

*4th International Conference on
Innovative Biological and Public
Health Research*

December 07-08, 2021

ABSTRACT BOOK



Siddiqui & Brothers Chemicals



MESSAGE BY THE VICE CHANCELLOR

Welcome to Government College University Lahore, the leading educational institution in the Indo-Pak Subcontinent, where excellence is nurtured, pursued and celebrated since its inception in 1864. In its 158th year of existence this institution is cognisant of the national importance of enrolment in higher education while retaining its legacy by being supportive to social, academic and research community. Our university's values underpin our vision and mission, and are integral to guiding the implementation of our strategy towards teaching, learning and research. GCU pursues its mission with courage, innovation and pluralism.



We are committed to excellence in academics, research and knowledge exchange. The staff members of GCU demonstrate collegiality and teamwork which act as catalyst in student's lifelong learning.

GCU's academic and career opportunities are balanced with a campus lifestyle with an outstanding array of sports, cultural and social choices by getting membership of more than 50 societies and clubs. All of these elements i.e. teaching, scholarships, academic support, selection of programmes, co-curricular opportunities make GCU different from other institutions. We endeavour to achieve our goals through our distinctive approach in disseminating knowledge based on curriculum, Inter-disciplinary courses, the student experience, research, linkages with the industry and the community.

Through this ethos our students have been and are emerging leaders who have always helped in shaping tomorrow. Our Motto "Courage to Know" challenges both students and staff members to realize their potentials, help in identifying strengths and guide to acquire much needed lifelong learning skills for academic and social interaction.

We aspire to provide learning and teaching experience that harnesses the students to enhance their capabilities and transform their life for the better. Student satisfaction is a huge challenge and of great significance, which assures learner's level of success. The students are encouraged to develop skills which will help them in gaining meaningful employment, further their education or contribute more effectively to the society.

Generations of students, staff and alumni have added on to the repertoire of the Ravian flare, and I am confident that these graduates of today and tomorrow will keep on contributing to the glory of their Alma Mater. The exalted image of this esteemed institution will not only benefit the future students, but also the boundless global community which will be the recipient of gains from GCU's knowledge leadership.

Prof. Dr. Asghar Zaidi
(Tamgha-e-Imtiaz)
Vice Chancellor
GC University, Lahore

WELCOME MESSAGE BY PRINCIPAL ORGANIZER

Dear participants of the 4th IBPHR-2021, I am very pleased and obliged to welcome you to this auspicious conference organized by the Department of Zoology, Government College University, Lahore. GC University, Lahore has been reputed for organizing such conferences that enlighten the young minds and promote the participation of students at scientific and intellectual levels. The marvelous history of GC University along with its endeavors inspires students to reach new heights.



I hope that the 4th IBPHR would be able to achieve its objective in providing an effective forum for the interaction and encouragement of young scholars with the researchers and scientists who are experts in the field of biological sciences across the world. Approximately, 135 abstracts will be presented at the conference in oral and poster presentations. Foreign speakers, eminent delegates, and distinguished scholars from all over the country are also joining us in this event to share their valuable knowledge and vast experience with the scientific community. I hope that deliberations from various eminent speakers will benefit the participants to enhance their knowledge.

I am very grateful for the determination, participation, and efforts of the faculty and staff members of the department of Zoology who have worked hard to make this conference a truly successful event. Dear participants, I wish you a very productive conference with exciting and encouraging discussions and exchange of knowledge so that together we can anticipate a future of groundbreaking knowledge and research.

Wish you a wonderful time at GC University, Lahore.

Prof. Dr. Hafiz Muhammad Tahir
Chairperson/Professor
Department of Zoology
GC University, Lahore

GOVERNMENT COLLEGE UNIVERSITY, LAHORE



GCU Lahore is a modern, demand-driven, futuristic, quality conscious and affordable public university. The University wishes to build its future through internationally recognized research work, scholarship and learning within a distinctive scholarly environment. The University is committed to be a research led institution that values knowledge and learning for their own sake, as well as for the cultural, social and economic benefits it offers. The University has created an environment in which leading academicians engage their pupils in rigorous intellectual activity and focus increasingly on the “learner-centred” approach to education and the promotion of research activities. Our plans embrace three additional strategic directions: institutional collaboration, international links and open-learning to increase flexibility and interaction. The aim is to extend the University's reach and its capacity for research pursuits. GCU creating an environment in which academic excellence can be combined with opportunities for personal development, enabling individuals to make their own future. The GCU respect the academic freedom of all staff members and students. This, believe, is the best means of promoting creativity and generating innovative solutions to problems.

HISTORY

The Government College University, Lahore abbreviated to GCU), is a public university located in the downtown area of Lahore, Punjab, Pakistan. It is one of the oldest university in Pakistan as well as oldest institution of higher learning in the Muslim world.¹Government

College Lahore or simply GCU, is synonymous with Lahore, it is among the first educational institutions that were established in the Punjab. Generations of students have passed through its portals and attained eminent



positions in all walks of life in Pakistan. Although the establishment of a Central College at Lahore was sanctioned in 1856 with the condition that the teachers should be graduates of Oxford, Cambridge, Dublin or Durham, it was not until January 1, 1864 that the college opened its doors in the palace (haveli) of Dhian Singh/Khushal Singh, in Lahore's Walled City. In April 1871 the college moved to a large Bungalow near Anarkali. In 1873 its location was changed to another house called Rahim Khans Kothi. It was in 1876 that the college moved into the present building. The construction had started almost in mid 1872 and was completed in 1877. Situated in the heart of the city, the site is surrounded by main business and administrative areas, schools, colleges and Punjab University old Campus. Presently raised to the status of university, Government College University (GCU) site is located at the junction of the Mall and the Lower Mall and occupies a focal point. The first principal was the famous Dr. G. W. Leitner whose name is closely attached to the College. In April 1871 the college moved to a large Bungalow near Anarkali. In 1873 its location was changed to another house called Rahim Khan's Kothi. When it was decided to move to more suitable premises, a site on an eminence north of the Soldier's Garden (Gol Bagh) was selected, and a 'picturesque building', with a large central clock tower was constructed. That Gothic was the

chosen style for the building is not surprising. Among the first major structures of Lahore, the missionary zeal frequently expressed by the Lawrence brothers (Henry and John Lawrence) no doubt had an impact on the architectural expression of the college.

BUILDING

The building was completed in 1877 at a cost of Rs. 320,000. The main tower is the centre of the GCU main building is marked with an enormous entrance tower—a most impressive element representing the image of Government College. Placed on a 15' high podium, and accessible from the garden by a wide flight of stairs, the tower rises to a total height of 176'. Divided into four distinct storeys, it is terminated in the form of a spire. The battered sides of the octagonal tower carry quaint dormer windows, with its enormous clocks visible from great distances. The classrooms are accessed from a deep verandah which also provides protection from the strong Punjab sun. "Oval Ground" of the University Campus. Oval Ground is the place where Ravians sit, relax, talk, study, discuss, analyze, ponder, and even muse and meditate. Here they make new contacts and explore new ways to manifest their liking for the unknown. The Oval offers them with opportunities to display the dynamic talents they possess. The most prominent part of the building is the Main Hall (now called Dr. Abdul Salam Hall). It consists of a central nave and aisles running along the 4 sides. The nave has double height. The 4 aisles are double storeyed and they form a gallery on the upper floor. The main entrance to the hall is through a porch on the West side. Another entrance on the South faces the Oval ground. This is an arched opening with grand and traditionally carved wooden door. After entering through this magical opening, a passage leads into the hall. Inside the hall, where the aisles cross each other at corners, big rooms have been provided. The hall is a wonderful example of composed mannerism that depicts harmony, symmetry and balance. The main conical-type clock tower at the facade is square at the base. The first two storeys are square and a squinch arch is placed to convert the square plan into octagon. The first two storeys are followed by two storeys of octagonal plan with arched openings and triangular projections.

QUALITY TEACHING & RESEARCH

GC University, Lahore has played a truly pioneering role in promoting research and inquiry in the country, particularly in the disciplines of Physical and Biological sciences. The university has a reputation of Academic excellence based on an impressive record of achievement in teaching and research. The research carried out by GCU scholars in various departments has been acknowledged internationally. The University has produced two Nobel Laureates: Dr. Hargobind Khorana (in the field of Chemistry) and Dr. Abdul Salam (in the field of Physics).



Dr. Hargobind Khorana



Dr. Abdul Salam

ACADEMICS

The University offers B.A/B.Sc. (4-year Hon.), M.A, M.Sc. (in some selected disciplines), M.B.A., M.Phil, and PhD programmes in all major disciplines. The University also take steps to sensitize our students about the meaning of the University Motto: "Courage to Know." We try to make the students inquisitive, thoughtful and independent in pursuit of knowledge. Special measures are taken through discussions, co-curricular activities, writing of term papers and dissertations to make the learners confident in their understanding of innovative themes and topics. Every student is thus brought into the mainstream of the grand academic culture of the GC University. During their stay, the students are bound to benefit from the academic, intellectual and cultural environment of this celebrated educational institution.

SPORTS

The sports history of GC University can be traced from the 1931-32 session when GC became the overall champion and won the general trophy of the Punjab University for the first time. GCU is one of the finest sports nurseries for producing and grooming sportsmen for National teams, and has been maintaining its tradition of excellence in sports and has produced hundreds of international sportsmen who represented Pakistan with distinction in Olympic Game/Asian Games / SAF Games and other International Sports Events since 1947. After getting the status of University in 2002 the GCU leadership started revamping the sports activities on higher level and re-established the Sports & Physical Education Department. A new post of Director of Sports and Physical Education was created and a Director was selected in July 2004. GC University has kept on healthy tradition of excellence in the field of sports and takes pride in maintaining high standard in every field of sports activities. GCU always play for the glory of sports and has the privilege to participate in all games organized by Lahore Board, HEC Sports Competition with distinction.



OLD RAVIANS UNION

The alumni of university are called "Ravians" due to universities magazine called "Ravi". Old Ravians Union Pakistan is an elected body of former students of GC University, Lahore (previously known Government College Lahore). The Union was established in 1934 and revived in 1995. It is the only organization of Old Ravians which has affiliation of the GC University, Lahore and its office is situated in the Campus. Constitutionally, Vice Chancellor of the GCU, is ex-officio patron of the Union. Mr. Kamran Lashari, Ex – Federal Secretary, Govt. of Pakistan & Ex - Chairman CDA is President of the Union. All Old Ravians are eligible to apply for membership of the Union. Elections of its various offices take place biennially in the GCU Campus. However, next elections will be held in November 2014. The Union arrange intellectual, social, cultural and sports events where Old Ravians meet and interact. The Union work to assist and help the University in different fields. It is also an instrumental for collection of funds from the Old Ravians for GCU Endowment Fund Trust which is used to provide financial aid to deserving students and for development of the University. The Union has its affiliated chapters in Karachi, Islamabad, India, UK, US and Canada. The spirit of Lahore sustained throughout the history of Government College University (GCU). Almost all the great intelligentsia who have richly contributed to the academic, literary and cultural life of the city, some how or other, shares a sense of belonging to GCU. Mohammad Hussain Azad and Allama Mohammad Iqbal are just two to mention.

THE DEPARTMENT OF ZOOLOGY, GC UNIVERSITY, LAHORE, PAKISTAN

The Department of Zoology, GC University, Lahore is the oldest seat of learning and imparting knowledge of Zoology at the Graduate and Postgraduate level in Pakistan. The Postgraduate Programme at the department was launched in 1908. In addition, it was the first centre to start teaching Zoology in this part of the Subcontinent until 1920 when the University of the Punjab, Lahor established its Department of Zoology. The Zoology Department of the University of the Punjab, Lahore was also housed in the building of the Department of Zoology at the Government College Lahore and continued functioning here till 1963. During these years, the Zoology faculties of Government College Lahore and the University of the Punjab jointly managed the Postgraduate Programme.

In 1963, the Department of Zoology initiated its independent M.Sc. Zoology Programme as a result of the untiring efforts of Dr. Nazir Ahmad (who had been promoted to Principal, Government College Lahore), Prof. Naseer-ud-Din Ahmad (Professor and Chairperson, Department of Zoology) and Dr. Ahsanul Islam (Professor of Zoology).

After attaining the status of an autonomous institution in 1997, and that of a University in 2002, curricula were upgraded and modernized in accordance with international standards.

Stephenson Natural History Museum

The Department of Zoology has one of Asia's oldest natural history museum; the Stephenson Natural History Museum, established by Dr. Lt. Col. Stephenson in 1906. It has more than 5,000 preserved specimens. This museum is used for teaching and research purposes at various levels.

Research Groups

The Department has an experienced faculty actively involved in research activities and has also established the following Research Groups:

- Wild Life and Ecology
- Fisheries and Aquatic toxicology
- Medical Entomology
- Microbiology
- Immunology
- Molecular Biology
- Human Genetics
- Cancer Biology
- Physiology

Research Journal

We recognize the responsibilities that come with research development and publication. Department of Zoology take great pride in publishing Journal entitled "**BIOLOGIA (PAKISTAN)**" available at www.biosoc.pk. The journal has gained popularity in the biological research circle since it is available online and the journal visibility has increased the citation number of the articles. The process of blind reviewing the manuscripts had increased the credibility of the journal. The articles published in this peer reviewed Journal help to manage and address important issues in various disciplines of science such as Parasitology, Microbiology, Molecular Biology, Medical Entomology, Palaeontology etc. The journal is in category "Y" of HEC recognized local science journals.

Research Laboratories

There are three general laboratories for Intermediate and under/Postgraduate students. In addition, there are six research laboratories for conducting research at the Postgraduate level. The department has established a Cell and Tissue Culture Laboratory which is fully equipped

for the culturing of various cell lines. In this laboratory a project is going on for controlling the endemic dengue disease and to meet the challenges in controlling the dengue vector. The Department has procured modern sophisticated apparatus like fluorescent and inverted microscopes with photographic attachment, CO₂ controlled Incubator for tissue culturing, Cryostat, Ultracentrifuge, PCR and Gel Documentation system and Gene Manipulator for advanced research activities.

Animal Maintenance and Rearing Facilities

The Department has an Insectary, a Forgery, a Fish Farm, a Rabbit House and a Mouse House for conducting experiments on various animals.

Academic Links

The department of zoology has established several links with international and national organizations.

The department of Zoology has active collaboration with University of Nottingham, UK in terms of research activities. The department has signed another MOU with University of Guelph, Canada for research activities and other collaborative activities.

On the national level the department is dynamically collaborating with several agencies. The MOUs have been signed with Pakistan Museum of Natural History, Islamabad, Punjab Fisheries department and Veterinary Research Institute, Lahore.

Future Prospects

Degree holders are usually absorbed in the market as Lecturers, Researchers at research organizations and Medical Representatives. They also get jobs at fisheries, wildlife and public health departments, etc.

THE MAGNIFICENT LAHORE

Lahore is the second largest city of Pakistan and the provincial capital of the Punjab. Historically, it is believed to be about 2000 years old. In ancient times, it was an outpost of Kangra hill Kingdoms and was a cut-off township on the trade route to Delhi. It had hardly any reputation in the Pre-Muslim era. Lahore came to eminence with Islam in South Asia.

History

Lahore has always been a seat of learning and knowledge. Sufism and speculative mysticism became its major discipline. Schools were opened and scholars from Baghdad, Iran and other oriental and occidental regions came to this historical city and settled here. The city flourished academically during the four centuries of the Delhi Sultanate. It became the second imperial capital in 1580 under the Mughal Emperor Akbar the Great. Lahore touched the peak of glory during the rule of the Mughals. The Mughal emperors beautified the city with some of the finest architectural buildings and gardens that have survived the hazards of time. It was this reputation of Lahore that fascinated the English poet John Milton who wrote in 1670: "Agra and Lahore, the Seat of great Mughal." In earlier 17th century, Lahore was the pole-star and trend-setter for all the cities of the Empire. In mid 17th century, there were more than ten thousand schools in the city.

Literary education and poetry were the distinction of the city during the reigns of Mughal Emperors Shahjahan and Aurangzeb. The reputation of the city continued even during the anarchy of 18th century and it remained to be remembered as the Mughal capital even under the Sikh rule (1780-1846).

During the British rule in the Sub-Continent, many impressive buildings were raised in Lahore, which blended beautifully the traditional Mughal with the Western Gothic and Victorian styles of architecture. The British, who occupied the Punjab in 1849, had practically revived the old view of Lahore. Thus when they founded Government College Lahore (Now G.C. University) in 1864 they did not ignore Lahore's academic background. They selected Dr. G.W. Leitner as its first Principal who was an Arabic scholar and had studied Islamic learning at Constantinople (Istanbul) in Turkey. It was Dr. Leitner who had managed the building of a mosque at Woking in England after his retirement.

Language

As per the 1998 census of Pakistan, Punjabi language is spoken by 87% of the population. Lahore being the capital of the province of Punjab exhibits a great variety of Punjabi dialects spoken by the people of different district's living in the city. Urdu being the national language is spoken and understood. English is also understood and spoken by a sizeable segment of the educated population. Minority Languages spoken by people of different parts of Pakistan and Afghan refugees living in Lahore (Pahari, Raangri, Mewati, Pashto, Sindhi, Baluchi, Brahvi, Wakhi Tajik, Kashmiri, Shina, Balti, Khowar, Burshiski and Dari).

Geography and climate

Lying between 31°15'—31°45' N and 74°01'—74°39' E, Lahore is bounded on the north and west by the Sheikhpura District, on the east by Wagah, and on the south by Kasur District. The Ravi River flows on the northern side of Lahore. Lahore city covers a total land area of 404 square kilometres (156 sq mi) and is still growing. Lahore features a five season semi-arid climate (Köppen climate classification *BSh*) (from another source: Composite monsoon climate) with five seasons Foggy Winters (Nov – Feb) with few western disturbances causing rains, Pleasant Spring (Feb – April), Summer (April – June) with Dustrain storms and Heatwave periods, Rainy monsoon (July-September) and Dry but pleasant autumn (September – November).

Transportation

Lahore is one of Pakistan's most accessible cities and the only city in the country where one can find public and private transportation 24 hours a day and 7 days a week. This includes public buses, as well as thousands of rickshaws and taxis.



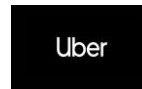
Allama Iqbal International Airport



Lahore Railway Station



Lahore Metro Bus



Taxi Services

Population

According to the 2017 census, Lahore's population was 11.13 million, making it the second largest city in Pakistan after Karachi. It is considered to be one of the 30 largest cities of the world.

Religion

94% of Lahore's population is Sunni or Shia Muslim, up from 60% in 1941. Other religions include Christians (5.80% of the total population, though they form around 9.0% of the rural population), and a small number of Bahá'ís, Hindus, Ahmediya, Parsis, and Sikhs.

Culture

The people of Lahore celebrate many festivals and events throughout the year, blending Mughal, Western, and other traditions. Eid ul-Fitr and Eid ul-Adha are celebrated. Many people decorate their houses and light candles to illuminate the streets and houses during public holidays; roads and businesses may be lit for days.

Cuisine

Lahoris are known for their love of food and eating. While Lahore has a great many traditional and modern restaurants, in recent years Western fast food chains, such as McDonald's, Pizza Hut, Domino's Pizza, Subway Sandwiches, Dunkin' Donuts, Nando's, Kentucky Fried Chicken and Hardee's have appeared all over the city. Recently the food streets in the historic locales of Lahore (Gawalmandi, Anarkali, and Fort Road) have attracted tourists. Food streets have undergone restorations and are cordoned off in the evenings for pedestrian traffic only; numerous cafés serve local delicacies under the lights and balconies of restored havelis (traditional residential dwellings). Some of the trendiest restaurants in Lahore are concentrated on the M M Alam Road in Gulberg. Here, dozens of high-class culinary

outlets, ranging from Western franchises to traditional, ethnic, or theme restaurants, attract all classes of Lahore's citizens.



Historical places and gardens

Lahore is an ancient city with more than 200 archaeological sites and historic places. The city is hub of art and culture in the country. Lahore has also been rated by the British newspaper 'Guardian' as the 2nd best tourist destination in Pakistan in 2008. Lahore has 2 UNESCO World Heritage Sites and plenty of national monuments. Every nook and corner of old Lahore is full of mysterious history and never-ending charm that attracts thousands of visitors locally and internationally. A visitor who happens to be in Lahore for the first time, sums up his/her experience in one line that is *Lahore is Lahore*.



Badshahi Mosque



Shalamar Garden

Alongwith many historical landmarks Lahore is also known as the City of Gardens. Many gardens were built in Lahore during the Mughal era, some of which still survive. Gardens and parks in the city include Hazuri Bagh, Iqbal Park, Mochi Bagh, Gulshan Iqbal Park, Model Town Park, Race Course Park, Nasir Bagh Lahore, Jallo Park, Wild Life Park, and Changa Manga, an artificial forest near Lahore in the Kasur district. Another example is the Bagh-e-Jinnah, a 141-acre (57 ha) botanical garden that houses entertainment and sports facilities as well as a library.



Lahore Museum



Greater Iqbal Park

Health care

Lahore has a number of hospitals, including Shaukat Khanum Memorial Cancer Hospital, Mayo Hospital, Hamid Latif Hospital, Nawaz Sharif Social Security Hospital, Lahore General Hospital, Jinnah Hospital, Gulab Devi Hospital, Sir Ganga Ram Hospital, Sheikh Zaid Hospital, Fatima Memorial Hospital Shadman Lahore, Ittefaq Hospital, Punjab Institute of Cardiology and Sharif Medical Complex. The current government of Punjab has a comprehensive plan to establish new hospitals and medical colleges in the city.



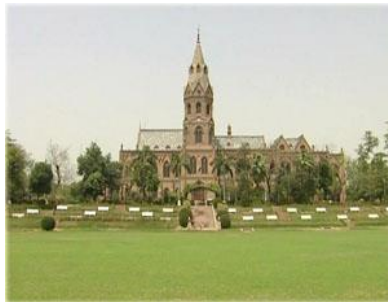
Shaukat Khanum Hospital



Jinnah Hospital

Education

Lahore is known as Pakistan's educational capital, with more colleges and universities than any other city in Pakistan. Lahore is Pakistan's largest producer of professionals in the fields of science, technology, IT, engineering, medicine, nuclear sciences, pharmacology, telecommunication, biotechnology and microelectronics, nanotechnology and the only future hyper high tech centre of Pakistan. Most of the reputable universities are public, but in recent years there has also been an upsurge in the number of private universities. The current literacy rate of Lahore is 74%.



Government College University



King Edward Medical University

Arts and media

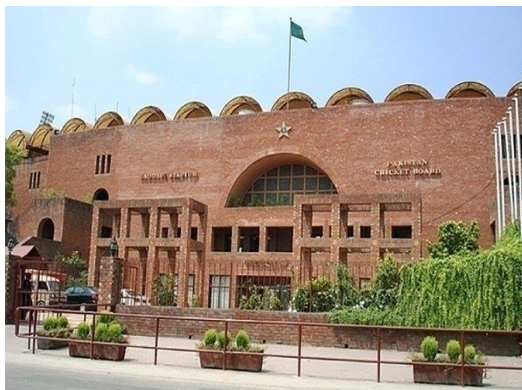
Lahore is at the core of Pakistan's media and arts scene. Pakistan's most prestigious art college, National College of Arts, is located here. The country's most prestigious fashion school, the Pakistan School of Fashion Design, which has some of the best photo studios and photographers in the country. The *Pakistan Fashion Design Council*, also successfully organised the Lahore Fashion Week 2010 as well as the PFDC Sunsilk Fashion Week Lahore 2011. Lahore has also been home to Pakistan's old classical music, ghazals and Qawwalis, with big names such as Noor Jehan, Arif Lohar, Nusrat Fateh Ali Khan, Mehdi Hassan and Ghulam Ali residing in the city. In recent years Lahore has produced some of Pakistan's greatest pop singers, such as Ali Azmat, Atif Aslam and Ali Zafar.



Alhamrah Art Galleries

Sports

Lahore is home of sports in Pakistan. It has many world class sports venues and stadiums. Lahore has successfully hosted many international sports events including final of the 1990 Hockey World Cup and final of the 1996 Cricket World Cup. The headquarters of all major sports governing bodies are located here in Lahore including Cricket, Hockey, Rugby, Football etc. and also has the head office of Pakistan Olympic Association.



Sports Stadiums in Lahore

Hotels in Lahore

Hotels in Lahore have started gaining significance nationally & internationally. Lahore has become a cosmopolitan city, where many races and nationality live together peacefully along with Lahoris. We can find, British, Indians, Americans and many other tourists from time to time from other countries. At the same time Lahore being a major industrial & business centre, you can always find lots of visitors from other parts of Pakistan like Karachi, Faisalabad, Islamabad, Multan and many more cities.

