood cell count, 71.1% and 72.2% normal mean corpuscular volume (MCV), 76.7% and 74.4% low hematocrit (HCT) values, 68.9% and 75.6% mean corpuscular hemoglobin concentration (MCHC) among the rural and urban populations respectively.

O-70/ICAZ-2021

Predatory mite of the genus *Storchia* (*Storchia pennisetumus*) (Stigmaeidae: Prostigmata: Acari) from Pakistan

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Abstract

The study was led to find the predatory fauna of family Stigmaeidae (Acari) from Punjab, Pakistan. The holotype adult female (immatures & male unknown) of genus *Storchia* (*Storchia pennisetumus*) was collected from urban cultivated area of city Layyah (Chock azam) from millet plantation (*Pennisetum americanum*) and described here. Nineteen (19) paratypes were collected, among which 7 with the same collection data and 12 from another locality from cotton crop *Gossypium hirsutum*. The description, figures, measurements and discussion is given. The collected samples were placed in Mite Research Laboratory, Department of Entomology, University of Agriculture, Faisalabad, Pakistan.

Keywords: *Storchia*, new species, Raphignathoidea. predatory mite, Stigmaeidae



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O-71/ICAZ-2021

Mutations in Slc34a1 Gene Cause Nephrolithiasis

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Abstract

Nephrolithiasis (NH) is an increasing urological disorder of human health that affects about 12% of the world population. NH is a serious illness that causes severe renal colic, urinary tract infection and even kidney failure may occur. Kidney Stone are formed by an interaction between genetics and environmental exposure. We have recruited patients clinically diagnosed with kidney stone disease from 20 different families. Autozygosity mapping showed that affected individuals are homozygous for the SLC34A1 gene region. Subsequent mutation screening revealed a homozygous mutations in SLC34A1 gene; a deletion in c.756del, p.(Arg251Glyfs) in 6 families. Homology analysis and phylogenetic analysis was performed with the help of Clustal W and OMEGA 6 software. Our study concluded that Pakistani population has specific causative variants of SLC34A1 gene leading to Nephrolithiasis. Furthermore, our findings increase the mutational spectrum in SLC34A1 gene associated with Nephrolithiasis of diagnostic and prognostic importance.

Keywords: Nephrolithiasis, Solute Carrier Family 34 member 1, Genetic disorders

O-73/ICAZ-2021

Comparative Study on the Effect of plants dietary protein and fats on the feed utilization, growth performance and body composition of *Labeo Rohita*

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Abstract

Aquaculture is considered an essential source of animal diet and presents approximately twelve percent of the total human food consumption. *Labeo rohita* is a major contributor of animal protein because of its high nutrient content and most important in carp's culture. The present study was conducted to examine the effect of plant dietary proteins and fats at different levels to check the growth performance and hematology of *Labeo rohita*. Four experimental diets were prepared with different levels of plant dietary protein and fats viz. 0%, 4%, 6% and 8%. 15 fingerlings were stocked in experimental tanks and fish was fed once a day. Water quality parameters (DO, temperature and pH) were monitored throughout the whole trial period. Highest value of increase in weight (g) gain was noted in T3 12.91 (g) as compared to T2 that is 9.63(g), T4 7.05 (g), T1 7.03(g) and other treatments respectively. Greatest values of FCR was found in T1 (3.02) as compared to T2 (2.51), T4 (2.26) and other treatments. Gain in fork length was observed in different treatments. The best length gain was observed in T3 (2.13) as compared to T2 (1.81), T4 (1.27) and T1 (1.05). Greatest value of gain in total length was observed in treatment T3 (3.12). Higher number of red blood cells were found in T3 2.91 ($\times 10^6/\mu/l$). Extreme hemoglobin contents 11.81 (g/dl) present in treatment T3 and maximum number of white blood cells present in 4.82 ($\times 10^3 \mu/l$) were observed in treatment 2. Statistical data was analyzed by comparison of ANOVA (analysis of variance) using like completely randomized design.



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O-74/ICAZ-2021

Molecular Characterization of avian species of Punjab province using mitochondrial gene

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Abstract

Birds are significant component of an ecosystem and play an integral role in maintenance of an ecosystem. Pakistan is bestowed by diversified range of avian species. Among avian pool of Pakistani passerine, Pigeons and parrots are most striking feature with remarkable significant usage. They are the true picture of beauty and richness of life on earth. They also have economical importance. Traditionally they have been characterized only on the basis of phenotypic and anatomical features. But all these physical approaches are crude as affected by environmental factors as well. Present project has been designed to characterize the avian species of Pakistan more authentically on the basis of mitochondrial genes to know more about the evolutionary relationship among local and with the avian fauna of neighbor's countries. Mitochondrial Cytb and ND2 genes were partially amplified and sequenced of total of 50 birds pigeons n=25 and parrots n=25. Unique polymorphic sites were found in their haplotypes which could be used as molecular markers for their authentic identifications.

O-75/ICAZ-2021

Environmental pollution and its nature-based solution for sustainable habitat of living organisms

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Abstract

Quality of life is depending on quality of natural environment. As it provides favorable situations for existence and growth of living organisms. All organisms are affected in/directly by environmental pollution. It is due to rapid increase in human population. Environmental pollution especially by anthropogenic (man-made) activities is main issue in front of the globe today and it require increasing awareness that clean and green environment is essential for good health of all living organisms. Environmental pollution is causing great threat to plants, animals and humen. Even from religious point of view it is our duty to keep the country clean and green as cleanness is part of our faith. As each problem has solution, because problem is always man made, so man needs to find the solution. In recent innovations there is a need to develop green spaces around and within polluted areas for existence of better environment. Plants are called lungs of the universe, without which life is not possible. So, "green revolution (plantation) is the best (nature-based) solution to arrest the environmental pollution". If haphazard population growth goes on without realizing the importance of trees then there will be more destructive changes for living organisms in near future

Key words: Anthropogenic activities; Environmental pollution; Green revolution; Natural balance; Sustainability.



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O-76/ICAZ-2021

Pharmacological Evaluation of Zinc dithiocarbamate derivative via Bio-assays

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Abstract

Organometallic complexes have emerged as vital tool in drug discovery which are currently being used as therapeutic compounds to treat several human ailments. Zinc dithiocarbamate and its derivatives have proven to be potential candidates in this context. This study aimed to evaluate pharmacological properties of a novel Zinc dithiocarbamate derivative. Cytotoxicity of the test compound was checked by Brine Shrimp Assay. In vitro antioxidant potential was determined by TRP, TAC and DPPH free radical scavenging assays. In vitro anti-microbial activity was assessed by disc diffusion method. Analgesic, anticoagulant and antidepressant potential was assessed by in vivo administration of test compound against their respective controls in *Mus musculus* model. After experimentation of test compound at multiple concentrations significant antioxidant potential was observed as compared to controls. However it did not exhibit antibacterial activity. Significant analgesic activity was displayed at concentration of 1mg/ml in mice model which progressively increases with the passage of time. Maximum anticoagulant was observed at concentration of 1mg/ml of the test compound respectively after a period of 3 hours of administration. However, the test compound induced depression like effect in mice. Therefore, it may be concluded that the test compound is a pharmacologically important synthetic drug with potent anti-oxidant, analgesic and anticoagulant properties.

O-77/ICAZ-2021

Evaluation of Pharmacological Potential of Synthetic Ferrocene Incorporated Thiourea via Invitro and In vivo Assays

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Abstract

Over the last few decades, advancements in synthetic chemistry have revolutionized the pharmaceutical industry across the world. Patients' health has been greatly improved because of innovation in synthetic chemistry allowing discovery of the novel medicines. This study investigated the biochemical properties of a novel Ferrocene incorporated Thiourea complex, an organometallic compound, via in-vitro as well as in-vivo analysis. For this purpose, total reducing power assay, total antioxidant capacity assay and DPPH assay were performed to inspect their antioxidant potentials. Brine Shrimp Assay was performed to assess the cytotoxic potential of the complex. Antimicrobial property was examined by using Agar Disc diffusion method against *Staphylococcus Aureus*. To examine analgesic, anticoagulant, and anti-depressant effects of the complex compound under controlled conditions, *Mus Musculus* mouse model was used. Results showed that the complex exhibited significant antioxidant and reduction potential at 1mg/mL concentration with $p < 0.05$. Complex exhibited DPPH scavenging potential in a dose-dependent manner. Ferrocene-incorporated Thiourea showed less cytotoxicity towards normal cells at lower concentration 0.5mg/mL ($p < 0.05$). In-vivo bioassays exhibited excellent analgesic, antidepressant and anticoagulant



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activities as compared to the controls. In conclusion, Ferrocene- incorporated Thiourea is a promising compound to be used as a potential drug in various diseases.

O-78/ICAZ-2021

Contamination profile of Aflatoxin M1 residues in milk supply chain of District Bannu, Pakistan

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Abstract

Aflatoxin M1 (AFM1) is a strong carcinogenic, teratogenic and mutagen found in the milk when lactating animals consume feed contaminated with aflatoxin B1 (AFB1). In the present study, the contamination of AFM1 was evaluated in the milk supply chain of the district Bannu, KPK, Pakistan. For the broader profiling of targeted toxin, enzyme-linked immunosorbent assay (ELISA) was used for the determination of AFM1 in non-branded milk samples. The results showed that 90.3% of samples (91 out of 94) were contaminated with AFM1 in the range of 0.01– 0.86 µg/L. The average contamination level was 0.46 µg/L. The determined values of AFM1 in the collected milk samples were above the standard limit of the European Commission while 70% of the samples exceeded levels established by United States regulations. According to these results, the estimated daily intake of AFM1 for adults was determined as 3.2 ng/kg of body weight per day. Henceforth, this study provides a strong basis for food and health regulation authorities of Pakistan to take firm steps for constant monitoring and regulating of such toxins in milk.

Key words: Aflatoxin, teratogenic, AFB1, ELISA, European commission, KPK, Bannu.

O-79/ICAZ-2021

Molecular Detection of Antibiotic Resistant Bacteria Isolated from Goldfish (*Carassius auratus*)

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Abstract

Goldfish (*Carassius auratus*) is common ornamental fish. During transportation, *C. auratus* are highly vulnerable to bacterial infections. To avoid infections, fish are treated with antibiotics which can develop antibiotic resistance in the normal bacterial flora. Therefore, the current study aimed to isolate and identified the drug resistant bacteria from *C. auratus*. A total 20 samples were collected from local ornamental fish market and isolate the bacteria from skin, gills and intestine through serial dilution method. Five different bacterial species *Bacillus* spp, *Salmonella* spp, *Staphylococcus* spp, *E. coli* spp and *Pseudomonas* spp were isolated and identified on the basis of biochemical test and sequencing of 16SRNA gene using universal bacterial primer. Antibiotic sensitivity of the identified bacteria was checked against the selected antibiotics. All the isolates were resistant against Kanamycin, Ciprofloxacin, Cefixime, Ampicillin, Azithromycin and Erythromycin. The use of novel and improved drugs are



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recommended to prevent the drug resistance in bacterial flora of *C. auratus* in order to control bacterial infections during transportation. Therefore, the present study will be helpful in efforts of formulating the antibiotic treatment policies to control bacterial diseases associated with fish.

Key words: *C. auratus*, Drug resistant Bacteria, Isolates, Antibiotics.

O-80/ICAZ-2021

Assessment of College Student's Mental Health during Covid-19 Pandemic: A Cross-Sectional Study in Pakistan

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Abstract

Our goal was to assess the student's mental health during COVID-19 by interpreting the prevalence of depression, anxiety and stress. A cross sectional survey was conducted among college students of Pakistan using a self-administered questionnaire in March 2021. Multivariate logistic regression modeling was used to identify the factors related with depression, anxiety and stress among college students during COVID-19 pandemic. A p-value of less than 0.05 was considered statistically significant. Among all students, moderate level of depression (28.6%), anxiety (30.3%) and stress (83.8%) was present in most of the students. Statistically significant variations were observed in student depression with respect to gender ($p=0.006$) and different age groups i.e. under 23 and 23-26 ($p<0.001$) and 26-30 years ($p=0.003$). Likewise, significant variations were found in students' anxiety levels in relation to different age groups ($p<0.001$). College students with a person over the age of 50 years residing in their household also have significant effect ($p=0.003$) on anxiety and depression. Stress was the major factor leading to depression ($p=0.012$) and anxiety ($p<0.001$). Anxiety also lead to depression in students ($p<0.001$). Moderate to severe levels of depression and anxiety were found to be caused in the college students due to increased stress.

O-81/ICAZ-2021

Screening of Four Indigenous Plants for their Synergistic Antibacterial Activity and Anti-cancerous Effect

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Abstract

The inappropriate and uncontrolled use of antibiotics has led to the rise of drug resistance in different pathogens. Pakistan and other less developed countries serve as a hotspot for such pathogens. The emergence of resistant strains, risk of transmission (both regional and global) as well as high cost of available treatment, implores the need for new modes of treatment. Cancer is a leading cause of mortality worldwide. The year 2020 witnessed an estimated 19.3 million new cancer cases and 10 million deaths due to cancer worldwide. Roughly 70% of cancer-



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related deaths befall in the low and middle-income nations. In the present study, four indigenous plants *Beaucarnea recurvata* (ponytail palm), *Chaemadorea cataractarum* (cat palm), *Carissa spectabilis* (wintersweet) and *Calliandra harrisii* (powderpuff plant) were accessed for their potential anti-cancer and synergistic antibacterial effect. Methanolic extracts of these plants were checked for synergism against isolates of *Staphylococcus aureus* and *Salmonella typhi* through well diffusion assay. Cytotoxicity of the plant extracts was determined through MTT assay against HepG2 and HeLa cell lines. Two plants, *C. spectabilis* and *C. harrisii* showed significant cytotoxicity against HepG2 cell line. While three plants *C. spectabilis*, *C. harrisii* and *C. cataractarum* showed significant cytotoxicity against HeLa cell lines. Furthermore, previously reported phytochemicals of *C. spectabilis* were docked against BCL-2 (an anti-apoptotic protein). Out of twenty six compounds only one compound, beta-D-Glucopyranose, TMS, was identified as a potential phytochemical with strong binding capability and acceptable drug-like properties. Hence, the potentially cytotoxic plants may be used to develop safe, efficient and economical antibacterial medicines, food preservatives and anticancer drugs against HCC and cervical cancer after further research.

Keywords: Phytochemicals, *Staphylococcus aureus*, *Salmonella typhi*, anti-cancer, HepG2, HeLa, BCL-2.

O-82/ICAZ-2021

Study of *Moringa Oleifera* Seed Extracts to Elaborate Its Antioxidant and Antibacterial Activity

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Abstract

Moringa oleifera is a miracle tree due to its impressive nutritional benefits. Traditionally, *M. oleifera* seeds are used as herbal medicines against various diseases due to the potent aphrodisiac, antihyperglycemic, antiulcer, anticancer and anti-inflammatory properties. The seeds are highly abundant in polyphenols but the abundance may vary according to growing season and varieties. This study was aimed to explore the pharmacological benefits of two indigenously produced varieties of *M. oleifera* seeds. Free radicals scavenging activity of solvent extracts of both varieties were evaluated by using the 2,2-diphenyl-1-picryl hydrazyl radical scavenging assay. Free radicals were scavenged due to phenolics and flavonoids found in these extracts as confirmed by Total Phenolics Content and Total Flavonoids Content. Further work was focused on phytochemical analysis using High Performance Liquid Chromatography (HPLC) and Fourier Transform Infrared (FTIR) spectroscopy. Moreover, *M. oleifera* seeds extracts were used for their antibacterial activity against different bacteria i.e. *Escherichia coli*, *Bacillus subtilis*, *Klebsiella pneumoniae* and *Staphylococcus aureus*. All extracts inhibited growth of bacteria to varying degrees which support its promising nature for its conventional use in treatment of different bacterial infections and as a source of natural antioxidants.

O-83/ICAZ-2021

Preparation, Pharmacokinetics, and Antitumor Potential of Miltefosine-Loaded Nanostructured Lipid Carriers

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Abstract:

Background: The purpose of this study was to investigate the suitability of nanostructured lipid carriers (NLCs) loaded with Miltefosine (HePC) as an anticancer drug for the treatment of breast cancer. **Methods:** HePC-NLCs



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were prepared using a microemulsion technique and then evaluated for particle size, polydispersity index (PDI), incorporation efficiency, in vitro release of entrapped drug, and hemolytic potential. Advanced analyses including survival rate, immunohistopathology, and (TUNEL) assays were performed to evaluate apoptosis in vivo. Results: The average particle size of the HePC-NLCs was 143 ± 16 nm, with a narrow PDI (0.104 ± 0.002), and the incorporation efficiency was found to be $91 \pm 7\%$. The NLCs released HePC in a sustained manner, and this release was significantly lower than that of free drug. The in vitro hemolytic assay demonstrated a significantly reduced hemolytic potential (~9%) of the NLCs compared to that of the test formulations. Furthermore, the HePC-NLCs exhibited higher cytotoxicity than the free drug in MCF-7 and SCC-7 cells. Moreover, the HePC-NLCs showed significantly enhanced ($P < 0.005$) antitumor activity compared to that of the control and free drug-treated mouse groups. Conclusion: These findings demonstrate the ability of NLCs as a drug delivery system for enhanced pharmacokinetic, antitumor, and apoptotic effects, most importantly when loaded with HePC.

Keywords: breast cancer, Miltefosine, nano lipid carriers, bioavailability, pharmacokinetics, antitumor efficacy

O-85/ICAZ-2021

Patterns of essential/toxic metals distribution in the hair of esophagus cancer patients in comparison with healthy donors

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Abstract

Esophageal cancer is the seventh most common cancer globally. Although several epidemiological studies have investigated the association between exposure to metals and the risk of esophageal cancer, the results are inconsistent. This study aimed to make a comprehensive evaluation regarding the association between essential and toxic metals and risk of esophageal cancer. We measured the concentrations of selected essential/toxic metals (Cr, Pb, K, Mg, Co, Fe, Cd, Zn, Se, Ni and Cu) in the scalp hairs of newly diagnosed esophagus carcinoma patients in comparison with counterpart controls by atomic absorption spectrometry after wet-acid digestion method. Body mass index (BMI) of each study participant and serum carcinoembryonic antigen (CEA) of the esophagus cancer patients was determined using immunoradiometric method as well. Average Pb, Cr, Co, Cd, and Ni levels were significantly higher in the scalp hair of esophagus cancer patients compared to the controls while the average Zn, Se, Cu and Fe concentrations were higher in healthy donors. The correlation coefficients between the essential and toxic metals in the carcinoma patients demonstrated significantly dissimilar communal relationships compared with the healthy subjects. Multivariate methods revealed noticeably dissimilar apportionment among the elements in the patients than the healthy counterparts. Significant disparities in the elemental levels were also noticed for various types (adenocarcinoma and squamous cell carcinoma) as well as stages (stage-I, stage-II, stage-III, and stage-IV) among the esophagus cancer patients. For instance, Cr, Ni, Zn and Cd contents were highest in adenocarcinoma and Pb, Co, Fe, Se & Pb levels were maximum in squamous cell carcinoma of esophagus cancer patients, respectively. Similarly Ni, Cr & Pb exhibited highest levels at stage-I and Cd, K & Mg depicted maximum concentrations at stage-IV in esophagus cancer patients. Majority of the metals revealed perceptible disparities in their levels based on gender, habitat, dietary, and smoking habits of the malignant patients and healthy subjects. Multivariate analysis of the metal data manifested significantly divergent apportionment of the toxic/essential metals in the scalp hair of the



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carcinoma patients when compared to the healthy persons. Overall, the study noticed significantly divergent distribution and associations of the essential/toxic metals levels in the scalp hair of the patients in comparison with the contents in healthy donors.

Keywords : Hair; Metals; Esophagus cancer; Statistical analysis; Types/Stages; Pakistan

O-86/ICAZ-2021

Phytochemical screening and characterization of *Moringa oleifera* Lam leaves extracts and their therapeutic potential against Streptozotocin-induced diabetic rats

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Abstract

All parts of the *Moringa oleifera* Lam plant is traditionally have been used as medicine to cure and manage several. The aim of present study was to investigate the antidiabetic activity, total antioxidant capacity and phytochemical screening of the *Moringa oleifera* leaves extracts on streptozotocin-induced diabetic rats. The rats were made diabetic after peritoneal injection of streptozotocin after their acute toxicity test. The fasting mean blood glucose level was determined before and after treatment in normal control, diabetic control and diabetic treated rats with both aqueous and ethanol extracts. To predict the insulin resistance in rats their insulin and glucose levels were also determined. The dose level to 5 g/kg of body weight for both extract was not found to be lethal indicating that LD50 values are higher than this dose. Aqueous extracts of *M. Oleifera* with 250 mg/kg and 500 mg/kg body weight decreased elevated blood glucose levels by $29.45 \pm 27\%$ and $41.56 \pm 0.67\%$ respectively whereas ethanol extract decreased the level upto $25.83 \pm 2.31\%$ and $27.39 \pm 1.93\%$ with 250 mg/kg and 500 mg/kg body weight, respectively. While the treatment with 10 mg/kg body weight of Glibenclamide the standard antidiabetic drug decreased the blood glucose level to 54.77%. Phytochemical screening of both extracts indicated the presence of flavonoids, steroids, tannins, saponins and phenolic compounds while anthraquinones and alkaloid found to be absent in both extracts. Presence of the phytochemical components may play a role to control the diabetic level. In conclusion maximum reduction in blood glucose level was showed by the aqueous extract with 500 mg/kg of body weight. Reduction in the blood glucose level of *M. Oleifera* leaves extract considered to be due the presence of flavonoids.