1 - Pearl Continental Hotel – Lahore

The best in hotels in Lahore ranks the PC Lahore which is always improving

Star Rating: 5

Location: Mall Road, Lahore

Contact Info:

Tel:+92(42) 3636-0210, 111-505-505 Fax:+92(42) 3636-2760, 3636-4362

Email:pchl@hashoogroup.com

Shahrah-e-Quaid-e-Azam P.O.Box#983,Lahore

2 - Avari Hotel Lahore

The second in line of hotels in Lahore is without doubt Avari Hotel Lahore.

Star rating: 5

Location: Mall Road, Lahore

Contact Info:

Tel: (92-42) 3-6366366

UAN: 111 AVARIS (111 282 747 Toll-Free: 0800-88888

Fax: (92-42) 3-6365367 E-mail: lahore@avari.com

87 Shahrah-e-Quaid-e-Azam, Lahore 54000, Pakistan

3 - Hospitality Inn Lahore

Star Rating: 4

Location: Egerton Road, Lahore

Total Room: 120

Contact Info:

25-26 Egerton Road, Lahore.

4 - Ambassador Hotel Lahore

Star Rating: 3

Location: Davis Road, Lahore

Contact Info:

7 Davis Road, Shimla Hill, Lahore

Phone: +92-42-36316820

Fax +92-42-36301868.

5 – Smart Hotel Lahore

Star Rating: 3

Location: Liberty Market Lahore

Contact Info:

36 Liberty Market Gulberg III, Lahore, 54600

Phone +92-42- 3578-4411

Fax +92-42- 3571-2800

E-mail : info@smarthotellahore.com

6 - Hotel Sunfort Lahore

Star Rating: 3

Location: Gulberg, Lahore

Total Rooms:

Contact Info:

72-D/1, Liberty Commercial Zone, Gulberg-III, Lahore, Pakistan.

Tel: +92 42 576 3810 - 19 Fax: +92 42 575 4277

E-mail: info@sunforhotel.com

7 - Amer Hotel Lahore

(Hotels in Lahore)

Star Rating: 3

Location: Lower Mall Road, Lahore

Contact Info:

46- Lower Mall, Lhr

Email: info@amerhotel.com.pk

Tel: +(92-42) 3711 5015 – 18

Fax: +(92-42) 3711 3424

8 - Maisonette Luxury Suites Lahore

Star Rating: 3

Location: Ghalib Road, Gulberg, Lahore
Contact Info
51-C-2, GulbergIII,Lahore
Phone:+92 321 6804298

9 - Leaders Inn Lahore

Star Rating: 3
Location: Montgomery Road, Lahore
Contact Info:
6-Montgomery Road, Behind Punjab Assembly, Lhr
Phone:+92 321 6804298

10 - Hotel Crown Plaza Lahore

Star Rating: 4
Location: Upper Mall, Lahore
Contact Info:
2- Upper Mall Scheme, Lahore, Pakistan.
Phone: 0092- 42- 111- 808- 111
Fax: 0092- 42- 35760978
E-mail Id: info@crowmplazalahore.com

GENERAL INFORMATION FOR PARTICIPANTS

IBPHR registration and information centre

The registration desk will be located at entrance of Bukhari Auditorium and Zoology department at the following hours:

Tuesday, December 7th: from 08.00 a.m. to 1.00 p.m.
Wednesday, December 8th: from 08.00 a.m. to 1.00 p.m.

Registration Fee

Faculty members	Rs. 3600/-
PhD and M.Phil	Rs. 2300/-
Undergraduates	Rs. 1900/-

The conference inquiries concerning the program can be obtained at the information desk.

Refreshment

The refreshment includes morning, afternoon teas and lunch on both days. Dinner and cultural event will be on the first day of the event.

Refreshment venues are Bukhari lawns.

First aid and medical emergency

Medical facility is provided to the participants by University Medical Officer and their staff. The clinic is located in the Student Service Centre. Special Ambulance Service is also available round the clock.

Cafeterias

The University has two well-furnished Cafeterias on Campus. Here the students eat and chat to get refreshed. A committee that ensures quality food items supervises the Cafeterias Food items are supplied to the students at reasonable and affordable rates. The Girls Cafeteria is located in the building of Student Service Centre (Ground Floor) adjacent to the main cafeteria.

Mosque

In order to facilitate Islamic Teaching and the observance of the five obligatory prayers, there are mosques situated at the University campus. In the mosque there are facilities for daily as well as for Friday prayers.

Awards & Honours

The souvenirs and certificates will be distributed by the chief guest to plenary and invited speakers, poster competition winners and conference organisers.

**4th INTERNATIONAL CONFERENCE ON INNOVATIVE BIOLOGICAL AND
PUBLIC HEALTH RESEARCH
(December 07-08, 2021)**

PROGRAMME

DAY ONE Tuesday, December 7, 2021

08:15 TO 9:15AM: Registration Venue: Bokhari Auditorium

Inaugural Ceremony

Time

Activity

09:00-9:40am	Registration of Participants
09:41-09:45am	Guest to be seated
09:46-09:50am	Arrival Chief Guest//Vice Chancellor
09:56-10:00am	National Anthem
10:01-10:05am	Recitation of Holy Quran
10:06-10:15am	Opening remarks by Chairperson
10:16-10:25am	Remarks by Dean, Faculty of Chemistry and Life Sciences
10:26-10:35am	Remarks Chief Guest
10:36-10:45am	Vice Chancellor's speech
10:46-10:55am	Presentation of souvenirs
10:56-11:30am	Refreshment

11:10AM-1:00PM – JOINT SESSION I: PLENARY LECTURES

CHAIRPERSON: Prof. Dr. Abdul Rauf Shakoori
CO- CHAIRPERSON : Prof. Dr. Javed Iqbal Qazi
Venue: Bokhari Auditorium

1. Prof. Dr. Michael Richardson

*Institute of Biology, Leiden University (IBL), Sylvius Laboratory (room 6.5.14b), Sylviusweg 72, 2333 BE, Leiden,
The Netherlands*

Evolution of snakes and co-evolution of their prey

2. Kimberly Hamad-Schifferli

University of Massachusetts Boston, USA

Exploiting the nano-bio interface for low-cost infectious disease diagnostics

LUNCH BREAK / PRAYER TIME (1:00PM -02:00PM)

**POSTER SESSION
(Bokhari Lawn)**

- **PO - 01 to PO - 38**

Note: Poster Presenters are directed to display their poster on December 7, 2021 at 09:00AM sharp in Lawns of Bokhari Auditorium. The posters will remain displayed till concluding ceremony.

02:00-04:00 PM

JOINT SESSION II: PLENARY LECTURE

Venue: Bokhari Auditorium

CHAIRPERSON: Prof. Dr. Muhammad Arshad

CO- CHAIRPERSON: Prof. Dr. Farkhanda Manzoor

1. Prof. Dr. Zeliha Selamoglu

*Department of Medical Biology, Faculty of Medicine, Nigde Ömer Halisdemir University
Campus 51240 Turkey*

Apitherapy Applications on Women's Health and Benefits of Hayit Honey

2. Prof. Dr. Nusrat Jahan

GC University Lower Mall, Katchery Road, Lahore, Pakistan

Semi-field evaluation of wAlbB Wolbachia potential for population replacement of dengue vector Aedes aegypti from Lahore, Pakistan

TEA BREAK (04:00 – 04:30 PM)

04:30PM - 06:30PM

**Hall 1
(Meeting Room)**

**Hall 2
(Fazl-e-Hussain Reading Room)**

**Session 1
Sericulture and Entomology (SE)**

**Session 2
Epidemiology and Public Health (EP)**

**Chairperson: Dr. Abida Butt
Co-chairperson: Dr. Muhammad Tahir**

**Chairperson: Dr. Saira Afzal
Co-chairperson: Dr. Naila Malkani**

Invited Lecture:

Dr. Muhammad Khalid Mukhtar
University of Sargodha, Pakistan

Potential role of spiders in health and agriculture

Invited Lecture:

Dr. Muhammad Irfan Khan
International Islamic University, Islamabad

Public health in national sustainable development strategy of Pakistan: implementation and prospects

SE 01: Evaluation of burn wound healing potential of sericin based hydrogels

Fatima Ijaz Cheema
Department of Zoology, GC University, Lahore, Pakistan
fatimaft683@gmail.com

SE 02: Biopesticidal potential of Sericine coated silver nanoparticles (Se-AgNps) against major agricultural pests

Syeda Durr e Shahwar Zaidi, Hafiz Muhammad Tahir, Muhammad Summer, Abdul Khaliq, Aqsa Ashfaq, Sara Mahmood, Fareeha Munir, Ayesha Muzammil
Department of Zoology, GC University, Lahore, Pakistan.
shahwarzaid61@gmail.com

SE 03: Silk derived formulations for accelerated wound healing in diabetic mice

Muniba Tariq, Hafiz Muhammad Tahir, Samima Asad Butt, Shaukat Ali
Department of Zoology, GC University Lahore, Pakistan
munibatariq12@gmail.com

SE 04: Enhancement of wound healing by silkworm fibroin, Aloe vera and ginger in alloxan induced diabetic mice

Rida, Shaukat Ali, Hafiz Muhammad Tahir, Muhammad Adeel Farooq, Ali Hassan, Hafsa Shahzad and Umaima
Department of Zoology, GC University Lahore
ridasulayman4@gmail.com

EP 01: Seroepidemiological studies of Brucellosis in Prenatal Women of district Poonch, Azad Jammu and Kashmir, Pakistan

^aAli Muhammad, ^bAnam Abdul Rehman, ^aRida Bashir, ^aMajid Mahmood, ^aNausheen Irshad

^aDepartment of Zoology, University of Poonch Rawalakot, Rawalakot 12350, Azad Jammu and Kashmir, Pakistan,

^bDepartment of Biotechnology, Mir Pur University of Science and Technology, Mir Pur 10250, Azad Jammu and Kashmir, Pakistan
alimuhammad@upr.edu.pk

EP 02: Risk factors associated with an outbreak of dengue fever in UC Chak Jalal Din Pothohar town, district Rawalpindi, Punjab, Pakistan

^aMuhammad Waris, ^aAli Hussain, ^aKashif Manzoor, ^aAqsa Shams, ^bKhalid Mahmood

^aDepartment of Wildlife and Ecology, University of Veterinary and Animal Sciences, Lahore, Pakistan, ^bDepartment of Zoology, University of the Punjab, Lahore, Pakistan
waris23gcs@gmail.com

EP 03: Substance abuse and mental health issues among HIV/AIDS patients: A systematic review and meta-analysis

Khunsa Junaid, Saira Afzal
Dept. of Public Health and Preventive Medicine, Dept. of Community Medicine and Epidemiology, King Edward Medical

<p>SE 5: Effect of natural food supplements on economical and biological traits of silkworm <i>Bombyx mori</i> L. Naila Shahzadi ^aDepartment of Zoology, GC University, Lahore, Pakistan. <i>nailashahzadi145@gmail.com</i></p> <p>SE 06: Current status of insecticides resistance and associated mechanisms in <i>Aedes aegypti</i> Saira Nawaz, Hafiz Muhammad Tahir, Asif Mehmood and Muhammad Summar Department of Zoology, GC University, Lahore, Pakistan <i>sairanawaz61@gmail.com</i></p> <p>SE 07: Infestation and prevalence of ticks and tick born disease in buffalo and cattle Sindho Wagan^a and Mansoor Ali Shah^b ^aNorth East Forest University China, ^bDepartment of Zoology, University of Sindh, Jamshoro <i>sindhuwagan@gmail.com</i></p> <p>SE 08: Laboratory evaluation of isolated entomopathogenic fungi against the guava fruit fly, <i>Bactrocera zonata</i> (Tephritidae: Diptera) Shahbaz Ahmad, Aysha Sarwar and Sumra Ashraf Department of Entomology, University of the Punjab, Lahore, Pakistan <i>shahbaz.iags@pu.edu.pk</i></p> <p>SE 09: Investigation of mosquito diversity in tehsil Babuzai, district Swat ^aFida Muhammada, ^aAkhtar Rasoola, ^aMuzafar Shaha, ^bMuhammad Israr ^aCentre for Animal Sciences and Fisheries, University of Swat, ^bDepartment of Forensic Sciences, University of Swat, Pakistan. <i>israr@uswat.edu.pk</i></p> <p>SE 10: Quantitative determination of <i>Azadirachta indica</i> and its micro-emulsion toxicity against Red Flour Beetle (<i>Tribolium castaneum</i>) ^aQaisar Irshad, ^aIrfan Baboo, ^bHamid Majeed, ^aHafiz Muhammad Sajawal, ^aAhsan Shafiq, ^aWaqar Shahzad Hashmi, ^aMuhammad Tausif Shahid, ^aGul Zahra Khan and ^aHafiza Rimsha Sehar ^aDepartment of Zoology, Cholistan University of Veterinary and Animal Sciences, Bahawalpur, Pakistan, ²Department of Food Sciences and Technology, Cholistan University of Veterinary and Animal Sciences, Bahawalpur, Pakistan. <i>qaisarirshad123@gmail.com</i></p> <p>SE 11: Insecticidal efficacy of greenly synthesized silver nanoparticles against aphids ^aMuhammad Kamran Khan, ^aMuhammad Hammad, ^aAnwar Khan, ^aSajida Naseem, ^bHafiz Muhammad Tahir ^aDepartment of Zoology, University of Education, Lower Mall Campus Lahore, ^bDepartment of Zoology, Government College University Lahore. <i>kamransafi1246@gmail.com</i></p> <p>SE 12: Morphological and Molecular Identification of <i>Rhipicephalus microplus</i> in association with host factors in Sheep and goats from District Okara, Punjab, Pakistan ^aMuhammad Rizwan, ^aShahzad Ali, ^bAbdul Razzaq, ^aAhmad Hassan, ^aUsama Saeed, ^cHaroon Akbar, ^cMuhammad Imran Rashid ^aDepartment of Wildlife & Ecology, University of Veterinary and Animal Sciences, Lahore, Ravi Campus, Pattoki, Pakistan, ^bAnimal Sciences Division, Pakistan Agricultural Research Council, Islamabad, ^cDepartment of Parasitology, University of Veterinary and</p>	<p>University, Lahore, Pakistan. <i>khunsajunaidmir@gmail.com</i></p> <p>EP 04: Significant reduction of disease severity and mortality rate in vaccinated COVID-19 patients in Rawalakot, AJK: A case control study aMajid Mahmood, aMarum Aslam, aAli Muhammad, bAnsar Mahmood aDepartment of Zoology, University of Poonch Rawalakot, AJK, Pakistan, bDepartment of Botany, University of Poonch Rawalakot, AJK, Pakistan. Corresponding author: drmajid@upr.edu.pk</p> <p>EP 05: Valuation and Policy Recommendation for Cleaning Environmental Pollution of a Biological Hazard: Smokeless Tobacco – Evidence from Case Study ^aDania Farah, ^bAneel Salman, ^cKhadija Bari Department of Economics and Finance, Institute of Business Administration, COMSATS University, Islamabad <i>hajra20052005@yahoo.com</i></p> <p>EP 06: Current outbreak of dengue fever in rural areas of Sindh, Pakistan ^aMansoor Ali Shah, ^bSindho Wagan ^aDepartment of Zoology, University of Sindh, Jamshoro, ^bNorth East forest University China <i>mansoor.shah@usindh.edu.pk</i></p> <p>EP 07: Prevalance of Hepatitis among coal mine workers ^aFariha Idrees, ^aAima Iram Batool, ^bFayyaz ur Rehman, ^aAksa Akram, ^aShahzad Munir Department of Zoology, University of Sargodha, Department of Chemistry, University of Sargodha <i>ferihaidrees@gmail.com</i></p> <p>EP 08: Study of occupational toxicity induced by various metallic nanoparticles in industrial workers of paint industry in Lahore Pakistan ^aFaiza Bashir, ^aIram Liaqat, ^bKhalid Mahmood Anjum ^aMicrobiology Laboratory, Department of Zoology, GC university, Lahore, ^bUniversity of veterinary and animal sciences, Lahore. <i>faiza.bashir1600@gmail.com</i></p> <p>EP 09: Outbreak of typhoid fever during corona pandemic in district Dir Lower during 2020 ^aIftikhar Ud Din, ^aMuzafar Shah, ^aNaseer Ullah, ^bMuhammad Israr, ^cAkhtar Rasool, ^cFazal Akbar ^aCentre for Animal Sciences & Fisheries, University of Swat, KP, Pakistan ^bDepartment of Forensic Sciences, University of Swat, KP, Pakistan, ^cCentre for Biotechnology & Microbiology, University of Swat, KP, Pakistan <i>muzafar@uswat.edu.pk</i></p> <p>EP 10: Predominance of diabetic mellitus with raised HBA1C from Dir Lower during COVID-19 lock down Noor Zaman Khan, Zahoor Ali Khan, Muhammad Israr, Akhtar Rasool, Fazal Akbar, Muzafar Shah University of Swat, KP, Pakistan muzafar@uswat.edu.pk</p> <p>EP 11: Polymorphism in miRNA s' target sites of CEP-63 and CEP-152 ring complex influences expression of CEP genes and favors tumorigenesis in Glioma Ishrat Mahjabeen, Yusra Masood, Ramsha Abbasi, Malik Waqar Ahmed, Mahmood Akhtar Kayani Department of Biosciences, COMSATS University Islamabad, Pakistan. <i>ishrat.mahjabeen@comsats.edu.pk</i></p>
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Animal Sciences, Lahore, Pakistan. rizwanasif400@gmail.com	
Dinner and Gala Night 07:00 PM	
DAY TWO: Wednesday, December 8, 2021	
09:00AM - 11:30AM	
Hall 1 (Meeting Room)	Hall 2 (Fazl-e-Hussain Reading Room)
Session 3 Microbiology (MI) Chairperson: Dr. Najma Arshad Co-chairperson: Dr. Iram Liaqat	Session 4 Molecular Biology and Genetics (MB) Chairperson: Dr. Farah Rauf Shakoori Co-chairperson: Dr. Dil Ara Abbas Bukhari
Invited Lecture: Dr. Muhammad Saeed Lahore University of Management Sciences (LUMS) Lahore, Pakistan. Designing inhibitors of viral proteases using fragment-based drug discovery approach	Invited Lecture: Dr. Azhar Rasul Government College University Faisalabad Tumor Metabolism- Novel and Selective Target for Cancer Therapy
MI 01: Antibacterial, antibiofilm and biofilm inhibition potential of medical plants against catheter associated microbes Aqsa Ashfaq, Iram Liaqat, Noor Muhammad, Syeda Dure Shahwar Zaidi Department of Zoology, GC University, Lahore, Pakistan iramliaq@hotmail.com	MB 01: Recurrent Mutations in Known OCA Genes are associated with Hereditary OCA Rabiah Shaukat, Saiqa Khushal, Aneela Abid, Ansar Ahmed Abbasi Department of Zoology Mirpur University of science and technology (MUST) Mirpur (10250), AJ&K Pakistan ansar.zoology@must.edu.pk
MI 02: Combating Superbugs with AI: System for Standardized Monitoring & Reporting of Antimicrobial Resistance Threats ^a Muhammad Ibrahim Rashid, ^a Habiba Rashid, ^b Muhammad Bilal ^a Institute of Basic Medical Sciences, Khyber Medical University, Peshawar, Pakistan, ^b Government Khawaja Rafique Shaheed College, Walton Road, Lahore, Pakistan. ibrahim.ibms@kmu.edu.pk	MB 02: Synthesis and characterization of magnetic nanoparticles for their possible application in magnetic hyperthermia of cancer treatment Yousaf Iqbal Department of Physics, University of Poonch, Rawalakot, Azad Kashmir, Pakistan, Department of Physics, Kyungpook National University, Daegu, South Korea yousafiqbal@upr.edu.pk
MI 03: New record of Syphacia (Syphacia) coccymyos Smales, 2011 (Nematode: Oxyuridae) recovered from the Rats and Mice of district Hyderabad, Sindh, Pakistan. Maree Rajper, Nadir Ali Birmani Department of Zoology, University of Sindh, Jamshoro, Sindh, Pakistan. rajparmarvi@gmail.com	MB 03: A computational prediction of S-Adenosyl methionine (SAM) interacting proteins and their interaction sites ^a Wajid Arshad Abbasi, ^a Syeda Adin Ajaz, ^a Kinza Arshad, ^a Sidrah Liaqat, ^b Saiqa Andleeb, ^a Maryum Bibi, ^a Syed Ali Abbas ^a Department of Computer Sciences & Information Technology, King Abdullah Campus, University of Azad Jammu & Kashmir, Muzaffarabad, AJ&K, Pakistan, ^b Department of Zoology, King Abdullah Campus, University of AJ&K, Muzaffarabad, Pakistan wajidarshad@ajku.edu.pk
MI 04: Biosynthesis and antibacterial activity of MgO-NPs produced from Camellia-sinensis leaves extract Abdulhameed Khan Department of Biotechnology, University of Azad Jammu and Kashmir, Muzaffarabad abdulhameed.khattak81@gmail.com	MB 04: Family clustering of TLR4 gene in myocardial infarction Muhammad Shahzad, Riffat Iqbal, Muzammal Raza, Muhammad Arshad, Kainat Zafar, Zarnab Chauhdary, Samreen Riaz Department of Zoology, GC University, Lahore, Pakistan riffatiqbal@gcu.edu.pk
MI 05: Citrullus loaded nanoemulsion as natural preservative for bread fungus (Rhizopus) avoidance on market shelves Hafiza Rimsha Sahar, Irfan Baboo, Hamid Majeed, Gul Zahra Khan, Naila khanum, Ifrah Manzoor, waqar shahzad Hashmi, Qaisar Irshad, Ahsan Shafiq and Hafiz Muhammad Sajawal	

Department of Zoology, Cholistan University of Veterinary and Animal Sciences, Bahawalpur.
rimshasahar96@gmail.com

MI 06: Molecular Identification and Antibiotic Resistance of *Staphylococcus aureus* Isolated from Bats from Sheikhpura Region

^aAttaullah, ^aShahzad Ali, ^aMuhammad Rizwan, ^aAbdul Malik, ^aUsama Saeed, ^bKendra Phelps, ^bKevin J Olival
^aDepartment of Wildlife & Ecology, Ravi Campus, University of Veterinary and Animal Sciences, Lahore, Pattoki 54000, Pakistan, ^bEcoHealth Alliance, New York, United State of America.
attaullah.saif@uvas.edu.pk

MI 07: Preparation of *Citrullus coloyntis* extract loaded metallic nanoparticles and their antibacterial efficacy

^aAhsan Shafiq, ^aIrfan Baboo, ^bHamid Majeed, ^aWaqar Shahzad Hashmi, ^aHafiz Muhammad Sajawal, ^aQaisar Irshad, ^aMuhammad Tausif Shahid, ^aHafiza Rimsha Sehar, ^aGul Zahra Khan
^aDepartment of Zoology, Cholistan University of Veterinary and Animal Sciences, Bahawalpur, ^bDepartment of Food Sciences and Technology, Cholistan University of Veterinary and Animal Sciences, Bahawalpur.
iahsandnp@gmail.com

MI 08: Random mutagenesis of *Bacillus megaterium* for enhanced production of L-lysine

^aAmjed Hussain, ^bHamid Mukhtar, ^cMuhammad Imran, ^dMajid Mehmood, ^aSanwal Aslam
^aDept. of Zoology, University of Kotli, Azad Jammu and Kashmir, ^bInstitute of Industrial Biotechnology, GC University Lahore-54000, Pakistan ^cInstitute of Biochemistry and Biotechnology, University of Veterinary and Animal Sciences, Lahore, Pakistan ^dDept. of Zoology, University of Poonch Rawalakot, Azad Jammu and Kashmir
amjedbiotech@yahoo.com

MI 09: Biototoxicity of Local Isolates of *Bacillus thuringiensis* for the control of Mosquito

Naureen Fatima and Dr. Dil Ara Abbas Bukhari
Department of Zoology, GC University Lahore, Pakistan.
naureenfatima2012@hotmail.com

MI 10: Use of different antimicrobial agents against gut bacterial fauna of captive wild animals

Bushra Nisar khan, Iqra Naeem, Aliza, Syed Husnain Ali Asghar, Hafiz Muhammad Hashir, Amina Tufail, Muhammad Junaid, Yusra Ashfaq
Institute of Zoology, University of the Punjab
bushra.hons@pu.edu.pk

MI 11: Biochemical and molecular characterization of succinic acid producing bacterial isolates from ruminant gut

Zahid Majeed and Alia Irfan
Department of Biotechnology, Challa campus, University of Azad Jammu and Kashmir, Muzaffarabad
Corresponding author: zahid.majeed@uajk.edu.pk

MI 12: Statistical optimization of synthetic azo dye (Remazol Red R (RRR) dye) decolorization and degradation by azoreductase from *Klebsiella pneumoniae* gm-04

Ghulam Mustafa, Ammara Younas, Itrash Zia and Muhammd Tariq Zahid
Department of Zoology, GC University Lahore, 54000 Lahore, Pakistan
tzahid_malik@yahoo.com

MB 05: PTPN22 gene polymorphism susceptibility: a comparative study on rheumatoid arthritis and osteoarthritis individuals of Pakistan

Maryam Mukhtar, Nadeem Sheikh, Andleeb Batool, Saira Kainat Suqaina, Tayyaba Saleem, Rabia Mehmood, Muhammad Babar Khawar, Mavra Irfan
Department of Zoology, University of the Punjab, Lahore, Pakistan, Department of Medicine, Karolinska Institute, Stockholm, Sweden, Department of Zoology, University of Central Punjab, Lahore, Pakistan, Department of Zoology, GC University, Lahore, Pakistan.
andleeb.batool@gcu.edu.pk

MB 06: Differentially regulated miRNAs express as possible biomarkers in oral cancer

^aAmmara Ramzan, ^aNimra Asghar, ^aMuhammad Imran Sohail, ^bMuhammad Usman Rashid, and ^aNaila Malkani
^aDepartment of Zoology, GC University, Lahore, Pakistan, ^bDepartment of Basic Sciences Research, Shaukat Khanum Memorial Cancer Hospital and Research Centre (SKMCH&RC), Lahore, Pakistan. nailamalkani@gcu.edu.pk

MB 07: *Silibum marianum* protects the liver from α -naphthylisothiocyanate induced cholestasis by regulating fernesoid x receptor

^aAteeb Khalil, ^aNimra Tahir, ^aSidra Mumtaz, ^aHassan Hameed, ^bIshtiaq Ahmad, ^aNaila Malkani, ^aImran Sohail
^aDepartment of Zoology, GC University, Lahore, ^bInstitute of Industrial Biotechnology, GC University, Lahore
imransohail@gcu.edu.pk

MB 08: Gene Panel Sequencing identifies previously Reported Mutations in Known Genes Involved in Hereditary Microcephaly in Consanguineous Families

^aAnsar Ahmed Abbasi, ^bMuhammad Sajjid Hussain
¹Department of Zoology Mirpur University of science and technology (MUST) Mirpur, AJ&K Pakistan, ²Cologne Center for Genomics (CCG), Faculty of Medicine, University Hospital Cologne, University of Cologne, 50931 Cologne, Germany.
ansar.zoology@must.edu.pk

MB 09: Is Nomophobia real and harm inflicting? Literature-based evidence from clinical investigations

Mahwish Iftikhar, Hajra Naz
Department of Biochemistry, University of Karachi, Pakistan
hajra20052005@yahoo.com

MB 10: Genetic analysis of gamma-aminobutyric acid type b receptor 1 (*GABBR1*) & nicotinic acetylcholine receptor alpha 4 subunit gene (*CHRNA4*) in pediatric epilepsy patients

^aMehwish Riaz, ^bVishal Haer, ^bAyesha Majid, ^aTayyaba Saleem, ^bMuddasir Hassan Abbasi, ^cMuhammad Babar khawar, ^aNadeem sheikh
^aInstitute of Zoology, University of the Punjab, Lahore, Pakistan, ^bDepartment of Zoology, University of Okara, Okara, Pakistan, ^cDepartment of Zoology, Faculty of Sciences, University of Central Punjab, Lahore-Pakistan
vishalhaer9@gmail.com

MB 11: Previously reported mutations in TYR and OCA2 genes are responsible for OCA in two consanguineous families

Saiqa Khushal, Rabiah Shaukat, Quaidia Jabeen, Ansar Ahmed Abbasi
Department of Zoology Mirpur University of science and technology (MUST) Mirpur (10250), AJ&K Pakistan
ansar.zoology@must.edu.pk

	<p>MB 12: Nonsense mutations in ASPM gene caused microcephaly in consanguineous families Madiha Shadab, Sundas Farooq, Tauqeer Ahmed, Ansar Ahmed Abbasi Department of Zoology, Mirpur University of science and technology (MUST) Mirpur (10250), AJ&K Pakistan <i>Corresponding author: ansar.zoology@must.edu.pk</i></p> <p>MB 13: Mutation in RAPGEF1 is responsible for intellectual disability in consanguineous family Tauqeer Ahmed, Rameez Nisar and Ansar Ahmed Abbasi* Department of Zoology Mirpur University of science and technology (MUST) Mirpur (10250), AJ&K Pakistan <i>ansar.zoology@must.edu.pk</i></p>
Tea Break/ Refreshment (11:30AM -11:45AM)	
11:45AM-01:45 PM	
Hall 1 (Meeting Rooms)	Hall 2 (Fazl-e-Hussain Reading Room)
<p>Session 5</p> <p>Fisheries, Ecology and Toxicology (FT)</p> <p>Chairperson: Dr. Muhammad Abid Co-chairperson: Prof. Dr. Atif Yaqub</p>	<p>Session 6</p> <p>Wildlife and Taxonomy (WT)</p> <p>Chairperson: Dr. Zulfiqar Ali Co-chairperson: Dr. Andleeb Batool</p>
<p>Invited Lecture:</p> <p style="text-align: center;">Dr. Shafaq Fatima Department of Zoology, Lahore College For Women University, Lahore, Pakistan</p> <p>Pilot Scale Commercial Production of <i>Labeo rohita</i> in In-Pond Raceways System in Pakistan</p>	<p>Invited Lecture:</p> <p style="text-align: center;">Prof. Dr. Hafsa Zaneb Department of Anatomy and Histology, University of Veterinary and Animal Sciences Lahore Pakistan</p> <p>One Health – a potential area for innovative collaborative research for advancing the public health causes</p>
<p>FT 01: Interactive Effect of Vitamin C and E on Growth, Lipid Peroxidation, Blood Biochemistry and Survival Rate of Silver Carp ^aFatima Khan, ^aMahroze Fatima, ^bSyed Zakir Hussain Shah, ^aNoor Khan, ^aHamda Azmat, ^aFayyaz Rasool, ^aAyesha Khiar, ^aMehwish Khan ^aDepartment of Fisheries and Aquaculture, University of Veterinary and Animal Sciences, Lahore, ^bDepartment of Zoology, University of Gujrat, Gujrat. <i>mahroze.fatima@uvas.edu.pk</i></p> <p>FT 02: Impact of feed with varying crude protein (CP) levels on growth performance of different fish species cultured under similar regimes ^aKashif Manzoor, ^aFayyaz Rasool, ^bShakeela Parveen, ^aMuhammad Hafeez-ur-Rehman, ^aMatiullah, ^aShahid Mahmood, ^aAmina Ayub ^aDepartment of Fisheries & Aquaculture, University of Veterinary & Animal Sciences, Lahore-Pakistan, ^bDepartment of Zoology, Wildlife & Fisheries, University of Agriculture, Faisalabad. <i>fayyazrasool@uvas.edu.pk; drfayyaz1980@gmail.com</i></p> <p>FT 03: Effect of particle size of corncob on growth, digestibility and intestinal histology of grass carp (<i>Ctenopharyngodon idella</i>) ^aSana Shahbaz, ^aNoor Khan, ^aMuhammad Akmal, ^bMuhammad Naveed-ul-Haque, ^aMuhammad Awais ^aDepartment of Fisheries and Aquaculture, University of Veterinary and Animal Sciences Lahore</p>	<p>WT 01: Exploring the Herpeto Fauna of Totalai Game Reserve, Khyber Pakhtunkhwa, Pakistan ^aKausar Saeed, ^bLuqman, ^bMuhammad Rais and ^cMuzafar Shah ^aDepartment of Zoology, University of Buner, Khyber Pakhtunkhwa, Pakistan ^bDepartment of Wildlife Management, PMAS Arid Agriculture University Rawalpindi, Pakistan ^cCentre for Animal Sciences & Fisheries, University of Swat, Khyber Pakhtunkhwa, Pakistan <i>kausarsaeed@yahoo.com</i></p> <p>WT 02: Study of behavioral activities of hedgehog Muhammad Jan Shair, Irfan Baboo, Ahsan Shafiq, Qaisar Irshad, Waqar Shahzad Hashmi, Hafiz Muhammad Sajawal, Muhammad Rizwan, Sadaf Naseer, Muhammad Younis, Khalil Ahmad and Muhammad Shahzad Cholistan University of veterinary and Animal Sciences, Bahawalpur. <i>muhammadjanshair18@gmail.com</i></p> <p>WT 03: Statistical analysis of Helminth parasites of House Rat <i>Rattus rattus</i> (Muridae: Rodentia) in Hyderabad, Sindh, Pakistan Ramesh, Nadir Ali Birmani and Saima Naz Department of Zoology, University of Sindh, Jamshoro, Sindh, Pakistan. <i>rameshzoologist@yahoo.com</i></p>

^bDepartment of Animal Nutrition, University of Veterinary and Animal Sciences Lahore.

noorkhan@uvas.edu.pk

FT 04: Epidemiology of Motile Aeromonas Septicemia (MAS) in Commercial Fish Farms of Selective Districts of Punjab, Pakistan

^aTooba Latif, ^aShahzad Ali, ^bAnam Iftikhar, ^bUsama Saeed, ^aAhmad Hassan, ^aMuhammad Rizwan, ^aAttaullah, ^cAbdur Rehman Azam

^aWildlife Epidemiology and Molecular Microbiology Laboratory (One Health Research Group), Discipline of Zoology, Department of Wildlife & Ecology, University of Veterinary and Animal Sciences, Lahore, Ravi Campus, Pattoki, Pakistan, ^bDepartment of Biological Sciences, University of Veterinary and Animal Sciences, Lahore, Ravi Campus, Pattoki, Pakistan, ^cDepartment of Zoology, The University of Lahore Sargodha Campus, Pakistan
tooba7latif@gmail.com; shahzad.ali@uvas.edu.pk

FT 05: Plant source meal supplementation by Waste of Date, *Phoenix dactylifera*, and its effect on Growth and Blood Indices on *Cyprinus carpio* fingerlings

Farzana Abbas, Muhammad Hafeez-urRehman, Nimra Mubeen
Department of Fisheries and Aquaculture, UVAS Ravi campus Pattoki

farzana.abbas@uvas.edu.pk

FT 06: Molecular and Biochemical characterization of Eisenia fetida associated vermibacteria intricate in heavy metals remediation and retain plant growth promoting traits.

Saiqa Andleeb¹, Anum Naseer¹, Abdul Basit¹, Wajid Arshad Abbasi², Samina Ejaz³, Shaikat Ali⁴, Nazish Mazhar Ali⁴, Iram Liaqat⁴

^aDepartment of Zoology, University of Azad Jammu & Kashmir, King Abdullah Campus, Chattar Kalas, Muzaffarabad, Pakistan, ^bDepartment of CS&IT, University of Azad Jammu & Kashmir, King Abdullah Campus, Chattar Kalas, Muzaffarabad, 13100, Pakistan, ^cDepartment of Biochemistry and Biotechnology, Bahawalpur Islamia University, Bahawalpur, Pakistan, ^dDepartment of Zoology, GC University, Lahore, Pakistan

Corresponding author: drsaiqa@ajku.edu.pk; drsaiqa@gmail.com

FT 07: Determination of air pollutant (pm 2.5) and its effects on lung capacity of female in district Kasur

Moneez Abbass, Hafiza Sana Yousaf, Iqra Idrees, Arifa Tahir, Shabnum Shaheen, Nadia Ghani

Department of Environmental Science, Lahore College for Women University Lahore.

moneeza.rana@gmail.com

FT 08: Functional status of liver and testis under treatment of *Nigella sativa* against Cr(VI) induced toxicity in male albino mice

Tooba Nauroze, Dr. Shaikat Ali, .Hina Mushtaq, Iqra Liaqat, Sumera Mumtaz, Shumaila Mumtaz, Lubna Kanwal, Shagufta Andleeb, Chaman Ara, Ali Hassan

Department of Zoology, GC University, Lahore

tooba.zoologist@gmail.com

FT 09: Zinc oxide nanoparticles caused Trans-placental and multigenerational toxicity can be mitigated by Fresh Orange Juice in Swiss Albino Mice

Chaman Ara, Shagufta Andleeb, Asmatullah, Barirah Majeed, Shaikat Ali, Asia Iqbal, Aliza Muzamil, Madeeha Arshad, Asma Chaudhary

Department of Zoology, University of Punjab, Lahore.

dr.chamanara@yahoo.com

FT 10: The Antidiabetic effect of silver nanoparticles using onion extract in experimentally induced diabetic mice

WT 04: A new record of Long horned grasshopper *Hexacentrus unicolor* Servilli 1831 (Hexacentrinae: Tettigonidae: Orthoptera) From Taulka Dadu

Asif Nazeer Memon, Naheed Baloch, Riffat Sultana, Abdul Sattar, Shamsher Unar, Sidratul Muntaha, Zaryab Gull

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WT 05: COI gene based phylogenetic studies of Alaudidae (Passeriformes) of Pakistan

^{a,b}Fakhra Nazir, ^aZahid Iqbal Khan, ^bSahar Fazal

^aCentre for Bioresource Research, Islamabad, Pakistan, ^bCapital University of Science and Technology, Islamabad, Pakistan

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WT 06: Exploring the Wild Avian and Mammalian fauna of Elum Valley of Khyber Pakhtunkhwa

^aKausar Saeed and ^bMuzafar Shah

^aDepartment of Zoology, University of Buner, KPK Pakistan,

^bCentre for Animal Sciences & Fisheries, University of Swat.

muzafar@uswat.edu.pk

WT 07: New collection of fossil remains of *Conohyus indicus* from the Siwalik Hills of Pakistan

^aSadaf Aslam, ^aAbdul Majid Khan and ^bMuhammad Akhtar

^aInstitute of Zoology, University of the Punjab, Lahore, 54590, Pakistan. ^bDepartment of Zoology, University of the Central Punjab, Lahore, Pakistan.

sadaf.hons@pu.edu.pk

WT 08: Diversity and morphological identification of domestic animals in district Swat

Sultan Muhammad^a, Ikramullah^a, Gul Lakhta^a, Akhtar Rasool^a, Muzafar Shah^a, Muhammad Israr^b

^aCentre for Animal Sciences and Fisheries, University of Swat,

^bDepartment of Forensic Sciences, University of Swat

israr@uswat.edu.pk

WT 09: Pathology of *Cysticercus fasciolaris* *Taenia pisiformes* Bloch 1780 (Cyclophyllidae: Taeniidae) parasitize liver of infected Rat (*Rattus rattus*) from Jamshoro, Sindh, Pakistan.

Farheen Shaikh, Saima Naz, Nadir Ali Birmani

Department of Zoology, University of Sindh, Jamshoro-76080, Sindh, Pakistan.

farheen.shaikh@usindh.edu.pk

WT 10: Survey of *Treron phoenicopterus* (Latham, 1790) in Sindh, Pakistan

Abdul Rehman Shaikh, Kalsoom Shaikh, Ghulam Sarwar Gachal, Hissamuddin Bhatti, Muhammad Taha Bhutto, Iqra Raees Shaikh, Hira Lakho, Ghulam Murtaza Moroojo

Department of Zoology, University of Sindh Jamshoro.

shaikhabdulrehmant99@gmail.com

<p>^aVishal Kiran, ^aRiffat Iqbal, ^bShaista Ali, ^aSadia Asmat ^aDepartment of Zoology, GC University Lahore, ^bDepartment of Chemistry, GC University Lahore, Pakistan riffatiqbal@gcu.edu.pk</p> <p>FT 11: Detection of aflatoxins B1 from layer and broiler feed samples collected from different cities of Punjab, Pakistan Roheela Yasmeen, Khadija Summia Department of Biology, Lahore Garrison University, Lahore. raheelasattar44@gmail.com</p> <p>FT 12: Appraisal of some heavy metals in water, bottom sediments and fish of Mangla Dam Lake Javaria Muneer, Rizwan Ullah Department of Zoology Mirpur University of Science and Technology (MUST), Mirpur-10250 (AJK), Pakistan rizwanmust@hotmail.com</p>	
LUNCH BREAK / PRAYER TIME (1:45PM - 02:15PM)	
02:15PM-4:00 PM	
Hall 1 (Meeting Room)	Hall 2 (Fazl-e-Hussain Reading Room)
Session 7 Physiology (PS) Chairperson: Dr. Tanveer Hussain Co-chairperson: Dr. Muhammad Imran Sohail	Session 8 Ethanopharmacology (ET) Chairperson: Dr. Saiqa Andleeb Co-chairperson: Dr. Tariq Zahid
Invited Lecture: Dr. Ghazanfar Ali Department of Biotechnology University of Azad Jammu and Kashmir, Muzaffarabad Pakistan A recurrent nonsense mutation in NECTIN4 underlying ectodermal dysplasia-syndactyly syndrome with novel phenotype in a consanguineous Kashmiri family	Invited Lecture: Dr. Asim Pervaiz Institute of Biomedical & Allie Health Sciences, University of Health Sciences, Lahore, Pakistan Cytostatic effects of Riproximin against cancer cells: Journey of a plant protein from laboratory to clinic
<p>PS 01: Efficacy of the synthesized biomolecules coated chitosan nanoparticles against polycystic ovary syndrome induced mice Rukhsar Basharat, Irfana Liaqat, Rabbia Musaddiq, Threem Zia, Saman Alam, Mohsin Munawar, Ayesha Ajmal. Department of Zoology, GC University Lahore, Pakistan samanalam220@gmail.com</p> <p>PS 02: Evaluation and analysis of polycystic ovarian syndrome (PCOS) and its metabolic complications in females of district Jamshoro Naheed Shah, Tahira Jabeen Ursani, Nadir Ali Shah, Nosheen Jehajo, Jawaid A. Khokhar Department of Zoology, University of Sindh, Jamshoro, Pakistan naheedshah16@gmail.com</p> <p>PS 03: Relationship of dietray habit with obesity in young adults Saima Sharif, Maria Umbreen, Shagufta Naz, Aqsa Sattar Department of Zoology, Lahore College for Women University, Lahore saima.sharif@lcwu.edu.pk</p> <p>PS 04: Simultaneous administration of prebiotics & iron fortificants does not affect liver function tests in iron deficient female sprague dawley rats</p>	<p>ET 01: Evaluation of Neem seed oil for the control of <i>Callosobruchus maculatus</i> (F.) (Coleoptera: Chrysomelidae) on Mash gram Nosheen Jehajo, Nasreen Memon, Naheed Shah Department of Zoology, University of Sindh, Jamshoro-76080, Pakistan nosheenjehajo@gmail.com</p> <p>ET 02: <i>Azadirachta indica</i> extract enhance functional recovery and extent of neuromuscular junctions re-innervation in mice following sciatic nerve injury Husna Juraat, Sidra Afzal, Chand Raza Department of Zoology, GC University Lahore, 54000, Pakistan. chandraza@gcu.edu.pk</p> <p>ET 03: Seed extracts of <i>Moringa oleifera</i> protects mice against rotenone-induced Parkinson disease motor impairments Sehrish Mohsin, Rabia Anjum, Chand Raza, Mehwish Faheem Department of Zoology, GC University Lahore, 54000, Pakistan. chandraza@gcu.edu.pk</p> <p>ET 04: <i>Mucuna pruriens</i> extract mediates functional recovery in mice following sciatic nerve crush injury Sidra Afzal, Madiha Iqbal, Chand Raza</p>

<p>^aAbdul Momin Rizwan Ahmad, ^bWaqas Ahmed ^aNational University of Medical Sciences, Rawalpindi, Pakistan, ^bUniversity of Veterinary & Animal Sciences, Lahore, Pakistan abdul.momin@numspak.edu.pk</p> <p>PS 05: Biological efficacy of ZnO nanoparticles using <i>Azadirachta indica</i> in experimentally induced diabetic mice ^aSadia Asmat, ^aVishal kiran, ^aRiffat Iqbal, ^bShaista Ali Department of Zoology, GC University Lahore riffatiqbal@gc.edu.pk</p> <p>PS 06: Histo-morphometric analysis of hepatic impairments induced by Dibutyl Phthalate in rabbit model Mohsin Munawar, Irfana Liaqat, Shaukat Ali, Saman Alam, Tahreem Zia, Fareeha Rashid Department of Zoology, GC University, Lahore. mohsinmunawar37@yahoo.com</p> <p>PS 07: Nanomaterials of <i>Cinnamomum zeylanicum</i> for the treatment of polycystic ovary syndrome Sahar Noor, Irfana Liaqat, Shaukat Ali, Mohsin Munawar, Saman Alam, Threem Zia Department of Zoology, GC University Lahore, Pakistan zoologistzia@gmail.com</p> <p>PS 08: Biological effects of chitosan nanoparticles on polycystic ovary syndrome induced mice Rabbia Musaddaq, Irfana Liaqat, Tahreem Zia, Mohsin Munawar, Saman Alam, Rukhsar Basharat Department of Zoology, GC University, Lahore rabbiamusaddaq2012@gmail.com</p> <p>PS 09: Impact of imidacloprid on feeding behavior and physiology of domestic pigeon (<i>Columba livia domestica</i>) Ali Haidar Gormani, Hafiz Muhammad Tahir, Azizullah, Muhammad Summer, Ayesha Muzamil, Aamir Ali, Saira Nawaz Department of Zoology, GC University Lahore, Pakistan alihaidargormani@gmail.com</p> <p>PS 10: Biological effects of chitosan nanoparticles on polycystic ovary syndrome induced mice Rabbia Musaddiq, Irfana Liaqat, Sahar Noor, Rukhsar Basharat, Threem Zia, Saman Alam, Mohsin Munawar, Ayesha Ajmal. Department of Zoology, GC University Lahore, Pakistan mohsinmunawar37@yahoo.com</p>	<p>Department of Zoology, GC University Lahore, 54000, Pakistan. chandraza@gc.edu.pk</p> <p>ET 05: <i>Moringa oleifera</i> seed extracts impart neuroprotection through antioxidant means in rotenone-induced Parkinson disease mouse model Chand Raza, Mehwish Faheem, Sehrish Mohsin, Rabia Anjum Department of Zoology, GC University Lahore, 54000, Pakistan. chandraza@gc.edu.pk</p> <p>ET 06: Phytochemical Analysis of Extracts of selected Plants having Anti-microbial activity against Bovine Mastitogens Asma Waheed Qureshi, Zahida Shaheen, Shafaq Nawaz GC Women University Sialkot, Pakistan asma.qureshi@gcwus.edu.pk</p> <p>ET 07: Therapeutic applications of garlic and turmeric for the diabetic wound healing in mice Muhammad Adeel Farooq, Shaukat Ali, Hafiz Muhammad Tahir, Rida, Ali Hassan, Hafsa Shahzad and Umaima Applied Entomology and Medical Toxicology Laboratory, Department of Zoology, Government College University Lahore. adeelfarooq237@gmail.com</p> <p>ET 08: Neuropharmacological effect of <i>Vigna unguiculata</i> and <i>Phaseolus vulgaris</i> on depression model ^aRabia Munnawar, ^aRaheela ikram, ^bSana Sarfaraz ^aDepartment of Pharmacology, Faculty of Pharmacy, Jinnah Sindh Medical University, Karachi, Pakistan, ^bDepartment of Pharmacology, Faculty of Pharmacy & Pharmaceutical Sciences, University of Karachi, Karachi, Pakistan. asma.qureshi@gcwus.edu.pk</p> <p>ET 09: Protective potential of pomegranate extract in nickel intoxicated mice ^aMadeeha Arshad, ^bSobia Zulfiqar, ^bFarukh Tahira Malik, ^bKinza Shakeel, ^bMohsin Raza, ^bIftikhar Khan ^aDepartment of Zoology, Division of Science and Technology, University of Education, Lahore, ^bDepartment of Zoology, University of Lahore, Sargodha Campus madeeha.arshad@ue.edu.pk</p> <p>ET 10: Evaluation of anti-scorpion venom potential of native plant extracts using mice model ^aSamima Asad Butt, ^aHafiz Muhammad Tahir, ^aShaukat Ali, ^aMuniba Tariq, ^aAli Hassan, ^aMuhammad Summer, ^aChand Raza, ^bShafaat Yar Khan ^aDepartment of Zoology, GC University, Lahore, Pakistan, ^bDepartment of Zoology, University of Sargodha, Pakistan. samimaasadbutt@gmail.com</p>
<p>Concluding Ceremony (Venue: Bokhari Auditorium): 4:00 PM – 5:00PM</p> <p>Refreshment: 05:00-06:00PM</p>	