Keywords: *Moringa oleifera*, Antidiabetic activity, Antioxidant activity, phytochemical screening, rats

O-89/ICAZ-2021

Study of shelf life of honey produced by *Apis mellifera* collected from South Punjab Pakistan

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Abstract

The aim of this study was to investigate the shelf life of Pakistani honey produced by *Apis mellifera* from South Punjab. A total of 50 honey samples were collected directly from honey bee keepers and analyzed for their



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physicochemical characteristics for one year. Data was collected after every four months during one year storage. The initial values of Physiochemical parameters such as pH, Free acidity, Electrical conductivity, Diastase Number, Invertase Number, HMF and Proline contents, Fructose, Glucose and Sucrose were 3.69 ± 0.60 , 21.54 ± 5.42 meq/Kg, 0.13 ± 0.03 ms/cm, 19.19 ± 2.68 (DN), 27.70 ± 5.53 (IN), 14.85 ± 4.37 mg/kg, 469.82 ± 84.85 mg/kg, 38.88 ± 1.71 g/100g, 35.51 ± 1.71 g/100g and 2.28 ± 0.46 g/100g respectively. After 12th months increase in Ph (5.51 ± 0.50), free acidity (40.80 ± 5.24 meq/kg), EC (0.27 ± 0.04 ms/cm), HMF (43.62 ± 3.96 mg/kg) and Sucrose ($4.36 \pm 1.29\%$) was recorded. Whereas Diastase Number 19.19 ± 5.23 (DN), Invertase number 27.70 ± 4.9 (IN), Proline content 148.30 ± 37.33 mg/kg, Fructose $26.62 \pm 5.47\%$ and Glucose values $21.44 \pm 3.33\%$ reduced. Results indicated that the change in honey composition during one year storage yet most of its quality parameters remain within international honey standard and fit for use.

Keywords: Moisture, Acidity, Ash, HMF, Proline, Diastase, Invertase, South Punjab

O-90/ICAZ-2021

Exploration of Antimicrobial, Antioxidant and Anti-Hepatic Cancer (Hep2 Cells) Potential of Green Extraction Technology-Based Pomegranate Peel Extract

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Abstract:

Pomegranate belongs to family "Punicaceae". A number of studies have reported biological activities of fruit but a very little data is available on peels. In present study, green extraction method was preferred to investigate antimicrobial, antioxidant and anti-hepatic cancer potential of pomegranate peels. Peels extract was prepared through green extraction method (PPGE) and Soxhlet extraction method (PPE). Antimicrobial activity on 7 bacterial and 3 fungal strains was measured through well diffusion method. DPPH scavenging assay was performed to determine antioxidant potential. MTT assay was used to check cytotoxic effect. This study demonstrated presence of Tannins, steroids, alkaloids, saponins and flavonoid. PPGE was the most potent against *Escherichia coli* (20mm) and *Aspergillus niger* and *Fusarium avenacium* (30.1667mm). It's least susceptible against *Aeromonas hydrophila* (14mm) and *fusarium brachygibossum* (25.100mm). PPE was more significant against *Escherichia coli* (19.030mm) and *Aspergillus niger* (28.167mm) and least potent against *Pseudomonas aeruginosa* (12mm) and *fusarium brachygibossum* (18.37mm). PPGE possessed higher radical scavenging ability with IC₅₀ 23.619 µg/ml than PPE. Peels are not potent against HepG2 cell line with IC₅₀ 120.285 µg/ml and 140.056 µg/ml of PPGE and PPE respectively. Overall results suggested the use of green extraction method, pomegranate peels as novel natural drug against pathogenic diseases and could be used as natural antioxidant.

O-91/ICAZ-2021

Potential of Chitinolytic Bacteria for Biological Control of Citrus Fruit Deteriorating Fungi

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Oral Presentations

Abstract

Citrus fruits are among top crops in international trade. Postharvest losses due to fungus have been reached up to 90% of fruit production. Organic chemicals are mostly used. They are effective but these chemicals have a greater risk of developing resistance in pathogens. Microbes have shown considerable promise in minimizing the use of common fungicides as biocontrol agents. Chitinases have drawn interest because of relevance as biocontrol agents. Study was performed to screen chitinolytic bacteria to determine their chitinolytic activity in degrading the chitin content of fungal walls. Six fungal isolates and twenty-one chitinolytic bacteria were isolated. Isolates showing highest hydrolytic zones were employed for antifungal activity by antagonistic effect. Isolate which shows maximum antifungal potential was identified by 16S rRNA gene-sequencing. Bacterial candidate identified in this study *Bacillus licheniformis*, showed high antifungal activity against *Aspergillus versicolor*. Extracellular protein yield and chitinase production in specific medium by isolates was 3.523 mg/ml and 116.76 U/ml respectively. Results showed highest chitinase activities at pH 8.5, temperature 50 °C and 4% chitin-concentration as maximum chitinase activity observed was 398.63 U/ml, 182.20 U/ml and 238.92 U/ml respectively. It was observed that citrus fruit treated with chitinases have potential to protect them from fungal deterioration.

O-92/ICAZ-2021

Hyperlipidemia associated with Hypertension and Risk of Coronary Heart Disease: A Case Control Study

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Abstract

Hypercholesterolemia, one of the most important risk factors for coronary heart disease is total cholesterol concentration of ≥ 240 mg/dL. Hypertension has become a major health problem due to serious damage to the body organs and induces many complications like coronary heart disease. The present study aimed to evaluate the correlation between hypertension & hyperlipidemia and their association with heart disease. The study included 100 patients diagnosed as case of hypertension and hyperlipidemia and 100 healthy individuals with same age and background. A standardized questionnaire was used to collect family history of patients and control. Blood samples of 3 to 5ml were drawn from all patient to analyze composition of blood serum including LDL, HDL, triglyceride and cholesterol level. Frequencies of all factors were calculated and the mean values of blood pressure, cholesterol, LDL and HDL were found in hazardous range in patients. The data was evaluated using a chi-square test and binomial regression statistical analysis. Risk factors analysis revealed that age, BMI, high blood pressure smoking and high salt intake had significant association with the high lipid profile in the patients. The risk of cardiovascular disease is increased in case of patients of high blood pressure and hyperlipidemia.

O-93/ICAZ-2021

Cross-Talk of EPO and EGF Genes in Cinnamomum Verum treated Cigarette-Smoke-Induced Lung Pathophysiology Rat Model

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Oral Presentations

Abstract

Integrity of distal alveolar epithelium is crucial for lung regeneration following injury. Present study was aimed to evaluate the effect of Cinnamomum verum extract; cross-talk of epidermal growth factor (EGF) and erythropoietin (EPO) genes in a smoke-induced lung injury rat model. For experimentation (N=30) albino rats were divided equally into three groups i.e. negative control NC, positive control PC, and treatment group TG. Cigarette smoke was exposed to PC and TG (4 CG/day). Cinnamomum verum was given orally for 21 days. Decapitation (n=3) was done after each week. Analyses (hematology, biochemical, HPLC, histology and gene expression) were carried out and results were statistically analyzed by Two-way ANOVA. In PC, significant elevation was seen for hematological parameters i.e. erythrocytes, hemoglobin, hematocrit and leukocytes concentration. Oxidative stress parameters TOS and Malondialdehyde were raised with subsequent lowering of TAC. Total protein and albumin were significantly lowered in PC group. HPLC analysis showed the extract had high content of Quercetin and P-coumaric acid which was beneficial in ameliorating effects of smoke. In histological analysis alveolar septal thickening and structural derangement were prominent in PC. Upregulation of EGF and EPO genes were seen in PC suggestive of lung injury. Cinnamomum verum extract has cytoprotective and antioxidant activities.

O-96/ICAZ-2021

Multi-Parametric Detection of Non-Cell-Autonomous and Cell-Autonomous Deaths in Cancer Cells

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Abstract

Epithelial cells require attachment to extracellular matrix to suppress an apoptotic cell death. It is described as a nonapoptotic cell death program in matrix-detached cells that is initiated by a previously unrecognized and unusual process involving the invasion of one cell into another. This phenomena of cell in cell structures called entosis (non-cell autonomous cell death). Live internalized cells are either degraded by lysosomal enzymes or released and this mechanism is commonly observed as ‘cell-in-cell’ cytological feature in human cancers. Cell death modalities induced by anticancer-therapies have been extensively studied but entosis induced by anticancer treatments has never been investigated. We have analysed the lethal fates of cancer cell by Multispectral imaging flow-cytometry based technology in which we have treated the cells with different anticancer drugs and are co-cultured with untreated cells observing that anticancer agents can simultaneously trigger cell-autonomous and non-cell-autonomous death. After ionizing radiation, oxaliplatin or cisplatin treatment, fractions of treated cancer cell populations were eliminated through cell-autonomous death mechanisms, while other fractions of the treated cancer cells engulfed and killed neighboring cells through non-cell-autonomous processes including cellular cannibalism. These results reveal that chemotherapy and radiotherapy can induce both non-cell-autonomous and cell-autonomous death of cancer cells, highlighting the heterogeneity of cell death responses to anticancer treatments and the unsuspected potential contribution of non-cell-autonomous death to the global effects of anticancer treatment.



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O-97/ICAZ-2021

Methanolic extract of *Withania Somnifera* escalates functional restoration in mouse model of peripheral nerve injury

Faiqa Sajid¹, Azhar Rasul², Nayab¹, Nazish Naeem¹, Shamaila Zafar¹, Rabia Akram¹, Tehreem Iman¹, Ghulam Hussain¹*

Abstract

Methanolic extract of *Withania Somnifera* escalates functional restoration in mouse model of peripheral nerve injury. Peripheral nerve injury results in partial or complete compromised physical activity and despite the tremendous efforts, the complete retrieval is still a dream. Here, we investigate the therapeutic efficacy of *Withania somnifera* against peripheral nerve injury and functions restoration. For this purpose, healthy mice of five groups (n=4/group) in which the control group was fed on the normal diet and the experimental groups were given the extract of *Withania somnifera* roots (at dose of 100mg/Kg of body weight) mixed in their diet. The treatment continued from the nerve crush day until the end of the experiment. Various behavioral (grip strength, sciatic functional index, hotplate withdrawal latency) and biochemical (random blood glucose, Total Antioxidant Status, and Total Oxidant Status) parameters were performed to evaluate the functional recovery followed by the nerve insult. The results highlighted an accelerating tendency in the treated animals. Based on the findings, we could conclude that the respective plant can be a potential candidate for further evaluation to treat peripheral nerve injury after confirmatory studies.

O-98/ICAZ-2021

Clinical and molecular characterization of two Pakistani families with Bardet–Biedl syndrome

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Abstract:

Bardet-Biedl syndrome (BBS) is a rare developmental and highly heterogeneous ciliopathic disorder with severe and variable multisystem manifestations including rod-cone retinal dystrophy, polydactyly, renal anomalies, truncal obesity, mental retardation, and hypogonadism in males while genital abnormalities in females. BBS patients also show some secondary features including speech and developmental delay, congenital heart defects, teeth abnormalities, digestive problems and diabetes mellitus etc. Pathogenic variants in 26 BBS genes have been identified, leading to BBS, segregating an autosomal recessive mode inheritance. In this study we have identified two pathogenic splice site variants in BBS1 (c.1339+1G>A) and BBS7 (c.719+1G>T) in Pakistani families of Pashtun ethnicity by using the exome sequencing platform, followed by the parental co-segregation through Sanger sequencing. The online bioinformatics tools were used to access pathogenic potential of the identified variants. The affected individuals showed homozygous while the parents showed heterozygous genotypes. These variants were not found in the normal/control individuals. The present study is aimed to find out the genetic cause of the disease in these families and also to show the genotype–phenotype correlation.

Key words: Bardet-Biedl syndrome, Splice site variant, Exome sequencing, BBS1, BBS7



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O-99/ICAZ-2021

Exploring the rheological properties of arabinoxylans isolated from different cultivators of psyllium husk

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Abstract

The objective of current study was to observe the effect of psyllium husk arabinoxylans on end use quality of flour. For the purpose, arabinoxylans was isolated through enzymatic method from different varieties (PAK-1 and IND-2) of psyllium husk. In 1st phase, nutritional profile of psyllium husk was explored and arabinoxylans was isolated. In 2nd phase, the psyllium husk arabinoxylans was added into flour (T0, T1, T2, T3, and T4) to observe its effects on the rheological characteristics of flour. Results showed that total dietary fiber content of psyllium husk in the range of 49.56±0.34 to 52.56±0.14%. The arabinoxylans in psyllium husk varieties were 34.52±0.06 g/100g and 38.92±0.05g/100g in PAK-1 and IND-2 respectively. Moreover, incorporation (5%) of arabinoxylans significantly improved the rheological properties of wheat flour. The water absorption (68.04±0.23%), dough stability (4.68±0.06 min), peak height (67.02± 0.13BU), and mixing tolerance index (69.02±0.07%) were high in wheat flour with the addition of arabinoxylans followed by wheat and maize bran cell walls. Furthermore, dough development time (6.69±0.14min) was the highest in control sample and the lowest mixing time was observed in T2 (5.38±0.04min). Conclusively, arabinoxylans contained different bioactive moieties that have numerous positive effects on rheological and functional properties of wheat flour.

Keywords: Psyllium husk, Arabinoxylans, Nutritional profile, Rheological properties

O-100/ICAZ-2021

Sphaeranthus indicus and *Cinnamomum cassia* synergistically attenuate Bishphenol S-induced reproductive toxicity in animal model

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Abstract

Bisphenol S (BPS), an industrial compound recently used to replace potentially harmful Bisphenol A (BPA) in the production of polycarbonate plastics, epoxy resins, and therapeutic receipt paper. Until yet, the likely harmful effects of BPS have not been reported on reproductive disorders. Thirty rats were allocated into six groups. The normal control (C; untreated), vehicle control (VC; 1ml of olive oil treated), and positive control (B-G1; BPS; 60 mg/kg per BW). The individual supplemented groups were allocated as *S. indicus* treated group (B-SL-G2; *S. indicus* =400 mg/kg+ BPS=60 mg/kg) and *C. cassia* treated group BC-G3 (B-C-G3; *C. cassia*=225 mg/kg+ BPS=60mg/kg). The combined supplemented group included *S. indicus* and *C. cassia* supplemented group (B-SL-C-G4; *S. indicus* =400 mg/kg+ *C. cassia*=225 mg/kg+ BPS=60 mg/kg). The study focused on hormonal profile, blood biochemistry, and histological analysis. The results found that individual or combine supplementation of *S. indicu* and *C. cassia* helped to normalize the levels of TSH, LH, and FSH. Both extract supplementations were improved the levels of HB, RBCs, as well as their indices and WBCs. The histological analysis revealed restoration of histoarchitecture of testis after individual or combined supplementations of extracts than only BPS treated group. The



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study concluded that the supplementation of *S. indicus* and *C. cassia* significantly ($P < 0.05$) attenuated BPS- induced male reproductive disorders. However, the best results were observed at combine doses of *S. indicus* and *C. cassia* methanolic that expressed synergic activity against reproductive disorders.

O-103/ICAZ-2021

Acacia Angustissima Leaf Meal Use as Alternative Protein Source in Broiler Chick Feed)

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Abstract

Broiler is the cheap source of protein for human. However, high demand of broiler causing much pressure on poultry industry. This pressure is mostly due to feed requirement. This study is design to find the effect of Acacia angustissima leaves on growth performance, carcass weight and internal organ of broiler. Total 40 chickens are taken in this experiment. Three different treatments 5%, 10% and 15% feeds are given to broilers along with one control. Total 40 chicks were purchased and kept in 4 different groups. Every group contain 10 chickens. They were feed for 6 weeks and their live weight and feed consumption was recorded on every Friday at 8am for each bird. At the end of experiment after 6 weeks, 4 chickens from each treatment were slaughter and their carcass weight and internal organs weight were calculated. It is observed that 5% treatment give 1551 g average weight on 6th week however, 10% remains 1462.2g and 15% on 1452.8g. The control group could produce 1501.9g. The treatments for live weight, breast weight, hot carcass and drum stick remain significant ($p < 0.05$). The significant value for defeathered weight and thigh remained non-significant ($p > 0.05$). Weight of intestine, gizzard and liver remained significant ($p < 0.05$) and heart's weight ($p > 0.05$). On average the weight of each chicken remain 1551g per chicken and feed intake 1079g/week. It is observed from this experiment, 5% inclusion of Acacia angustissima is best for growth performance and feed intake.

O-104/ICAZ-2021

Evaluation of anti-proliferative potential of bioactive peptides in Breast Cancer

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Abstract

Breast cancer is a complex disorder caused by the progressive multiple gene mutations combined with epigenetic modifications of the cells. In this milieu, the present research was designed to explore the anti-proliferative potential of bioactive peptide based cytotoxins in DMBA induced breast cancer rat model. Purposely, the water soluble peptide (WSPs) fractions obtained after enzymatic hydrolysis of whey, casein and fish bone proteins were subjected to peptides characterization by reversed-phase high pressure liquid chromatography (RP-HPLC), amino acid quantification and in vitro assays (antioxidant) for bioactivities of interest. To carry out in vivo bio-efficacy trial female Wister rats were divided into 6 groups: G0 (Negative control), G1 (Doxorubicin receiving rats), G2 (Casein WSPs extract), G3 (Whey WSPs extract), G4 (Fish bones WSPs extract) and G5 (Mixed WSPs). The level of carcinoembryonic antigen (CEA) tumor biomarker was 2.05 ± 0.05 ng/mL in G1, 2.51 ± 0.10 ng/mL in G5 and 2.78 ± 0.08 in G4 respectively. The maximum decline of erythrocyte sedimentation rate (ESR) was observed in G1 (2.05 ± 0.82 mm/hour) followed by G5 (2.43 ± 0.05 mm/hour). The histopathological analysis of the mammary



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tissues indicated less lobules hyperplasia, neutrophils infiltration and moderate apoptosis in G1, G4 and G5. In conclusion, fish bones and mix WSPs possess therapeutic potential against breast cancer.

Keywords: Breast cancer, bioactive peptides, tumor biomarkers, histopathology

O-105/ICAZ-2021

Efficacy of Entomopathogenic Fungi, *Beauveria Bassiana* and *Trichoderma Longibrachiatum* against Cabbage Aphid (*Brevicoryne Brassicae*)

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Abstract

Cabbage is one of the edible vegetables used almost in every country. Many potential pests attack that damage crop production is known as cabbage aphid (*Brevicoryne brassicae*). It is an economically dangerous and damaging insect pest and different chemical methods are used to control this potentially damaging pest. Biopesticides as microbial control agents reduce the damaging effects of the chemicals. Therefore, a laboratory bioassay was conducted to evaluate the efficacy of two entomopathogenic fungi, *Beauveria bassiana* and *Trichoderma longibrachiatum*, against this notorious insect pest. In this experiment, three concentrations were made of each entomopathogenic fungus, i.e., 1x10⁶, 1x10⁷ and 1x10⁸cfu ml⁻¹ through serial dilution method. The detached leaf method was used for the application of spores on the sterilized cabbage leaves. Data were analyzed by using Probit analysis using Minitab. The LC₅₀ of *Beauveria bassiana* was calculated as 110.756, 109.955, 107.280, 106.330 and 105.806 ppm for 3rd, 4th, 5th, 6th and 7th day, respectively. Moreover, LC₅₀ of *T. longibrachiatum* was calculated as 110.584, 110.374, 107.607, 106.570 and 105.924 ppm for 3rd, 4th, 5th, 6th and 7th day, respectively. Aphid mortality rate increased by increasing dose rate and mortality also increased over time ($P < 0.05$). The results obtained from the bioassay of *Beauveria bassiana* and *Trichoderma longibrachiatum* showed that the mean mortality rate was higher at the highest concentration 1x10⁸cfu ml⁻¹ on day 7. It was concluded from the LC₅₀ that *B. bassiana* and *T. longibrachiatum* are equally effective against cabbage aphid under controlled conditions. From the results, it was also concluded that both EPF were effective in managing the cabbage aphid and can be used as alternate to chemicals due to their eco-friendly nature.

O-107/ICAZ-2021

Histopathological and biochemical study of effects of copper nanoparticles on *Labeo rohita*

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Abstract

The aim of this research was histopathological and biochemical study of effects of copper nanoparticles on *Labeo rohita*. Cu-NPs of 51 nm sized exposed to fresh-water (fish) *Labeo rohita* as water organism model. Fish were separated into four groups of fifteen fish in every group in glass aquaria. Group-1 acted as control (no-Cu-NPs) while other exposed to three different doses (5 mg, 10 mg and 15 mg/ L) of Cu-NPs for 28 days. Fish were



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sacrificed from each tank at 1-week interval. Organs were excised and processed for biochemical and histopathological evaluations. The results were analyzed by one way ANOVA followed by Dunnett test. Biochemical analysis showed toxicity in gills and muscles and induced dose/time dependent oxidative stress. Throughout the experimental period an increasing trend was observed in SOD activity at all doses in gills and muscles as compared to control. CAT activity decreased at low dose of all weeks while CAT activity increased at medium and high dose of all weeks in both gills and muscles. MDA activity decreased at low dose in gills while increased in muscles at low dose (week 2, 3 and 4). In contrast, decreased at medium and high dose throughout the experiment as compared to control. This study concluded, Cu-NPs induced dose-time dependent toxicity in gills and muscles of *Labeo rohita*.

Keywords: Biochemical, Histopathology, Cu-NPs, Toxicity, *Labeo rohita*

O-108/ICAZ-2021

Effect of different concentrations of water soluble astaxanthin on the anti-oxidant activity of Hep G2 cells.