Poster Presentations

No.	Abstract Title	Author List	Affiliations
PO 01	The disproportionate vulnerability of women to toxicants.	Dua Batool, Reeba Athar and Hajra Naz	Department of Biochemistry, University of Karachi, Pakistan <i>Corresponding author: reebaathar@gmail.com</i>
PO 02	A meta-analysis on relation of obesity with occurrence of gastrointestinal cancer.	Sarmad Bilal, Rizwan ullah Khan, Muhammad Imran Sohail, Naila Malkani	Department of Zoology, GC University, Lahore. <i>Corresponding author: nailamalkani@gcu.edu.pk</i>
PO 03	Identification nucleotide sequence variations in leptin gene in two indigenous Pakistan sheep lohi and koka breeds.	^a Sara Mehmood, ^a Shakar Jaan Tahir ^a Andleeb Batool, ^b Abdul Wajid	^a Department of Zoology, GC University, Lahore, ^b Department of Molecular Biology, Virtual University <i>Corresponding author: andleeb.batool@gcu.edu.pk</i>
PO 04	Role of <i>CTLA-4</i> gene in development of rheumatoid arthritis	Aneeqa Zafar, Riffat Iqbal, Samia Azad, Muhammad, Zarnab Chauhdary, Kainat Zafar	Department of Zoology, GC University, Lahore, Pakistan, <i>Corresponding author: riffatiqbal@gcu.edu.pk</i>
PO 05	Interaction between <i>MMP9</i> Polymorphism and Myocardial Infarction.	Aneeqa Zafar, Riffat Iqbal, Samia Azad, Muhammad Shahzad, Muzammal Raza, Muhammad Arshad	Department of Zoology, GC University, Lahore, Pakistan, <i>Corresponding author: riffatiqbal@gcu.edu.pk</i>
PO 06	Antibacterial and bacteriostatic potential of coelomic fluid and body paste of <i>Pheretima posthuma</i> (Vaillant, 1868) (Clitellata, Megascolecidae) against ampicillin resistant clinical bacterial isolates.	Mudassar Hussain, Iram Liaquat	Department of Zoology, GC University, Lahore, Pakistan <i>Corresponding author: iramliaq@hotmail.com</i>
PO 07	Biological synthesis, characterization and antibacterial activities of silver nanoparticles against human pathogens.	Shahzad Tufail, Iram Liaquat	Department of Zoology, GC University, Lahore. <i>Corresponding author: iramliaq@hotmail.com</i>
PO 08	Expression Deregulation of RAD51 acts as a biomarker in leukemia.	Nida Sarosh, Sumaira Fida Abbasi, Asma Batool	COMSATS, Islamabad <i>Corresponding author: nidasaroshshraf@gmail.com</i>
PO 09	Biological efficacy of ZnO nanoparticles using <i>Azadirachta indica</i> in induced diabetic mice.	^a Sadia Asmat, ^a Riffat Iqbal, ^b Shaista Ali	^a Department of Zoology, GC University Lahore, ^b Department of Chemistry, GC University Lahore, Pakistan <i>Corresponding author: riffat.iqbal@gcu.edu.pk</i>

PO 10	Characterization of Venom Components of Indian Red Scorpion <i>Hottentota tamulus</i>	Khajid Ullah Khan, Nadia Islam, Hafiz Muhammad Tahir and Muhammad Tariq Zahid	<i>Department of Zoology, Government College University Lahore, 54000 Lahore, Pakistan</i> <i>Corresponding author: tzahid_malik@yahoo.com</i>
PO 11	Study of bacterial pathogens and physicochemical parameters of water of river Sutlej at Head Islam.	Ayesha Masood and Nazish Mazhar Ali	Department of Zoology, GC University Lahore <i>Corresponding author: nazishmazhar@gcu.edu.pk</i>
PO 12	Association between lead exposure and expression variation of ALAD and antioxidant genes in construction site workers.	Zertashia Akram, Muhammad Shahbaz Haris, Hunium Arshad, Ishrat Mahjabeen	Department of Biosciences, COMSATS University Islamabad, Pakistan <i>Corresponding author: zertashia.akram@comsats.edu.pk</i>
PO 13	Mitochondrial sirtuins genetic variations and gastric cancer risk: Evidence from retrospective observational study	^a Ishrat Mahjabeen, ^a Muhammad Rizwan, ^a Gul Fareen, ^{a,b} Malik Waqar Ahmed, ^c Amir Farooq Khan, ^a Mahmood Akhtar Kayani	^a Cancer Genetics and Epigenetics Lab, Department of Biosciences, COMSATS University Islamabad, Park Road Tarlai Kalan, Islamabad, Pakistan, ^b Pakistan Institute of Rehabilitation Sciences (PIRS), Isra University Islamabad Campus, Islamabad, Pakistan, ^c Lady Reading Hospital, Peshawar, Pakistan <i>Corresponding author: mrizwanrana01@gmail.com</i>
PO 14	Prevalence and Association of Anthropometric indices of growth with Vaccination status in Children Less than 5-Year of Age.	Meha Siddique, Saira Afzal	Dept. of Public Health and Preventive Medicine, Dept. of Community Medicine and Epidemiology, King Edward Medical University, Lahore, Pakistan. <i>Corresponding author: mehasid94@gmail.com</i>
PO 15	Emerging Health Risk of Aspergillosis and Mucormycosis in COVID-19 Patients; a Systematic Review and Meta-analysis.	Mehreen Nasir	King Edward Medical University, Lahore, Pakistan <i>Corresponding author: fabia.nasir@gmail.com</i>
PO 16	Prebiotics & enhanced iron absorption.	^a Abdul Momin Rizwan Ahmad, ^b Waqas Ahmed	^a National University of Medical Sciences, Rawalpindi, Pakistan, ^b University of Veterinary & Animal Sciences, Lahore, Pakistan <i>Correspondence: abdul.momin@numspak.edu.pk</i>
PO 17	Efficacy of the synthesized biomolecules coated chitosan nanoparticles against polycystic ovary syndrome induced mice.	Rukhsar Basharat, Irfana Liaqat, Tahreem Zia, Mohsin Munawar, Saman Alam Rabbia Musaddaq	Department of Zoology, GC University, Lahore. <i>Corresponding author: buttsahibsahib6@gmail.com</i>
PO 18	Evaluation of antibacterial activity of vitamin C against human bacterial pathogens.	Shumaila Mumtaz, Samaira Mumtaz, Shaukat Ali, Hafiz Muhammad Tahir, Syed Akif Raza Kazmi, Tafail Akbar Mughal and Mobeen Younas	Department of Zoology, GC University, Lahore, Pakistan <i>Corresponding author: dr.hafiztahir@gcu.edu.pk</i>

PO 19	Antibacterial activity of biologically active Streptomyces.	Noor Muhammad and Iram Liaqat	Department of Zoology, GC University, Lahore, Pakistan <i>Corresponding author: iramliaq@hotmail.com</i>
PO 20	Study of bacterial pathogens and physicochemical parameters of water of river Chenab at Marala Headwork.	Madiha and Nazish Mazhar Ali	Department of Zoology, GC University, Lahore <i>Corresponding author: nazishmazhar@gcu.edu.pk</i>
PO 21	Bacterial laccases mediated decolourization and degradation of Reactive blue -19.	Ammara Younas, Sidra Ihsan and Muhammad Tariq Zahid	Department of Zoology, GC University Lahore <i>Corresponding author: mtariqzahid@gcu.edu.pk</i>
PO 22	Investigating antibacterial and antibiofilm and biofilm inhibitory activity of herbs against pathogenic catheter associated bacteria.	Amna Fazal and Iram Liaqat	Department of Zoology, GC University, Lahore, 54000 <i>Corresponding author: amnafazal50@yahoo.com</i>
PO 23	Preparation of <i>Citrullus colocynthis</i> extract against gram-positive bacteria.	^a Waqar Shahzad Hashmi, ^a Irfan Baboo, ^b Hamid Majeed, ^a Ahsan Shafiq, ^a Hafiz Muhammad Sajawal, ^a Qaisar Irshad, ^a Muhammd Tausif Shahid, ^a Hamna Iqbal, ^a Gul Zahra Khan, ^a Rimsha Sahar, ^a Naila Khanum, ^a Ifrah Manzoor	^a Department of Zoology, Cholistan University of Veterinary and animal sciences, Bahawalpur, ^b Department of Food Science and Technology, Cholistan University of Veterinary and animal sciences, Bahawalpur <i>Corresponding author: waqarhashmi324@gmail.com</i>
PO 24	Histopathology and Toxicity of Zinc Oxide Nanoparticles on Mice Gut and its Microbiota.	^a Muhammad Ramzan, ^a Chaman Ara, ^a Hafiz Abdullah Shakir, ^a Asmatullah, ^b Shaukat Ali, ^a Amna Butt, ^b Zaghar Mustafa	^a Institute of Zoology, University of the Punjab, Lahore, ^b Department of Zoology, Government College University, Lahore. <i>Corresponding author: ramzanrasheed226@gmail.com</i>
PO 25	Preparation and characterization of <i>Azadirachta indica</i> (Neem) leaf extract Nano-emulsion as Anti-bacterial agent.	^a Hafiz Muhammad Sajawal, ^a Irfan Baboo, ^b Hamid Majeed, ^a Qaisar Irshad, ^a Waqar Shahzad Hashmi, ^a Ahsan Shafiq, ^a Muhammad Tausif Shahid, ^a Gul Zahra Khan, ^a Hafiza Rimsha Sahar	^a Department of Zoology, Cholistan University of Veterinary and Animal Sciences, Bahawalpur, ^b Department of Food Science and Technology, Cholistan University of Veterinary and Animal Sciences, Bahawalpur <i>Corresponding author: muhammadsajawaldnp@gmail.com</i>
PO 26	Expression Deregulation of RAD51 acts as a biomarker in leukemia.	^a Nida Sarosh, ^a Sumaira Fida Abbasi, ^b Asma Batool	<i>Corresponding author: nidasaroshshraf@gmail.com</i>
PO 27	Evaluation of different sunflower (<i>Helianthus annuus</i> L.) genotypes for yield and its related characters.	^a Sadaf Memon, ^b Rizwan Ali Kumbhar, ^a Muzamil Hussain Memon ^a Shabana Memon	^a Department of Plant Breeding and Genetics, Sindh Agriculture University, Tandojam, Pakistan, ^b Department of Crop Genetics and Breeding, College of Agronomy, Sichuan Agricultural University, Chengdu, China <i>Corresponding author: rizwankunbhar@gmail.com</i>

PO 28	Using PCR-RFLP of <i>cyt-b</i> gene for domestic cats identification in district Swat.	^a Aftab Ahmad, ^a Shahid Ali, ^b Haq Nawaz, ^b Aziz Khan, ^b Madiha Aziz, ^c Murad Ali Rahat, ^a Fazal Akbar, ^a Jaffar Khan, ^d Muhammad Israr	^a Centre for Biotechnology and Microbiology, University of Swat, ^b Centre for Animal Sciences and Fishereies, ^c Department of Genetics, Hazara University, Mansehra, ^d Department of Forensic Sciences, University of Swat <i>Corresponding author: israr@uswat.edu.pk</i>
PO 29	Organic manure efficacy on vermire mediation and phytoremediation of heavy metals	^a Anum Naseer, ^a Saiqa Andleeb, ^a Abdul Basit, ^b Shaukat Ali, ^b Nazish Mazhar Ali, ^b Iram Liaqat, ^c Aisha Nazir	^a Department of Zoology, University of Azad Jammu and Kashmir, King Abdullah Campus, Muzaffarabad, 13100, Pakistan, ^b Department of Zoology, GC University, Lahore, Pakistan, ^c Institute of Botany, University of the Punjab, Quaid-e-Azam campus, Lahore, Pakistan. <i>drsaiqa@ajku.edu.pk; drsaiqa@gmail.com</i>
PO 30	Prevalence of influenza A virus and risk assessment in birds in Kasur Pakistan.	^a Ghulam Jaffar, ^a Shahzad Ali, ^b Anam Iftikhar, ^a Usama Saeeda, ^{c,d} Emily Robie, ^{c,d,e,f} Gregory C. Gray	^a Department of Wildlife & Ecology, University of Veterinary and Animal Sciences, Lahore, Ravi Campus, Pattoki, Pakistan, ^b Department of Biological Sciences, University of Veterinary and Animal Sciences, Lahore, Ravi Campus, Pattoki, Pakistan, ^c Division of Infectious Diseases, Duke University School of Medicine, Durham, North Carolina, USA, ^d Duke Global Health Institute, Duke University, Durham, North Carolina, USA, ^e Emerging Infectious Disease Program, Duke-NUS Medical School, Singapore, ^f Global Health Center, Duke Kunshan University, Kunshan, China <i>Corresponding author: shahzad.ali@uvas.edu.pk</i>
PO 31	Effect of housing systems on the growth and blood indices of American Pekin ducks.	Farzana Abbas, Muhammad Hafeez-ur Rehman	Department of Fisheries and Aquaculture, UVAS Ravi campus Pattoki <i>Corresponding author: farzana.abbas@uvas.edu.pk</i>
PO 32	Prevalence & predictors of stunting in children under 5 years of age: a Systematic review and Meta-analysis	Sadia Rafique	Dept. of Community Medicine and Epidemiology, King Edward Medical University, Lahore, Pakistan. <i>Corresponding author: drsaadiarafique@yahoo.com</i>
PO 33	Anti-cholestatic effect of extract of <i>Berberis lycium</i>	Zainab Mujtaba, Eisha tir Razia Hussain, Naila Malkani, and Imran Sohail	Department of Zoology, Government College University, Lahore <i>Corresponding autho: imransohail@gcu.edu.pk</i>

PLENARY LECTURES

Plenary Lecture-I

Evolution of snakes and co-evolution of their prey

Prof. Dr. Michael Richardson

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ABSTRACT:

Venomous snakes are important subjects of study in evolution, ecology, and biomedicine. Snakes have evolved numerous adaptations, including a venom-delivery system (fang and venom glands) in some species. Crotalin snakes (rattlesnakes and pit vipers) have also evolved a highly specialized organ called the loreal pit. This pit is a thermal-sensing device that helps the snake to locate warm basking sites and warm-blooded prey. In this talk, I will consider our research data on the embryonic development of the venom-delivery system as well as unpublished data on the development of the loreal pit. These structures are both examples of evolutionary novelties. I show how morphology and developmental gene expression can lead to new insights into evolution. Interestingly, the venom of advanced snakes also stimulates the prey to evolve countermeasures, including resistance that may lead to a co-evolutionary arms race. In the second part of this talk, I address this phenomenon on the basis of our recent studies of the alpha-neurotoxins of cobras. These toxins bind the alpha-1 nicotinic acetylcholine receptor (nAChR) at the neuromuscular junction, causing paralysis and asphyxia. Several venomous snakes and their predators have evolved resistance to α -neurotoxins. The resistance is conferred by steric hindrance from N-glycosylated asparagines at amino acids 187 or 189, by an arginine at position 187 that has been hypothesized to either electrostatically repulse positively charged neurotoxins or sterically interfere with α -neurotoxin binding, or proline replacements at positions 194 or 197 of the nAChR ligand-binding domain to inhibit α -neurotoxin binding through structural changes in the receptor. We analyzed this domain in 148 vertebrate species, and assessed its amino acid sequences for resistance-associated mutations. Of these sequences, 89 were sequenced de novo. We found widespread convergent evolution of the N-glycosylation form of resistance in several taxa including venomous snakes and their lizard prey, but not in the snake-eating birds studied. We also document new lineages with the arginine form of inhibition. Using an in vivo assay in four species, we provide further evidence that N-glycosylation mutations reduce the toxicity of cobra venom. The nAChR is of crucial importance for normal neuromuscular function and is highly conserved throughout the vertebrates as a result. Our research shows that the evolution of α -neurotoxins in snakes may well have prompted arms races and mutations to this ancient receptor across a wide range of sympatric vertebrates. These findings underscore the inter-connectedness of the biosphere and the ripple effects that one adaption can have across global ecosystems.

Plenary Lecture-II

Exploiting the nano-bio interface for low-cost infectious disease diagnostics

Kimberly Hamad-Schifferli
University of Massachusetts Boston
Email: kim.hamad@umb.edu

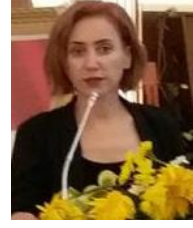


ABSTRACT:

The global COVID-19 pandemic has underscored the need for innovations in disease diagnostics. The convergence of the fields of nanotechnology and medicine has resulted in new approaches for novel disease therapies, biomedical imaging and sensing, and numerous others. In particular, the use of gold nanoparticles in rapid diagnostics for infectious diseases has been emerging as an application with the potential to address some of the major challenges in global health. These assays are low-cost and can be used in rugged environments, so they are attractive for widespread deployment for disease surveillance, quarantining, and treatment. One of the biggest challenges for effectively using nanoparticles in biological applications is the physical interface between the nanoparticles and its biological environment. Surface fouling and non-specific adsorption can lead to undesirable side effects such as diminished targeting specificity and cell uptake, unfavorable biodistribution, and toxicity. However, non-specific adsorption can actually be exploited for biological applications. We show how the unique properties of the nano-bio interface can be utilized for different medical applications including disease diagnostics for dengue, zika, chikungunya, Ebola, and other pathogens. We will discuss the unique interface issues in lateral flow immunoassays, and also how multicolored nanoparticles can impart important new capabilities to the assays such as antibody repurposing for emerging outbreaks.

Plenary Lecture-III

Apitherapy Applications on Women's Health and Benefits of Hayit Honey



Prof. Dr. Zeliha Selamoglu

Department of Medical Biology, Faculty of Medicine, Nigde Ömer Halisdemir
University Campus 51240 Turkey

Email: zselamoglu@ohu.edu.tr

ABSTRACT:

The natural products and safe food production have gained importance especially in the developed countries, as society consciousness concentrates on human health. The studies on honeybee products used for antioxidant therapies, the data are shown that the phenolic components are intensively. These components have strong antioxidant capacity and are consumed as natural preservatives. Apart from honey as a food, the use of alternative treatments is due to the fact that honey has many biological activities. Honey has been used with the apitherapeutic feature in the treatment of medical gynecological problems of women especially in the researches made nowadays. Honey are commonly used for both foodstuffs and treatment of many diseases. The monofloral hayit honey has aphrodisiac effect with a nice aromatic leaves and its leaves are used as spices. This honeybee product obtained from the hayit plant (*Vitex agnus-castus* L.) has effects on estrogen levels. It has also been reported to be used in early menopause treatment, which is caused by surgery, radiation, or drug use other than naturally occurring menopause. This presentation provides basic information on the use of honeybee products in the field of apitherapy, together with the identification of the presence of the active components of *Vitex agnus-castus* L. used in the treatment of certain gynecological problems.

Plenary Lecture-IV

Semi-field evaluation of *wAlbB Wolbachia* potential for population replacement of dengue vector *Aedes aegypti* from Lahore, Pakistan



Prof. Dr. Nusrat Jahan
GC University Lower Mall, Katchery Road, Lahore, Pakistan
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ABSTRACT:

Dengue is a vector-borne disease that lack vaccine or effective drug, resulting in vector control being the primary disease control strategy. *Wolbachia* is an intracellular bacterium that can spread through vector population via cytoplasmic incompatibility (CI). It has been shown to inhibit the transmission of a number of the human pathogens such as dengue, chikungunya viruses and filarial nematode in *mosquitoes*. In order to utilize *Wolbachia* to block the transmission of pathogens to the humans, a more efficient vector population replacement strategy is required. The main objective of the current study was to evaluate the potential of *wAlbB Wolbachia* to invade wild population of *Ae. aegypti* with high frequency of infection through various release ratios. For this purpose three experimental (1,2,3) and two control (4-5) groups with constant number of wild males and females (1:1) were designed under semi-field conditions. In group 1-4 *Wolbachia* infected females ($Wcl_{\text{♀}}$) were remained constant (20) while *Wolbachia* infected males ($Wcl_{\text{♂}}$) varied with 1:1, 1:2, 1:4 & 1:0 (20, 40, 80 & 0) ratios while negative control (5) did not have any *Wolbachia* infected male and female. After one week of 1st release, *Wolbachia* infected population was released again in 2nd release with fixed ratio (05 $Wcl_{\text{♀}}$ constant X $Wcl_{\text{♂}}$ 10, 20, 40) to boost the replacement strategy. Presence of *Wolbachia* was confirmed by PCR in each successive generation using *wsp* *Wolbachia* specific primers. The results indicated that the release of additional infected males (group 3) into the population can accelerate the population replacement by increasing the frequency of incompatible mating and results in decline of uninfected population. *Wolbachia* invasion was evaluated on three parameters; oviposition count, eggs hatch rate and *Wolbachia* induced population replacement frequency in successive generations. There was no significant difference ($p > 0.05$) in egg laying capacity of females of various experimental groups compared with control at 1-4 generations. However, significantly lower ($p \leq 0.05$) hatch rate (48%) was observed in release ratio 1:4 of *Wolbachia* infected females X males (group 3) at generation 1. In addition highest average population replacement was also observed in group 3 and group 2 ($100\% \pm 0.00$) at generation 3 (F3) and generation 4 (F4) respectively. There is a direct correlation between an increased ratios of infected males released with the increase rate of population replacement. In conclusion 100% *Wolbachia* infected population replacement occurred in group 3 with maximum *Wolbachia* infected males as rapid as within 3-4 months period. There is a dire need for further research on mass rearing of *Wolbachia* infected males to use in the field trials in specific localities for dengue vector population replacement and suppression in Pakistan to control the disease.

INVITED LECTURES

Invited Lecture-I

Potential role of spiders in health and agriculture

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ABSTRACT:

Spiders have 49'685 known species, most of them are venomous, and they are more in count than the combined total of all the venom containing animals in the world. Very few spiders can bite to humans and most of them are not harmful. The spider venom has the potential to be used against lethal cardiovascular ailments like cardiac arrhythmia, atrial fibrillation etc., various cancers and neurological disorders (Parkinson's disease, pathological anxiety, ADHD, Alzheimer's disease, epilepsy, brain damage). Many ingredients of venom have the potential to be used as analgesic (chronic aching back, headache and arthritic pain), antifungal, antibacterial, antimalarial, and to treat muscular dystrophy, and erectile dysfunction. Engineered spider protein, anti-venom vaccine, has also been produced that is safer and more effective than previously used anti venom vaccine. Due to its specificity in site of action, spider venom is harmless to humans. Spider venom is gaining importance as potential to be used to control insect pests due to its species selectivity. The novel environment friendly bio-pesticides could be developed from the spider's venom which would kill the target pest and would not be hazardous to humans or other organisms if they entered into the food chain. Furthermore, development of resistance to these pesticides would be slow. We can reduce the application of insecticides by using spiders to controlling insect pests of Agriculture and vector of many diseases that will not only protect human health, wildlife, and environment but also save millions of rupees. The silk of spiders has also potential to be used in health and other fields.

Invited Lecture-II

Public health in national sustainable development strategy of Pakistan: implementation and prospects



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ABSTRACT:

Public health is the science of protecting the safety and improving the health of communities through education, policy making and research for disease and injury prevention. Public health promotes the welfare of entire population, ensures its security and protects it from the spread of infectious disease and environmental hazards, and helps to ensure access to safe and quality care to benefit the population. Working at the community level promotes healthy living, helps prevent chronic diseases and brings the greatest health benefits to the greatest number of people in need. Health has a central position in the global agenda through SDG 3, and is closely linked to over a dozen targets in other goals related to urban health, equal access to treatments, and non-communicable diseases, among others. In fact, the SDGs represent a unique opportunity to promote public health through an integrated approach to public policies across different sectors (the Health in All approach defined by the WHO). For example, better education for girls (goal 4.1) that would improve maternal health (goal 3.1); tackling child malnourishment (goal 2.2) would have a great impact on child health (goal 3.2); and ensuring access to safe water (6.1) or tackling ambient air pollution (11.6) will evidently have a direct impact on several SDG3 targets. On the other hand, using coal to improve energy access (goal 7), would have a negative impact on health. Thus, the achievement of the health goals will need policy coherence to reinforce synergies between certain SDGs and minimize trade-offs. Health is crucial for sustainable human development, both as an inalienable human right and an essential contributor to the economic and social development of the society. Sustainable Development Goal 3 is to “ensure healthy lives and promoting well-being for all at all ages”. It is now widely recognized that without a strong nexus with social determinants of health and inter-sectoral bridges, it is difficult to overcome poverty. Therefore, Pakistan Vision 2025 envisages to reduce the widespread prevalence of communicable diseases; strengthening disease surveillance; addressing inadequacies in primary and secondary healthcare facilities; correcting rural-urban biases; bridging basic nutritional gaps and improving the pharmaceutical sector to ensure the availability; affordability and quality of drugs. Pakistan has launched its National Sustainable Development Strategy in 2017 and for achieving SDG 3 by 2030, has set 5 targets with indicators. This article critically analyses the measures taken for achieving targets set for SDG-3 in NSDS of Pakistan and discusses prospects for future implementation.

Invited Lecture-III

Designing inhibitors of viral proteases using fragment-based drug discovery approach



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ABSTRACT:

Viral protease is an essential factor in the reproductive cycle of dengue virus (DENV), coronavirus (SARS-CoV-2), hepatitis C virus (HCV) and other RNA-based viruses and is involved in the co- and post-translational maturation of viral structural and non-structural proteins. Inhibition of the proteolytic activity of viral proteases is considered as an attractive strategy for discovering specific and direct-acting antiviral (DAA) drugs, due to their unique chemical landscape. There is a long-standing pursuit of discovering small organic molecules that can inhibit the proteolytic activity of DENV NS2BNS3 protease. More recently, the global pandemic of COVID-19 has initiated a worldwide effort to discover therapeutics to control the SARS-COV-2 infections. Towards this direction, our research group is investigating the structural and functional properties of the main protease (Mpro) of SARS-CoV-2 to design and discover effective DAAs. Getting insight from the solved 3D structure of the DENV NS2BNS3 protease and SARS-CoV-2 M^{pro}, surface topology and chemical landscape of their active sites and putative allosteric sites are being explored for designing novel inhibitors with favorable binding interactions. Following this rationale drug designing approach, several synthesized libraries of heterocyclic compounds are screened in high-throughput enzymatic assays to identify hits for lead optimization. This presentation will cover various challenges of using viral protease as a drug target in the context of the progress of developing specific DAAs. Finally, the atomic level details of important protease-inhibitor binding interactions, will be presented. These findings are highly promising in the context of development of anti-viral therapeutics against DENV and COVID-19.

Invited Lecture-IV

Tumor metabolism-novel and selective target for cancer therapy



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ABSTRACT:

The development of cancer-specific therapeutics has been limited because most of healthy cells and cancer cells depend on common pathways. The recent evidence suggests that targeting the cancer specific metabolic and mitochondrial remodelling may offer selectivity in cancer treatment. Malic enzyme 2 (ME2) is predominantly overexpressed in a number of tumor types and inhibition of ME2 results in decreased tumor growth. Reversing the mitochondrial suppression and the increased glucose consumption in cancer cells is an important step and has great potential for therapeutic drug developments. Therefore, we performed library screen to discover novel inhibitors of tumor metabolic enzyme, ME2, for cancer treatment. Here, progress regarding screening for ME2 inhibitors will be reported.

Invited Lecture-V

Pilot scale commercial production of *Labeo rohita* in In-pond raceways system in Pakistan

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ABSTRACT:

A pilot scale commercial-scale, in-pond raceways system was constructed in 2019 on a commercial fish farm in East-Central Punjab, Pakistan. Three raceways were installed in a 8 acres earthen pond. With an operating depth of 2 m, the volume of water enclosed is 220 m³. The total culture volume of the raceways for holding and growing fish is 660 m³, equivalent to 2.33 % of the total surface area of the production pond. One raceway was originally stocked with 8,200 labeo (*Labeo rohita*) fingerlings weighing between 300 – 310 g. During the grow out period of 171 days, mean survival was 99.90 %. A total of 8,755 kg (40 kg/m³) of fish were harvested from the raceway. Gain in biomass per day was noted to be 39.2 1kg. Feed conversion ratio (FCR) for labeo was 1.20. Present study shows that IPRS technology proved to be successful for adoption by Aquaculture sector for more production / m³ and conservation of water and land.

Invited Lecture-VI

One Health – a potential area for innovative collaborative research for advancing the public health causes



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ABSTRACT:

Across the world, innovative research trends point towards multidisciplinary approaches and mandate collaboration among researchers from diverse research backgrounds. These collaborative efforts, in the field of biological and public health' have particularly brought together Biologists, Veterinarians and Medical researchers with the resolve to address public health threats; an overarching phenomenon that is embraced as 'One Health' concept. One Health aims to achieving optimal public health outcomes and sees them as being continuously influenced by the integrated roles played by humans, animals and plants. Antimicrobial resistance (AMR) is one such example of public health concern, which deserves concerted efforts by researchers from animal health, public health, biological sciences and environmental sciences domains to support one health approach and propose innovative solutions. The AMR has been declared as one of the top 10 public health threats facing humanity (World Health Organization). The AMR develops when microbes such as viruses, bacteria, parasites and fungi no longer respond to antimicrobial agents due to change in the structure of the former. It makes infections difficult to treat and increases the disease prevalence and risks severe illness and death. Resultantly, the antimicrobial agents become increasingly ineffective leading to persistent infections as well as enhanced risks of disease spread. According a World Bank estimate, 700,000 people die of AMR annually and this death toll could rise to as high as 10 million deaths annually by 2050 if not attended. The scientific community from diverse backgrounds has great responsibility to collaborate and discover innovative research solutions to prevent the emergence and spread of antibiotic resistance worldwide. Possible avenues for collaborative research could be development of rapid and low cost diagnostic tests, development of approaches to limit the risks of environmental exposure, innovative research on prevention of antimicrobial resistance and surveillance and promotion of research and development of novel antimicrobial strategies and antimicrobial agents.

Invited Lecture-VII

A recurrent nonsense mutation in *NECTIN4* underlying ectodermal dysplasia-syndactyly syndrome with novel phenotype in a consanguineous Kashmiri family.



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ABSTRACT:

EDSS1 (Ectodermal dysplasia-syndactyly syndrome) is an autosomal recessive inherited anomaly caused by variations in the *NECTIN4/PVRL4* gene. Clinical manifestation of the syndrome includes defective nail plate, sparse to absent scalp and body hair, spaced teeth with enamel hypoplasia and bilateral cutaneous syndactyly in fingers and toes. Here, we report a consanguineous family of Kashmiri origin presenting features of EDSS1. Using whole exom sequencing we found a recurrent nonsense variant [NM_030916: c.181C>T, p.(Gln61*)] in the *NECTIN4* gene. The variant segregated perfectly with the disorder within the family. The candidate variant was absent in 50 inhouse exomes pertaining to other disorders from the same population. In addition to previously reported clinical phenotype, upper lip cleft was found in affected members as a novel phenotype which is not reported by the previous studies in EDSS patients. Therefore, our study adds a novel phenotype to EDSS patients and contributes to the *NECTIN4*-related clinical classification.

Invited Lecture VIII

Cytostatic effects of Riproximin against cancer cells: Journey of a plant protein from laboratory to clinic



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ABSTRACT:

Breast, colorectal, liver and lung cancers are highly malignant diseases with low 5-year survival rates in advanced stages, which highlight the need of finding new therapeutic options. Considering this, we are interested in exploring the anticancer potential of riproximin, a type II ribosomal inactivating plant protein, against the above mentioned cancers in laboratory conditions. In the present experiments, we studied the anticancer effects of riproximin against breast (MDA-MB-231), colorectal (SW620), liver (HepG2) and lung (H1299) cancer cell lines. Following exposure to riproximin, cytotoxic and cytostatic effects were measured by MTT dye reduction and FACS assays respectively. Furthermore, to understand the observed anticancer effects at molecular levels, the selected cell lines were exposed to riproximin and alterations in cell cycle relevant 84 genes were investigated by qRT-PCR methodology. Riproximin was highly active against the selected cell lines and induced significant cytotoxicity effects in the cancer cells. Furthermore, the protein imposed a halt in S phase of the cell cycle in the cancer cells. At molecular levels, riproximin altered the expression of a number of cell cycle relevant genes including cyclins, CDKs and cell cycle inhibitors (CIP/Kip family) in the four cell lines.

Antineoplastic effects of riproximin contribute to decreased proliferation of the cancer cell lines. This plant protein induces arrest in S phase and alters the expression of multiple cell cycle relevant genes. Further understanding at molecular levels supported by *in vivo* experimentation will be required to validate its therapeutic potential against the cancer cells.

ORAL PRESENTATION SESSIONS

SERICULTURE and ENTOMOLOGY (SE)

SE 01:

Evaluation of burn wound healing potential of sericin based hydrogels

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ABSTRACT:

Wound healing is a dynamic and sequential biological process which involves the restoration of the injured tissues. Burn wound healing is an emerging clinical problem which requires effective wound management strategies. Various types of wound dressings such as foams, gauze, films and bandages are available in the market. But the available wound dressings have many disadvantages including delay in wound healing process and cause pain when removed from site of wound. Researchers are continuously making headways in the development of hydrogels as ideal burn wound dressings. Hydrogels are three-dimensional polymer networks formed by crosslinking of synthetic or natural polymers. Hydrogels are insoluble in water and have ability to retain large amount of water due to hydrophilicity of the polymeric chains. Hydrogels are ideal wound dressings due to their high moisture content, permeability to metabolites, non-toxicity, flexibility and biocompatibility. Sericin is a natural globular protein obtained from the silk synthesized by silkworm. Sericin is preferably used to make hydrogels because of its biodegradability, good hydrophilic and wound healing properties. Sericin accelerate the process of wound healing as it can promote the growth of fibroblasts and keratinocytes, deposition of collagen and generate low immune response. Sericin due to its brittle nature and poor mechanical strength can be blended or cross-linked with natural or synthetic polymers to form hydrogels. Sericin based hydrogels have greater burn wound healing potential. They are able to absorb wound exudates, provide moisture to burn wound and reduce the formation of scar. Sericin based hydrogels can cause contraction of burn wound within 11-14 days. Sericin based hydrogels are the promising alternatives to the conventional wound dressing materials.

SE 02:

Biopesticidal potential of Sericine coated silver nanoparticles (Se-AgNps) against major agricultural pests

Syeda Durr e Shahwar Zaidi, Hafiz Muhammad Tahir, Muhammad Summer, Abdul

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ABSTRACT:

The present study was conducted to evaluate the biopesticidal potential of Sericin coated silver nanoparticles (Se-AgNps) against agricultural pests. Sericin based silver nanoparticles were synthesized by using sonication method while Calotropis and Marigold coated silver nanoparticles were synthesized by using heat method and these nanoparticles characterized using particle size analyzer, UV spectrometry, SEM and FTIR. Sonication assisted Se-AgNPs and Marigold conjugated AgNPs revealed the highest biopesticidal activity against Thrips, Army worms and Pink ball worms. Maximum mortality was recorded by using Marigold coated silver nanoparticles against Thrips, Army worms and Pink ball worms. Moreover, by using Minitab and

SPSS software LC50, LC95, LT50 and LT95 was calculated. LT50 and LT95 was decreased by using 0.3% Marigold, Calotropis and sericin coated silver nanoparticles while LT50 and LT95 was increased by using 0.2 and 0.1% nanoparticles. Above mentioned findings of the study suggested that Marigold and sericin coated silver nanoparticles showed best results in biopesticidal activity as compared to the Calotropis coated silver nanoparticles.

SE 03:

Silk derived formulations for accelerated wound healing in diabetic mice

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ABSTRACT:

The present study aimed to prepare effective silk derived formulations in combination with plant extract (Aloe vera gel) to speed up the wound healing process in diabetic mice. Diabetes was induced in albino mice by using alloxan monohydrate. After successful induction of diabetes in mice, excision wounds were created via biopsy puncture (6 mm). Wound healing effect of silk sericin (5%) and silk fibroin (5%) individually and in combination with 5% Aloe vera gel was evaluated by determining the percent wound contraction, healing time and histological analysis. The results indicated that the best biocompatible silk combination was of 5% silk fibroin and 5% Aloe vera gel in which wounds were healed in 13 days with wound contraction: $98.33 \pm 0.80\%$. In contrast, the wound of the control group (polyfax) healed in 19 day having $98.5 \pm 0.67\%$ contraction. Histological analysis revealed that the wounds which were treated with silk formulations exhibited an increased growth of blood vessels, collagen fibers, and much reduced inflammation. It can be concluded that a combination of Bombyx mori silk and Aloe vera gel is a natural biomaterial that can be utilized in wound dressings and to prepare more innovative silk based formulations for speedy recovery of chronic wounds.

SE 04:

Enhancement of wound healing by silkworm fibroin, Aloe vera and ginger in alloxan induced diabetic mice

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ABSTRACT:

Diabetes, a heterogeneous group of disorders, primarily characterized by elevated blood glucose level. Because of its high incidence and prevalence, it becomes the main concern about human health in the 21st century. Diabetes involved various complications specifically in delayed wound healing. Natural products have an amazing effect in healing different diseases and are being used for centuries. In the current study, diabetes was induced in Swiss albino mice by using alloxan monohydrate. After the successful induction of diabetes in mice, excision wounds were created via a biopsy puncture (6mm). Various plant extracts were applied to the diabetic wounds and checked the healing of the wound. The wound-healing effect of

silk fibroin (5%), aloe vera (5%), and ginger (3%), individually along with their combinations silk fibroin (5%) + aloe vera (5%), silk fibroin (5%) + ginger (3%), aloe vera (5%) + ginger (3%), and silk fibroin (5%) + aloe vera (5%) + ginger (3%) was evaluated by determining the percent wound contraction, healing time, histological analysis. The level of various biomarkers i.e., MMPs (MMP 2, MMP 9) and IL (IL 1, IL 8) were also observed using biochemical tests. The results indicated that the best compatible combination was silk fibroin (5%) + aloe vera (5%) + ginger (3%) in which wounds were healed in 12 days with wound contraction: $98.54 \pm 0.30\%$. In contrast, the wound of the control group (polyfax) healed in 18 days having contraction: $96.66 \pm 0.42\%$. Histological analysis showed that the fibroin combination with both extracts (ginger and aloe vera) exhibited an increased growth of collagen fibers, blood vessels with lessened inflammation. These extracts and their combination also maintained the disturbing level of biomarkers. It can be concluded from the current research that the natural products used in combination possess high regenerative and healing capabilities and can be used as an effective remedy in the healing of chronic wounds.

SE 05:

Effect of natural food supplements on economical and biological traits of silkworm *Bombyx mori* L.

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ABSTRACT:

In this study the effect of natural food supplements (sericin (5%), honey (3%), Bovine milk (25%) and Probiotics (5%)) on economical and biological traits of *Bombyx mori* was investigated. The mulberry silkworms on day 1 of the 5th instar were separated into nine groups of 20 each: namely eight experimental groups and one control group. Plain (untreated) mulberry leaves were offered to the control group while experimental groups were fed on the mulberry leaves dipped in exogenous nutrients alone (5% sericin, 3% honey, 5% probiotics) and in combination (5% sericin + 3% honey, 25% bovine milk + 5% sericin + 3% honey, 25% bovine milk + 5% probiotics + 5% sericin, 3% honey + 5% sericin + 5% probiotics and 5% sericin + 5% Probiotics) on the odd days (1, 3, 5 and 7 days). Conversely, plain mulberry leaves were given to the silkworms on even days (2, 4, 6 and 8). Results showed that the % increment in larval weight was 23.48% higher in G7 (3% Honey) (130.41%) than control (105.6%). Similar trend was observed in G2 (5% sericin) for average cocoon weight (1.34 ± 0.06) and cocoon length (2.97 ± 0.05). In addition, the shell weight (0.30 ± 0.04 g), pupal weight (1.03 ± 0.04 g) and shell ratio ($22.61 \pm 2.83\%$) were found higher in G2 (5% sericin) larvae as against the control (G1). Similarly, cocoon width (1.67 ± 0.03 cm), denier (2.83 ± 0.03) and filament length (1616.5 ± 17.61 m) were recorded higher in G7 (3% Honey) as compared to the control. Percentage of sericin ($27.84 \pm 0.89\%$) and fibroin ($84.36 \pm 0.28\%$) was higher in G9 (5% Sericin + 5% Probiotics) and G5 (25% Bovine milk + 5% Probiotics + 5% sericin) against control. It is concluded by this study that 3% honey and 5% sericin (solitary) have positive effect on the economical and biological characters of *B. mori*.

SE 06:

Current status of insecticides resistance and associated mechanisms in *Aedes aegypti*

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ABSTRACT:

The present study was performed to evaluate the current status of insecticide resistance against pyrethroids (deltamethrin, cypermethrin and lambda-cyhalothrin) and organophosphate (temephos) in different populations of Lahore (Model town, Mishri shah, Sadar Cantt, Walton and Valencia). The susceptibility of larval and adult population was tested following standard WHO guidelines. Against temephos all field populations of Lahore showed less mortality than susceptible laboratory strain having RR_{50} ranging from 10-20 RR_{90} from 7.75-12.25. In larval populations against pyrethroids low to moderate level of resistance was found with RR_{50} : 0.3-1 and RR_{90} : 1-15 and in adult population moderate to high resistance was present with percentage mortality <98%. To study metabolic basis of insecticide resistance content of monooxygenase, esterase (carboxyesterase and acetylcholinesterase) and glutathione S transferase of resistant field populations was measured and compared with susceptible laboratory strain. Statistical significant increase in enzyme level was found in all field populations than laboratory strain. The value of acetylcholinesterase was 1.2 to 2.5 fold higher, esterase was 1 fold higher, monooxygenase was 3.9 to 4.7 fold higher and GST was 1.9 to 2.6 fold higher in field populations than laboratory strain. This study clearly depicts the presence of resistance against most commonly used insecticides (pyrethroids and organophosphate) in larval and adult population of Lahore.

SE 07:

Infestation and prevalence of ticks and tick born disease in buffalo and cattle

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ABSTRACT:

Ticks are very serious vector of many pathogenic diseases and it transmitted many diseases in cattle, wild animals and also in human. Every years many animals die due to tick born diseases. In Africa and some part of Asia human mortality also reported due to tick born diseases. Present study was conducted in Hyderabad and adjoining areas from August 2019 to December 2019. Buffalo and cattle were selected for study. Different animal shades were also observed. Total 7 seven species of hard tick belonging to family Ixodidae were identified. Due to Infestation of ticks some parasitic disease were also reported in animals. Mostly tick infestation was found on Buffalo as compared to cattle. During present study it was also observed that milk and meat production badly affected by tick infestation.

SE 08:

Laboratory evaluation of isolated entomopathogenic fungi against the guava fruit fly, *Bactrocera zonata* (Tephritidae: Diptera)

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ABSTRACT:

Guava is one of the most popular fruit in the world by its taste and nutritional value. In Pakistan, it is the third most rapidly growing fruit. The peach fruit fly, *Bactrocera zonata* is one of the major hindrances in the yield and productivity enhancement of fruits. The entomopathogenic fungus is considered an effective management practice against fruit flies. In order to estimate the efficiency of two species of fungi, *Beauveria bassiana* and *Metarhizium anisopliae* were tested at concentrations of conidia, 1×10^8 , 1×10^7 and 1×10^6 against adults of *B. zonata* in the laboratory conditions. The mortality was recorded after 7 and 15 days of treatment. Both fungal species were found significant at the concentration of 1×10^8 . For *B. bassiana* mortality observed were 40% and 43.33% at the interval of 7 and 15 days respectively, on the concentration of 1×10^8 conidia/ml, while *M. anisopliae* showed 35% and 40% mortality against adults of *B. zonata*. The use of EPF in IPM plans can lead to effective management against fruit fly since there is a need for sustainable and environmentally safe practices in fruit farming.

SE 09:

Investigation of mosquito diversity in tehsil Babuzai, district Swat

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ABSTRACT:

Mosquitos are slender, fragile, long-legged insects which are distributed world widely. Normally mosquitos are terrestrial and nocturnal species, have long proboscis and scales on the body which help in identification. The aim of this study is, to investigate the mosquito fauna in tehsil Babozia, District Swat. Total 159 collection of samples was performed from four union councils randomly in ground level and water bodies, using mosquitoes net and spray, each mosquito was preserved in 70% Ethanol. On the bases of morphological keys available in literature, identification was performed in which only two species were reported. *Culex Quinquefasciatus* present in maximum frequency (reported 97 samples) and also recovered 61 samples of the *Aedes aegypti*. This study concluded that, the climatic factor such as urbanization, pollution, deforestation and agriculture especially rice cultivation enhances the growth rate of *Culex Quinquefasciatus* and *Aedes aegypti* (serve vector for Dengue fever). To stop the growth of mosquito's population some prevention steps should be taken to prevent spreading of Mosquitos born harmful diseases like Dengue fever, zika virus (congenital microcephaly) and elephantiasis.

SE 10:

Quantitative determination of *Azadirachta indica* and its micro-emulsion toxicity against Red Flour Beetle (*Tribolium castaneum*)

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ABSTRACT:

The research aimed to examine the efficacy of Neem (*Azadirachta indica*) aqueous extract and its micro-emulsion against red flour beetle (*Tribolium castaneum*) destruction through contact toxicity under laboratory conditions. Neem plant has all around called as a wonder tree due to its diverse nature. Red flour beetle is the most devastating pests to stored grain products. GC-MS analysis exhibited the existence of biological compounds extracted from Neem, but most active compound was Azadiractin, which was responsible for insecticidal activities. Treatments consisted of Neem extract were the concentrations of 200 μ l, 400 μ l, 600 μ l, 800 μ l and 1000 μ l and micro-emulsion administrated at 50 μ l, 100 μ l, 150 μ l, 200 μ l and 250 μ l in liquid form. Results demonstrated, when concentration of extract and micro-emulsion was increased the death rate and insensible behavior of beetles also increased. Thus, result exhibited that bio-pesticides provide better technique to remove *T.castaneum* infestation for preserved items.

SE 11:

Insecticidal efficacy of greenly synthesized silver nanoparticles against aphids

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ABSTRACT:

Hazardous nature of chemical insecticides is causing severe problems to both humans and their environment. Therefore, it is dire need to discover environment friendly and more effective substances to control insect pests. Greenly synthesized nanoparticles are among the best candidates as insecticides. In present study Silver (Ag) nanoparticles were synthesized with *Azadirachta indica* (neem) leaf extract in which leaf extract was used as both reducing and capping agent. This method of nanoparticles synthesis is quite environment friendly (Asimuddin et al., 2020). Size based Characterization was performed by using BT-90 nano laser particle size analyzer, which revealed the size of synthesized particles as 76.8nm. To evaluate the insecticidal activity of these nanoparticles, they were applied on green peach aphid by leaf dipping method and their mortality was observed. Original nanoparticles solution and its two dilutions i.e., 3:1 and 1:1 were applied on treated groups. Control group was treated with De ionized water. Readings were recorded after regular interval of time. After 20 hours of treatment 100% mortality was recorded in original silver nanoparticles solution. However, in 3:1 and 1:1 solutions 100% mortality was noted after 24 hours. LT50 recorded for original solution and dilutions (3:1 and 1:1) was 8.09, 10.56 and 12.45 hours respectively. These results showed that greenly synthesized silver nanoparticles have potential to kill the aphids.

SE 12:

Morphological and Molecular Identification of Rhipicephalus microplus in association with host factors in Sheep and goats from District Okara, Punjab, Pakistan

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ABSTRACT:

Recent global climate changes have led to an increase in the spread of ticks and tick-borne diseases (TBDs) especially in developing countries. TBDs affected domestic ruminants and humans in terms of health impairment and lower productivity with an approximate annual economic loss of US 13.9 -18.7 billion dollars. Pakistan is an agricultural country, and domestic animals are the major contributors in the national economy. Review of research studies showed higher prevalence of ticks in sheep and goat but limited reference available on molecular identification of various ticks species. Therefore, present study was designed to determine of host specificity and molecular identification of Rhipicephalus microplus from sheep and goats in district Okara, Pakistan. The funds for this research were granted by Agriculture Linkage Program (ALP), Pakistan Agriculture Research Council, Islamabad. A total 1200 animals (600 goats and 600 sheep) were selected for molecular determination of Rhipicephalus microplus infestation associated with host specificity factors (i.e. sampling site, animal species, sex, age) from three Tehsils of District Okara. Ticks were detached from animals with the help of tweezers and stored in 70% ethanol. Data related to host specificity was collected on already designed performa. Morphological identification was done by using a taxonomic key. PCR and sequencing techniques were used for molecular identification of tick i.e. Rhipicephalus microplus. PCR products were sequenced and phylogenetic analysis were done by the OMEGA tool. The Association of host specificity factors with infestation of Rhipicephalus microplus was statistically analyzed by Chi-square and multiple regression analysis. Overall 46.8% and 26.1% infestation rate of Rhipicephalus microplus was recorded in goat and sheep, respectively. In goats, highest prevalence was recorded from Okara (20.3%), followed by Depalpur (15.1%) and Renala (11.1%). While in sheep higher (9.5%) tick infestation was recorded from Okara and Depalpur, while lower (7.1%) in Renala. Female animals were found more likely infested as compared to males. While higher prevalence was recorded in young age group of animals. The statistical analysis showed there is significant difference among host associated factors (species, age, sex and sites. Rhipicephalus microplus ticks were identified morphologically and confirmed by ITS-2 gene through PCR and sequencing in Pakistan. It is concluded that Rhipicephalus microplus was higher prevalent among ruminants in district Okara Punjab. Rhipicephalus microplus is mainly infect large ruminants but also infect small ruminants and spread protozoans diseases like babesiosis and anaplasmosis. Therefore, a comprehensive field research is recommended to dig out the association of this tick in other animal species and its further protozoans diseases prevalence. These outcomes can be further used for the planning of integrated control strategies of ticks and tick-borne diseases.