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Abstract

Astaxanthin (3,3'-dihydroxy- β - β' -carotene-4,4'-dione) is a pigment, belonging to the carotenoids family. Recently, many health benefits have been reported, which may be related to its ability of acting as antioxidant as well as quenching the reactive oxygen species (ROS). The present study was performed to determine the effect of water soluble astaxanthin on the antioxidant enzyme system and reactive oxygen species production of Hep G2 cells. Hep G2 cells were cultured with different concentrations of astaxanthin (0, 1, 10, 100, 250, 500 and 1000 μ g/ml) for 24 hour. Cell viability was determined by using 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl-2H-tetrazolium bromide MTT assay. Intracellular catalase (CAT), Total superoxide dismutase (T-SOD), Malondialdehyde (MDA) and glutathione per oxidase (GSH-Px) activities were determined by using different assay kits according to the manufacturer's instructions. To determine the ROS, redox sensitive fluorescent 2, 7-dichlorofluorescein diacetate (DCFH-DA) probe was used. The results showed that the water soluble astaxanthin improved the antioxidant enzyme system of Hep G2 cells at the level of 500 μ g/ml. Furthermore, astaxanthin quenched the ROS in dose dependent manner, and found to be maximum at 1000 μ g/ml. However the study examined the antioxidant behavior of astaxanthin in cultured cells, and further studies are needed to implement it in human health.

O-111/ICAZ-2021

Bio-pesticidal efficiency of crude venom *Hottentotta tamulus* (Scorpiones: Buthidae) against *Brevicoryne brassicae* (Hemiptera: Aphididae)

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Abstract:

Pesticides that obtained by chemical methods are harmful for human health and environment. So that there is need to work about biological control of pests, which is eco-friendly to the environment. The given study was organized to check bio-pesticidal potential of different concentration of crude venom of *Hottentotta tamulus* (Scorpiones: Buthidae) against *Brevicoryne brassicae* (Hemiptera: Aphididae). Venom was obtained from scorpion by Electrical Stimulating Method. Venom was applied on target pest separately, with concentrations of 0.5ul, 1ul and 1.5ul. After 18 hours % mortality was 73.33, 100 and 100 with concentration 0.5ul, 1ul and 1.5ul respectively. The values of LT50 and LT95 for scorpion venom are 6.73 and 12.17 respectively. These values show that venom of scorpion is more effective against given species of aphids. The result of given study suggests that venom of *H. tamulus* can be used in the formation of bio-pesticides.

O-112/ICAZ-2021

Isolation and characterization of bacteria causing European foulbrood disease and efficacy of antibiotics for it, from European honey bee (*Apis mellifera*) colonies

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Abstract

European foulbrood is an intestinal infection of *Apis mellifera* larvae, caused by *Melissococcus plutonius*. The aim of this study was to isolate and characterize bacteria causing European foulbrood disease symptoms and to evaluate effectiveness of antibiotics against it. Infected larval samples (N=22) were randomly collected from hives showing EFB disease symptoms from local apiaries of Punjab, Pakistan i.e. Hafizabad, Sheikhpura, Shahkot and Nankana during August 2019. Isolates subjected to morphological and biochemical identification and 16S rRNA gene sequencing were identified as *Citrobacter amalonaticus* and *Serratia nematodiphila*. Using well diffusion method Ciprofloxacin (Fluoroquinolone) was most active with highest mean zone of inhibition 32.18 ± 1.41 mm, followed by Streptomycin (Aminoglycoside) 27.31 ± 0.76 mm, Oxytetracycline (Tetracycline) 22.91 ± 1.34 mm and Amoxicillin (Penicillin) 21.07 ± 1.21 mm. Mean ZOI were statistically significant for each isolate, compared using Tukey's HSD test ($p < 0.05$). Results showed that isolate I-21 (*S. nematodiphila*) was most sensitive to Ciprofloxacin while I-12 and I-16 (*C. amalonaticus*) were resistant to Oxytetracycline and Amoxicillin, respectively. Minimum inhibitory concentration (MIC) calculated by broth macro-dilution method was $120 \mu\text{g/ml}$ for Ciprofloxacin, $180 \mu\text{g/ml}$ for Streptomycin and $240 \mu\text{g/ml}$ for Oxytetracycline and Amoxicillin. This is first report for detection of *C. amalonaticus* and *S. nematodiphila* as causative agents for EFB disease symptoms in *A. mellifera* hives.

O-113/ICAZ-2021

Polymorphic Status of Metallothionein Gene 1 and 2 in Type 2 Diabetes Mellitus)

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Abstract

Because of the increase in the incidence rate of obesity, stress, poor life style, use of low quality foods, smoking, and air pollution etc type 2 diabetes mellitus is commonly increasing. These factors can increase the level of ROS and other oxidative agents in body that can directly become the cause of damage to DNA, protein and other



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macromolecule. To prevent this damage certain antioxidant species and enzymes are present in body. One of the genes that can prevent damage is Metallothionein gene. MT gene as a potent antioxidant removes potentially damaging oxidizing agents. High expression of this gene is responsible for lowering the oxidation in body. This gene acts like an antioxidant against oxidative stresses. Oxidative stress comprises the main cause of type 2 diabetes mellitus. When MT genes are suppressed by any factor than the level of oxidation increases in the body and become the main cause of T2DM. This study was conducted to check the association between polymorphism in Metallothionein gene 1 and 2(MT1A, 1B and 2A) and type 2 diabetes mellitus. By using the polymerase chain reaction based restriction fragment length polymorphism PCR-RFLP, single nucleotide polymorphism SNP rs8052394 was checked in 106 Pakistani people of in which 76 were patients and 30 were controls. It involves the extraction of DNA of both sample and control and then running them on Agarose gel for the conformation of DNA. After it PCR was used for the amplification of DNA. 6 primers were used in single PCR reaction i.e. two forward and reverse primers of MT1A, two forward and reverse primers of MT1B and two forward and reverse primer of MT2A gene respectively. The amplified DNA was run on 2% of gel in order to get the amplification results. PstI Endonuclease enzyme was used to digest the amplified DNA. Then the digested DNA was run again on 5% gel electrophoresis. In order to get the clear idea about mutations it was seen under the UV light. Effects of different demographic factors like age, BMI, smoking, gender, residential area etc were also calculated in this study to check the development of T2DM. Both types of homozygous and heterozygous mutations were seen in this study. Homozygous wild type mutation GG and heterozygous mutation GA and homozygous mutation AA was observed in this study. 17% of sample has both these types of mutations. Heterozygous mutation was seen in 67% of males and 37% of females whereas in 36% of males and 14% of females homozygous mutation was seen. Heterozygous mutation GA was more in males as compared to females.

O-114/ICAZ-2021

Association of XPC polymorphism with breast cancer risk

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Abstract

The font size should be 12 in Times New Roman. Type or paste your text into this file. To determine the association of XPC and breast cancer risk, a case-control association research study was conducted with 430 breast cancer cases and cancer free individuals by using TETRA-ARMS-PCR. Conditional logistic regression model was used for analysis of distributional differences of clinicopathological, demographic factors and XPC polymorphism among breast cancer patients and cancer free individuals. Prediction of protein structure was done through computational tools for comparative 2D and 3D structure analysis by Ribbon diagram. To predict the survival distributions, Kaplan-Meier test was applied. Obesity, breast cancer family history and positive marital status were associated with increased risk of breast cancer ($P < 0.01$). Genotyping of the XPC polymorphism rs2227999 G>A showed its significant involvement ($P < 0.0001$) in breast cancer development, inferring it as potential risk factor for incidence of breast cancer. However, overall survival was not statistically significant for XPC polymorphism probably due to short follow up time period. Conformational changes have been observed in C-terminus of XPCR492H. Three additional α -helical regions were observed in XPCR492H at Glu177-Ile182, Thr281-Ile289 and



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Lys913-Lys917 while Glu30-Phe37 and Phe372-Cys377 helical conformations were shifted into loop in XPCR492H . XPC polymorphism showed association with higher risk of breast cancer. XPC C-terminus experiences conformational and functional changes by rs 2227999 polymorphism

O-115/ICAZ-2021

Antidiabetic activity of Berberis brandisiana is possibly mediated through modulation of Chemarin and Adipocytokines in High Fat Diet and Streptozotocin Administered Rats)

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Abstract:

Medicinal plants play a key role in protection of chronic disorders like diabetes, hypertension and dyslipidemia. Berberis brandisiana (BB) is traditionally used to treat diabetes and has been not been validated yet. This study has been designed to evaluate the antidiabetic activity of Berberis brandisiana (BB). Aqueous methanolic extract of Berberis brandisiana (BB) was tested for its antihyperglycemic effect by explaining its role on oxidative stress, chemarin, adiponectin, leptin and TNF α and IL-6 levels, lipid profile, LFTs and RFTs in high fat diet (HFD)/streptozotocin (STZ) induced diabetic rats. Supplementation of HFD for 4 weeks followed by intraperitoneal administration of STZ (40 mg/kg b.w.) to wister rats resulted in hyperglycemia with significant ($p < 0.01$) increase in serum blood glucose, systolic blood pressure, glycated hemoglobin levels (HBA1c), TNF α (Tumer Necrosis Factor α , IL-6 (Interlukin-6), Chemarin and leptin, lipid profile (TC,TG,HDL, LDL), LFTs (AST,ALT,ALP), RFTs (Urea, Creatinine) decrease in serum insulin, antioxidant enzymes (SOD, CAT, and MDA) and adiponectin levels was observed . Oral administration of aqueous methanolic extract of (BB) for 8 weeks, dose dependently (150 and 300 mg/kg b.w.) caused marked decline ($p < 0.01$) in serum blood glucose, HBA1c, systolic blood pressure while antioxidant enzymes (SOD, CAT, MDA) and adiponectin levels were significantly improved ($p < 0.01$) whereas Chemarin, adipocytokines (TNF α , IL-6) levels were significantly decreased ($p < 0.01$) as compared to diabetic rats. Lipid profile, LFTs and RFTs, were found improved ($p < 0.05$) as compared to the rats fed with high fat diet and streptozotocin. Histopathological studies of liver, pancreas, adipose tissue, heart, kidney and aorta revealed restoration of normal tissue architect in (BB) treated rats.

Conclusion:

These data show that Berberis brandisiana possesses antidibetic activity possibly mediated through its positive influence on diabetic parameters, systolic blood pressure, chemarin, and adipocytokines, TNF α , IL-6 and oxidative stress (SOD,CAT,MDA). Thus, this study provides a rationale for the medicinal use of Berberis brandisiana in diabetes.

Keywords: Berberis brandisiana, chemarin, adiponectin, adipocytokines, diabetes.

O-116/ICAZ-2021

Effect of Neem Leaf Supplemented Diets on Growth and Hematological Parameters of Grass Carp

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Abstract

In recent past, the aquaculture industry is intermittently trying to replace fish meal (FM) and fish oil (FO) in fish feeds with sustainably created plant based raw materials. The need for this replacement was majorly due to the continuous increase of aquaculture, the limited FM and FO resources, and the consistently growing demand of seafood worldwide. Currently, the latest trend in aquaculture feed manufacturing is to use medicinal plants as growth enhancers and immune stimulators. To explore the potential use of Neem plant as novel alternative fish feed ingredient, the current study was carried out to find the potential effects of Neem leaf supplemented feed on growth rate and on hematological parameters of grass carp. Total 20 fishes were collected from the local fish hatchery. The Neem leaf supplemented feed was given in different concentrations (2g, 5g, and 10g) for 30 days to test groups while the control group was exposed to basal diet. The haematological parameters results showed that red blood cell (RBC) and haemoglobin decreased as Neem leaf meal increased in the diet. The white blood cell (WBC) and lymphocytes range was increase as Neem leaf meal increased in the diet. Similarly, a positive impact of Neem supplemented feed was observed on the growth rate of grass carp.

Key words: Neem, Grass carp, growth, Heamatology

O-117/ICAZ-2021

Production of Queen Honey Bee through Doolittle Grafting Method

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Abstract

Production of honey bee queens with desirable characters through artificial queen rearing techniques are among advance approaches in beekeeping. The current research work was conducted at KUST Model Bee Form of Kohat University of Science and Technology, Kohat on Apis mellifera honey bee colonies during the spring month of March and April 2021. In current study Doolittle Grafting Method was used for production Apis mellifera queen bee. Total 230 larvae of different ages. 12-24 hours, 24-48 hours and 48-72 hours old larvae were used for grafting. Out of these 230 grafted larvae, number of queen cup cells accepted were 65, capped cup cells were 65 and number of emerged queen cup cell were 46. The effect of age of larva and addition of royal into queen cup cells before grating on the acceptance of queen cup cells was also studied. Young age larva i.e., 12-24 hours up to 48 hours old larva showed high acceptance rate. Age wise acceptance rate of 12-24 hours, 24-48 hours and 48-72 hours old larvae were 80%, 55% and 25% respectively. Overall percentage of acceptance are 48%, 36% and 16% respectively. This shows that queen produced from one day old larva has highest acceptance rate. Addition of royal jelly into queen cup cells before grafting gives highest larval acceptance rate in March and April. In current study effect of dry and wet grafting on queen cup cells was also studied and the rate of acceptance of queen cup cells with wet and dry grafting were 80% and 15% respectively. However further studies are recommended to determine effect of all factors on morphology of queen.

O-121/ICAZ-2021

Relationship between Platelet Aggregation and Mitochondrial Proteins in Obesity

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Abstract

Platelets, with a key role in haemostasis and thrombosis, are known to be hyperactive in obese people. The mechanism by which hyper-aggregation occurs in obesity is largely unclear. Mitochondrial Ca^{2+} uniporter complex (MCU) transfers Ca^{2+} from the cytosol into the mitochondria, which aids in platelet function. We aimed to determine how obesity affects platelets, with a specific focus on the expression of proteins involved in Ca^{2+} transport and tyrosine phosphorylation. Adenosine diphosphate (ADP) and adrenaline-induced platelet aggregation were investigated using time-lapsed spectrophotometry. Western blotting was used to determine the amount of MCU subunits. The MTT test was employed to determine the activity of mitochondrial dehydrogenases in platelets, whereas biochemical assays were done to determine obesity-related biomarkers. We also performed correlation analysis to see if there was a link between BMI and waist circumference (WC) and platelet count, blood pressure (BP), glucose, and lipid profile. BMI and WC strongly associated with glucose, triglycerides, LDL, and VLDL, according to our findings. Total cholesterol and BMI were also shown to have a favorable relationship. However, there was no link between WC and total cholesterol. There was also no link between HDL and BMI or WC. Furthermore, neither BMI nor WC had a significant relationship with platelet count, systolic BP, or diastolic BP. Surprisingly, the platelet aggregation profile of obese people did not differ from that of normal people. The activity of mitochondrial dehydrogenase in normal and obese platelets did not differ. Normal and obese individuals had the same relative abundance of MCU, EMRE, and PYK2. In conclusion, platelet aggregation caused by ADP and adrenaline is unaffected in normal and obese persons. The MCU complex may not be implicated in obese platelets.

Keywords: Obesity, Platelet, BMI, Waist circumference, Mitochondria

O-122/ICAZ-2021

Synergistic Effect of *Lavendula Angustifolia* L Oil on the Antimicrobial Activity of Gentamicin against Methacillin Resistant *Staphylococcus Aureus*

Habib Ullah

Abstract

The growth of resistance to diverse antimicrobial agents by bacteria, fungi, viruses, parasites, etc. is a great test to the medical field for the treatment of infections caused by them, and hence, there is a pressing require searching for new and new antimicrobials. The antimicrobial activity of essential oils and gentamicin drug is well known. The aim of this study will to verify the existence of the synergistic antimicrobial outcome of lavender essential oil and combined with the drug gentamicin. W investigated the efficacy of the combinations of gentamicin and lavender essential oil against the following strains: *Staphylococcus aureus* MRSA KBrn13, *Staphylococcus aureus* MRSA KBrn23 and *Staphylococcus aureus* MSSA KBrn31. In order to decide the sensitivity of these microorganisms, I determined the minimum inhibitory concentration (MIC – Minimal Inhibitory Concentration) and Fractional Inhibitory Concentration (FIC) and kinetic growth of bacteria like colony Forming Unit (CFU) and that gentamicin drug functionalized with essential oils have significant antimicrobial potential against MRSA and MSSA. The study of the interaction of gentamicin with lavender essential oil will evaluated by the checkerboard method and Time kill assay. Synergistic interaction between lavender essential oil and gentamicin will be observed against *Staphylococcus aureus* KBrn 13 and *Staphylococcus aureus* MRSA KBrn 23 and *Staphylococcus aureus* MSSA KBrn 31. In particular, a very strong synergistic interaction will observed against *Staphylococcus aureus* MRSA (lavender essential oil and gentamicin drug MRSA 13 FIC index = 0.4; MRSA 23 FIC index = 0.2 and



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MSSA KBm 31 FIC index = 1.2. Lavender essential oil combination with antibiotic appears as a new strategy to combat the various resistant strains the combination of essential oil with gentamicin verified to be effective against MRSA and MSSA. Therefore, lavender is appearing as one of the best option to be used in combination with antibiotic to increase effectiveness against resistant bacteria.

Keywords: lavender essential oil, gentamicin, antimicrobial activity, synergistic activity

O-124/ICAZ-2021

Pharmacological evidence to the usefulness of Coumarin in metabolic syndrome

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Abstract

This study was carried out in order to attest the usefulness of Coumarin in cardiometabolic disorders. In the in-vitro assay, rat isolated aortae were used in a tissue organ bath assembly coupled with an isometric transducer and a PowerLab data acquisition system. In vivo assays were carried in fructose-fed animal model representing characteristics of cardiometabolic disorders. In the isolated rat aorta preparation, Coumarin caused a concentration-dependent (0.3-100 μ M) relaxation of low K⁺ (25 mM)-induced contractions whereas partial relaxation was observed against high K⁺ (80 mM) contractions. Pretreatment of the tissue with Glibenclamide (10 μ M) had a negligible effect on the inhibitory effect of Coumarin on low K⁺ (25 mM)-induced contractions, while 4-aminopyridine (1 mM) completely obstructed this effect. Tetraethyl ammonium (TEA; 10 mM) shifted the inhibitory effect of Coumarin towards a higher dose but with less efficacy than 4-aminopyridine. In fructose-fed animal model, Coumarin administration showed improvement in obesity, hyperlipidemia, hypertension and endothelial dysfunction characteristic features of cardiometabolic disorders. These results indicate that Coumarin possesses potential against cardiometabolic disorders and also showed a vasodilatory effect mediated possibly through the dominant activation of voltage-dependent K⁺ channels followed by non-specific K⁺ channels with a weak effect on Ca⁺⁺ influx. This study provides pharmacological basis for the possible future development of Coumarin as a drug candidate for the management of cardiometabolic disorders including hypertension.

Keywords: Coumarin, cardiometabolic disorders, hypertension, voltage-dependent K⁺-channel Activation

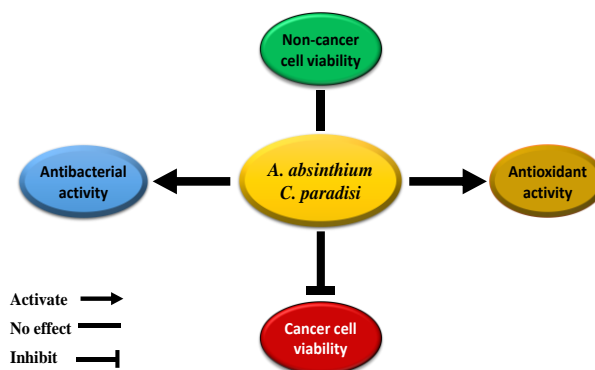
O-125/ICAZ-2021

Antioxidant and antibacterial activities of *Artemisia absinthium* and *Citrus paradisi* extracts repress viability of aggressive liver cancer cell line

M. Safdar

Oral Presentations

Graphical Abstract



Abstract

Background: Numerous reports show that herbal medicines can be utilized in the treatment of different liver disorders. In this study, antioxidant, antibacterial, and anticancer activities of individual as well as combined 80% ethanolic extracts of *Artemisia absinthium* leaves and *Citrus paradisi* peels were investigated.

Methods and results: Values of total phenolic contents (TPC), total flavonoid contents (TFC), DPPH-radical scavenging activity, and ferric reducing antioxidant power (FRAP) were measured to explore the antioxidant capacity. To assess antibacterial activity, four bacterial strains (*Escherichia coli*, *Staphylococcus aureus*, *Salmonella enterica*, and *Klebsiella pneumoniae*) were used. Anticancer activity was assessed on Huh-7 (liver cancer) and Vero (non-cancerous) cell lines. FRAP activity of combined plants extract was higher as compared to their individual effect; the trend did not hold in the case of DPPH-radical scavenging activity. Antibacterial activity of combined extracts by disk diffusion method was observed only against *E.coli*. MTT results indicated that both plants had a cytotoxic effect on Huh-7 cell line but did not show any effect on Vero cell line. Our data showed a strong negative correlation between the amount of TPC, TFC, & DPPH radicals-scavenging activity and viability of Huh-7 cell line. However, no effect was shown on the non-cancerous cell line.

Conclusion: The ethanolic extracts of *Artemisia absinthium* leaves and *Citrus paradisi* peels can be used against liver cancer because of their antioxidant, antibacterial, and anticancer activities.

Keywords Antioxidant activity . TPC, TFC . DPPH . FRAP . antibacterial . anticancer activity

O-126/ICAZ-2021

Production of Industrially Important Enzyme Protease from *Bacillus velezensis* Y1 strain, isolated from the manure of piglets.

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Abstract

The rapid increase in the demand of enzymes has led to a huge competition. Therefore, companies are trying to minimize the manufacturing cost and that's the main reason why natural sources of enzymes are pivotal. The most important natural source of protease is bacterial genus *Bacillus* as it has the ability to produce higher yields of proteolytic enzymes with exceptional properties. In this study, *Bacillus velezensis* Y1 strain was isolated from the manure of piglets. And the study focused to produce protease enzyme from this strain by optimizing different parameters with the solid state fermentation. The effects of various factors on the production of protease in the increasing order of their effectiveness were found to be as follows: loaded liquid volume < pH < time < temperature. The characteristics of the protease showed that optimum pH was 6.0, and reaction temperature found to be most appropriate was 50 °C. The PCR amplified fragments of protease were 1752 bp consisting of an open reading frame of 1521 bp encodes a protein containing 506 amino acids. The results showed that the under study strain *Bacillus velezensis* Y1, can be a dominant workhorse in fermentation microbiology and an excellent producer of protease, an industrially important extracellular enzyme.

O-127/ICAZ-2021

Levosulpiride-loaded Nanostructured Lipid Carriers (LEVO-NLCs) for Brain Delivery with Antipsychotic Effect

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Abstract

The main purpose of this study was to develop, characterize and investigate the levosulpiride-loaded nanostructured lipid carriers (LEVO-NLCs) for effective brain delivery with anti-psychotic and anti-depressant effect. Levosulpiride (LEVO) is a BCS class IV benzamide derivative with poor water solubility, less permeability, low bioavailability and low pKa. In addition to all these problems, brain delivery of LEVO is also challenging due to blood brain barrier (BBB). So, nanostructured lipid carriers (NLCs) was used as a drug delivery system because of having high payload, less drug expulsion, lipid nature and small size of NLCs that made them effective and efficient to cross blood brain barrier without any surface modification. Microemulsion method was used for the preparation of LEVO-NLCs and optimization was done by Box-Behnken model of Design Expert®. The final optimized formulation was investigated for particle size, zeta potential, PDI and entrapment efficiency (%). TEM, FTIR, XRD and DSC analysis were performed followed by checking its in vitro release profile by using dialysis bag diffusion method at 7.4 pH. In-vivo plasma and brain kinetics study was performed to evaluate and investigate the concentration of drug in blood and brain at specific time intervals in order to confirm the sustained release pattern and maximum bioavailability of the drug in blood and brain. Anti-psychotic and antidepressant activities of the drug were confirmed by applying different behavioral tests like forced swim test and tail suspension test in LPS-induced depression and psychosis mice model. Furthermore, Immunohistochemical analysis was used to measure the expressions of different neuro inflammatory mediators like COX-2 and p-NF-κβ. In addition to it, histopathological analysis using Nissl staining was performed in order to evaluate the improvement in neurodegeneration and neuroinflammation in brain tissues because of depression and psychosis induction. The optimized formulation demonstrates particle size of 157.2 nm with zeta potential of -29.6 mV having 0.395 PDI with entrapment efficiency of 83.6796 % and it's in vitro dissolution profile confirmed sustained release pattern of drug from LEVO-NLCs reaching up to 60% after 24 hr in comparison to drug suspension which was more than 90% in 24 hr. Higher AUC



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of LEVO-NLCs in brain (106642.27 ± 876.44 ng.h/mL) as compared to LEVO-Suspension (15684.33 ± 1005.49 ng.h/mL) confirmed the maximum bioavailability and permeation of drug in brain. Behavioral tests showed less immobility time and more struggling behavior in LEVO-NLCs group than LEVO-Suspension. Immunohistochemistry results showed reduced expression of neuro inflammatory mediators (COX-2 and p-NF- κ β) in brain. Histopathological analysis by Nissl staining showed more neuroprotective effective of LEVO-NLCs against LPS-induced neurodegeneration. Altogether, it can be concluded that NLCs has the potential to deliver chemotherapeutic agents to the brain, most importantly to produce effective bioavailability and improved antipsychotic and antidepressant effect as indicated in case of the LEVO in this study.

Key words: Levosulpiride, Nanostructured lipid carriers, Effective brain delivery, Anti-psychotic activity, Anti-depressant activity, LPS-induced psychosis & depression mice model

O-129/ICAZ-2021

Hematological studies of freshwater fish, *Labeo rohita* exposed to engineered ZnO nanoparticles

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Abstract

A research work entitled “Hematological studies of freshwater fish, *Labeo rohita* exposed to engineered ZnO nanoparticles” was conducted at the animal house of Institute of Pure and Applied Biology, Bahauddin Zakariya University, Multan, to assess the changes in hematology of fish (*Labeo rohita*) which was exposed to nanoparticles for 15 days. Nanoparticles were synthesized by co-precipitation method. These particles are characterized by X-ray diffraction and scanning electron microscopy (SEM). Dose and time dependent effects of nanoparticles on haematological indices were measured by exposing fish to two different conc. Of ZNO NPs for 15 days and sampling was done after 0, 5, 10 and 15 days of exposure. Results were compared to the control fish. The hematological parameters i.e., hematocrit, hemoglobin and RBCs were decreased significantly in treated group as compared to the control group as the mean value of RBCs in control group was 3.16 ± 0.16 ($\times 10^6$) and in treated group was 1.57 ± 0.55 ($\times 10^6$) and hemoglobin was 5.45 ± 0.07 (g/dl) in control and in treated groups it was recorded 4.20 ± 0.39 . This decrease is reported due to hemolytic reaction occur because of higher exposure concentration of ZnO nanoparticles. White blood cells (WBCs), Mean corpuscular hemoglobin (MCH), Mean cell volume (MCV) and Mean cell hemoglobin (MCHC) content was observed to be significantly increased with increase in exposure duration and dose of nanoparticles that might be due to the activation of defense mechanism after the exposure to ZnO nanoparticles and leucocytes increased in number

O-130/ICAZ-2021

Effects of Chlorpyrifos on Haematological and Biochemical parameters of *Ctenopharyngodon Idella*

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Abstract

Pesticide effluence in aquatic ecosystems is an environmental issue throughout the world. Chlorpyrifos is a broad-spectrum organophosphate insecticide widely used in agricultural pests control. The current study assessed



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the toxic effects of Chlorpyrifos insecticides on the Haematological and blood Biochemical parameters of Grass Carp, an economically important freshwater fish of Pakistan. Different concentrations of Chlorpyrifos were given to Grass Carp and the 96 hours LC50 value of Chlorpyrifos was calculated to be 165 µl/L at 25 °C. The LC50 concentration of Chlorpyrifos was further used for 24, 48, 72 and 96 hours for determination of its harmful effects. Rapid movements, nervousness in swimming, lack of balance in position and equilibrium, more mucous secretion and changed in their color of Grass Carp was observed dependent upon time. Haematological analysis showed significant decrease in Red Blood Cells (RBCs), Haemoglobin (Hb), Mean Corpuscular Haemoglobin (MCH) Mean Corpuscular Hemoglobin Concentration (MCHC) and Haematocrit (Ht), whereas significant increase was observed in White Blood Cells (WBCs) of Grass Carp after exposure to Chlorpyrifos. The biochemical analysis showed significant decrease in cholesterol, total protein, albumin and triglyceride level whereas significant increase was recorded in glucose level at different time points after Chlorpyrifos exposure. We concluded that Chlorpyrifos is highly toxic for Grass Carp that effect the blood biochemistry and haematology of Grass carp even during short exposure. Precautions may be taken in the use of Chlorpyrifos and/or alternate ecofriendly insecticide may be used in the agricultural fields.

Key words: Ctenopharyngodon Idella; Chlorpyrifos; Toxic effect; Biochemical; Haematological; LC50.

O-132/ICAZ-2021

DNA damage caused by chronic exposure of Copper in the fish, *Labeo rohita*

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Abstract

During chronic exposure of copper, for 84 days, the fish peripheral erythrocytes were collected fortnightly to observe the dose and time dependent DNA damage in the *C. mrigala* through comet assay. DNA damage was measured in terms of damaged nuclei, genetic damage index (GDI), and comet tail lengths (CTL). Peripheral erythrocytes of *C. mrigala* exhibited significantly variable DNA damage after exposure to various concentrations (2/3rd, 1/3rd, 1/4th, and 1/5th LC50) of cadmium, negative and positive controls for 84 days, and sampling was done fortnightly viz. 14-, 28-, 42-, 56-, 70- and 84-days. The exposure of fish at 2/3rd of LC50 caused significantly maximum nuclear damage and GDI values as 80.33±6.34% and 2.64±0.18, respectively. The comet tail lengths were developed variably due to exposure of 2/3rd of LC50 (235.49±20.52µm) and negative control (3.45±0.06µm). The nuclear damage was significantly higher after 56 days of metal exposure (58.22±31.44%), followed by 70 (54.00±29.90%), 42 (52.22±29.25%), 28 (46.33±26.60%), 84 (44.11±28.34%) and 14 days exposure period (41.22±25.46%). Copper exposure to *C. mrigala* caused significantly variable induction of GDI and CTL of comets while the damage to the nuclei was significantly maximum after 56 days. However, the same remained significantly minimum due to 14 days of exposure period.

O-133/ICAZ-2021

Containers Breeding Mosquitoes of District Poonch, Azad Jammu & Kashmir

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Oral Presentations

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Abstract

Artificial containers are potential breeding sources for mosquitoes that are well-recognized vectors of human diseases such as malaria, dengue fever, zika and several others throughout the world. Surveys were carried out to investigate the potential container breeding habitats of mosquitoes from district Poonch, Azad Jammu and Kashmir. Thirty different localities were selected and further categorized on basis of different Latitude, Longitude and elevation. Data was collected according to standard larval sampling procedure. Overall, total 19,013 potential containers were observed in which 5254 were indoor and 13759 were outdoor. A total 1,415 containers (7.44 %) were found positive from which 383 (7.28 %) were indoor and 1032 (7.50 %) were outdoor. Results revealed that natural containers were more dominant with the percentage of 9.48 % and rubber containers were less dominant with the percentage of 5.01 %. Five types of containers were more preferred by following species; *Ae. albopictus* more prefer cement (45.71%) *Ae. koreicus* prefer plastic (30.69%) *An. willmori* prefer rubber (32.81%) *An. lindesayi* prefer natural (32.30%) and *Cx. pipiens* prefer cement containers (33.33%). Moreover, medium size containers (1-10 L) were mostly found positive. Entomological indices showed different results; Container index (CI) was 7.44 %, the House index (HI) was 7.29 %, and the Breteau index was 63.83 %, while, the higher values of risk factor for natural and plastic were observed (1.2735 and 1.0756, respectively). Hence, the study concluded that natural breeding habitats are more preferred breeding habitats for mosquitoes.

O-135/ICAZ-2021

Bionomics and Floral Host Range of *Bombus simillimus* (Hymenoptera: Apidae) from Tolipir National Park, Azad Jammu and Kashmir, Pakistan

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Abstract

From the last decades use of commercial bumblebee species for crop pollination in managed cropping systems is increasing and on other hand *Bombus* pollinators are in decline, becoming endangered species around the globe. *Bombus simillimus* is native bumblebee species of Azad Kashmir and Northern Pakistan and this study was designed to explore their ecological behavior like seasonal distribution, habitat preference and floral host range from Tolipir National Park Azad Jammu and Kashmir, Pakistan. Results explore that hibernating queens of *B. simillimus* emerged in April and start of May, workers recorded from July to last of September and sexual (male and daughter queens) were found in September and October. Maximum population was observed in August and there was no population from November to March. Queens of *B. simillimus* mostly preferred the forest boundaries for nesting place and their least preference was forest area to build their nests. Individuals of *B. simillimus* were recorded on 33 floral host plants during the foraging activities and Asteraceae plant family found with maximum foraging plants of *B. simillimus*. Hibernating queens emerged from April to May and preferred the forest boundaries for nesting place. Maximum population of *B. simillimus* found in August and Asteraceae plant family was major foraging host family for this species. This study will be helpful to develop conservation strategies for this important native bumblebee pollinator in future.

Key Word: Bumblebees, Ecological studies, Distribution and host range, Behavior



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O-136/ICAZ-2021

Antibacterial activity of silver nanoparticles against a locally isolated strain of E. coli., a food pathogen

Sana Saeed¹, Dr Umbreen Shaheen^{1*}, Dr Samad²

Abstract:

Silver Nanoparticles (SNPs) are the most commercialized nano-materials because of their well-established broad-spectrum antimicrobial properties and their lower tendency to induce microbial resistance.1 An estimated 600 million people, almost one in ten people, in the world fall ill after eating the food which is being contaminated by bacteria.2 In this study, Silver Nanoparticle's antibacterial activity was assessed against Escherichia coli by using well diffusion method. SNPs were synthesised and characterised at our lab using UV-vis spectrophotometry and Scanning Electron Microscopy. Different concentrations of SNPs were utilized to find out the minimum inhibitory concentration against a locally isolated food pathogen strain of E coli.

O-139/ICAZ-2021

Fish waste Fish processing plant for compost production

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Abstract

Fish processing wastes also have a high potential for compost production due to their richness in organic compounds. Fish waste is used as organic fertilizer, nutrients for agricultural purposes or as a renewable source. Fish waste has been proven to be an organic fertilizer and nutrient for both agricultural use and soil strengthening. Composting is a biological process that takes place under aerobic conditions in the presence of oxygen. The final pH of the compost is strongly influenced by the organic matter, the decomposition stages of the compost and the increase of the modifiers. Large amounts of salt in compost affect seed germination and root health. Compost produced using fish waste and by examining the electrical conductivity, pH and C / N ratio can be used as organic fertilizer. Disposal of fish waste causes environmental problems and the disposal process is also problematic. Novel technologies must be a way to use and improve this waste and turn it into organic matter provide usable before disposal and to reduce contamination.

Keywords: Fish processing, Wastes, Fertilizer, Compost, Organic

O-140/ICAZ-2021

Isolation and Characterization of Gelatin from Scales of Labeo Rohita

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Abstract

Gelatin is the abundant source of protein in the animal kingdom. Due to its distinctive properties, it is commonly used in many industries as in food, pharmaceutical and as materials for photography. This study extracted gelatin from scales of Labeo rohita and characterize with different methods as Ultraviolet-visible spectroscopy (U.V), Fourier transform infrared (FTIR) spectroscopy analysis, X-Ray diffraction (XRD) and



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Scanning electron microscopy (SEM). Initially, gelatin absorbance was confirmed through U.V in the range of 200 to 400nm. The highest absorbance was showed at 260nm, which is the optimized value for the synthesized of Gelatin. Whereas XRD showed that Gelatin was crystalline in nature, SEM observed the shape of Gelatin is micro porous and as poly dispersed. Beside this, scales of *L. rohita* produced totally 29 % yield of gelatin. Moreover, the proximate analysis of gelatin observed high protein content (87.66%) as compared to moisture (6.2%) and ash contents (1.8%). In conclusion, the present study confirms that Gelatin can be produced from fish scales that can be used for various purposes. Further, the study may hint that the extracted Gelatins from fish by-products can increase the economic value of fish.

Key words: Gelatin, *L. rohita*, Fish Scales,

O-141/ICAZ-2021

Malnutrition in children in the Covid-19 Pandemic

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Abstract

The Covid-19 pandemic has caused not only a social but also an economic recession all over the world. Many people have faced financial problems such as not being able to meet their expenses. One of the challenges faced is food insecurity. It has been observed that access to healthy food has decreased all over the world. One of the disadvantaged groups most affected by this is children. Children with inadequate nutritional intake have lower immune systems and are more prone to diseases and malnutrition. As in other infectious diseases, when the nutritional status is poor, the possibility of protection from Covid-19 infection and complications of the disease decreases. In conclusion, covid-19 has negatively affected the lives of many children. Measures such as developing new policies, including food aid, providing school menus to students free of charge, and performing health screenings in schools should and are expected to be implemented by the administrators as a state policy.

Keywords: Children, Nutrition, Food insecurity, Malnutrition, Covid-19, Pandemic.

O-147/ICAZ-2021

Peripheral nerve injury and muscle functions restoration: A comparison of the various extracts of *Cannabis sativa*

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Abstract

Peripheral nerve injuries are among those complicated medical conditions, which are still lacking an effective first-line therapy. Natural compounds have a long history of medicinal usage for treating such injuries. In this scenario, the present study was aimed to explore the role of n-Hexane and ethyl acetate extracts of *C. sativa*



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leaves against sciatic nerve injury in a mouse model. For this purpose, 18 albino mice were divided into 3 groups (1 control and 2 treated groups; n=6 for each group). The control group was fed on a plain diet while treatment groups were given a diet containing 10 mg/kg *C. sativa* (n-Hexane and Ethyl acetate extracts). The sensorimotor function regains assessed by hot plate test, grip strength, and SFI assessments was found significantly ameliorated in the *C. sativa* n-Hexane group when compared with control and *C. sativa* ethyl acetate extract group. Furthermore, morphometric analysis of muscle fiber cross-sectional area revealed a noticeable improvement in muscle fibers' diameter in the *C. sativa* n-Hexane extract-treated group, along with a prominent increase in TAC and momentous decrease in TOS. Conclusively, these findings advocate that *C. sativa* n-Hexane extract exhibits the potential to escalate functional recovery following a peripheral nerve injury. However, the real remedial agents of this extract and the mechanism involved in improving functional restoration warrants further work.

O-148/ICAZ-2021

Growth performance, nutrient utilization and body composition of *Catla catla* fingerlings fed on *Moringa oleifera* leaf meal based diet

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Abstract

A 90-days feeding trial was conducted to determine potential of six isonitrogenous and isoenergetic experimental diets; formulated by replacing fish meal (FM) with *Moringa oleifera* leaf meal (MOLM) based diets at varying replacement levels (0%, 10%, 20%, 30%, 40% and 50%). Cr₂O₃ incorporation level was 1% in all diets. For each test diet, fifteen fingerlings having an initial average weight (7.29±0.07g) were stocked in tanks. Diets were fed to the fingerlings at feeding level (5%) of total biomass twice a day. From the analysis, a significant ($p<0.05$) improvement in growth parameters was found which marks indication of maximum digestibility of nutrients such as crude protein, crude fat and gross energy in fish fed on MOLM based diet at 10% replacement level. Analysis of carcass composition also showed that replacement of FM with MOLM up to 10% increased crude protein and decreased crude fat deposition in fish body as compared to fish fed on control and other MOLM based diets. It was concluded that the 10% replacement of FM by MOLM based experimental diet is cost effective for *Catla catla* fingerlings without compromising growth parameters.

Key words: MOLM, *C. catla*, growth performance, nutrient digestibility, body composition

O-150/ICAZ-2021

Recent trends in extraction, purification, characterization and antioxidant profiling of plants based polysaccharides

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Abstract:

Plant matter is made up of various phyto-constituents and polysaccharide is one of the major components. Polysaccharides are the subject of research due to their versatility in origin, abundance and functional attributes. This work emphasis on extraction methods, purification and fractionation of polysaccharides and different



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characterization methods including molecular weight determination, structural conformation by congo red method, viscosity, rheology and other characterization by TGA, SEM, EDX, XRD, NMR, FTIR, UV-VIS spectroscopy. Antioxidant profiling of leave polysaccharides and other functional assay methods have been discussed in details. The work illuminates the various aspects of polysaccharides for their exploration and characterization as key players in functional foods, excipients in pharmaceuticals and radical scavengers.

Keywords: Polysaccharides, Extraction, Purification, Characterization, Protocols

O-151/ICAZ-2021

Designing an Efficient Peptide-Based Vaccine against *Campylobacter jejuni* Implicated in Guillain Barré Syndrome Using Immunoinformatics Approach

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Abstract

Guillain Barré syndrome (GBS) causes acute flaccid paralysis and affects humans more frequently after poliomyelitis. The primary trigger of Guillain Barré syndrome is the molecular mimicry between lipooligosaccharides of *Campylobacter jejuni* (*C. jejuni*) and human gangliosides of the peripheral nervous system. *C. jejuni* is the most well known precursor, associated with Guillain Barré syndrome. Campylobacteriosis is the world's leading cause of diarrhea. Many vaccines against *C. jejuni* infection have been proposed but there are concerns about the efficacy and safety of these vaccines. So far, there is no approved vaccine against *C. jejuni*. This study aimed to develop *in silico* vaccine against *C. jejuni* RM3420, triggering Guillain Barré syndrome. This study utilized the CadF epitope of *C. jejuni* to construct a peptide vaccine. Prediction of B-cell epitopes was performed by ABCpred and BepiPred 2.0 web servers while T-cell epitopes were predicted by their binding affinity to MHC-I and MHC-II through IEDB online web server. Docking was performed by AutoDock vina software and visualized through PyMol. This study predicted NYFEGNLDMDNRYA and GYGQDNPRSSND as potent B cell epitopes and NYFEGNLDM as a T cell epitope as a vaccine candidate against *C. jejuni*. NYFEGNLDM was docked against HLA-C*06:02 and showed considerable binding. This study proposes NYFEGNLDM as the most potent T cell epitope that could be used as a vaccine candidate against *C. jejuni* RM3420 causing Guillain Barré Syndrome.

O-153/ICAZ-2021

Analysis of serum microbiome of HIV infected individuals using 16S metagenomics sequencing

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Abstract

HIV infects the CD4 cells which marks the suppression of our immune system. DNA from serum of healthy, treated and untreated HIV infected individuals was extracted. The DNA was subjected to 16S metagenomic sequencing and analyzed using QIIME2 pipeline. 16S sequencing analysis showed serum microbiome was dominated by Firmicutes, Proteobacteria, Bacteroidota and Actinobacteria. Treated HIV infection showed highest abundance of Firmicutes (66.40%) significantly higher than untreated HIV infection (35.88%) and control (41.89%). Bacilli was most abundant class in treated (63.59%) and second most abundant in untreated (34.53%) while control group showed highest abundance of class Gamma-proteobacteria (45.86%). Untreated HIV infection group showed Enterococcus (10.72%) and Streptococcus (6.599) as the most abundant species. Untreated HIV infection showed significantly higher ($p=0.0039$) species richness than treated and control groups. An altered serum microbiome of treated HIV infection and higher microbial abundance in serum of untreated HIV infection was observed.