**EPIDEMIOLOGY AND PUBLIC HEALTH
(EP)**

EP 01:

Seroepidemiological studies of Brucellosis in Prenatal Women of district Poonch, Azad Jammu and Kashmir, Pakistan

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ABSTRACT:

Brucellosis is considered as one of the most prevailing zoonosis by Food and Agricultural Organization and by World Health Organization, human brucellosis is mostly known as Maltese fever, undulant fever, Mediterranean fever, Crimean fever, remitting fever and goat fever and in animals it is known as contagious abortion or Bang's disease. This study aimed to find out the seroepidemiology of brucellosis in prenatal women of rural population as well as its associated risk factors in the district Poonch, Azad Jammu and Kashmir. We conducted a cross sectional study conducted from January 2016 to December 2016 in different tehsils of district Poonch to find out seroprevalence of brucellosis among rural women and to investigate its associated risk factors. Random sampling was used to as a sampling technique and sample of 205 rural women was selected including pregnant and aborted. A questionnaire regarding age, management system and body conditions by interviewing women were developed. Among 205 serum samples 18 (8.78%) were found to be seropositive for Brucellosis tested through RBPT and 12 (13%) were positive through ELISA. Epidemiological data revealed that the assessed risk factors in 18 positive RBPT cases were animals contact, consumption of raw dairy products and contact with aborted tissues. Multiple symptoms reported in 18 RBPT were sweating, fever, fatigue, Anorexia, weight loss, headache, chills, body pain, Arthralgia, Nausea, body weakness, stiff neck and loss of appetite. It was found that the incidence of brucellosis in women was higher among the age group of 24-31, and it was highest in house wives, among rural population in patients of low economic status. Farther it was noted that the prevalence among women having close contact with infected animals who were consuming raw milk and meat were at high risk of brucellosis. The associated risk factors were direct animal interaction, contact with aborted tissues and consumption of raw dairy products and these risk factors could contribute to the increase of the brucellosis cases.

EP 02:

Risk factors associated with an outbreak of dengue fever in UC Chak Jalal Din Pothohar town, district Rawalpindi, Punjab, Pakistan

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ABSTRACT:

Dengue fever (DF) appeared to be emerging in Chak Jalal Din Pothohar Town District Rawalpindi Punjab, Pakistan in September - November in 2019. A controlled case study was performed to investigate risk factors for the surveillance of DF in union council Chak Jalal Din district Rawalpindi. A total of 169 patients with DF were studied in that area. Out of 169 patients 115 were male and 54 were female. We further divided under study patients in three categories such as below 25 years (43 patients), 25 to 40 years (73 patients) and above 40 years (31 patients). The risk factors for these patients were factories, water ponds, godowns, swimming pools, nurseries, service stations, abundant buildings, marriage halls, hotels, schools, grave yards, mosques, religious places, parks, tyre shops, junk yards, workshops, railway stations, colleges, bus terminals, tube wells, grid stations, high raised buildings, parking stands, horticulture places, filtration plants, dairy plants, open sewerage system, supply of water through water tanks, its improper storages at homes, unhygienic conditions found during indoor survey especially in rented areas, under construction buildings and living in a house discharging sewage directly into to ponds were all significantly associated with DF. These all factors provided best habitat for the growth of dengue larva at that area. These results contribute to the understanding of the dynamics of dengue transmission in union council Chak Jalal Din and its vicinity, which was needed to implement dengue prevention and control programmes effectively and efficiently.

EP 03:**Substance abuse and mental health issues among HIV/AIDS patients:
A systematic review and meta-analysis**

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ABSTRACT:

Various substance use and psychiatric issues development is enhancing concern among HIV/AIDS patients globally. Patients suffering from HIV/AIDS must consider for the “Triple diagnosis” HIV/AIDS, psychiatric diagnosis, and substance use disorders during their clinical management. However, various studies have focused these issues but there is deficiency of comprehensive literature on the “Triple diagnosis”. Therefore, the primary objective of this systematic review and meta-analysis was to find out the pooled prevalence of common substance abuse as well as common mental health disorders among HIV/AIDS patients worldwide. Google scholar, PubMed central, Medline, PakMediNet biomedical databases from January 2010 to May 2021 were used for comprehensive literature review. Selection of studies, extraction of data from the studies and assessment of quality checking of included studies were performed by two authors independently. The prevalence of common mental disorders and substance abuse disorders was calculated by random effect models and I^2 and Q statistics were also calculated to determine the substantial heterogeneity. From various electronic databases, 237 records were identified and only 19 studies after applying eligibility criteria were included in the systematic review and meta-analysis. The overall pooled prevalence of any current substance use was 25.13% and pooled prevalence of depression among HIV/AIDS patients were 30.31% as compared to general population. There was no significant publication bias

but substantial heterogeneity was observed in the presented studies. The current systematic review and meta-analysis focused on the prevalence of substance abuse as well as mental health disorders among HIV/AIDS patients. A current alcohol consumption and tobacco smoking are most common substance abuse and depression and anxiety are the most common mental health disorders among HIV/AIDS patients. The policy makers should designed strict strategies to limit extensive utilization of substance use and there should be incorporation of psycho-social provision and mental health services with curative services of HIV/AIDS.

EP 04:

Significant reduction of disease severity and mortality rate in vaccinated COVID-19 patients in Rawalakot, AJK: A case control study

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ABSTRACT:

The vaccine was the only hope to control the recent SARS-CoV-2 pandemic all over the world. Because of so much importance, many vaccines have been developed rapidly in a short period of time. These vaccines, because of urgent requirement, were launched all over the world even before completion of their all phases of clinical trials. So, the efficacy and potency of these vaccines are not completely known still. The present was designed to study the extent of protection given by vaccination in terms of reduction in disease severity and death rate. To achieve this objective, a total of 1251 symptomatic COVID-19 patients were enrolled which included 987 unvaccinated and 264 vaccinated patients. Disease severity and death rate were compared between vaccinated and unvaccinated patients overall and group by group. Different groups of the patients were made on the base of age, gender, smoking, diabetes mellitus, hypertension, cardiovascular disease, and lungs disorder. The quantitative variables were compared by independent sample T-test while the qualitative variables were compared by Pearson's Chi-Square test with layering on the base of different factors. It was found that the vaccinated patients had significantly lower mortality rate as compared to unvaccinated ones overall and in all groups except for the patients with cardio vascular disease. Similarly, the disease severity was significantly lower in vaccinated as compared to unvaccinated patients overall and in all groups except for patients with cardiovascular disease and the patients with lung disorder. Moreover, the vaccinated patients had a shorter recovery time as compared to unvaccinated patients. The study concluded that the vaccination has significantly reduced the disease severity and in turn the death rate due to COVID-19 infection in Azad Jammu and Kashmir, Pakistan.

EP 05:

Valuation and Policy Recommendation for Cleaning Environmental Pollution of a Biological Hazard: Smokeless Tobacco – Evidence from Case Study

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ABSTRACT:

Smokeless tobacco (SLT), unburned carcinogenic consumable that contains many toxic substances, is harm inflicting to the consumers by causing various life threatening diseases and can also be a source of transmitting diseases like novel corona virus by collaborative consumption and spitting the mucosal accumulate. This mucosal spit also affects trees, walls and bridges that are painted by splotted patches leading to environmental pollution. Thus, in order to gauge the valuation of a SLT-splotch free environment using 'willingness to participate' and 'willingness to pay', a survey based case-study was conducted at a public sector university. A detailed questionnaire composed of demographics, variables relating to smokeless tobacco consumption and its pollution eradication measures was administered following an interview based approach in Urdu. STATA based cross tabulations revealed that willingness to participate in the cleanliness drive of Gutka and Paan stained walls was comparable across gender with a greater percentage of males (84.2%) and females (80.6%) agreeing to take part. Participants were equally willing to participate physically, monetarily, both or morally. Females had a greater inclination towards monetary contribution (60%) with a significantly higher average willingness to pay worth PKR 1177.8. Gender comparison of willingness to participate in the cleaning SLT stains was indifferent with respect to gender when compared in terms of age brackets, district of residence, education, marital status and SLT consumption as majority of participants in all categories of stated variables were affirmative to participate in cleanliness drive. Robust logistic regression showed that attaining education till high school increased the odds of voluntary participation by 3.56 ($p < 0.05$). Urdu speaking participants were 8.09 times more willing to participate as compared to other ethnic counterparts ($p < 0.001$). Odds of participating in cleanliness drive was reduced by 24% for less than daily SLT users ($p < 0.01$) and by 30% for not at all users of SLT ($p < 0.05$). The findings are a motivation that cleanliness drive can be initiated at the site of case study and future policy recommendations of fine imposition and strict institutional regulations can help to curb the spread of SLT induced contamination and spread of diseases.

EP 06:

Current outbreak of dengue fever in rural areas of Sindh, Pakistan

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ABSTRACT:

Dengue fever spread increased day by day in Pakistan. Previously it was reported from major urban areas of country but now its speed reported in rural areas. Present study of dengue fever and dengue fever mosquito was carried out from August to September 2021 in district Matiari, Sindh Pakistan. During present study, different localities of District Matiari visited and found very alarming situation of disease. Total 650 case of dengue fever mosquito were reported in these localities. Previously there was no any local case of dengue fever reported from these localities. Major Vector mostly found was *Aedes aegypti*. Larvae of mosquitoes mostly collected from

mud pots in restaurants of towns and also from villages. Present study revealed that current outbreak of dengue is very alarming situation for rural areas peoples, which are unaware from dengue. We assume prevalence and abundance of dengue fever mosquito was because of climate change effect. Dengue, *Aedes aegypti*, Mosquito, Matiari, Sindh, Pakistan.

EP 7:

Prevalance of Hepatitis among coal mine workers

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ABSTRACT:

Hepatitis (HBV, HCV) is the most prevalent disease that can lead to cirrihosis and chronic liver damage . Hepatitis is inflammation of liver that impairs the normal function of liver cells and is caused by viral pathogens, mutation or interaction of any toxic substance with liver cells. Hepatitis has high prevalence rates in underdeveloped and underprivileged work environments and nonhygienic living setups. Occupational workers like coal miners are at higher risk of developing hepatitis. Coal miners in Pakistan are working in adverse conditions with least or no work safety measures. The hygiene and living conditions of workers are miserable. The present study is designed for evaluating of prevalence of hepatitis in coal miners. An observational study was carried out for the period of six months in Pail and Padhrar coal mines. A sample size of 70 miners was considered and by taking their consent, questionnaires were filled and blood samples were taken for hepatitis screening test using rapid testing kits. Statistical analysis was done and it was found that 22.2 % of miners were positive for HCV. Among the hepatitis patients, 42.3% were married, 39.3% went to dental treatment , 66.7% of workers had blood transfusion once in life and 41.5% of workers shared razors . A strong positive correlation is present between the prevalence of hepatitis and unhygienic health practices along with lack of awareness among coal miners. Thus it can be concluded that work environment acts as a contributory factor in developing infectious diseases such as hepatitis B and C . There is a need of carrying further prevalence surveys across the country and efforts should be made to improve the work conditions and hygiene of workers in order to prevent them from recurring and life-threatening diseases.

EP 8:

Study of occupational toxicity induced by various metallic nanoparticles in industrial workers of paint industry in Lahore Pakistan

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ABSTRACT:

The growing use of varied nanoparticles in multiple industries, science, and pharmacy has increased human susceptibility to nanoparticles. Metallic nanoparticles are broadly utilized in paint manufacturing. The objective of this report was to examine the occupational toxicity among Pakistani paint workers in Lahore. Fifty blood samples were collected from paint employees and local workers. Blood samples were digested using the conventional wet acid procedure. Then digests were analyzed under atomic absorption spectroscopy to estimate the deposition of TiO₂ nanoparticles. Serum inspection of catalase, superoxide dismutase, glutathione peroxidase, uric acid, bilirubin, alkaline phosphatase (ALP), aspartate aminotransferase (AST), and alanine aminotransferase (ALT), as well as hematologic assessment revealed that paint workers were afflicted by metallic nanoparticles, which culminated to inversions in normal levels of all these parameters. As a conclusion, laborers who are exposed to metallic nanoparticles in workplace, this study could be effective in health surveillance.

EP 9:**Outbreak of typhoid fever during corona pandemic in district Dir Lower during 2020**

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ABSTRACT:

The aim of my study was to find out outbreak of Typhoid fever during corona pandemic. For this purpose I collected data from Fazal-Rahim Clinical Laboratory, Qazi Clinical Laboratory, Frontier Clinical laboratory Timergara, DHQ Timergara, THQ Chakdara, THQ Samarbagh and various CD hospitals from from lower Dir. Typhidot test was performed for every individual. During data collection 623 individuals' data was collected. The result showed 318 males (51%) and 307 was female (49%). Age group 0-15 years recorded the highest incidence of cases 196 (31.46%); also September recorded the highest affected month 155 cases (24.8%). Overall, typhoid is a common disease in the local population of Lower Dir, it is dominant in males with the highest burden recorded in the economically-productive age group 0–15 years. Further studies are required to show the antibiotic susceptibility method; there is need to develop ways for the control of the disease and to organize pure water and clean food through people awareness and education.

EP 10:**Predominance of diabetic mellitus with raised HBA1C from Dir Lower during COVID-19 lock down**

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ABSTRACT:

The aim of our study was the Prevalence of Diabetes mellitus with raised HbA1C from Dir lower during COVID-19 lockdown. For the achievement of our aim, we collect 503 symptomatic data of diabetes with raised HbA1C from different laboratories of district Dir lower. During our observation 408 individual were positive for diabetes with 81.11%, and the remaining 95 individuals were normal. Prevalence of diabetes were high in the age group of 41-55 with 33.40%. Total of 26 data collected in the age group of 10-25 years in which 09 individuals are diabetic with 1.79% prevalence and 17 are non-diabetic. The age group of 26-40 year represent total of 140 data, out of which were normal and 111 were positive for diabetes with 22.07%. Similarly, 196 data were collected in the age group of 41-55 year in which 168 individuals have diabetes with prevalence of 33.40%, and 28 individuals are normal. And age group of 56-70 and above represent total of 141 data in which 23 individuals are non-diabetics and 118 is positive for diabetes with 23.46%. we also investigated gender wise prevalence of diabetes mellitus from Dir lower, during our study the prevalence of diabetes is high in males compare to females. In total of 503 collected individuals, the total number of males was 278, out of which the number of normal individuals is 50, and 228 males are positive for diabetes with 45.33% prevalence. And the total number of females were 225, in which 180 individuals have diabetes mellitus with 35.78% prevalence and 45 was negative for diabetes.

EP 11:**Polymorphism in miRNA s' target sites of CEP-63 and CEP-152 ring complex influences expression of CEP genes and favors tumorigenesis in Glioma**

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ABSTRACT:

Present study was designed to screen the genetic polymorphisms and expression profiling of CEP genes (CEP-152 and CEP-63) in brain tumor patients. For this purpose, study was divided into two phases. In the first phase, 300 blood samples of brain tumor patients and control individuals were collected. Mutation analysis of CEP-152 and CEP-63 gene was carried out using ARMS-PCR technique. Already reported SNP for CEP-152 (rs2169757) and CEP-63 (rs9809619 & rs13060247) was selected. Logistic regression analysis showed significant higher frequency of mutant genotype of CEP-152 SNP (rs2169757) and CEP-63 SNPs (rs9809619 & rs13060247) in glioma/meningioma tumor patients compared to controls. Kaplan Meier analysis showed that mutant genotype of rs2169757 ($p = 0.008$) and rs2169757 ($p = 0.02$) was associated with significant decreased risk of glioma patients. In the second phase, 150 brain tumor tissue samples along with adjacent uninvolved healthy tissues as controls were collected. Expression analysis of CEP-152 and CEP-63 was carried out using real time PCR. Our results showed highly significant upregulation of CEP-152 ($p < 0.0001$) and downregulation of CEP-63 ($p < 0.0001$) in glioma/meningioma tumor tissues compared to adjacent control tissues. Kaplan Meier analysis showed that significant deregulation of CEP-152 ($p < 0.02$) and CEP-63 ($p < 0.005$) was associated with decrease survival of glioma patients. In conclusion, present study showed that

genetic variations and expression deregulation of CEP-152 and CEP-63 gene was associated increased risk of brain tumor and can be used as prognostic/diagnostic marker for brain tumor patients.

MICROBIOLOGY (MI)

MI 01:

Antibacterial, antibiofilm and biofilm inhibition potential of medical plants against catheter associated microbes

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ABSTRACT:

Urinary catheter is mostly implanted when patients are suffering from urinary retention, bladder obstacle and general surgery healing. Implanted urinary catheters play role in causing catheter associated urinary tract infection (CAUTIs) which account about 75-80%. Catheter associated urinary tract infections are caused by Gram-negative and positive bacteria and fungi such as *Klebsiella pneumonia*, *Pseudomonas aspneumoniae*, *Escherichia coli* and *P. aeruginosa*, *Proteus*, *Staphylococcus aureus*, *Enterobacter* and *Candida* species. A large population of microorganisms has the ability to form protective complex mucopolysaccharide barrier known as 'biofilm' with the help of quorum sensing (QS) mechanisms. By (QS) mechanism, different microbes communicate with each other inter and intra-cellularity and as a result the microbes modify themselves against immune responses, develop antibiotic resistant transfer processes and undergo genetic exchange due to alteration in phenotype. Scientists switched towards the medicinal plants as a complementary treatment or replacement against CAUTIs. Here, two medicinal plants *Terminalia arjuna* and *Ipomea carnea* are being used in current study. The medicinal value of leaves extract of *I.carnea* and bark extract of *T. arjuna* plants (aqueous/organic) is due to different phytochemical compounds and secondary metabolites obtained from these two medicinal plants with effective potency against catheter associated microorganisms. The aim of this study is to evaluate the antibacterial, antibiofilm and biofilm inhibitory activity of *T.arjuna* and *I.carnea* against catheter associated microorganisms.

MI 02:

Combating superbugs with AI: System for standardized monitoring & reporting of antimicrobial resistance threats

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ABSTRACT:

Antimicrobial resistance (AMR) is the ability which enables the bacterial pathogens to survive despite the antibiotic treatment. In recent years misuse and over-prescription of antibiotics have resulted in this phenomenon to become a pandemic lurking in the shadows. On the directives of WHO the Government of Pakistan adopted the National Antimicrobial Resistance Action Plan in 2017. This plan emphasizes the need for development of an integrated antimicrobial surveillance system for monitoring of AMR situation in the country. Contemporary surveillance and reporting systems which collect, analyze and report the antibiotic resistance data, these do not provide a complete picture of the spread of resistance in the developing countries. These systems lack the capabilities of real-time data collection and analysis

of the resistance data from remote healthcare setups and diagnostic labs. The System for Standardized Monitoring & Reporting of Antimicrobial Resistance Threats [SMART] is a platform for collection and analysis of AMR data. It has been designed in accordance with WHO guidelines and allows integration with available global monitoring systems (WHONet & GLASS). This system is capable of issuing early warning alerts for resistance epidemics in any locality, community and/or healthcare setup(s) associated with this system. During the pilot stage the surveillance system will be subjected to healthcare requirements and needs of key public and private healthcare setups of the province in order to assess and evaluate the needs of provincial surveillance capabilities and to develop a more efficient monitoring system with capabilities of connecting all healthcare setups of the province for integrated AMR surveillance. This system will enable the researchers to not only estimate the resistance inclinations and the physicians in prescribing more effective antimicrobial treatment options but will also enable them to predict the future resistance trends.

MI 03:

New record of *Syphacia (Syphacia) coccymyos* Smales, 2011 (Nematode: Oxyuridae) recovered from the rats and mice of district Hyderabad, Sindh, Pakistan.

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ABSTRACT:

In continuation of the ongoing NRPU research project No. 9412 funded by HEC, Islamabad on the Helminth parasites of Rat and Mice. *Syphacia (Syphacia) coccymyos* Smales, 2011 (Nematoda: Oxyuridae) was reported from the caecum of Black Rat (*Rattus rattus*) and House mouse (*Mus musculus*) from Hyderabad district Sindh, Pakistan. *S. (S.) coccymyos* can be differentiate from all other species in the subgenus by body having cuticle with transverse striation, cephalic vesicle prominent, making soft curved gesture in apical view, cephalic plate elongated at lateral side, and with narrower at dorso-ventral side. Previously this species is reported from the type host *Coccymys ruemmleri* of Papua New Guinea and Australia. And set as first record from Pakistan.

MI 04:

Biosynthesis and antibacterial activity of MgO-NPs produced from *Camellia-sinensis* leaves extract

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ABSTRACT:

Nanoparticles (NPs) usage against bacteria as an alternative to antibiotics is increasing day by day. Nanoparticle has numerous applications such as in synthesis of antibacterial coatings for implantable devices and medicinal materials to prevent infection and promote wound healing, in antibiotic delivery systems, and in microbial diagnostics. Magnesium oxides nanoparticles (MgO-NPs) were synthesized by a

novel technique based on the leaf extract of *Camellia sinensis* (Green tea). The synthesized nanoparticles were evaluated for antibacterial activity (against both gram-positive and gram-negative pathogens) and therefore can be a suitable therapeutic alternative to the usage of antibiotics. The antibacterial activity of synthesized MgO-NPs is tested against clinical isolates of gram-negative (*Escherichia coli*, *Pseudomonas aeruginosa*, *Serratia marcescens*, *Klebsiella pneumoniae*) and gram-positive (*Staphylococcus aureus*, *Staphylococcus epidermidis*, *Streptococcus pyogenes*) pathogenic bacteria. Agar well diffusion assay data indicate that MgO-NPs exhibit antibacterial activity at all concentrations tested against both gram-negative and gram-positive pathogenic bacteria, producing zone of inhibition (ZOI) in the range of 9.6 ± 1.1 to 21.0 ± 1.5 mm diameters. The maximum response is observed at $25 \mu\text{g ml}^{-1}$ concentration of MgO-NPs, producing a zone of inhibition ranging from 15 ± 1.2 mm (*E. coli*) mm to 21.0 ± 1.5 mm (*S. marcescens*).

MI 05:

Citrullus loaded nanoemulsion as natural preservative for bread fungus (Rhizopus) avoidance on market shelves

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ABSTRACT:

Contamination of bread and bakery goods with mould (fungus) is a source of worry, resulting in financial losses and customer displeasure. The major way for preventing this problem is to add organic acid salts to the process as a preservative. Other methods, however, can be employed to increase the shelf life of a product. Physical methods, such as changed atmospheres and gamma irradiation, have both advantages and downsides. Processes such as bio preservation and the activity of antimicrobial chemicals isolated from plants and have been noted in the literature due to their significant efficacy in inhibiting fungal growth. As a result, the current study concludes that various unit activities, natural preservatives, and predictive methodologies are all excellent instruments for extending the shelf life of bread and bakery items. However, the widespread use of these technologies is still contingent on issues such as economic feasibility, customer acceptance, and more research in real-world food matrices to validate their efficacy. The use of "natural green" plant extracts or products produced from them in different food and beverage applications becoming more popular in the food business. The functional qualities, availability, cost effectiveness, consumer awareness, and influence on the sensory aspects of the finished product all play a role in the selection and application of these plant extracts. As a result, further research involving electrostatic spray and nanoscale delivery of the active components present in these natural, green, plant extracts and using them as a component in a multiple hurdle approach would improve food safety and quality while also providing alternative "green" solutions to food processors.

MI 06:

Molecular identification and antibiotic resistance of *Staphylococcus aureus* isolated from bats from Sheikhpura region

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ABSTRACT:

Bats (Chiroptera) are the second most diverse order of mammals. They play a very important role in the ecosystem in terms of pollination, seed dispersal and pest control. However, certain species of bats are also linked to the origin of zoonotic diseases in humans and disease transmission to other animals. Outbreaks of *Staphylococcus* (*S.*) *aureus* have globally emerged during the past decade. *S. aureus* is a bacterium that colonizes and infects both humans and animals. Very little is known about *S. aureus* in bat populations, including molecular identification and antibiotic resistance profiling in this important group of mammals. The objective of the study was molecular identification and antibiotic resistance profiling of *S. aureus* isolated from oral and rectal parts of bats in district Sheikhpura, Pakistan. A total of one hundred bats were captured by non-lethal methods from Sheikhpura fort. Bats were trapped and identified to species in the field using standardized protocols. We captured seven species; *Pipistrellus coromandra*, *Rhinopoma microphyllum*, *Pipistrellus pipistrellus*, *Rousettus leschenaultii*, *Rousettus aegyptiacus*, *Scotophilus kuhlii* and *Rhinolophus hipposideros*. Oral and rectal samples were collected using sterile cotton swabs. Isolation of bacteria was done by incubation in nutrient broth at 37°C for 24 hours. After enrichment, samples were inoculated on Mannitol salt agar. Colonies were selected on the basis of yellowish color. The isolated bacterial strains were subjected to DNA extraction using commercial kit and molecular identification by using species specific primers of *Staphylococcus aureus*. Moreover, antibiotic resistance was determined by phenotypic and genotypic methods. A total of thirty eight *S. aureus* strains were isolated and confirmed using species specific PCR. 16S rRNA gene sequencing and subsequent phylogenetic analysis confirmed that all sequences showed the highest similarity to *S. aureus* sequences. Twenty *S. aureus* isolates were from fruit bats and eighteen were from insectivorous bats. Based on disc diffusion method, a relatively high proportion of *S. aureus* found in bats were resistant to gentamicin (33%) and erythromycin (44%) while resistance for tetracycline was low in *S. aureus* isolates (7%). Isolates were also screened for the presence of tetracycline (TetK, TetM), gentamicin (aacA-D) and erythromycin (ermA) resistance genes using PCR assays. 10% *S. aureus* isolates contained TetK, and TetM genes. The aacA-D was found in 26% *S. aureus* isolates. However, 33% *S. aureus* isolates carried ermA gene. The present investigation is the first report of the phenotypic and genotypic evaluation of antibiotic resistance in the *S. aureus* strains isolated from bats. Our study confirmed that bats may serve as a reservoir of drug resistant strains of *S. aureus*.

MI 07:

Preparation of *Citrullus colocynthis* extract loaded metallic nanoparticles and their antibacterial efficacy

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ABSTRACT:

Microorganisms are becoming increasingly resistant to traditional antibiotics, and a decrease in newly synthesized antibiotics has led to efforts to discover alternative antimicrobial agents. In this study, *Citrullus colocynthis* metallic nanoparticles were tested against several pathogenic bacteria to determine their antibacterial efficacy. The main focus of study to check the antibacterial effect of *C. colocynthis* extract loaded metallic nanoparticles against gram-positive as well as gram-negative bacteria. Using nanoparticles of *C. colocynthis* extract, it was found that antibacterial activities were better as compared to those of their crude counterparts. Nanoparticles of *C. colocynthis* show strong inhibitory activity against *Bacillus subtilis*, *Escherichia coli*, *Staphylococcus aureus* and *Klebsiella pneumonia*. A soxhlet extraction method used for extraction of *C. colocynthis*. The aqueous extract of seed and pulp *C. colocynthis* were used to produce Magnetic Nanoparticles (MNPs). The formation was confirmed by UV-Vis transmission spectroscopy.

MI 08:

Random mutagenesis of *Bacillus megaterium* for enhanced production of L-lysine

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ABSTRACT:

Bacillus megaterium is a versatile biotechnological important microorganism used for production of large amount of L-lysine. In present study wild type L-lysine producing strain of *B. megaterium* was selected. By using suitable and optimized fermentation medium wild strain produced 1.2 g/L L-lysine in 250 ml of shaking Erlenmeyer flask. Then this wild strain was subjected to ultraviolet (UV) treatment. For this purpose fresh wild strain was plated on nutrient agar plates and exposed to a suitable concentration of UV light for different time intervals i.e. 10 min to 60 min, until 90% death rate was observed after incubation of 24 hrs to 72 hrs in nutrient agar plates. Out of 25 homoserine auxotroph mutants, only two UV mutants (BFUV8 and BFUV20) showed higher amount of L-lysine production as compared to wild strain.

Auxotrophic mutant BFUV8 produced 1.5 g/L L-lysine and BFUV20 showed 1.3 g/L of L-lysine production. Wild strain of *Bacillus megaterium* was also subjected to chemical mutagenesis. For this purpose chemical mutagens N-ethyl-N-nitrosourea (ENU), ethyle methane sulfonate (EMS) and nitrous acid (NA) were used in different concentrations for different time intervals, until 90% death rate was observed on nutrient agar plates after incubation period of 24 hrs to 72 hrs. Ten homoserine auxotroph mutants obtained by NA treatment. Out of these ten homoserine auxotrophs only two mutants i.e., BFNA5 and BFNA9 showed increased L-lysine production i.e. 1.7 g/L and 1.6 g/L respectively. By using ENU as a mutagen, three mutants namely BFENU12, BFENU14 and BFENU20 showed higher L-lysine production as compared to wild strain. BFENU12 was found to produce 1.9 g/L, BFENU14 produced 1.8 g/L and BFENU20 produced 2.0 g/L of L-lysine. Two mutants BFEMS11 and BFEMS17 obtained by EMS treatment, showed enhanced production of L-lysine and maximum 2.2 g/L L-lysine was produced by BFEMS11 and 2.0 g/L of L-lysine was produced by BFEMS17 in suitable fermentation medium.

MI 09:

Biotoxicity of Local Isolates of *Bacillus thuringiensis* for the control of Mosquito

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ABSTRACT:

Novel *cry 11* genes are potential aspirants for resistance management strategies because of their specific structures and their specific mode of action. Control of various mosquitoes species at various developmental larval stages is a useful measure to mitigate transmission of pathogens by mosquito vectors so plays an important role to control vector borne diseases in Pakistan. Therefore, is desirable to clone and express novel *cry* genes from several new isolates of *Bacillus thuringiensis* (*Bt.*). Aiming to identify variety in the *Bt* in different Pakistan ecosystems and to assess the pathogenicity of this bacterium to larvae of *Ae. aegypti*, *C. quinquefasciatus*, and *Anopheles stephansi*. However, *B. thuringiensis* (*Bt.*) strains with different gene combinations should be sought for use as an alternative to *Bti* and to prevent the resistant insects selected. The present study was aimed to control resistant insects by isolating soil samples from different areas of Pakistan intended for effective mosquitocidal *cry4*, *cry11* positive *Bacillus thuringiensis* (*Bt.*). Fifty samples were collected from different areas of Pakistan ecosystem. It was noticed that 36%, 22%, 20%, 12%, 10%, *Bt.* were quarantined from dry soil, moist soil, soil containing cattle waste, garden soil, sandy soil samples respectively. Major source of *cry11* positive *Bt.* isolates were dry soil and dung containing soil. Genomic DNA was isolated and a DNA fragment of 650bp, full length gene of 1.9kb and 439bp of *cry11*, *cry4* gene was amplified by PCR respectively. Fourteen *Bacillus thuringiensis* were brought to be positive for *cry11* and *cry4* gene. The 16S rDNA study exposed that these screened *Bt.* confirmed 99% homology with *Bt. kurstuki* RKD12, *Bti.strain* AM65-52, *BtkoMC28*, *Bt.YB.T.-1518*. The toxicity bioassays with *Bt.* spores and protein diet proved that eleven *Bt.* isolates harboring *cry11* and *cry4* genes (*viz.*, NF1*Bt.*,2,3,4,5,6,7,8,9,10,11) were most toxic to 4th instar larvae of mosquito, *Aedes aegypti*, *Anopheles stephensi*. Among eleven *Bt.* isolates, three *Bt.* isolates (9NF, 6NF, and 3NF) was found the most toxic and was isolated from dry soil, dry soil with leaf litter and animal dung at Kashmir

Neelam Valley, Swat Kaghan Valley near Kalam and Faisal town LHR. Spore LC50 of 9NF is 327.8 ± 0.17 , 366.1 ± 0.7 $\mu\text{g}/\text{ml}$ against *Aedes aegypti* and *Anopheles stephensi* (4th instar larvae) after 24 hours respectively and showed 100% mortality at 1 mg of spores/ml. The positive control HD-500 showed 94% mortality. It was found that LC50 (327.8 , 440.7 , $460.8 \mu\text{g}/\text{ml}$) of 9, 6, 4NF is quite less than HD500 LC50 ($683 \mu\text{g}/\text{ml}$). So, 9NF is most toxic as compared to HD500 while LC50 is 644.105 ± 45 against *Culex pipens* which shows less toxicity against spore diet as compared to genera *Aedes* and *Anopheles*. Protein LC50 of 9, 6, 4NF ($\mu\text{g}/\text{ml}$) is 69.130 ± 5 , 84.1 ± 5 , 95.1 ± 407 $\mu\text{g}/\text{ml}$ against *Aedes aegypti* harbouring *cry11* and *cry4* gene. All isolates did not show the same level of toxicity which reflects the variation in expression level of *cry11*, *cry4* gene present in local *Bt.* isolates. The study provides a convenient method which is time saving and economical. This study recommends that *B. thuringiensis* at spore stage provides good mortality percentage. Detection of the presence of the *Bt.* strains that showed pathogenicity for mosquito larvae in the three biomes studied was possible. Therefore, these strains are promising for the control of insect vectors, particularly the 9NF strain.

MI 10:

Use of different antimicrobial agents against gut bacterial fauna of captive wild animals

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ABSTRACT:

The fresh fecal samples of different captive animals (carnivores, herbivores and omnivores) were taken from four captive areas i.e, Lahore Zoo, Jallo Wildlife Park, Safari Zoo Lahore, and Marghazar Zoo Islamabad. Different biochemical tests were applied on the fecal samples and identified the 29 fermentor and 23 non-fermentor species of bacteria. Resultantly, all species of bacteria; gram positive (*Staphylococcus aureus*, *Enterococcus*) and gram negative (*E.coli*, *Salmonella* spp, *Citrobacter freundii*, *Pseudomonas auregnosa*), of all the captive areas are pathogenic. Different Antimicrobial agents like extract of garlic, ginger, onion, aloe vera, antibiotics like penicillin, streptomycin, and nano-composites of chromium, silver were applied against these bacteria. Garlic and ginger extract showed significant inhibition against all these bacterial growth. Carom essential oil showed maximum inhibitor effect against *Salmonella* species, *Citrobacter ferundi*, *Enterococcus* species and *Staphylococcus aureus*. The inhibitory zone of carom seed essential oil with *Salmonella* species, *Citrobacter ferundi*, *enterococcus* species, and *stephylococcus aureus* was 42mm, 55mm, 35mm, and 53mm respectively in diameter. The orange essential oil showed positive antimicrobial sensitivity test against *Citrobacter ferundi*. Honey gave maximum inhibitory zone of 13mm in diameter against *Pseudomonas auregnosa*. The *E.coli* was susceptible to streptomycin. Carom seed and orange essential oils can be used as a food ingredient of captive animals. Garlic and ginger should also be an important part of meal of captive animals for healthy life. Key Words: Wild Animals, Antimicrobial Activity, Essential Oils, Nanoparticle, and Inhibitory Zone.

MI 11:

Biochemical and molecular characterization of succinic acid producing bacterial isolates from ruminant gut

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ABSTRACT:

Succinic acid (SA) is a building block chemical due to its various potential uses and its sustainability. The biobased SA production has attracted considerable interest by replacing the fossil fuels. The objective of this research work is to carry out biochemical and molecular characterization of the succinic acid producing microorganisms from the ruminant gut. For screening of succinic acid producing isolates bromocresol green media and thin layer chromatography (TLC) methods were used. Out of 20 isolates, 8 isolates showed positive results on bromocresol green media for screening of organic acid. Out of these 8 positive isolates only 3 isolates showed production of succinic acid on TLC plate. On the basis of cultural and morphological characteristics, Analytical Profile Index 20E Test and sequencing of amplified 16S rRNA gene, predicted four bacterial strains included one *Klebsiella* spp., two *Escherichia coli* spp.

MI 12:

Statistical optimization of synthetic azo dye (Remazol Red R (RRR) dye) decolorization and degradation by azoreductase from *Klebsiella pneumoniae gm-04*

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ABSTRACT:

Klebsiella pneumoniae gm-04 produced an extracellular azoreductase that reduces the azo bond during the azo dye decolorization and degradation process. To optimize the expression of azoreductase, statistically-based experiments were applied. Three significant factors were screened on decolorization activity using Plackett–Burman design. Inoculum%, IPTG, and time of induction were identified as having the highest positive influence on the protein production and decolorization potential. Central composite design of response surface methodology was employed for the concerted effect of these three factors on protein production and decolorization activity. This method showed that the optimum medium containing Inoculum% (1.25%), IPTG (0.5mM) and time of induction (6h), for the production of protein and potential of decolorization of Remazol red R (RRR) dye up to 90% decolorized in 3hr. The applied methodology was validated through the adequacy and accuracy of the overall experiments, and the results proved that the applied methods were most effective. Further, the size of AzK enzyme was confirmed by sodium dodecyl sulfate (SDS) gel, and the degradation 2-[3-(hydroxyamino) benzene-1-sulfonyl] ethane-1-sulfonic acid of Remazol red R (RRR) dye by azoreductase were analysed by using an ultraviolet–visible (UV-Vis) spectrophotometer and high performance liquid chromatography (HPLC).

MOLECULAR BIOLOGY (MB)

MB 01:

Recurrent Mutations in Known OCA Genes are associated with Hereditary OCA

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ABSTRACT:

Oculocutaneous albinism (OCA), is known as a genetic disorder which occurs due to some error in biosynthesis of a pigment called melanin responsible for producing colour in body and it also gives diverse phenotypic appearances. Pathogenic variants in eight genes have been reported to be involved in OCA. In current study two families segregating autosomal recessive Oculocutaneous albinism were recruited from different localities of Mirpur/Bhimber Azad Jammu and Kashmir. Tetra primer analysis was carried out in both families. Family A showed 1045 c.1045-15 T > G mutation in Exon 2 of OCA2 gene. Family B showed c.649 C>T (p.Arg 217 Trp) in Exon 1 of TYR gene. Both variants identified with Tetra primers were confirmed by Sanger Sequencing.

MB 02:

Synthesis and characterization of magnetic nanoparticles for their possible application in magnetic hyperthermia of cancer treatment

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ABSTRACT:

Now a day in modern medicine, cancer is considered to be the most challenging problem, not satisfactorily solved yet. Therapies such as radiation and chemotherapy are being used to treat cancer with some side effects. Even with these therapies, the treatment of cancer is not guaranteed and the patients are left with a lot of side effects. In chemotherapy, while destroying cancer cells, many healthy cells are also been destroyed. In addition to nausea and vomiting, patients undergoing chemotherapy may subject to more side effects such as infertility, hair loss, blood disorder, diarrhea, nervous system effects and in worst cases death because lots of healthy cells being destroyed. Thus, Medical field is continuously looking for new and improved treatments for curing cancer diseases, which need to have a high efficacy and be cost-effective, creating a large demand on scientific research to discover such new treatments. One important aspect of any treatment is the ability to be able to target only the tumor and not cause harm to another healthy part of the body. For this reason, magnetic nanostructures have been and are currently being extensively researched for their possible medical uses, including magnetic hyperthermia of cancer treatment, medical imaging, magnetic hyperthermia, drug delivery, antibacterial and antiviral applications. The utilization and application of magnetic nanoparticles (MNPs) as heating sources in hyperthermia therapy has made a therapeutic breakthrough in cancer treatment. The effectiveness of this cancer therapy has derived from a great capability of MNPs to generate focused heat in unapproachable tumors being successfully and effectively inactivated. The main challenges of this therapy are the improvement of the induction heating power of MNPs and the control of the hyperthermia temperature in a secure range of 42 °C to 47 °C, at targeted area. Here, in this work, we report the synthesis and characterization of silica-coated iron-oxide nanoparticles with a core– shell structure, which can be used for magnetic hyperthermia of

cancer treatment. The nanoparticles were synthesized by the reverse micelle method. The silica coating was performed simultaneously with the synthesis of the nanoparticles. The nanoparticles were characterized using various analytical tools. X-ray diffraction measurements confirmed their cubic spinel structure. Transmission electron microscopy (TEM) revealed monodisperse nanoparticles of nearly spherical core-shell structures with an average diameter of 17 nm. The bonding of the silica on the surface of the iron-oxide nanoparticles was confirmed by Fourier transform infrared spectrometry (FTIR). The silica-coated iron-oxide nanoparticles exhibited superparamagnetic properties with a saturation magnetization of 48.8 emu/g measured with a vibrating sample magnetometer (VSM). The applicability of the nanoparticles to magnetic hyperthermia was tested by measuring the temperature increase in an aqueous solution of nanoparticles in a 260 kHz alternating magnetic field. An optimum nanoparticle concentration of approximately 2.0 mg/ml achieved a saturation temperature of 42 °C, the target value for magnetic hyperthermia. The specific absorption ratio (SAR) for this sample was 87 W per gram of iron. The dependence of the SAR on the nanoparticle concentration and magnetic field strength was also measured. These results demonstrated the applicability of silica-coated iron-oxide nanoparticles to magnetic hyperthermia.

MB 03:

A computational prediction of S-Adenosyl methionine (SAM) interacting proteins and their interaction sites

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ABSTRACT:

S-Adenosyl methionine (SAM) a universal methyl group donor also plays a vital role in biosynthesis and acts as an inhibitor to many enzymes. Due to protein interaction-dependent biological role, SAM has become a favorite target in various therapeutical and clinical studies such as treating cancer, Alzheimer's, epilepsy, and neurological disorders. Therefore, the identification of the SAM interacting proteins and their interaction sites is a biologically significant problem. However, wet-lab techniques, though accurate, to identify SAM interactions and interaction sites are tedious and costly. Therefore, efficient and accurate computational methods for this purpose are vital to the design and assist such wet-lab experiments. In this study, we present machine learning-based models to predict SAM interacting proteins and their interaction sites by only using primary structures of proteins. Here we modeled SAM interaction prediction through whole protein sequence features along with different classifiers. Whereas, we modeled SAM interaction site prediction through overlapping sequence windows and ranking with multiple instance learning that allows handling imprecisely annotated SAM interaction sites. Through a series of simulation studies along with biological significant evaluation, we showed that our proposed models give a state-of-the-art performance for both SAM interaction and interaction site prediction. Through data mining in this study, we have also identified various characteristics of amino acid sub-sequences and their relative position to effectively locate interaction sites in a SAM interacting protein. Python code for training and evaluating our proposed models together with a webserver

implementation is available at the URL:
<https://sites.google.com/view/wajidarshad/software>.

MB 04:

Family clustering of *TLR4* gene in myocardial infarction

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ABSTRACT:

Main objectives of current study are to find out the association of *TLR4* gene with myocardial infarction through family clustering analysis as well as case control association study and also to evaluate the environmental factors responsible for onset of MI in Pakistani population. MI is caused by reduced blood flow in a coronary artery as a result of atherosclerosis & occlusion of an artery by an embolus or thrombus. Blood samples were collected from five families with positive family history of MI. DNA was isolated and targeted sequence was amplified by primer specific PCR reaction. Genotyping was achieved by sanger sequencing. In this study, it was observed that smoking, air pollution, Body mass index, positive family history, diabetes and hypertension were strongly responsible for development of MI. In family clustering study, TT genotype of rs4986791 was found to be significantly associated with MI while heterozygous CT of same SNP representing carrier genotype in few family members of pro-band. Other SNP (Asp299Gly; rs4986790) did not show any association with MI, all subjects were homozygous for normal AA genotype. In case control association study, we found T allele as a risk allele having significant association ($p < 0.05$) of variant rs4986791 with MI. Moreover, allele A of rs4986790 was found as protective allele for participants. However other studies with greater sample size are needed to verify our results.

MB 05:

PTPN22 gene polymorphism susceptibility: a comparative study on rheumatoid arthritis and osteoarthritis individuals of Pakistan

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ABSTRACT:

One of the mysteries in modern medicine is why only some people out of the whole population develop bone disorders such as RA and OA. Modern research indicated that genetics along with stochastic and environmental factors play a key role in disease onset. PTPN22 susceptibility was very well reported in the development of RA in different populations but its susceptibility in Pakistani individuals as well as in OA development is still a mystery. Therefore, a case-control study was conducted to compare the susceptibility of the PTPN22 gene among RA and OA patients. For this purpose random sampling was conducted and blood samples were collected from

diagnosed patients and healthy controls. Genotyping was performed by PCR-RFLP technique followed by direct sequencing method. Data were tabulated and analyzed by PLINK software. It was observed that at the allelic level rs2476601 was not significantly differed among RA subjects whereas it was found to be a significant risk factor in osteoarthritis onset at both genotypic as well as allelic levels. The rs2488457 polymorphism was significantly varied among RA, OA, and control subjects at both allelic and genotypic levels. Polymorphism on rs2476601 leads to the replacement of tryptophan from arginine whereas rs2488457 was an intronic variant. In conclusion, PTPN22 was found to be an important risk factor in not only RA development but also OA onset. Further studies should be carried out to suspect its susceptibility in other genetic makeups.

MB 06:

Differentially regulated miRNAs express as possible biomarkers in oral cancer

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ABSTRACT:

Oral cancer is a commonly encountered head and neck neoplasm, being the 6th most widespread human disease worldwide. The aim of this study is to investigate the miRNA biomarkers in oral cancer. Comprehensive bioinformatics analysis was performed on two GEO datasets “GSE168227” and “GSE74530”. DIANA Tool-mir path v.3, STRING, Cytoscape 3.6.0, Enrichr and Tarbase v8 were used for the identification and analysis of miRNAs and their targets in oral cancer. We identified three miRNAs; hsa-miR-145-5p, hsa-miR-99a-5p, and hsa-miR-17 in the current study, which were differentially regulated in oral cancer. Total 12 differentially expressed genes were identified including FN1, IGF1R regulated by has-miR-145-5p, FZD5, IGF1R regulated by has-miR-99a-5p, VEGFA, P1K3R1, STAT3, MAPK1, CDKN1A, HIF1A, CCND1, PTEN regulated by has-miR-17-5p and STAT3, CASP3 regulated by has-miR-17-3p. Our study shows that miRNAs; hsa-miR-145-5p, hsa-miR-99a-5p, and hsa-miR-17 may express differentially in oral cancer and can be used as biomarkers.

MB 07:

***Silibum marianum* protects the liver from α -naphthylisothiocyanate induced cholestasis by regulating fernesoid x receptor**

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ABSTRACT:

Cholestasis is characterized by impaired bile flow and results in inflammation, cirrhosis and liver failure. The treatment options include ursodeoxycholic acid (UDCA), 4-Phenybutyrate (4-Pb) and FXR agonist. Recently, the phytonutrients are being tested for their anticholestatic potential. As *Silibum marianum* has been used for the treatment of liver ailments since ancient time, the current study is aimed to evaluate its protective effect in α -naphthylisothiocyanate (ANIT) induced cholestasis mice models. The serum biochemistry and liver histology was analysed. Furthermore, the expression of selected transporters and proteins involved in bile formation was also measured via qPCR. The results indicated that pretreatment with *Silibum marianum* protects the liver from cholestatic injury of the ANIT. The underlying mechanism involves the activation of Farnesoid X receptor (FXR) which ultimately regulates the transporters and proteins responsible for bile acid homeostasis. In conclusion, the *Silibum marianum* might be used for the treatment of cholestasis.

MB 08:

Gene panel sequencing identifies previously reported mutations in known genes involved in hereditary microcephaly in consanguineous families

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ABSTRACT:

Autosomal recessive microcephaly is a heterogeneous genetic disorder characterized by reduced head circumferences and sloping forehead. Affected individuals also show mild to moderate intellectual disability. To date 27 genes have been identified which are involved in autosomal recessive microcephaly. In Pakistani Population ASPM and WDR62 are most frequently involved genes and mutations in these two genes are responsible for MCPH. In present study 10 families were subjected to gene panel sequencing for ASPM mutation. Gene panel sequencing showed one missense c.8987G>A; p.Arg2996Gln, one nonsense mutation c.9286C>T; p.Arg3096*, one deletion c.8200_8201delAA; p.Asn2734Leufs*16 in 3 families. Remaining seven families are negative for ASPM mutation and will be subjected to Whole exome sequencing. Furthermore two families were screened with STS markers followed by Sanger sequencing which showed mutation in WDR62 and CENPJ respectively. This study broadens the spectrum of mutations involved in hereditary microcephaly in Pakistani Population.

MB 09:

Is Nomophobia real and harm inflicting? Literature-based evidence from clinical investigations

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ABSTRACT:

With the advent of smart phones, their excessive usage has become a world-wide

concern as their persistent presence have produced significant impact on cognition, behavior, nomophobia, social, professional and environmental aspects which need to be analyzed constantly. The purpose of this study is to carry out a review regarding the various clinical investigations that are significant in showing the direct or inverse relations between the usage of mobile phones versus mental and physical health. This review article discusses some of the worth mentioning studies to monitor the effects of mobile radiations on skin, in which the sample size in the 6 studies (one cohort study and five cross-sectional studies) was 392119, taken from both men & women at the mean age of 35. The diseases that were assessed in these studies included skin cancer, dermatitis, itching, burning feeling and rash. In a clinical trial, a sample size of 30 patients with epilepsy and 30 controls underwent digital Electroencephalography (EEG). The results showed an increase in abnormal events during exposure which decreased after exposure to mobile phone radiations (MPR). These radiations can affect genes, neural tissue, endocrine regulation and sperms. The researchers have reported that electromagnetic radiations can lead to DNA breakage and formation of Reactive Oxygen Species (ROS) thus causing hair loss over the temporal region from repeated and prolonged conversations on mobile phone. The high demand of IT technology has transformed mobile phones into smart phones through which people can perform several tasks inclusive of education which are just a click away however, this advancement has developed nomophobia among the people. Investigations through the self-reported questionnaires have shown a significant rise of nomophobia among the individuals of all age groups. As the modern lifestyle has become dependent on cell phones and people are exposed to certain radiations that are devastating to their health, it has become judicious to carry out the investigations that could be beneficial to overcome its pernicious effects on the users; hence, playing our role as the savior of environment globally.