O-154/ICAZ-2021

Next generation sequencing identifies pathogenic mutations in HGF, POU3F4, TECTA and MYO7A in consanguineous Pakistani deaf families

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Abstract

Approximately 70% of congenital deafness is attributable to genetic causes. Incidence of congenital deafness is known to be higher in families with consanguineous marriage. In this study, we investigated the genetic causes in three consanguineous Pakistani families segregating with prelingual, severe-to-profound deafness. Results. Through targeted next-generation sequencing of 414 genes known to be associated with deafness, homozygous variants c.536del (p. Leu180Serfs*20) in TECTA, c.3719 G>A (p. Arg1240Gln) in MYO7A, and c.482+1986_1988del in HGF were identified as the pathogenic causes of enrolled families. Interestingly, in one large consanguineous family, an additional c.706G>A (p. Glu236Lys) variant in the X-linked POU3F4 gene was also identified in multiple affected family members causing deafness. Genotype-phenotype cosegregation was confirmed in all participating family members by Sanger sequencing. Conclusions. Our results showed that the genetic causes of deafness are highly heterogeneous. Even within a single family, the affected members with apparently indistinguishable clinical phenotypes may have different pathogenic variants.

O-155/ICAZ-2021

Neuroprotective effects of melatonin SLNs in cerebral ischemic injury model

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Abstract

The objective of this research was to formulate solid lipid nanoparticles (SLNs) loaded with a lipophilic drug melatonin (MLT) in order to resolve its poor solubility. The method of nanotemplate engineering was used to



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prepare (MLT-SLNs) and characterized for particle size, morphology, thermal behaviour and polymorphic changes. In vitro release study was conducted using dialysis bag diffusion technique while in vivo pharmacologic studies were conducted on rats to evaluate neuroprotective effects. The results showed that MLT-SLNs were spherical and uniform with size ranging in nanometers. MLT-SLNs showed significant changes in thermal behaviour as it changed from crystalline to amorphous form as compared to MLT dispersion. The release of MLT from MLT-SLNs over 24 h was found to occur in a sustained fashion. In vivo tests of MLT-SLNs for neuroprotective effects showed improved effects in infarct percentage, neurobehavioural studies, biochemical test, oxidative enzyme analysis, ELISA, immunohistochemistry and H & E staining as compared to MLT dispersion, thus enhancing the suitability of NPs to carry poorly soluble lipophilic drugs such as MLT. To sum up in a nutshell the findings of this study in relation to MLT-SLNs, provided a compelling argument for use of this approach in the treatment of ischemic stroke

O-156/ICAZ-2021

Pollen Analysis of Honey Produced by *Apis mellifera* from Punjab, Pakistan

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Abstract

Pollen analysis helped to categorize honey on the basis of its floral source. Thirty honey samples which were produced by *Apis mellifera* and were collected from various botanical and geographical areas such as Chakwal, Multan, Jehlum, Kallar kahar, Rawalpindi and Muree of Punjab Province, Pakistan, and stored at room temperature (25°C) in plastic jars. All the samples of honey were subjected to Melissopalynological analysis i.e. study of pollens, as per method recommended by International Honey Commission with the aim to confirm the floral origin of the honeys. Pollens count was carried out by haemocytometer under microscope which followed by statistical analysis. High quality pictures were taken by camera fitted on light microscope. Results showed that *Citrus sp.* (13.4%), *Prosopis sp.* (3.4%), Poacea (13.6%), *Brassica sp.* (4.8%), *Syzygium sp.* (2.8%), *Acacia sp.* (10.2%), *Ziziphus sp.* (13.9%), *Eucalyptus sp.* (4.35%), *Cajanus sp.* (0.6%), *Azadirachta sp.* (22.5%), *Psidium sp.* (1.2%), *Moringa sp.* (3.46%), *Pisum sp.* (3.4%), *Morus sp.* (1.2%), *Impatiens sp.* (1.2%), *Trifolium sp.* (0.6%), *Pinus sp.* (0.5%) pollens were found in fresh honey samples with varying %age.

Key Words: *Apis. Mellifera*, Melissopalynology, Honey

O-157/ICAZ-2021

***In vitro* evaluation of standardized extracts of *Artemisia brevifolia* Wall. for antiprotozoal and anticancer potential**

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Abstract

The current study was designed to evaluate biological attributes of *Artemisia brevifolia* Wall. as a promising herbal therapy. *In vitro* antiprotozoal and anticancer potential of standardized extracts of *Artemisia brevifolia* was assessed and correlated to the presence of therapeutically significant polyphenols and Artemisinin



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analogs in underlying study. Test extracts were prepared by successive extraction with a comprehensive range of solvents and subjected to phytochemical evaluation via TLC based Fingerprinting and HPLC based characterization. Selective extracts were screened for antiprotozoal potential by flowcytometry analysis against *Plasmodium falciparum* i.e. D6 and W2 respectively. Antileishmanial activity against leishmania tropica promastigotes was analyzed by MTT based colorimetric assay. Antiproliferative activity against different cancer cell lines was analyzed by sulforhodamine B and MTT protocols. Chromosomal aberration, micronucleus and comet assays were performed to determine the genotoxic potential using above mentioned cancer cell lines. EtAC extract retrieved Artemisinin and polyphenol analogues thus proved most proficient extract phytochemically with antimalarial potential with an IC₅₀ and % Parasitemia of 71.43±1.4 and 30±5.77 in D6 and 100±2.3 and 50±5.77 in W2 respectively. Maximum cytotoxic potential was exhibited against HCT-15 with an IC₅₀ of 18.80±1.9 µg/ml by EA extracts. Genotoxicity was evaluated by parameters including tail length, head length, %head and tail DNA scoring, no extract produced profound DNA damage exhibiting the safe behavior of *A.brevifolia*. A noteworthy difference in the number of total chromosomal aberrations was observed, for determining anticlastogenic effect. The results of the undertaken study shows that the phytochemical quantification has a relationship with in vitro biological screening, therefore the observed activity might be attributed to the presence of quantified phenolics.

Keywords: *Artemisia. brevifolia*, HPLC, Antiprotozoal, Anticancer, anticlastogenic

O-159/ICAZ-2021

Taxonomic Studies of Sub-order Caelifera (Orthoptera) of District Bhakkar, Punjab, Pakistan

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Abstract

Orthoptera consist on a group of insects that are dominant and have great importance including short-horned grasshoppers and long-horned grasshopper. Their ecosystem vary because of their herbivorous nature they present in grasses, desert and forest ecosystems. The present study describe the diversity and distribution of sub-order Caelifera in Bhakkar Punjab. This study reveals that this sub-order comprises different super-families that are arranged with them and also include grasshoppers and the insects like grasshoppers. The superfamilies that arranged with them are Tetrigoidea or ground hoppers and Tridactyloidea or ground hoppers. The Cealifera diversity in district Bhakkar was documented for 2018-2019. This area is partially desert and this is the main reason of the presence of Cealifera. This It includes 11,000 species that are known and total valid genera about 2,400. Living superfamilies of this are 2 out of 1150 species and 255 genera and these are Eumastacoidea and Proscopioidea. These are mainly herbivores but some of them are omnivores feeding on both cultivated and wild plants. The feeding punctures of these insects may result in a partial or complete damage to cotton bolls, peas, beans, pods and also damage the leaves of plants and grasses. The species vary in size, morphological characteristics and color. Morphological characteristics also provided like morphology of head, antennae, mouthparts, thorax, wings, legs and abdomen. The samples were collected from Bhakkar using appropriate entomological tools during vegetation and summer season because summer is the best season for the growth of Cealifera. Identification of specimens



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associated with different crops, grasses, vegetables, and fruits done by running taxonomic keys. Finally taxonomic key for Caelifera upto specie level was prepared to facilitate their identification. The results of this study shows that Caelifera comprises 8 superfamilies from that superfamilies only 5 superfamilies occurred in Pakistan that are Acridoidea, Pyrgomorpoidea, Tetrigoidea, Eumastacoidea and Tridactyloidea respectively. These superfamilies also have families that are further divided into subfamilies. It will be helpful in future for further taxonomy of this sub-order.

O-160/ICAZ-2021

Plant Diversity in the Deserts of Sindh Used for the Veterinary Disorders and Sustainable Development of Livestock

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Abstract

The project is confined to the exploration of medicinal plants used as herbal drugs for the treatment of cattle population in the deserts of Sindh, Pakistan. The study involved data documentation, plant collection, identification, field photography and data analyses using qualitative and quantitative ethnobotanical techniques (Use reports (UR), Use value (UV) and Relative frequency of citation (RFC)). In total, 57 important medicinal plant species belonging to 29 families were reported for the treatment of veterinary disorders. The most dominant life form was herbs whereas it was reported in the current study that the most used common methods of utilization of recipes were decoction, powder, and juices. Among the plants used in veterinary disorders, *Senna italica* Mill., *Solanum surrattense* Burm. f., *Fagonia bruguieri* DC., *Fumaria indica* (Hauskn.) Pugsley, *Mukia medraspatana* (L.) M.Roem., *Opuntia dillenii* (Ker Gawl.) Haw., *Tamarix aphylla* (L.) H.Karst. and *Tribulus terrestris* L. were commonly reported. The present study highlights the baseline data for further experimental elucidation and validation through phytochemical and pharmacological research, which could be of develop interest in the design of sustainable development of new herbal drugs based upon traditional recipes. In addition, species with only a few documented traditional uses may be further explored for preservation of traditional knowledge to them.

O-162/ICAZ-2021

Comparative hepatic, nephro, and gonadal toxicity of green and chemically synthesized copper oxide nanoparticle on spargue- dawley rat parents and offspring via lactation

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Abstract

In present study, green and chemical routes were adopted for the synthesis of copper oxide (CuO) NPs and analyzed for characterization techniques. Furthermore, comparative hepatotoxic, nephrotoxic and reprotoxic effect of both green and chemically synthesized CuO NPs (G-CuO & C-CuO) on spargue-dawely rats and their offspring was carried out to determine toxicity transfer through gestation and lactation. Spherical and phase pure monoclinic CuO NPs (36.6 and 32.85 ±5 nm) were successfully fabricated. Amongst them, C-CuO-NPs exhibited dose dependent toxicity in both parents and pups via alterations in biological markers. Antioxidant status revealed significant reduction in higher dose C-CuO NPs in parents. Maximum hepatic and nephro genotoxicity of 2.3, and



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1.97 % tail DNA was observed in high dose C-CuO NPs female while in gonads 2.72 % tail DNA in male offspring. In serum, parents depicted gender and dose dependent effects on LFTs, RFTs and hormones. Furthermore, liver's histology displayed dose dependent dilation and congestion of sinusoids in C-CuO-NPs while kidney presented moderate tubular injury and necrosis with intact glomeruli. Pups showed normal hepatic and renal architecture while gonads display no marked alteration. These results demonstrated that lactation played some role in toxicity but not significantly.

O-164/ICAZ-2021

Biocontrol of Disease Caused by *Meloidogyne Incognita* in Okra Plant Using Plant Growth Promoting *Bacillus* Spp

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Abstract

(*Abelmoschus esculentus*) locally known as bhindi is a member of family Malvaceae. It is rich source of vitamins, minerals, proteins, and carbohydrates. The okra crop is grown on 15500 hectares area with total production of 117900 tons. Its yield decreases due to diseases caused by root-knot nematodes. *Meloidogyne Incognita* is the most destructive one which cause huge economic losses to okra production. Nematicides are generally used to control the nematodes however they have several adverse effects including toxicity, environmental contamination, and hazard. The PGPR have shown considerable potential as biological control agents. *Bacillus* species reduced population densities of the soybean cyst nematode in the greenhouse, micro plot, and field studies. Therefore, the present study was designed to determine the plant growth promoting traits and nematocidal potential of bacteria isolated from the fields of district Kohat for the management of root-knot nematodes (*Meloidogyne* species) in okra plant. Roots of infected okra plant and rhizospheric soil were collected from different locations in the District Kohat Khyber Pakhtunkhwa, Pakistan. The root-knot nematodes were isolated by using the Baermann funnel, and the root incubation methods and were identified based on their phenotypes. The bacteria were isolated from the rhizospheric soil by using serial dilution plating on LuriaBertani (LB) agar plates. *Bacillus subtilis* were identified based on morphological and biochemical characteristics. Plant growth promoting traits of *B. subtilis* were also investigated. Finally, the strains, their cell pellet and their metabolites were applied to the juvenile and eggs of *Meloidogyne incognita*. It was observed that *B. subtilis* has biocontrol potential against *Meloidogyne incognita*. The juvenile survival was 98% without exposure to *B. subtilis* and decreased to 70% when exposed to *B. subtilis* broth culture after 24 hours. Moreover, cell pellet and metabolites of *B. subtilis* showed 55% and 65% mortality rate against the juvenile of *M. incognita* respectively after 24 hours. Furthermore, the *B. subtilis* broth culture, their cell pellet and their metabolites showed 50%, 30% and 45% activity against the eggs hatching of *M. incognita*. The *B. subtilis* also showed plant growth promoting traits by zinc and phosphate solubilization, ammonia and indole acetic acid production. From this study, it may be concluded that *B. subtilis* showed nematocidal activity against *Meloidogyne incognita* and produced nematocidal metabolites. It also promotes plants growth by zinc and phosphate solubilization, ammonia and indole acetic acid production.



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Synthesis of Zinc oxide nanoparticles using *Zingiber officinale* legume and their antibacterial activity against Multi-drug resistant bacteria

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Abstract

Antibiotic resistance by microorganisms is a global issue that needs proper attention to be resolved as most of the deaths occurred due to infections caused by multi-drug resistant (MDR) bacteria. Different pathogenic organisms such as *Escherichia coli*, *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *Klebsiella pneumoniae*, *Shigella* spp., are responsible for bacterial infections in human being as well as animals. Nanoparticles exhibit novel properties due to variations in specific characteristics such as size, distribution and morphology of the particles. Zinc oxide nanoparticles are interesting because it exhibits high catalytic efficiency, strong adsorption and are used frequently as antimicrobial agent. Green synthesis using plant extracts are commonly preferred for the synthesis of ZnO-NPs due to the environmental friendly nature, cost effectiveness, and safe nature for human therapeutic use. The plant ginger is the most frequently consumed dietary item throughout the world. It has a wide variety of pharmacological properties such as anti-inflammatory, antioxidant, analgesic, hepato-protective etc. The present research study will be focused on to synthesize ZnO-NPs from the legume extract of *Zingiber officinale* and then determine its antibacterial potential to enhance the activity of commercially available antibiotics against MDR bacterial species. Antibiotic sensitivity of all bacterial isolates were tested against (Ceftazidime, Clarithromycin, Cephadrime, Metromidazol, Oxacilin) antibiotic discs. The result showed that the bacterial strains *Shigella*, *Enterobacter*, *Pseudomonas aeruginosa*, *E. coli* and *Klebsiella* were showed completely resistance against Oxacilin (100%), Metromidazol (100%), Cephadrime (100%). The result showed that all tested bacterial strains were susceptible to ginger aqueous nhexane, and methanol extracts. *Shigella*, *Enterobacter* and *s.aureus* are more susceptible as compared to other bacterial strains against aqueous and methanol ginger extracts. *Shigella* spp., (27mm, 27.8mm), *Enterobacter* spp., (16.3mm, 21.3mm), *s.aureus* (23.6mm, 26.6mm) the zone of inhibition was observed with ginger aqueous and methanol extracts. SEM images of ZnO observed loose morphological aggregates, irregular and cubical with variable sizes. The UV-Vis spectra revealed that ZnO NPs can be prepared using natural reducing agent present in *Zingiber officinale* legumes extract. The UV Vis-Spectroscopy study showed sharp peaks that confirmed the synthesis of ZnO-NPs and also their involvement with natural reducing agents present in the leaf extract. The EDX profile gave information about the chemical composition of the nanoparticles such as; Oxygen was (39%), Zinc was (49.89%), and Carbon was (30.79%). The data of the antibacterial assay exhibit that most of the selected bacterial strains were highly susceptible to the ZnO NPs. The bacterial strains show different inhibition zones against various concentrations of ZnO nanoparticles. *Klebsiella pneumoniae* was found to be the most susceptible strains among all strains by showing the highest inhibition zone (12 mm) against 10 mg of ZnO nanoparticles, for 5 mg (10 mm), for 4 mg (9.8 mm), at 2 mg (8.9 mm) and for 1 mg is (7.9 mm) respectively. The biosynthesis of ZnO nano particles using a powdered ginger legume extract provides an ecofriendly, easy, cost effectiveness and efficient route for synthesis of nano particles. From this study, it was concluded that SEM images observed the morphology of ZnO particles. The EDX profile gave information about the chemical composition of the nanoparticles such as; Oxygen, Zinc and Carbon. The data of the antibacterial assay exhibit that most of the selected bacterial strains were highly susceptible to the ZnO NPs. From the above study it was concluded that



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Zingiber officinale legumes acts as a potential reducing as well as capping agent for the green syntheses of zinc oxide nanoparticles. This study will help to improve the quality of existing commercially available antibiotics against MDR bacterial isolates.

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Molecular Epidemiology of Hepatitis C Virus (Hcv) Genotypes in South Waziristan, Khyber Pakhtunkhwa

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Abstract

Hepatitis C is global health burden caused by hepatitis C virus and is the major cause of acute and chronic liver diseases. Around 184 million people have been diagnosed with chronic HCV infection globally. The present study is designed to explore the molecular epidemiology of HCV genotypes in South Waziristan Khyber Pakhtunkhwa. A total of 174 HCV infected patients were included in this study. Blood samples were collected and HCV RNA quantification and genotyping were done by RT-PCR. Out of the total 174 HCV positive patients 55.7% were male and 44.3% were female individuals. HCV Genotype 3 was reported the most prevalent genotype in patients of all age groups followed by genotype 2. During the current research work HCV genotype 3 and 5 was frequently observed in patients with previous history of unsafe injection received, genotype 2 was observed in patients who had history of dental and general procedure whereas genotype 1 was observed more in patients who previously visit to barbers shop. During the current research work HCV genotype 3 was noted as the prevalent genotype (39.7%) in all eight tehsils of South Waziristan, followed by genotype 2 (20.1%), Untypable (15.5), type 1a (8.6%), type 1b (6.3%), genotype 4 (4.6%), genotype 5 (2.3%), mix genotype (1.7%), and genotype 6 (1.1%). Hepatitis C is still endemic in the general population of South Waziristan and needs further investigation of HCV genotypes by using more sensitive assays and considering large sample size.

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Minced Meat Preservation by using Gelatin Based Iron Oxide Nanoparticles

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Abstract

Meat is perishable food products having limited shelf-life. Being a rich source of proteins, meat serve as a good source for microbial growth, which cause food poisoning. Addition of chemical preservatives can increase the shelf life of meat. However, because of the consumer awareness, the preservation by natural sources is getting popularity. The ions in iron oxide nanoparticles attach to bacterial cell wall and destroy it, thus results in cell death. In this project we proposed to prepare iron oxide nanoparticles by gelatin as reducing agent. We proposed that the gelatin iron-oxide nanoplexes exhibited antimicrobial properties against food borne pathogens. Hence, we expect to circumvent the use of toxic preservatives for preservation of meat. The food borne pathogens mainly Staphylococcus aureus, Escherichia coli, and Pseudomonas aeruginosa were isolated from 15 food samples collected from local grocery store. Iron oxide nanoparticles were prepared by bio-chemical approach using gelatin as reducing and capping agent. Characterization of gelatin IONPs was done by UV, XRD, FTIR, AFM and TEM techniques.



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The inhibitory effect of gelatin-iron oxide nanoplexes were determined by macrodilution method. The beef was coated with gelatin-iron oxide nanoparticles and stored in refrigerated for 16 days to investigate quality changes. There was total 15 food samples. The isolation and characterization of food pathogens was done by Gram staining and standard biochemical tests. E.coli was most predominant in bakery samples followed by Staphylococcus aureus and Pseudomonas aeruginosa. The antibacterial activity of synthesized gelatin-iron oxide nanoparticles showed high activity against E. coli and the zone of inhibition was 9 mm. Furthermore, the zone of inhibition for Staphylococcus aureus was 7mm while for Pseudomonas aeruginosa, the zone of inhibition was recorded at 6mm. The bacteria in the beef meat that was coated with gelatin-iron oxide nanoparticles was 4.9 log CFU/ g, within accepted range. It reduced the bacterial load up to maximum limit. The results suggest that gelatin-based iron oxide nanoparticles could be used as antibacterial agent plus it has significant preservative properties on meat so, it could be used to extend the shelf life of meat.

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Control of Disease Caused by Phytophthora Capsici in Pepper Plant using the Soil-Borne Bacillus Spp Isolated from Kohat Khyber Pakhtunkhwa.

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Abstract

Phytophthora blight disease is caused by *Phytophthora capsici*. It is responsible for severe damage to pepper plants, in humidified conditions. Many human-made toxic chemicals are used to control this disease, but they may often lead to fungicide resistance. pepper crops cultivated over an area of 1776 thousand hectares throughout the world, with a production rate of 7182 thousand tons per annum. Biological control being ecofriendly and sustainable is a good alternative for the effective control of *P. blight* disease. The study is designed to evaluate the efficacy of soil-borne bacterial isolates against the *Phytophthora capsici*. *Phytophthora capsici* was isolated from infected green pepper plant. Specific identification was done by special test through carrot agar media. *Bacillus subtilis* was isolated for the biocontrol of *P. capsici*. In vivo experiment was done, pepper plant was grown in a nursery, and the plant was infected purposely with *P. capsici*, bacteria was applied on the plant. After 15 days the fungus *P. capsici* growth was inhibited. All the isolates produced ovoid, papillate sporangia. Sporangial length of isolates ranged from 44.7 to 53.1 μm while the width varied from 24 to 38.4 μm . Antagonism assay was performed to check the potential of rhizobacterial strains in mycelial growth inhibition against *P. capsici* in vitro. Significant activity against *P. capsici* was noted in dual culture assay on PDA. The activity of isolates was found against *P. capsici* and significantly inhibited the mycelial growth after 96 hrs. Incubation. Fungal growth inhibition (cm) was ranged 63.7–90.3% over un-inoculated control. Maximum fungal mycelial growth inhibition was done by *Bacillus cereus* (90.3%), among all the tested bacterial agent's over untreated control. Bacteria were identified on the base of biochemical characteristics. Rhizobacteria with high antifungal potential were evaluated for disease suppression and plant growth promotion traits in pot trials under greenhouse conditions. All the tested bacterial strains enhanced the seed germination ranged (77.6–93.1%) as compared to control treatment (60.8%) and reduced the seed mortality caused by *P. capsici*. However, maximum seed germination was done (93.1%), *Bacillus cereus* (90.7%). Plant growth characters viz., shoot and root length (cm), fresh and dry shoot and root weight (g) were enhanced by the bacterial seed inoculation as compared to untreated control. All the rhizobacterial strains enhanced the shoot and root length in range (9.57–14.77 and 3.30–5.63 in cm) as compared to control where shoot and root length was 3.53



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cm and 1.09 cm respectively. This study concludes that *B. subtilis* showed activity against *P. capsici* which also promotes plant growth.

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Effect of *Withania somnifera* and *Calotropis procera* on S100 β protein expression level in nerve compression injury in a mouse model.

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Abstract

Plant-derived substances, or phytochemicals, are abundant in nature. They have been employed in the treatment of major human health concerns since ancient times. This intrigues modern researchers, who want to learn more about their health-promoting properties while avoiding any negative consequences. PNI are among the many difficult medical conditions that have yet to receive first-line therapy. The efficiency of methanolic extracts of *Withania somnifera* roots and *Calotropis procera* leaves in enhancing functional retrieval after mechanically induced sciatic nerve damage was tested in this study at different time intervals. One is control group ($n = 28$) and other two are treated groups with *Withania somnifera*; 25 mg/kg ($n = 28$) and *Calotropis procera*; 100 mg/kg ($n = 28$). To assess and compare improved functional recovery in all groups, behavioral assessments were conducted. ELISA tests were performed on serum samples on the 3rd, 6th, 9th, and 12th days, respectively. For the purposes of measuring molecular markers and histological features, PCR and histopathology were used. Behavioral investigations, ELISA, and other assays demonstrated that *C. procera* leaves showed a statistically significant ($p < .05$) results and increase sensorimotor function restoration.

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Study of The Growing incidence of Resistance to Antibiotics in Pathogenic Bacteria Associated with Patients of General Surgery

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Abstract

Surgery or surgical procedures are medical practices that are used to treat or heal injuries, wounds, pathological conditions of patients that are normally not cured by simple procedures. It also includes other conditions of patients like cutting or suturing of tissues, insertion of implants or tissue grafting etc. Healthcare-associated infections (HAIs) are seen as a global public health threat. It has strong correlation with overall morbidity, mortality and has substantially increased burden on healthcare systems. Pakistan one of the developing country, is also facing the same challenges and there are numerous reports highlighting drug resistance. Scarced data is available on SSIs from the Pakistan and few pilot studies have documented resistance issues being associated with SSIs. Expansion of surveillance, prevention of infection, and antimicrobial stewardship programs are some the steps that can be consider preventing or minimize the spread of resistant strains in surgical patients. In the present study, a total of one hundred clinical wound samples were obtained from DHQ hospital Kohat. *Pseudomonas aeruginosa* (35%) followed by positive *S. aureus* (40%), *E. coli* (15%), *Bacillus alvei* (5%), *Proteus* spp



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(5%), were found to be the predominant agents isolates from the wound sample. All the isolates were identified based on their biochemical tests. Antibiotic sensitivity of all bacterial isolates were tested against (Vancomycin, Ampicillin, Oxacillin, Imipenem, Cefatazidime, Chloromphenicol, Kanamycin, Erythromycin, Clindamycin, Colistine sulphide, Levofloxacin, Cefixime) antibiotic discs. The most effective antibiotic against all the strains is Levofloxacin because it shows the highest zone for all of them. The least effective antibiotic for *E. coli* and *S. aureus* is Colistine sulphide because it shows the lowest zone while for *Pseudomonas* the least effective antibiotic is chloramphenicol. VA, OX, E, and AMP are not effective against any of the strain because they show no zone.

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Mosquitocidal Activity of Indigenous Bacillus Strains Isolated from the Fields of District Kohat

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Abstract

Dengue viruses and malarial protozoa are of increasing global concerns in public health. More than 80% of the global population is at risk of mosquito-borne diseases. Chemical insecticides are highly effective and convenient to use, but they are a potential threat for the environment and all kinds of life on earth. Therefore, the use of biological control agents for the control of insects such as mosquitoes is a safer and sustainable strategy. Bacillus-based biological control agents play a fundamental role in the field of bioinsecticides. Many Bacillus species like *B. wiedmannii*, *B. thuringiensis*, *B. subtilis* are effective against a broad range of insects. Total 30 samples were collected from the local fields of District Kohat. After morphological and biochemical characterization, three bacteria were identified i.e. *B. wiedmannii* strain FSL W8- 0169, *B. wiedmannii* strain TD10 and *B. subtilis*. These isolates were further used for bioassay experiments. Mosquitoes and their larvae were collected from crops and water using different traps like Netting, Pipetting, aspirators, light traps, etc. Bioassay experiment was done to check mosquitocidal activities of the above mentioned isolates. In supernatant, the mosquitocidal activity of *B. wiedmannii* strain FSL W8-0169 was observed to be the highest (72%) followed by *B. subtilis* (70%). *B. wiedmannii* strain TD10 showed the lowest mosquitocidal activity (67%), whereas in broth, *B. subtilis* showed highest activity (69%) against mosquitoes followed by *B. wiedmannii* strain FSL W8-0169 (52%). *B. wiedmannii* strain TD10 showed the lowest activity (45%). From this study, it is concluded that the above mentioned strains can be used as an alternate of chemical insecticide against mosquitoes to control different mosquito-borne diseases.

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Molecular Detection of Mastitis and its Impact on Hemato-Biochemical Parameters and Milk Leukocytes Count in Buffalos of D.I Khan

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Abstract

In Pakistan, buffalos are common livestock playing an important role in the national economy by producing milk and considered primary source of motive power for agriculture and rural transportation. Pakistan is the world second-largest producer of buffalo's milk after the United States. Mastitis is an inflammatory disease of mammary glands of lactating animals (buffalos) that can cause severe decrease in milk production resulting in massive economic losses to dairy owner. The aim of this work was to find out molecular detection of mastitis and its impact on haemato-biochemical parameters and milk leukocytes count in buffalos. Around 98 milk sample of buffalos were tested for mastitis in which 26 are positive via California mastitis test (CMT) collected from buffalos of district D.I. Khan for seropositivity. differential leukocytes counts in milk were calculated by standard counting method. Overall prevalence of mastitis was 28.13% (26/98) via CMT. hematological parameters of seropositive buffalos indicated significant variation ($P < 0.05$) in values of total erythrocytes count (TEC), total leukocytes count (TLC), hemoglobin (Hb) and packed cell volume (PCV) as compared to seronegative buffalos. Out of 98 samples, 26% milk samples were positive for *S. aureus*. 11 *S. aureus* isolates were amplified by 16S rRNA gene based PCR.

Key words: Mastitis, CMT, *Staphylococcus aureus*, PCR.

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Palynological Characterization of Honeybee Floral Species from Khyber Pakhtunkhwa, Pakistan

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Abstract

Melissopalynology is a multifacet and modern field of plant taxonomy. The value of Bee floral analysis is a tool for the construction of past vegetation and environment and its applications in areas like climate change studies, pollen allergy, archaeology, aerobiology, geology, honey analysis and forensic sciences. The architectural complexity of the exine wall, and their use in the studies of plant systematics and evolution to solve the problem of critical taxa. The morphological diversity in pollen grains and simple methods of handling them, make Melissopalynological studies a valuable taxonomic tool. Melissopalynology and conservation status of Bee flora can play an important role in the country's economy in general, by earning valuable foreign exchange and fulfilling our domestic requirements. It can also provide direct and indirect employment to a large number of people and also by supporting a number of herbs based industries production of pollen vaccine, and an assessment of honey quality and source. A detailed study of Bee flora of Khyber Pakhtunkhwa, Pakistan was covered. This information was useful for taxonomists dealing with Bee flora, pollen grains and development of new methodologies. The information on pollen will be useful for, honeybee keeping experts, melissopalynologists, herbalists, medical doctors/immunologists who prepare vaccines from pollen grains. It can also provide direct and indirect employment to a large number of people and also by supporting beekeepers and honey traders. The study will provide new dimension towards further research in the discipline of Melissopalynology, the study may be useful as an addition to pollen flora of Pakistan.

Keywords: *Melissopalynology, Honeybee flora, Pollen, Khyber Pakhtunkhwa.*



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Exploration of Ethnomedicinal Plants Resources and their Practices in Human and Livestock Healthcare in Thal Desert, Punjab, Pakistan

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Abstract

The utilization of plants and plant resources for various ethnobotanical purposes is a common practice in local towns and villages of developing countries, especially in regard to human and veterinary healthcare. For this reason, it is important to unveil and document ethnomedicinal plants and their traditional/folk usage for human and livestock healthcare from unexplored areas. Here we advance our findings on ethnomedicinal plants from Thal desert, Pakistan, not only for conservation purposes, but also for further pharmacological screenings and applied research. Like the rural population of other countries, the local people in deserts also rely on medicinal plant to treat livestock and human diseases may be due to traditional culture, easy availability and cheaper sources. Comparative analysis of this study and their matching with other studies from Pakistan may reflect the novel use of these plants, which can provide a base line for herbal drug development. Scientific and experimental validation of traditional knowledge is necessary to ensure safety and efficacy; therefore, the phytochemical, toxicological and clinical studies on the documented flora are recommended for a better understanding. In the study area, ethnomedicinal plant are also under severe threats, and combined efforts should be made to secure both the plant resources and folk knowledge. In this regard, awareness campaigns, conservation efforts and pharmacological and applied research studies are required.

Keywords: Botanical exploration, Thal desert, Ethnomedicine, Livestock, Healthcare

O-177/ICAZ-2021

Molecular Detection of Brucellosis and Its Impact on Hemato-Biochemical Parameters of Cattle in District Tank

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Abstract

Brucellosis is an important worldwide bacterial zoonotic disease and is caused by Brucella belonging to the family Brucellaceae and order Rhizobiales. In female abortion in the last trimester and developing of fetal membranes (RFM) are the diagnostic signs whilst orchitis and epididymitis are the common characteristics of the disease that occur in males. Brucellosis is considered endemic in ruminants in Pakistan therefore this study is aimed to find out the molecular characterization, seroprevalence and hematobiochemical analysis of Brucellosis in the study area. Blood sample were collected from jugular vein of cattle in EDTA tubes. Sera were separated from blood samples for indirect ELISA for the detection of antibodies against Brucellosis. DNA was extracted from ELISA positive serum samples and analyzed by conventional polymerase chain reaction (c-PCR) using genus and species specific primers. Hematobiochemical analyzer was used to find out hematological parameters. The overall prevalence of Brucellosis was 26.13% (23/88) through indirect-ELISA technique. Hematological parameters of



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seropositive cattles indicated significant variations ($P < 0.05$) in values of total erythrocyte count (TEC), total leukocyte count (TLC), hemoglobin (Hb) and packed cell volume (PCV) as compared to seronegative cattles. The serum biochemical values for alanine transaminase (ALT) and blood urea nitrogen (BUN) in seropositive cattles also increased significantly ($P < 0.05$).

Key words: Brucellosis, Seroprevalence, Hematobiochemical Analysis, Zoonotic

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Genetic Characterization of Stat1 and Ifnar Genes among Covid-19 Patients in Khyber Pakhtunkha, Pakistan

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Abstract

Coronavirus disease 2019 (COVID-19) is a global public health threat throughout the world, caused by severe acute respiratory syndrome coronavirus (SARS-CoV-2). The lack of appropriate medications or treatments to fight effectively against this virus has made this disease dangerous and life-threatening. Different genes are involved in immune responses against COVID-19 infections including the signal transducer and activator of transcription 1 (STAT1) and IFNAR. STAT1 and IFNAR have a crucial role in the Type I interferon signaling pathway that is involved in immune response at the first line of protection against COVID-19 disease. Previously it has been reported that genetic mutations in STAT1 (MIM613796) and IFNAR (MIM 616669) are involved in acquiring COVID-19 infections more frequently than normal individuals. Blood samples were collected from the patients who tested positive for COVID-19 infections from different hospitals in Khyber Pakhtunkhwa, Pakistan. Genomic DNA from the blood samples were extracted using the Phenol-Chloroform method and will be stored at 4°C. Exon-specific primers will be designed for STAT1 and IFNAR genes using Primer3 Plus web software. The DNA samples were then subjected to a polymerase chain reaction (PCR) based amplification of genes. The amplified product was determined on agarose gel electrophoresis. The size of amplified product was 466 bp when compared to 100 bp leader. The PCR product will be sent for sequencing for further analysis.

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Assessment of Socio-economic factors in prevalence of animal diseases in Peshawar

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Abstract

The livestock species play major financial and socio-cultural role for the welfare of rural families, such as food security, foundation of earnings, saving ability, employment, soil fertility, transport, agricultural purchase, and ecological agricultural production. Many risks analysis studies have been conducted to identify the role of various factors in the spread of animal diseases, however very few have accounted for the role of socio-economic factors. The present study was carried out at The Dairy Farm, The University of Agriculture Peshawar, and Ashfaq Dairy Farm Yaqatot Peshawar, Khyber Pakhtunkhwa, Pakistan. The aim of this work is to bond this gap, with the main hypothesis that different socio-economic factors could be valid indicators for the occurrence of different animal diseases like Mastitis, Babesiosis, Liver flock, Anaplasmosis, Diarrhea and Enterotoxaemia, which are the main cause of economic loss. The results obtained from this work show the percentage of increasing cases of different diseases during a period of ten years i-e from 2011 -2020. The highest rate of Anaplasmosis cases during 2017 was



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31% while Babesiosis was reported as 13% during 2014. Similarly, during 2012, Diarrhea was marked as 16%, Liver flock at 68% in 2020, Mastitis 59% during 2016, Theileriosis 49% in 2014, Enterotoxaemia 86% and Pneumonia 12% during 2020. The main causes of these high rate of disease are due to mismanagement, unemployment, poor water distribution, carelessness, and unavailability of proper treatment in time. This result of this study can be used for better management of livestock and taking preemptive measures to reduce the risk of different diseases. The information obtained from this research work will also be useful for farmers and local authorities to minimize the risk of different livestock diseases.

Key word: livestock; socio-economic; Anaplasmosis; Diarrhea; Enterotoxaemia

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Control of Nematodes (*Meloidogyne Incognita*) in Common-Bean Plant by *Trichoderma* Species Isolated from the Fields of District Kohat

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Abstract

Introduction: Common bean (*Phaseolus vulgaris*) is a member of the family Fabaceae. It contains low fat, high protein content, dietary fibers, and complex carbohydrates. In Pakistan due to various reasons including nematodes infestation the production of common-bean is insufficient. For the control of plant pathogenic nematodes *Trichoderma* spp. considered as suitable biocontrol agents. Thus the study was designed to isolate nematocidal strains of *Trichoderma* from the fields of District Kohat against root-knot nematodes. **Methodology:** Total 5 strains were isolated from the soil samples and identified as *Trichoderma* species by microscopic and cultural characteristics. The root-knot nematode was isolated from roots of the infected common-bean plant and identified as *M. incognita*. The *Trichoderma* isolates were tested for nematocidal activity using an in-vitro assay. Based on the in-vitro activity three *Trichoderma* isolates were selected for in-vivo activity and molecular identification. For in-vivo activity the common-bean seeds were treated with *Trichoderma* spore suspension adjusted as 108 /ml. The seeds were sown in pots containing nematodes infested soil (1000 nematodes per pot). **Results:** During the in-vitro study the maximum J2s mortality of 71% and maximum eggs hatching inhibition of 68% were noticed in culture filtrates of *Trichoderma* isolate ISO-03. The filtrates of *Trichoderma* isolates ISO-02 and ISO-05 against J2s were 42% and 21%. While the culture filtrates of *Trichoderma* isolates ISO-02 and ISO-05 have reduced 39% and 18% of eggs' hatchability. The *Trichoderma* isolate ISO-3 was found highly effective in the reduction of galls and egg masses in the roots of common-bean plant and has also been identified as plant growth promoter. In addition, the *Trichoderma* isolates were also examined against the fungal pathogen in dual culture assay. *Trichoderma* isolates ISO-3 has shown significant growth reduction of *R. solani*, *F. udum*, and *A. niger* 75% 73% and 58%. **Conclusion and recommendation:** From the study it is concluded that *Trichoderma* isolate ISO-03 has shown significant toxicity against *M. incognita* during the in-vitro and in-vivo studies. Further, a large-scale study in a greenhouse and field study is required to find the efficacy of the above isolates.



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Palatability of foods Grasses for Livestock of Potohar Plateau Pakistan Fodder Grasses as Ruminants

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Abstract

Indigenous people have been using local grasses for rearing their animals for centuries. The present study is the first record of traditional knowledge of grasses and livestock feeding system from the Potohar Plateau in Pakistan. A snowball sampling method was used to identify key participants. Information was collected from the respondents from six districts of Potohar plateau through semi-structural questionnaire and site visits. The data was analyzed through Smith's salience index and Composite Salience using ANTHROPAC package in R software. On the whole 61 grasses were recorded from the study area: most of them belong to the Poaceae family (52 species). Based on palatability grasses were categorized into three major groups i.e. (A) High priority, (B) Medium priority and (C) Low priority. Species in Group A, abundantly present in the study area represent a source of highly palatable forage for all ruminants. 232 (141M +91W) local participants were interviewed. Participants were grouped into three major age categories: 20–35 (48 participants), 36–50 (116 participants) and 51–67 years old (68 participants). ANTHROPAC frequency analysis confirmed the Smith's salience index and Composite Salience; *Cynodon dactylon* was the favorite species (6.46 SI, 0.6460 CS) followed by *Cymbopogon jwarancusa* (5.133 SI, 0.5133 CS) and *Sorghum* sp. was the third most salient species (5.121 SI, 0.5121 CS). Grasses were mostly available during the months of August and October and had also ethnoveterinary importance. This document about the traditional feeding of livestock in Potohar Plateau can underline the importance of conserving a traditional knowledge, which was poorly documented before many studies throughout the world highlight the diverse and abundant use of grasses and sedges as fodder; grasses and sedges are generally reported to be palatable and highly productive resources and to have high forage potential especially in arid and semiarid areas.

Key Words: Grasses, Fodder, Ruminant, Livestock

O-182/ICAZ-2021

Prevalence of Alzheimer Disease in Nowshera District.

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Abstract

Alzheimer's disease is the memory lose in which human lose their memory and cannot remember something. In this research I will study the prevalence of Alzheimer's disease in Nowshera district. I will search the Alzheimer's patient and collect data from them, that determines the prevalence of Alzheimer's disease in Nowshera district. In this research I will find that what thing or what situation make the Alzheimer's disease, I also find their signs and symptoms and causes. Many people don't know that they have Alzheimer's disease, I also realized that those have Alzheimer's disease and prevent *them self*, or start treatment in initial stage. In this thesis I search 80 patient in district Nowshera, in which 61 are female and 19 are male. The prevalence of Alzheimer's disease is increase with age and due to tension, stress, obesity, diabetes, low of education, social problem and smoking



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The Prevalent Complications Associated With Hemodialysis

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Abstract

Hemodialysis is a treatment to filter wastes and water from people whose kidneys are failing. But along with the procedure there are certain complications. The present study investigated the complications and side effects associated with dialysis. Study was carried out at Nawaz Sharif kidney hospital Swat. Data was collected through structured questionnaires from 200 hemodialysis patients. The observed complications were nausea (100%), vomiting (83.7%), headache (82%), pruritus (56%), and muscle cramp (88%). Low blood pressure level (89%) of the total and low level of physical activeness was around 86.7%. It is concluded that dialysis is a treatment of a lethal disease but due to its associated complications it becomes an uneasy treatment for patients. It is important to consider all these complications and work for the improvement of the procedure of dialysis.

Keywords: Hemodialysis, Chronic Renal Failure, Blood Pressure, Body Mass Index, Glomerular Filtration Rate, Peritoneal Dialysis

O-186/ICAZ-2021

Environmental Impact of Biofuel Production from Castor Seed Oil: A Poisonous Plant to Livestock

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Abstract

Environmental concerns and energy crises led to an urge in search of alternative sources of fossil fuel. In this scenario, biodiesel has appeared as one of the emerging renewable alternative sources of petro-diesel. Besides a variety of potential edible feed stocks, non-edible plant oils can be a suitable substitute of edible seed oil in biodiesel production from economic perspective, because castor seeds are poisonous to human and animals as well. In current study, *Ricinus communis* seed oil was selected as feedstock for biodiesel production. The oil content of dried seed was found to be 40.3% mmKOH/g. The high FFA level was reduced by two-step transesterification (Pre-treatment) to less than 1%. The pretreatment was carried out with an acid catalyst (1% w/w H₂SO₄) at 50°C for 1 hour. The mixture was allowed to settle down for 2 hrs after the completion of reaction. After esterification, the transesterification was performed with heterogeneous MgO nanocatalyst at 1:5 methanol to oil molar ratio, 65°C, 2 wt. % catalyst and 600 rpm agitation rate. Under optimum conditions, methyl esters (FAME) yield was 97%. Based on physicochemical properties of FAME produced from *Ricinus communis* seed oil is a recommendable environmental friendly feed stock for biofuel

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Biological Activities of Crude Extract and its Derived Fractions Obtained from *Cenchrus Biflorus* L.

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Abstract

Cenchrus biflorus is a common medicinal plant widely used against numerous infectious diseases. The agrochemical potential of methanolic extract, n-hexane, chloroform, ethyl acetate, aqueous and n-butanol fractions were assessed to measure the antibacterial, antifungal, insecticidal and antiplasmodial activities of the plant. The crude, chloroform, and n-butanol soluble fractions showed excellent activities against *Escherichia coli*, *Styphilococcus aureus*, *Salmonella typhi*, and *Klebsiella pneumonia* and *Pseudomonas aeruginosa* but have no activity against *Staphylococcus aureus*. Similarly the crude, n-hexane, and chloroform fractions were also found to have significant activity against fungal strains including *Fusarium oxysporium*, *Aspergillus niger* and *Aspergillus flavus* and *Alternaria alternata* have no activity against *Aspergillus niger*. Chemical pesticides have shown very good results at the beginning, but with the passage of time the need was realized to use the natural plant sources for the safe control of insects. Similarly *Cenchrus biflorus* have also positive effect against plasmodium growth. The current study will provide minor contribution towards it. High mortality rate was recorded for the crude extract and chloroform fraction against ants. From our experiment it is informed that *Cenchrus biflorus* may be used to treat bacterial and fungal diseases and also as insect repellent and it is also possible to isolate antibacterial, antifungal, insecticidal and antiplasmodial drug from this plant.

O-192/ICAZ-2021

Algal Biomass Organization as Bioenergy; an Integrated Biodiesel and Bioethanol Production

Farhana Bibi, Dr. M. Ishtiaq Ali

Abstract

Global issues such as deprivation of fossil reserves and environmental pollution are common concern worldwide. The production of bioenergy can sustain the energy-environment nexus, as well as replaces fossil fuels as feedstock thereby leading to a cleaner and greener environment. Our study aims to describe the importance of microalgae in achieving the global target of sustainability through integrated production of biodiesel and bioethanol. In this study, Box-Behnken statistical design (BBD) of experiment has been utilized to optimize growth parameters (N-conc., Temperature and pH) for high biomass and lipids accumulation of indigenous microalgae *Tetradesmus nygaardii*. The results show that high level of parameters favors high biomass production (543mg/L) while lipids accumulation was found maximum (272mg/L) with low level of parameters. The Response surface methodology (RSM) was utilized to find out the effect of parameters interaction on biomass and lipids accumulation, which assessed interaction AC (N-conc. and pH) as the strongly affecting interaction towards higher biomass and lipids production. Synthesized biodiesel properties were found in accordance with ASTM D6751 and EN14214 standards of biodiesel specification. The de-oiled algal biomass was subjected to *Saccharomyces cerevisiae* based submerged fermentation for bioethanol production. The carbohydrates content of optimized biomass was observed as 59%, with 29.8 gL⁻¹ of fermentable sugars after acid catalyzed saccharification. The bioethanol yield was estimated as 51.3% g ethanol/g glucose. These results demonstrate the potential of *Tetradesmus nygaardii* to produce high lipids and biomass as a promising feedstock for integrated production of biodiesel and bioethanol.



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Animals as vectors for pollen grains & seed dispersal

Jamil Raza

Abstract

Birds provides great services to maintain natural ecosystems in different parts of world. Mutualistic relationship of plants and birds give economically more benefits to humans in the form of high yield crop production. Pollination services, provided by birds and other mammals are very important for the ecosystems. Plant eater birds, rely on plants as food source. These birds consume seeds, nuts, fruits, pollen and nectar, as a source of food. Many birds rely only on flowers rather than the whole plants. Birds gets protein source from pollen grains while use nectar as a source of sugar. Mostly, those birds which rely on bloomed flowers only confined to mainly tropical parts of world, where flowers are in bloomed throughout the year. Mostly hummingbirds use their thin bills to obtain nectar as source of sugar. Several hummingbirds have especial elongated or curved bills, which allow these birds to feed on specific flowers. These birds are natural vectors which carry pollen from flower to flower in their bills and plumage, pollinate the plants. Plant species of temperate zone more or less 78% rely on animal pollination while in the tropical areas up to 94% dependence of animal pollination. Some mammal species visit flowers to feed on pollen grains and nectar, as primary diet or an opportunistic manner. And some frugivorous mammals are helping in dispersal of seeds, by mutualistic interaction. Plants provide fleshy fruits to these mammals and in return the mammals eat fruit disperse seeds form main source of plant. Over all the world, 70% of important crops rely on the animal pollination. Ecological services by animals as vector for pollen and seeds dispersal are immense important for ecosystems.

Key words: Animals, pollination, ecosystems, plants, birds

O-196/ICAZ-2021

Biofuel by Product as A Livestock Feed

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Abstract

Energy demand is increasing day by day all across the world due to growing energy crises and environmental changes. In the current scenario of energy and climate change, the pursuit for alternative energy sources is very important to minimize the use of fossil fuels. Biodiesel as an alternative source provide a potential solution to present-day problems like fuel crises and environmental pollution. At present, second generation feedstock is being utilized by global fuel market and relies mainly on non- edible seeds as feedstock for biodiesel production. Some common biodiesel feedstock used in Pakistan, USA and Europe are *Jatropha*, *Ricinus* and *Pongamia*. Biodiesel by-product have an adequate influence on the feed market contributing to 8-9 million tons of protein meal output per year. The by-product obtained after extraction of oil from non-edible feed stock for biodiesel synthesis has economically displaced traditional feed components and hence is an essential and valuable element of the biofuel sector and global feed market. Oil cake is rich in protein and its residues are valuable feedstuff for all farm animals. Also, residues contain some major and minor components such as carbohydrates, proteins, minerals, fibers and some lipids. Therefore, oil cake is considered to be a significant source for animal feed, is used in egg production by chicken since oil seed cake is used as their feed.

Keywords: Alternative energy, Biofuel, Non – edible seeds, Oil cake.



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O-201/ICAZ-2021

Balancing competing interests of land and fire-beekeeping in Southern Pakistan

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Abstract

Across the globe, wild bees are threatened by ongoing natural loss of habitat, risking the survival of annual agriculture production and biodiversity of plants. The study will be conducted in many agro-ecological zones of Southern Pakistan. Information's about honey seasons, productions, flora of particular area and climate will be collected. Socio-demographic profiles of beekeepers, knowledge, materials and product yields data will be generated through a cross-sectional household survey and literature review captured the nectar production potential of *the species*. Beside the economic and ecological application of wild bees and many species of plants are now managed for pollination purposes in globe, somewhat is known about how land, fire usage and beekeeping practices combinedly effects gene flow. Using *Apis mellifera* as a model organism, containing both managed and wild species that are assumed to be particularly capable to habitat loss, here examine the main drivers of tropical flow of gene in honeybees. Study will shows the most importance of beekeeping practices in shaping the patterns of genetic distinction across bee species. Additionally, study will exhibit that most of honeybee species maintain high gene flow across different kinds of landscapes. This study will be assessed the income generating potential of farmers through increased honey production in Southern Pakistan. Increasing number of hive products will be accidental upon achieving the proper combination of hive type, composition and the crop foraged by honeybees. The study will shows that adoption of hives new technologies should be driven by the beekeepers' skill-level and financial capacity. For beginner beekeeper the use of traditional hives should be increased so that to reduce their amount and to increase the opportunity to acquire the suitable expertise in bee handling. It should be suggested that future efforts to preserve wild tropical bees should focus on regulating beekeeping practices to maintain natural gene flow and enhancing honeybee habitats, prioritizing species showing a limited dispersal capability.

O-203/ICAZ-2021

Antibiotic Susceptibility of Microflora Extracted from All-Male Tilapia (*Oreochromis Niloticus*) in Pakistan

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Abstract

Aquaculture is an emerging field of interest because it is the fastest-growing food production sector globally. Nile tilapia, *Oreochromis niloticus*, is one of the most important and inexpensive fish. All male tilapia is a mono-sex culture and they have a higher growth rate and disease resistance power than female tilapia. The purpose of this study was to isolate the bacterial pathogens infecting all-male tilapia (*Oreochromis niloticus*) and to determine their susceptibility to antibiotics (Ampicillin, Amoxycillin, Gentamicin, Florfenicol, Nalidixic acid, Erythromycin, Kanamycin, Nitrofurantoin, Neomycin and Oxacillin) of fish bacteria in Pakistan. Forty-eight healthy fish samples were collected and bacterial strains were isolated from fish skin and gills. The bacterial strains were identified by their



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morphological characteristics and biochemical testing. The isolated bacterial strains were *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Klebsiella pneumoniae* and *Enterococcus*. The antibiotic susceptibility of identified bacteria was determined by the Kirby Bauer disc diffusion method. All isolates were susceptible to seven antibiotics out of a total of ten antibiotics. All bacterial strains were resistant to Oxacillin. To the best of our knowledge, this is the first study to identify the bacterial strains from healthy fish and determine their antibiotic vulnerability in Pakistan. It will help us in the future management of fish diseases in the country.

Keywords: Nile tilapia; Mono-sexual; Antibiotic Susceptibility.

O-205/ICAZ-2021

Epidemiological Studies of Polycystic Ovarian Syndrome Subjects In Hospital Population of Gujranwala City

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Abstract

Polycystic Ovarian Syndrome (Pcos) Is A Common Women's Disease Of Reproductive Age. Those Suffering From Pcos Experience Menstrual Cramps, Acne, Obesity And Excessive Hair Growth. The Present Study On Epidemiological Studies Of Polycystic Ovarian Syndrome Was Carried Out In Dhq Gujranwala. The Aim Of This Research Was To Estimate The Prevalence And To Find The Genetic And Environmental Risk Factors Of Pcos. The Study Was Descriptive And Based Upon 500 Pcos Patients Aged From 12 To 45 Years Whose Data Was Collected Through A Standardized Questionnaire. Overall, The Results Showed Highly Significant Values (P<0.05). The Mean Age At Diagnosis Was 26 ±1.26 Years. Most Of The Patients Were Obese. The Highest Percentage Of Patients (24.60%) Was Observed In The Category Of Skilled Non Manual, 69% Of Patients Were Married And 48% Of Patients Were Cousins. Mothers Of 6.4% Of Patients Had Pcos And 93.6% Of Patients' Mothers Don't Have It. Hyperandrogenism, Dyslipidemia, Anxiety, Diabetes Mellitus, And Cardiovascular Disease As Allied Diseases Manifested Very Small Percentage. In Addition To This, 59.78% Of The Patients Had Gestational Diabetes. Also, 43.2% Of Patients Have Primary And 56.8 % Have Secondary Infertility. This Study Depicts That The Prevalence Of Pcos Needs Eradicating Plans From District Gujranwala.

O-206/ICAZ-2021

Prevalence Of *Giardia lamblia* In Children Of Peshawar.

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Abstract

Giardia lamblia is a water-born protozoan that infects intestinal tract causing infectious gastroenteritis. In developed countries, Giardiasis account for 2-7% of all diarrheal illness. Clinical manifestation of Giardiasis can be variable ranging from asymptomatic to acute or chronic diarrheal diseases. The present study was conducted to determine the age, sex and month-wise prevalence of *Giardia lamblia* in children aged 1-12 years from April to September 2018. A total of 150 children were enrolled in the study. Stool samples were collected and analyzed for parasite presence using microscopy. Out of 150 samples *Giardia lamblia* was detected in 6 (4%) cases. Prevalence was higher in children with aged 5-8 years (6.1%) compared to other groups. Male children were more infected



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(4.2%) as compared to female children with a Prevalence rate of (3.2%) respectively, but the difference was not significant. Different seasons also affected the Prevalence rate of *Giardia lamblia* being more prevalent in summer. The higher Prevalence rate of 11% was observed in the month of August followed by 8.3% and 4.3% in the months of July and September respectively. The lowest rate was recorded in month of April 2018 and September 2018, 150 children were randomly selected. A stool sample with socio-demographic data was collected from each child. Climate change and population growth are also predicted to increase both malnutrition and the prevalence of these parasites in children.

Keywords: *Giardia lamblia*, Prevalence, Stool, Children, Parasite, Study

O-209/ICAZ-2021

Histological Evaluation of Selected Organs in Major Carps Exposed to Phenolic Compounds

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Abstract

The present study was carried out to investigate the cytotoxicity and histopathological alterations in various organs of major carps exposed to varying concentrations of Phenolic. Fingerlings of fish procured from fish seed hatchery Satyana Road Faisalabad and brought to the Department of Zoology, Government College University Faisalabad, where fish fingerlings were acclimatized for 15 days. Previously determined LC₅₀ (25.09 mg/L) was applied. The fingerlings were divided into two groups i.e. control and experimental. The three sub-lethal doses of phenol were made as T-1 (40%), T-2 (60%) and T-3 (80%) and applied for the duration of thirty days. Several morphometric and water quality parameters of aquaria were determined. WQPs were altered significantly ($p < 0.005$) as compared to control group. Maximum alterations in growth parameters such as weight, fork length and total length were observed in T-3 containing aquarium. Maximum mean weight gain (g) was recorded for *Catla catla* (5.74 ± 0.26) and minimum for *Cirrhinus mrigala* (3.10 ± 0.41) in experimental groups. Control group showed highly significant ($p < 0.05$) increase in weight of *Catla catla* (8.04 ± 0.40 g), *Labeo rohita* (7.22 ± 0.14 g) and *Cirrhinus mrigala* (6.98 ± 0.78 g) as compared to experimental groups. The value of fork length and total length (cm) of *Catla catla* (3.2 ± 0.16) (3.0 ± 0.66) was found maximum and minimum for *Cirrhinus mrigala* (2.1 ± 0.16) (1.5 ± 0.50). In liver maximum histopathological alterations were pragmatically viewed as dilated and congested central vein, damaged sinusoids, hypertrophy, vacuolization and dysplasia of hepatocytes as well as several anomalies in the intestine of selected fish species were recorded such as necrosis and erosion of villi, degeneration and expansion of villi was also recorded. *Cirrhinus mrigala* was more sensitive with respect to growth parameters and histopathological alterations in its various organs as compared to the other species. Conclusively histopathology performed the reliable role for the evaluation of environmental pollution.

O-210/ICAZ-2021

Impact of monoterpenoids supplementation on growth performance, nutrient digestibility and body composition in *Oreochromis niloticus* fed *Moringa oleifera* leaf meal based diets

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Abstract

With the increasing world population, the demand for fish is growing, thus there is need to identify dietary products beneficial for fish production. The aim of this study was to determine the effect of two monoterpenoids



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carvacrol and menthol on the growth performance, nutrient digestibility and body composition in Nile tilapia *Oreochromis niloticus* fed *Moringa oleifera* leaf meal (MOLM) based diets. Beside basal diet (control), nine experimental diets supplemented with graded levels of carvacrol and menthol at 200, 300 and 400 mg/kg individually or in mixture (1:1) were fed to the fingerlings (6.55 ± 0.03 g). Monoterpenoids supplementation resulted in significantly ($P < 0.05$) better growth, feed utilization and nutrient digestibility in comparison to the control group. The highest growth, feed efficiency and nutrient digestibility were observed in fish fed the diet supplemented with 200 mg/kg carvacrol and menthol mixture. In general, fish fed diets with monoterpenoids had significantly higher protein and ash, but lower lipid in comparison to the control group. Our results showed that dietary carvacrol and menthol promoted growth, feed efficiency and nutrient digestibility in Nile tilapia when supplemented either individually or in mixture, and suggest as the optimal supplementation a carvacrol and menthol mixture (1:1) at 200 mg/kg.

Keywords: moringa leaf meal; monoterpenoids; carvacrol; menthol; *Oreochromis niloticus*

O-212/ICAZ-2021

Identification of Anticancer potential of Camptothecin loaded into Graphene Oxide based hydrogel for on site delivery against colon cancer (HCT-116)

Saira Mansha, Amna Sajjad, Aniq Zarbab, Asma Shahid

Abstract

Colon cancer (CC) is the 3rd most frequent malignancy in terms of incidence and 2nd in terms of mortality. Polymer-based drug delivery systems have been considered for many years for controlled and targeted drug release for cancer treatments. In this study we aim to develop an effective, biocompatible and biodegradable co-polymer injectable hydrogel based on chitosan (CS), polyvinyl alcohol (PVA), and Graphene oxide (GO) chemically cross linked and impregnated with Camptothecin (CPT) for safe and effective in vitro colon cancer treatment. The prepared hydrogels were characterized by FTIR and SEM. Through FTIR we examined intermolecular hydrogen bonding between functional groups of different polymers employed in hydrogel preparation and physical properties were analyzed by scanning electron microscopy (SEM). Swelling studies were performed. The in vitro drug release kinetics exhibited time-dependent drug release from hydrogels and the maximum drug release was 97.34% after 6hrs. CS-PVA-GO hydrogel loaded with CPT as an anticancer drug were used against the colon cancer cell line (HCT-116). CPT alone and CPT loaded on CS-PVA-GO hydrogel significantly decreased the viability of HCT-116 cells. The present work emphasizes that Graphene oxide-based hydrogels loaded with CPT could be an encouraging candidate for colon cancer (CC) treatment.

O-213/ICAZ-2021

Health risk assessment of hazardous heavy metal contaminated *Oryza sativa* and *Triticum aestivum* grown with four different irrigation systems near Lahore, Pakistan.

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Abstract

Carcinogenic and noncarcinogenic effects have been caused by persistent heavy metals. Heavy metals may take part in human food chain from his dietary source. This study was aimed to find the health risks associated with As, Cd and Pb contaminated *T. aestivum* and *O. sativa* consumption. This study was also designed to assess the effect of irrigation system on heavy metal accumulation by these food crops. Samples of soil along with their relative crop (*T. aestivum* and *O. sativa*) have been collected and analyzed from four different irrigation systems i.e. Ground water(GW), river Ravi water(RW), domestic wastewater (Dom.WW) and drain wastewater (DR. WW). It has been observed that GW irrigated food crops has least health risks. While, industrial drain irrigated crops produce highest risk to human health. The consumption of *T. aestivum* and *O. sativa* by adults produce high health indexes as 1.91, 2.64, 4.98 and 8.78 and of *O. sativa* as 4.05, 6.81, 10.14 and 12.52 with GW, RW, DomWW DrWW irrigation systems respectively. While, ingestion of same amount of these crops by child health risks increase significantly. Data regarding all health indexes exceeded the threshold (1). While, these dietary stuffs also produce significant carcinogenic effects in humans.

Key words: Health risk assessment, *T. aestivum*, *O. sativa*, heavy metals, toxicity

O-217/ICAZ-2021

Acute toxicity of Variable doses of dietary ZnO nanoparticles on blood chemistry of mono sex *lapia niloticus*

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Abstract:

The study estimates the impact of different doses of ZnO nanoparticles on hemotoxicity and serum analysis of mono sex *Tilapia niloticus*. During experimental work, LC₅₀ values for mono sex *Tilapia niloticus* were estimated. Nano zinc oxides were synthesized by the co-precipitation method. Characterization of synthesized NPs was determined by SEM and XRD. In these experiments, nano zinc oxides (42nm in size) of 150mg, 300mg, and 450mg were mixed per kg food with a specially prepared diet. Fish were fed at 3% of their body weight for fifteen days in four different groups, one for control and the other three for experimental purposes. Results revealed that RBCs, WBCs, platelets cells, and haemoglobin counts were lowest at high concentration of ZnO NPs (450 mg/kg). But decreasing the concentration of ZnO NPs RBCs, WBCs, platelet cells and haemoglobin counts were found increasing. With increasing the dose of ZnO NPs lymphocytes, HCT counts were measured low but the number of monocytes, PCT, and MCV was gradually increased. At a low dose of Zinc oxide nanoparticles, no effects on MCH and MCHC were found, but at high concentration (450mg/Kg of ZnO NPs) number of MCH was found to be increased. Acute toxicity was observed with reference to kidney and liver through serum analysis. With increasing the dose of ZnO NPs cholesterol level, albumin, creatinine, SGPT (ALT), and alkaline phosphate were gradually increased. Triglycerides, proteins, and SGOT (AST) increased with increasing the ZnO NPs concentrations but at high concentration, their levels decreased. The results were statistically found significant (p<0.05). These nanoparticles cause damage to fish growth by increasing their dose in their diet.

Keywords: Zinc Oxides NPs, Mono sex *Tilapia niloticus*, Haematology, Serum analysis



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O-218/ICAZ-2021

The Negative Effect of Climate Change on Animals

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Abstract

Climate change due to global warming, which has been showing its effect seriously in recent years, has negative effects on animals. Irregular changes in the precipitation regime and the corresponding increase in temperature cause the destruction of animal fodder pastures and wetlands. The experienced climate change has negative effects especially on animal distribution, migration, behavior and nutrition. Increases in temperatures adversely affect the health and welfare of animals. The decrease in air humidity with the lack of precipitation leads to the occurrence of some diseases on the animal. Along with climate change, some negativities are seen in animal behavior. Birds start to lay eggs earlier than normal time. Birds migrate earlier and some bird species give up their tendency to migrate in some countries due to global warming. Mammals begin to emerge from hibernation earlier. This situation affects their physiological behavior negatively. Due to global warming, the rise in sea level causes the disappearance of beaches, which are the nesting areas of sea turtles. Warming of sea water has led to the extinction of some turtle species. Research has shown that melting glaciers in polar regions negatively affect the lives of polar bears and penguins. Droughts cause extinction of insect species living in the soil. Studies have shown that increases in greenhouse gas emissions lead to the extinction of animal species and their extinction. Measures to be taken to reduce global climate change will also reduce the negative impact of animal species and age.

Keywords: Climate Change, Global Warming, Animal Life.

O-219/ICAZ-2021

Determination of virulence factors related to nosocomial infections-associated multi-drug resistant *Acinetobacter baumannii* through next generation sequencing

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Abstract

In the present era, resistance of human pathogens to antimicrobial agents has prevailed so much that it is posing serious health threats. Some pathogens are resistant to multiple drugs at a time and can cause deaths. Some organisms are even showing resistance to last resort drugs. There are several bacterial isolates that are becoming less sensitive to all available drugs including nosocomial infections-associated *Acinetobacter*. *A. baumannii* is an important clinical species that is associated with hospital acquired infections. *A. baumannii* has adapted several resistance mechanisms and various pathogenic and virulence factors are contributing to increase its pathogenicity. To resolve this mystery of virulence, we performed next generation sequencing for samples taken from Armed Forces Institute of Pathology, CMH Multan, Pakistan. The obtained data was run through bioinformatics pipeline. Analysis of *A. baumannii* genome led to the determination of several virulence determinants. The virulence genes belong to different categories *i.e.* enzymes, proteins and biofilm formation. Some drug target genes were also identified that play a vital role in increasing pathogenicity of *A. baumannii* isolates. This identification of pathogenic islands will help in the development of proper protocols and procedures to prevent and cure lethal diseases caused by this pathogenic bacterium. Determination of pathogenicity islands can be a key factor in preventing severe nosocomial infections.

Keywords: Nosocomial Infection, *Acinetobacter baumannii*, Multi-drug Resistance, Next Generation Sequencing, Pathogenicity Islands, Computational Biology



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O-220/ICAZ-2021

***Chlorella Vulgaris*: A potential source to treat fertilizer industry wastewater**

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Abstract

The fertilizer industry waste water contains a huge amount of toxic pollutants that pose severe health effects on human and aquatic life. Several expensive treatments for decontamination of wastewater are available but still waste water quality seemed unable to reach allowable discharge limit. In recent times, phycoremediation has emerged as a potential method for treating wastewater coming from different industries. Present study investigated the potential of locally isolated *Chlorella vulgaris* strain (ZAA1) for the treatment of waste water effluents from fertilizer industry. The cultivation of microalgae was performed using BG-11 media under continuous light (4000 lux) and constant aeration for 7 days. Physiochemical analysis of wastewater such as pH, electrical conductivity, total dissolved solids, biochemical oxygen demand (BOD), chemical oxygen demand (COD), phosphates (PO₄²⁻) was determined by using standard methods of APHA (American Public Health Assessment) while cadmium quantification was done by atomic absorption spectroscopy at 0 day without algal culture and at 7th, 14th and 21st day interval period after treatment of 100%, 75%, 50% and 25% wastewater with *Chlorella vulgaris* ZAA1. The results of study showed significant enhancement in the dry biomass, cell count and chlorophyll content of locally isolated *Chlorella vulgaris* occurred at BG-11 media and 25% wastewater dilution due to low amount of heavy metals and toxic compounds and maximum growth was observed at 21st day as compared to water control. While low growth of microalgae appeared in high concentrated (100%, 75% wastewater) as compared to BG11 media. Significant decline in pH and EC was observed after 21st day of treatment. Maximum reduction in BOD, COD and phosphate was noticed in 25% fertilizers industry wastewater dilutions after 21 days. According to the our results, *Chlorella vulgaris* resulted in a gradual decrease in cadmium concentration in wastewater samples from day first to 21st. Taken together, low concentrated (25%) wastewater of fertilizers industry can be used as a cost effective source for microalgae growth and *Chlorella vulgaris* ZAA1 has a potential to phycoremediate toxic containments and heavy metals particularly Cd²⁺ present in wastewater.

Keywords: Microalgae, Fertilizers Wastewater, Cadmium, Phycoremediation, Biological Oxygen Demand, Chemical Oxygen Demand



Poster Presentations

P-08/ICAZ-2021

Control of cystic echinococcosis: current and future prospective

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Abstract

Echinococcus (E.) granulosus cause cystic echinococcosis (CE) or hydatidosis in canids and ungulates. It is a neglected zoonotic disease causes severe economic losses by diagnosis, treatment cost and follow-up in public health while low productivity and viscera condemnation in livestock sector. Control with decline in transmission to human, is a real goal. Human CE cases get more attention from clinician but for definitive control, their coordination with veterinarians and policy makers is required. Control measures need good personal hygiene, avoid ingestion of sheep viscera by dogs, deworming, vaccination of intermediate and definitive host, reduce dog population, better health education and chemotherapy. Recurrence issues need prolonged patient follow-up like cancer patients. Surgical methods help to resect cyst while non-surgical are palliative treatments. Control of CE in future is a challenge due to lack of effective strategies and vaccine efficacy in definitive host i.e. canine to intercept the transmission chain to humans. Technological improvements are made in the diagnosis of canine, genetic characterization of strains and vaccination in animals since introduction of present and past control campaigns. But there is a need of active surveillance seeking for human CE cases as a requirement in every control and prevention programme.

P-09/ICAZ-2021

Probiotic therapy: an emerging managemental strategy for parasitic diseases

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Abstract

Probiotics are live microorganisms usually some strains of beneficial bacteria like Enterococcus, Lactobacillus, Bifidobacterium or yeast, when dispensed in appropriate amount render health benefits to host. They inhibit growth of harmful bacteria like E. Coli, Salmonella and Colistridium perferingens and manage gastrointestinal disorders, respiratory infections, allergic symptoms, bacterial, viral, enteric and non-enteric parasitic disease by general mechanism of immune modulation, anti-inflammatory properties and enhancement of mucosal barrier integrity. Chemotherapeutic treatment in such cases unbalance the natural flora of gut and cause drug-resistance. Probiotics modulate immune response by maintaining the tight junctions of intestinal cells, prolonging their survival by induction of IgA and β -defensine, producing fatty acids, lactic acid, acetic acid and proteases that inactivate the bacterial toxins. They compete with pathogens, reduce host-pathogen interactions, interfering their attachment to intestinal mucosa and stimulate mucus production results in improved clinical signs, reduced inflammation, time of gastrointestinal symptoms and parasite load like parvovirus, hydatidosis, giardiasis, Eimeria, Cryptosporidia and helminths etc. The efficacy of probiotic depends on the active agent used, dose and pattern of dosing, characteristic of host and underlying luminal microbial environment or any infectious condition. It is cost



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effective alternate therapeutic or preventive approach and researchers need to address exact molecular mechanism, best probiotic, their combination and dosage.

Key words: Probiotics, Parasite management, Veterinary immunology

P-13/ICAZ-2021

Melatonin via p53/Ubc13 pathway ameliorates the cardiotoxicity produced by Bisphenol A

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Abstract:

Bisphenol A (BPA) component of various household items is toxic for human health. BPA by producing the reactive oxygen species causes different defects in neuron, development, metabolism, reproduction, and cardiovascular system anomalies. Present study aim is to evaluate BPA induced cardiotoxicity by Ubc13 & p53 mediated apoptosis and therapeutic effect of melatonin (Mel) against it. BPA. BPA and melatonin were injected subcutaneously into Sprague Dawley rats with the dosage of 100 µg/kg BW, and 4 mg/kg BW, respectively. The liver function test, lipid profile, oxidative profile, and anti-oxidative profile shows the toxicity of BPA in cardiac tissues which was decreased by treating with the melatonin. The expression of dnm11, p53 upregulated modulator of apoptosis (PUMA), and p53 were upregulated in BPA treated group, while Ubc13 expression was downregulated which was confirmed by qRT-PCR and western blotting. Melatonin showed its therapeutical potential by upregulating the Ubc13 and downregulating the expression of apoptotic proteins dnm11, PUMA, and p53. The results of current study showed that melatonin exerts its therapeutic effect against BPA induced cardiotoxicity via p53/Ubc13 pathways

P-14/ICAZ-2021

Larvicidal Activity of Honey Bees Propolis and Allium Sativum Extract Mixture against Wax Moth

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Abstract:

There are a different chemotherapeutic and management practices exercised to minimize the effect of wax moth. However, using pesticides cause several problems to beekeepers and bees. There are no chemotherapeutic agents registered and used against wax moth. In fact, it is only management practices that are recommended as remedy for wax moth control. The aim of this work was to investigate the larvicidal activity of honey bees propolis and Allium sativum extract mixture against larvae of wax moth.

Methodology: propolis was frozen and homogenized before extraction in ethanol. Allium sativum was collected and dried in a dark until extracted in methanol. Mixture was prepared by mixing both extract in the ratio of 1:1. Larvae were cultured in a plastic cage, in dark area. A contact bioassay was conducted by dipping 10 larvae in an extract mixture for 10 seconds, 20 seconds and 30 seconds. Larvicidal activity of honey bees propolis and A. sativum extract mixture was observed after contact bioassay.

Findings: 100% mortality was observed after 48hrs when larvae were treated for 10 seconds, 20 seconds and 30 seconds. Larvae were found live in control condition.

P-15/ICAZ-2021

Antimicrobial and Antioxidant Potential of Lactobacillus coryniformis BCH-4 Compounds with Bioprotective Properties on Maize (Zea mays. L)

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Poster Presentations

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Abstract

Lactic acid bacteria produce different types of antimicrobial compounds (AMCs) with bioprotectant properties. In recent work, *Lactobacillus coryniformis* BCH-4 antimicrobial compounds were evaluated to control the *Aspergillus flavus* growth in maize. Maize grains treated with 75 to 100 % concentrated bioactive compounds; no fungal growth was noted after 72h incubation with *A. flavus*. Proximate analysis of treatment A1 (raw), A2 (MRS broth + *A. flavus* inoculated grains) and A3 (AMCs + *A. flavus* inoculated grains) showed that moisture contents were increased in A2 as compared to A1 and A3. Whereas the contents of fats, proteins, and fibre ash were decreased in A2 as compared to A1 and A3. Moreover, beta carotene contents were not found to be different in A1 and A3 but decreased in A2. HPLC analysis showed that 2-oxopropanoic acid, 2-hydroxypropane-1,2,3-tricarboxylic acid, 2-hydroxybutanedioic acid, 2-hydroxypropanoic acid, propanedioic acid, and butanedioic acid and these acids showed potent antifungal potential against *A. flavus*. FTIR analysis showed different functional groups; hydroxyl, carbonyl, and ester-groups along with organic and fatty acids, which indicated that other AMCs in addition with organic acids. Conclusively, *L. coryniformis* BCH-4 antimicrobial compounds were found to be best alternative to synthetic preservatives and improved the nutritional profile of food.

Keywords: *Lactobacillus coryniformis*, antimicrobial compounds, maize (*Zea mays* L.), HPLC, FTIR

P-16/ICAZ-2021

(Antimicrobial Effect of *Punica granatum* plant tinctures on *Salmonella typhimurium*: a cause of Avian Salmonellosis)

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Abstract

Poultry sector is suffering very badly by the havocs of salmonellosis in both layer and broiler birds caused by bacteria *Salmonella typhimurium*, which belongs to the family Enterobacteriaceae. Although it affects all the domestic animal species like sheep, cattle, and pigs including humans, but it's capability of infecting poultry species cannot be neglected due to the significant role of poultry sector in the economy. Several pathogenic *Salmonella* outbreaks are affecting thousands of poultry flocks and causing the loss of millions of dollars every year. Different approaches are being employed to cope up in terms of prevention, control, and treatment of avian salmonellosis. The efficacy of antibiotics is decreasing with the passage of time due to the prevailing issue of antibiotic resistance. Among the various combating strategies, one emerging strategy is to harness the extracts and tinctures of a wide range of medicinal plants. In this context, we are hoping that the tincture of a plant *Punica granatum* may show significant antibacterial results against *S. typhimurium* of Salmonellosis. The use of these plant tinctures may be adopted in adjuvant with the already available vaccines against *S. typhimurium*. The huge economic loss due to salmonellosis can be avoided using such plant tinctures which would be helpful addition in dealing with universal problem of AMR.



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P-18/ICAZ-2021

Toxicological Effects of ZnO Nanoparticles on Haematological Parameters of Freshwater Fish *Cirrhinus mrigala* in Pakistan

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Abstract

ZnO nanoparticles' elevated concentrations pose serious hazardous effects for aquatic life and humans. Toxicological effects of ZnO nanoparticles on the haematological parameters of the fish, *Cirrhinus mrigala* were determined after 15 days exposure to nanoparticles. For this purpose, nanoparticles were synthesized by precipitation method and characterized by X-ray diffraction and Scanning electron microscope. Haematological indices viz., RBCs, WBCs, Hb, HCT, MCV, MCH and MCHC were selected as parameters and taken from samples of blood collected through cardiac puncture after each 5 days (0, 5, 10, 15) by using automated cell counter Micro HCT capillary tube and Cyanmethemoglobin. Results showed that all the haematological parameters decreased with the increasing concentrations of ZnO NPs but value of MCV increased with the increase in ZnO NPs whereas, WBCs increased with increasing exposure concentration of ZnO but decrease with increase of exposure duration as the value of WBCs after 5 days of ZnO NPs exposure was observed as 59.15 ± 6.61 g/dl, after 10 days 56.82 ± 5.22 g/dl and after 15 days 55.27 ± 4.40 g/dl. Hence, the study recommends adopting protective measures to protect the aquatic life from harms of nanotoxicity and to assure overall health of environment.

P-19/ICAZ-2021

Antimicrobial Resistance: An Emerging Threat to Poultry Industry in Pakistan

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Abstract:

The poultry industry is one of the most flourishing industry in Pakistan having major contributions in meeting the animal protein requirements of the country. Recently, this industry is facing a heavy disease burden due to the increased prevalence of diseases nationwide. The issue of antimicrobial resistance in poultry is rising due to the increased use of antibiotics as growth promoters. These antibiotics are not only being added to the poultry feed as growth promoters but are also being exploited for the treatment of different bacterial diseases of poultry. Due to improper diagnosis of poultry diseases and the irrational use of antibiotics, this industry is suffering from the issue of multidrug resistance which not only affects animals but also affects humans due to cross-resistance. Effective strategies should be applied to overcome this issue which includes the use of alternatives or substitutes of antibiotics. These alternatives include probiotics, prebiotics, essential oils extracted from different herbal plants, and organic acids. An intensive study on the antimicrobial resistance genes is required for understanding the mechanisms behind antimicrobial resistance. Phage therapy should also be considered to prevent and solve the issue of antimicrobial resistance. Moreover, the use of antibiotics should be limited, and measures should be taken to enhance the immunity of the birds against various prevalent diseases. Further studies should be carried out in order to increase the efficiency of these antimicrobial substitutes against different poultry diseases.

Keywords: Antimicrobial resistance, Poultry, Gene manipulation, antibiotics



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P-23/ICAZ-2021

Microbiological Analysis and Antibiotic Susceptibility of Ascitic Fluid drained from Spontaneous Bacterial Peritonitis patients

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Abstract

(Spontaneous bacterial peritonitis (SBP) is a common and frequently fatal bacterial infection of ascites occurring in patients with cirrhosis. Ascites refer to the pathological assemblage and collection of fluid in peritoneal cavity. The aim of the present study was to investigate the causative agents of ascitic fluid drained from SBP patients and to determine antibiotic susceptibility of bacterial isolates. In recent study twenty five confirm SBP patients were studied. E. coli was the most prevalent species. The percentage of E. coli was 92% followed by Shigella spp (72%), Salmonella spp (68%), Enterobacter spp (60%), K. aerogenes (52%), S. aureus (32%), S. epidermidis (30%), A. israelii (28%), P. aeruginosa (24%), C. freundii (20%) and S. marcescens (08%). A total of six antibiotics were used to check antibiotic susceptibility pattern of bacterial isolates. The antibiotics were Meropenem, Moxifloxacin, Ciprofloxacin, Ceftriaxone, Cefixime and vancomycin. Among used antibiotics Meropenem was highly effective against all tested bacterial species. Meropenem showed maximum zone of inhibition against S. aureus (34mm), followed by A. israelii (33mm), P. aeruginosa (32mm), C. freundii (31mm), S. marcescens (28mm), S. epidermidis (27mm), E. coli (26mm), Salmonella spp (23mm), K. aerogenes (21mm), Enterobacter spp (21mm) and Shigella spp (15mm). It is concluded that gram positive and gram negative MDR bacteria were the most common cause of SBP).

P-24/ICAZ-2021

Role of Halophilic Bacteria in Remediation of Salt-Affected Soils Cultivated with Wheat (*Triticum Aestivum* L.)

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Abstract:

Plant growth promoting bacteria (PGPR) play an important role in promoting or increasing plant growth and development. Halophilic bacteria stimulate plant growth under high salinity by using certain mechanisms such as synthesis of indole acetic acid (IAA), gibberellins (GA), cytokinins (CK), abscisic acid (ABA), solubilization of insoluble phosphate, synthesis and excretion of siderophores, and production of ACC deaminase to reduce high growth inhibitory levels of ethylene occurring in plants at salt stress conditions. In the present study halophilic bacteria was isolated and applied to find their effect on wheat seed germination, seedling vigor and seedling mass under saline conditions. Experiment was designed and different salt concentration (50 mM, 100 mM and 150 mM) were used on wheat with and without bacteria. It was observed that halophilic bacteria significantly reduced salt stress and increased seed germination, seedling and plant growth as depicted by the root/shoot length, plant weight, chlorophyll, carotenoid and protein contents. This research underlined the prospects of application of halophilic bacteria for improved growth and production of wheat under salt stress.



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Key Words: Salinity, Halophilic Bacteria, Plant Growth, Seed Germination

P-25/ICAZ-2021

Development of Filter Paper Coated with Nanoscale Zero-Valent Iron Nanoparticles for Wastewater Treatment

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Abstract:

Water is a fundamental and mandatory compound of our lives. Contamination of water by heavy metals has become one of the major concerns in the recent days. Nanotechnology has emerged as an efficient tool for environmental remediation. Nanoscale zero-valent iron nanoparticles have gained considerable attention due to the facts that they are lesser toxic to human, highly reactive in the adsorption of heavy metals, cost-effective and can be easily synthesized in comparison to other nanoparticles.

In the present study nanoscale zero-valent iron nanoparticles was synthesized using the extract of *Camellia sinensis* plant and their subsequent cotation on filter paper to observe their remediation of wastewater containing copper, cadmium, lead and nickel heavy metals. Experiment was designed and it was observed that filter paper coated with nanoscale zero-valent iron nanoparticles remediated copper 92.3%, cadmium 90.5%, lead 93.8% and nickel 85.6%. This research highlighted the possibilities of the application of filter paper coated with nanoscale zero-valent iron nanoparticles for wastewater treatment.

P-26/ICAZ-2021

Statistical optimization of the microalgae oil-based biodiesel production on its quality & yield by employing lipase based immobilization on CeO₂ nanorods

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Abstract

Biodiesel is a fuel product of chemical or microbial enzymes catalyzed transesterification of oils and fatty acids content of microalgae. Owing to its renewable nature, it is an effective alternative to the diesel and petrol due to its properties as carbon negative ecofriendly substitute of petrochemicals with the ability to produce the lesser GHG emission and sequester loads of CO₂ from environment. Transesterification based on microbial lipases especially in the presence of organic media have several advantages over the typical chemical catalyzed reactions, since these avoid the problems like soap formation, and leads to enhanced lipase stability, feasible down streaming processes and increased yield. This current study focuses on the usage of the immobilized form of the lipase extracted from the *Aspergillus terreus* as a nano-biocatalyst. Microalgae is used as oil source and study focuses on optimization of CeO₂@PDA@*A. terreus* lipase catalyzed transesterification reaction and the assessment of the maximum yield & quality of the microalgal oil based biodiesel produced at the 10% concentration of CeO₂@PDA@*A. terreus* lipase, 35°C temperature at 30hour time and in 0.6% water content with methyl/oil ratio of 6:1. Bodied nanorods by dopamine will be characterized by FTIR spectroscopy, EDX, SEM, and the conversion to biodiesel will be confirmed via GC/MS and FTIR spectroscopy. The cerium oxide (CeO₂) nanorods have tremendous activity for the lipase immobilization since it provides the small spherical but enhanced surface area for



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the immobilization of lipase from *A. terreus*, ultimately leading to enhanced biodiesel production. It also possesses the antioxidant properties so the undesired reaction during transesterification reaction affecting the biodiesel yield and quality. The process is expected to be significant in production of biodiesel with much lower NO_x emission, enhanced cetane index, lower viscosity and the process is environment friendly as the produced biodiesel has much lower GHGs emissions.

P-28/ICAZ-2021

Screening of Selected Plant Extracts for Inhibitory Activity against alpha-glycosidase enzyme

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Abstract

The development of diabetic-specific therapeutics has been limited because of complexity in enzymes involved in glucose metabolism. The evidence suggests that targeting these specific metabolic enzymes could assist in diabetes treatment. Lipase and α -glucosidase are overexpressed in diabetes and inhibition of these enzymes results to control of this disease which could be an important step and has great potential for therapeutic drug developments. In current study, 53 plant extracts library was established and screened to discover novel inhibitors against Lipase and α -glucosidase for diabetes treatment. Here, preliminary screening inhibition data for α -glucosidase and lipase is reported.

P-29/ICAZ-2021

Control of Diabetes Mellitus in Dogs

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Abstract

Diabetes Mellitus is a chronic disease that affects dogs having age between 5 to 12 years, but the susceptibility varies with breed and sex. Breed and familial predisposition have been reported in Samoyed, Miniature Poodles, and Tibetan Terrier breeds of dogs. While it is less commonly found in German Shepherd and Boxer dogs. Only Diabetes mellitus type 1 is reported in dogs as compared to type 1 and type 2 which occur in humans. In type 1 diabetes, insulin deficiency occurs due to the destruction of pancreatic beta cells. Feeding high-fat diets can damage the pancreas and play a vital role in causing pancreatitis in diabetic dogs. The diabetic dogs show polyuria, polydipsia, weight loss, and weakness. Insulin is the definitive treatment of Diabetes mellitus in dogs, but frequent insulin therapy is crucial for the health of dogs. Complications related to diabetes are hypoglycemia (due to incorrect dosing of insulin), ketoacidosis, and cataracts. Long-acting insulins are not suitable for dehydrated animals. To overcome this issue, efficient alternative strategies should be applied such as monitoring the diet nutritionally to decrease the intake of glucose. More insoluble fibers should be added to dog food so that they can improve glycemic control. Moreover, regular exercise and daily walks of the dogs may help in controlling the blood glucose levels.