MB 10:

Genetic analysis of gamma-aminobutyric acid type b receptor 1 (*GABBR1*) & nicotinic acetylcholine receptor alpha 4 subunit gene (*CHRNA4*) in pediatric epilepsy patients

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ABSTRACT:

Epilepsy is the compilation of different neurological disorders, characterized by abnormal periodic and unprovoked seizures in the brain. Some of the mutations have been reported in genes *CHRNA4* & *GABBR1* and their association with different types of epilepsy but their association with GEFS+ has not been elucidated before specifically in pediatrics of Pakistani families. Therefore, the current study aimed to examine the polymorphism of exon 5 and exon 7& 11 of *CHRNA4* & *GABBR1* gene respectively involved in the onset of GEFS+ in pediatric patients. For this purpose, DNA was isolated from the blood samples (n=20) collected from all the clinically diagnosed pediatric patients from Okara & Faisalabad- Punjab, Pakistan. It was processed for genotypic analysis of *CHRNA4* and *GABBR1*. One novel missense

mutation (c.1136T>A) in exon 7 of gene *GABBR1* and two of the mutations (synonymous or silent polymorphism) (c.639T>C) (c.678T>C) were identified in exon 5 of the *CHRNA4* gene. The effect of all the variants is benign and is not deleterious. Therefore, we didn't find any significant association of these genes with the onset of GEFS+ in pediatrics of the Pakistani population. However, to infer the causation, a large number of patients and complete genes should be screened to elucidate the association of *CHRNA4* & *GABBR1* with GEFS+.

MB 11:

Previously reported mutations in TYR and OCA2 genes are responsible for OCA in two consanguineous families

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ABSTRACT:

Oculocutaneous albinism (OCA), an autosomal recessively inherited nonsyndromic form of albinism, illustrated by either complete absence or deficiency of melanin in the skin, hair and iris. Pathogenic variants in eight genes have been reported to be involved in causing OCA. In all published population studies, however, the detection rate of alleles causing OCA varies. This condition varies in severity and often resulting white skin, vision defects and light hair colors. In present study two families afflicted with autosomal recessive oculocutaneous albinism were recruited from Azad Jammu and Kashmir. Both families were subjected to Tetra primer analysis Family A showed 1255 c.1255G>A (p.Gly 419Arg) in exon 4 of TYR gene and family B showed 486 c.1456 G > T (P. Asp 486 Tyr) mutation in Exon 14 of OCA2 gene. Both variants identified with Tetra primers were confirmed by Sanger Sequencing.

MB 12:

Nonsense mutations in ASPM gene caused microcephaly in consanguineous families

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ABSTRACT:

Autosomal recessive microcephaly is a heterogeneous genetic disorder characterized by reduced head circumferences and slopping forehead. Affected individuals also show mild to moderate intellectual disability. To date 27 genes have been identified which are involved in autosomal recessive microcephaly. In Pakistani Population ASPM and WDR62 are most frequently involved genes and mutations in these two genes are responsible for MCPH. In present study two consanguineous families were recruited from AJ&K. Screening of these two families with STS markers followed by Sanger sequencing showed c.4975C>T nonsense mutation with protein modification p.Arg3244* in ASPM gene in Family A. Family B showed c.3188T>G nonsense mutation with protein modification p.Leu1063*. Thus our study correlates with previous data that ASPM gene is major candidate gene responsible for MCPH in Pakistani population.

MB 13:

Mutation in RAPGEF1 is responsible for intellectual disability in consanguineous family

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ABSTRACT:

Intellectual disability is a common neurological disorder in consanguineous populations. Intellectual disability is affecting approximately 1% of global population. It is an unresolved problem and majority of patients remains untreated due to lack of awareness and some other reasons. Because of extreme heterogeneity, genetic cause of disease is still unknown. Here, we report for the first time a homozygous mutation of RAPGEF1 in a consanguineous family with two siblings affected by intellectual disability. RAPGEF1 is a guanine nucleotide exchange factor responsible for transmitting extracellular signals to the Ras family of GTPase located at the inside of membrane.

**FISHERIES, ECOLOGY and TOXICOLOGY
(FT)**

FT 01:

Interactive Effect of Vitamin C and E on Growth, Lipid Peroxidation, Blood Biochemistry and Survival Rate of Silver Carp

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ABSTRACT:

In the present study Interactive effect of vitamin C and E on growth, lipid peroxidation, blood biochemistry and survival rate of Silver Carp was checked. Six isonitrogenous and isocaloric experimental diets were formulated by supplementing vitamin C and E at (0, 0), (250, 0), (500, 0), (0, 100), (250, 100) and (500, 100) mg/kg levels, named as D1, D2, D3, D4, D5 and D6 respectively. Feeding trial was conducted for 2 months. At the end of the feeding trial, growth performance, whole body composition, hematology, body indices, vitamin C and E content in liver, antioxidant enzyme activity, serum biochemistry and TBARS assay was monitored. At the end of feeding trial, remaining 15 fish from each treatment exposed to *Aeromonas hydrophilla* and mortality was checked. Treatment D5 better growth performance and vitamin C and E content in liver. Crude fat and crude protein showed significant results. Hematology showed significant increase results at high supplementation of vitamin C and E. Hepatosomatic index was higher in the D4 and VSI show non-significant result. SOD activity was high in D6 while GPx activity was higher in all treatments supplemented with 100 mg/kg of vitamin E along with 0, 250 and 500 mg/kg of vitamin C. CAT activity was higher in treatment supplemented with high dose of vitamin C and E. ALP showed better activity in D5 treatment while ALT and AST showed best result in D6. Survival after challenge was maximum in the groups treated with high dose of vitamin C and E (D3, D4 and D6). Result of the study showed that vitamin C and E supplementation improved the growth and health of silver carp.

FT 02:

Impact of feed with varying crude protein (CP) levels on growth performance of different fish species cultured under similar regimes

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ABSTRACT:

Fish polyculture has resulted in high fish production per unit area, mainly due to the best utilization of all kinds of nutrients. In this nine month's experimental study, five different fish species were stocked in five earthen ponds designated as control (one pond), Treatment-T1 (two ponds) and Treatment-T2 (two ponds). Fish stocked in T1 and T2 ponds were fed with a commercial feed containing 20% and 25% crude protein, respectively, whereas fish stocked in the control pond was fed with a

conventional mixture of feed ingredients (fish meal, gluten, sunflower, and rice polish) having 20% CP. The fish was fed @ 3% of the fish wet body weight twice a day. The fish was sampled every fortnight. Physicochemical parameters of the ponds were measured daily. The results showed that the maximum weight gain (255 g) was recorded in *Pangasius pangasius* in treatment T2 and minimum (52.5 g) in *Cirrhinus mrigala* in the control pond. Overall, maximum fish production was recorded after harvest in treatment T2 followed by that in treatment T1 and control pond, respectively. Overall, the commercial fish feed enriched with crude protein was very effective in promoting growth and development of pond fish.

FT 03:

Effect of particle size of corncob on growth, digestibility and intestinal histology of grass carp (*Ctenopharyngodon idella*)

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ABSTRACT:

An eight week experiment was conducted to determine effect of particle size of corncob on growth, body composition, hematology, digestibility and intestinal histology of grass carp (*Ctenopharyngodon idella*). The fish were stocked in twelve tanks divided into 4 treatments each having 3 replicates. The corn cob was ground and sieved to make four different particle sizes 1mm, 2mm, 3mm and 4mm respectively. Fish was fed with feed of 30% CP having four different particle sizes of corncob. The results showed that fish fed with 1mm particle size in T0 showed significant ($P < 0.05$) increase in weight gain and higher specific growth rate (SGR) as compared to other treatments. Similarly, crude protein and hematological parameters were significantly ($P < 0.05$) higher in T0 (1mm). Moreover, treatment T0 showed best results in terms of intestinal histology. Additionally, in nutrient digestibility analysis ADC (protein), ADC (lipids) were found significantly ($P < 0.05$) higher in T0 as compared to other treatments while ADC (dry matter) was observed higher in T4 (4mm). Water quality parameters remained same in all treatments. In conclusion the 1mm particle size of corncob significantly improved the growth rate, body composition and hematological parameter and nutrient digestibility of *C. idella*.

FT 04:

Epidemiology of Motile Aeromonas Septicemia (MAS) in Commercial Fish Farms of Selective Districts of Punjab, Pakistan

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ABSTRACT:

Pakistan is an agricultural country and fisheries is one of the fast growing sectors to fulfill the growing food requirements. Apart from other factors, bacterial diseases are one of the major contributors of economic losses in the fisheries sector. In Pakistan, there is no detailed information available on bacterial pathogens associated with heavy economic losses in commercial fish farms of Pakistan. Keeping in view the economic importance of bacterial diseases for fisheries, the present study was designed to study epidemiology of motile *Aeromonas* septicemia (MAS) in commercial fish farms in Punjab, Pakistan. The present study was conducted in forty fish farms located at four locations including Chunian, Muzaffargarh, Jhang, and Hafizabad in Punjab, Pakistan. In the first phase of the project, fish farms were surveyed for data collection related to MAS incidence. Based on the findings from collected data, four different diseased fish species samples i.e. *Ctenopharyngodon idella*, *Cirrhinus cirrhosus*, *Labeo rohita*, and *Tilapia* were collected for isolation and characterizations of *Aeromonas* species associated with MAS in fish. History of MAS was reported in multiple fish farms especially in low temperatures. Manuring of ponds with animal manures, sharing of fishing nets and poly-culture practices were main contributors in disease incidence. *Aeromonas hydrophila* was isolated and confirmed biochemically as the causative agent of MAS. Finally, *Aeromonas hydrophila* was identified using genus and species specific Polymerase Chain Reactions (PCRs) assays. Based on genotyping, diversification was noted in case of Pakistani *Aeromonas hydrophila* strains. The present study was a key identifier of evidence related to MAS in selected pond fish of Punjab Province, Pakistan. The findings of the present project will surely be a source of exploring operative prevention and control measures of MAS in Pakistani commercial fish farms.

FT 05:

Plant source meal supplementation by Waste of Date, *Phoenix dactylifera*, and its effect on Growth and Blood Indices on *Cyprinus carpio* fingerlings

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ABSTRACT:

Appropriate use of local protein by-products could reduce feed costs and enhance environment and economic sustainability. Therefore, formulation of cheaper diets using locally available ingredients, especially carbohydrate sources, could have a significant impact on common carp farming. Therefore, the present study was design to test the effects of date (*Phoenix dactylifera*) waste meal on the common carp fingerlings on their growth, blood and biochemical profile as well as on the disease resistance. The study was conducted at Fish Hatchery, University of Veterinary and Animal Sciences, Ravi campus, Pattoki. Common carp fingerlings (2.44±0.02 g) were sourced from Fish Hatchery, University of Veterinary and Animal Sciences, Ravi Campus. The health of the fish fingerlings was checked and randomly distributed into 12 glass aquaria (50 L) at 14 fish per aquaria density (3 aquaria per treatment) and

acclimatize for 14 days before experimental feeding regime. Four experimental diets having 0%, 5%, 10% and 15% of DWM were fed two times daily (09:00 and 15:00 h) at rate of 3% of body weight for 12 weeks. At the end of feeding trial, specific growth rate (SGR%/day), weight gain (WG g), percent of body weight gain (WG %), condition factor (CF), feed conversion ratio (FCR), feed intake (FI %/day), protein efficiency rate (PER), lipid efficiency rate (LER), survival rate (SR) and biomass gain (g) were calculated. Formulated feed and fish samples were subjected for proximate composition (moisture, ash, fats, NFE (nitrogen free extract), protein contents). Blood was collected from each treatment and analyzed. The result of partial replacement of plant source meal by DWM on growth performance and feed utilization of common carp presented that there were no significant differences in all growth and feeding parameters between fingerling of control and DWM supplementation diet, ($P>0.05$). Fishes treated with DWM, showed reduction in mortality after 12 weeks. The hematological and biochemical parameters of fingerling carp fed the experimental diets showed no significant differences in value of RBC, Hct, MCV and MCH components between the treatment groups ($P>0.05$), but control group showed a significant increase ($P<0.05$) in RBC, Hb and Hct compared with other treatments. There were no significant differences in blood indices wrt to control group and 15% DWM. The stress rate to thermal-salinity and acidity increased significantly in control group and 5% DWM ($P<0.05$), respectively. Also a non-significant elevation of alkalinity stress was observed in the fish fed with different experimental diets ($P>0.05$). Finally, it is concluded that DWM (10%) could be a good substitute for expensive plant sources for the improvement of growth and blood variables in common carp.

FT 06:

Molecular and Biochemical characterization of *Eisenia fetida* associated vermibacteria intricate in heavy metals remediation and retain plant growth promoting traits

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ABSTRACT:

Heavy metals contamination in the soil is a major threat to the environment, wild life and human health. Microbial remediation is an emerging and promising technology to reduce the heavy metals toxicity. Therefore, the aim of current research was to isolate and to identify the heavy metal tolerated bacteria from the *Eisenia fetida*, and to screen the bactoremediation and phytoremediation capabilities of vermibacterial isolates. Vermibacteria were isolated from the gut of *E. fetida*, identified through staining, culturing, biochemical tests, and ribotyping. Plant growth promoting traits were also evaluated. Phylogenetic results revealed that isolated vermibacterial strains showed resemblance with *Bacillus thuringiensis*, *Bacillus aryabhatai*, *Staphylococcus hominis*, *Bacillus toyonensis*, *Bacillus cabrialesii*, *Bacillus*

tequilensis, *Bacillus mojavensis*, *Bacillus amyloliquefaciens*, *Bacillus toyonensis*, *Bacillus anthracis*, and *Bacillus paranthracis*. All identified vermibacterial species are Gram-positive (rod and cocci) in nature, not only indicated the efficient biosorption of lead, cadmium, and chromium but also produce all plant growth promoting traits such as indole acetic acid (IAA), amylase, protease, lipase, hydrogen cyanide, ammonia, and siderophore production, and also act as a phosphate solubilizers. Therefore, the current findings showed that all identified vermibacteria could be used as a potential bioremediation agents in heavy metals polluted environment and could be used as a microbial biofertilizers to enhance the crop production in polluted area.

FT 07:

Determination of air pollutant (pm 2.5) and its effects on lung capacity of female in district Kasur

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ABSTRACT:

Air quality is increasingly becoming a global problem with the increase in industrialization and urbanization. Air quality is also much deteriorated in villages of Pakistan. One of the major reasons for damaging air quality is burning of biomass. Biomass burning emits certain types of harmful products which are dangerous for human health and the environment. Present study was conducted to determine the concentration of PM 2.5 and their effects on the lung capacity of females in different villages of Kasur District near Wagah border. The villages were Usman Wala, Noor Pur, Khudian Khass and Marali Hithar. As females are taking the bio indicators of air pollution due to their sensitivity and vulnerability to come into contact easily under the effect of environmental stressor. Female's Health Initiative study is especially relevant because it found a stronger effect from PM_{2.5} on premature cardiovascular and respiratory illness, one of the leading causes of women's mortality. PM 2.5 Concentrations were measured using a Particulate counter instrument, Health status was assessed through questionnaire and lung functions were monitored by spirometer. Readings were taken for 5 months from each village during March-July 2021. 200 questionnaires were filled by females 50 from each village. Peak expiratory flow rate was determined from 200 females. Results showed the concentrations of PM 2.5 were more than permissible limit by National Ambient Air Quality Standards. The health status of females was not good due to more time spend on cooking. They had fever, skin issues and respiratory problems especially during cooking. The Peak Expiratory Flow Rates were also less than the normal rates. The lung functioning was low in most of the females. The high levels of PM can cause premature deaths, Asthma, cardiovascular deaths and heart diseases. It is concluded that biomass burning plays an important role in air pollution particularly PM.

FT 08:

Functional status of liver and testis under treatment of *Nigella sativa* against Cr(VI) induced toxicity in male albino mice

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ABSTRACT:

Exposure to Cr (VI) leads to hepato-toxicity and infertility in humans. *Nigella sativa* is well known for its therapeutic and antioxidants properties. To assess the ameliorating effect of *Nigella sativa* against Cr (VI) induced toxicity on liver and testis in albino mice challenged with potassium dichromate (K₂Cr₂O₇), *N. sativa* seed extract and nanoparticles. Division of albino mice was done in 8 groups' viz., control, Cr, NS, NS+N.P, NS+Cr (P), NS+NP+Cr (P), for 60 days, NS (T) and NS+NP (T) in treatment group/Kg BW respectively. K₂Cr₂O₇ was give for 30days followed by treatment for next 30 days with 50ppm Cr and NP or NP 50mg. Data in the form of LH, Testosterone, SOD, CAT, ASAT, ALAT, ALP, MDA, GSH and creatinine level were analyzed using one way ANOVA and LSD tests. The results showed significant increase in FSH, LH, Testosterone, SOD, catalase, ASAT, ALP levels and total protein whereas a decreasing trend was observed in ALAT, GSH, MDA and creatinine levels after treatment. This study supported protective effects of *N. sativa* against Cr (VI) induced toxicity in liver and testis.

FT 09:

Zinc oxide nanoparticles caused Trans-placental and multigenerational toxicity can be mitigated by Fresh Orange Juice in Swiss Albino Mice

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ABSTRACT:

Due to emerging field of nanotechnologies, human exposure to nanoparticles is unavoidable, particularly to zinc oxide nanoparticles (ZnO NPs), which are extensively used due to its pervasive applications. Ongoing study aimed to evaluate the trans-generational toxic potential of Zinc Oxide nanoparticles (ZnO NPs) through exposure to F₀ mothers, in F₁ Pups and F₁ mature offspring and protective potential of fresh orange juice (OJ) against the probable toxicity. Females after positive vaginal plug observations were considered F₀ mothers and Day 0 of gestation. Total Twenty-eight F₀ mothers were randomly allocated into four groups (n=7), Control; untreated, Dose group; exposed to ZnO NPs, Dose+ Antidote group; co-administrated ZnO NPs + OJ, Antidote group; OJ (2ml) during organogenetic period from GD 6th-12th. Fifty percent of F₀ mothers were subjected to caesarean sections at 18th day of gestation (pre- parturition) and F₁ Pups were recovered, macrophotographed and dissected for liver evisceration, while 50% of F₀ mothers undergo normal delivery. After

parturition, F1 offspring were born and left them to grow till postnatal week 8. Under euthanasia F0 mothers and F1 offspring were dissected, liver tissues and blood samples were extracted for further analysis. Observations showed that ZnO NPs exposure in F0 mothers at Pre-parturition and Post-Parturition resulted in decreased body weight, increased liver weight and elevated levels of ALT and AST significantly $P \leq 0.05$ as compared to Control and Antidote groups. More or less similar observations were recorded in F1 generation. Morphological analysis of F1 pups indicated various kind of birth defects in ZnO NPs exposed group in contrast to other groups. Histopathological Analysis of maternal livers intoxicated with NPs showed disruptive structure of central vein, hepatocytes and kupffer cells in F0 mothers, while F1 pups showed distorted development of liver tissue and congestion, in contrast to Control. F1 offspring of NPs exposed mothers, even at postnatal week 8 showed pyknotic nuclei and activated kupffer cells in liver sections against control. But in case of Dose + antidote group morphological, biochemical and histological alterations were less severe than Dose group. So from above results we can conclude that the exposure to ZnO NPs instigate teratogenicity and hepatotoxicity in F1 pups, F0 mothers, and F1 offspring respectively, while Fresh Orange juice act as a remedial agent against aforementioned toxicities.

FT 10:

The Antidiabetic effect of silver nanoparticles using onion extract in experimentally induced diabetic mice

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ABSTRACT:

The current progress in the area of technology and science is the surfacing of nanotechnology and its emerging role in all disciplinary fields. Importance of nanotechnology in diabetics research is increasing day by day. This field encompasses nanostructures, nanomaterials, nanoparticle design and their applications in humans etc. It offers more accurate and precise information for detecting diabetes mellitus. Nowadays, in nanotechnology field, green way of metal nanoparticles synthesis plays a very significant role. The advantages of exploiting various plants and their extracts in the metal nanoparticles synthesis include less toxicity, economic and environmentally friendly. *Allium cepa* (Onion) along with silver nitrate was used as a plant source in green synthesized nanoparticles which exhibits a various medicinal activities including anti-diabetic activity. Diabetes mellitus is a chief root cause of many people demise next to the cancer. Green synthesized onion silver nanoparticles were characterized via different characterizing techniques named as UV-vis spectroscopy, Fourier transform infrared spectroscopy (FTIR), photoluminescence analysis (PL), X-ray diffraction (XRD) and scanning electron microscopy (SEM). This study gives insights of management of diabetes in diabetic mice. For this purpose, Alloxan induced diabetic mice were treated with onion synthesized silver nanoparticles via administering their doses with varied concentrations. This study was conducted both in vivo and in vitro.

FT 11:

Detection of aflatoxins B1 from layer and broiler feed samples collected from different cities of Punjab, Pakistan

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ABSTRACT:

Mycotoxins are secondary metabolites produced by fungi results in contamination of food, cause diseases so has major impact on animals and human health. While aflatoxins are type of poisonous mycotoxins produced by *Aspergillus* species. Present study was conducted to see levels of aflatoxins that are present in poultry feed. A total of 50 feed samples from layer and broiler farms were collected from five different cities of Punjab such as Lahore, Sialkot, Gujranwala, Sheikhpura and Kasur. Ten samples were collected from each city. Upon quantification by Thin Liquid Chromatography (TLC) method the contamination was detected in 24 samples out of which 11 (22 %) were contaminated beyond the permissible range and 13 (26%) were contaminated within the permissible range. Positive samples were run for the assessment of all different types of aflatoxins such as B1, B2, G1 and G2. However, only aflatoxin B1 was detected in the positive samples. The highest percentage of contaminated samples were collected from Kasur city and broiler feed samples were found more contaminated ($p < 0.05$) as compared to layer feed samples when statistically analyzed by independent sample T test. Different detoxification methods such as physical and chemical methods were also compared. The most effective physical method of detoxification was noticed heating upto 250 °C for 10 minutes as it reduce aflatoxin concentration up to 58%. While, in the chemical methods the Hydrochloric acid was a highly effective chemical for detoxification as it reduced aflatoxin level up to 58.4% only with its 0.5 % concentration. Other chemicals were also effective but they were required in higher concentrations to show their efficacy which can affect the nutritive value of the feed samples. It was concluded by the study that broiler feed samples collected from Kasur were more contaminated that may be due to poor storage conditions of feed. It is recommended that improvement in storage conditions and regular monitoring is required by feed authorities so that contamination of aflatoxins can be reduced.

FT 12:

Appraisal of some heavy metals in water, bottom sediments and fish of Mangla Dam Lake

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ABSTRACT:

Lakes are most diverse and interactive ecosystems in the world. In this study physiochemical parameters were determined of Mangla Dam Lake which is in District Mirpur Azad Jammu and Kashmir (AJK). Concentrations of heavy metals such as Cd, Cr, Cu, Mn, Ni, Pb and Zn were determined in samples of water, sediment, muscle, gills, intestine, liver, and kidneys of fish of the Mangla Dam Lake. Lake water showed average pH 7.64, Turbidity 2.59 NTU, Conductivity 461µm/cm, TDS 205mg/L and Salinity 0.22mg/L. Low dissolved oxygen of 3.43 mg/L is recorded here. The analyzed data was compared with the international guidelines. In water concentration of Cd > Pb > Zn > Ni > Cr > Mn > Cu. In sediment concentration of Mn > Cr > Zn > Ni > Cu > Cd > Pb. Heavy metal concentrations decreased in muscles

as Cr > Zn > Pb > Cd > Mn > Cu > Ni. In gills Zn > Cr > Pb > Mn > Cd > Cu > Ni. In intestine, Zn > Cr > Cu > Mn > Pb > Cd > Ni. In liver, Zn > Cr > Cu > Pb > Mn > Cd > Ni. In kidneys Zn > Cr > Cd > Pb > Cu > Mn > Ni.

**WILDLIFE and
TAXONOMY (WT)**

WT 01:

Exploring the Herpeto Fauna of Totalai Game Reserve, Khyber Pakhtunkhwa, Pakistan

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ABSTRACT:

The preliminary study was conducted at Totalai Game Reserve, Khyber Pakhtunkhwa, Pakistan. Samples of herptiles were collected from seven units. Four species of Amphibians and 13 species of Reptiles were reported belonging to 15 genera. The species richness (S) having value of 7.28 and Shannon Winner diversity index (H) having great value of 2.192 while Simpson index (1-D) was 0.86. The herptiles of Totalai Game reserve were evenly distributed having Evenness value (E) 0.53 and Equitability (J) 0.77. Fisher's alpha was also used because it includes rare species, giving them the same value regardless of their abundance and has higher biological significance value of 2.71.

WT 02:

Study of behavioral activities of hedgehog

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ABSTRACT:

The behavioral aspects of Hedgehog (*Hemiechinus collaris*) kept in Nocturnal Captive, Nocturnal free range, diurnal captive and diurnal free range conditions were recorded and compared with each other. The behavior aspects as Jumping, aggressiveness, digging, stress, roll up, immovability, walking, standing, drinking lying and feeding were observed. Non-significant differences were observed in jumping and feeding behavior of all four type conditions. Similarly, aggressiveness, digging, stress, roll up, immovability, walking, standing, drinking and lying behaviors shows significant differences in Nocturnal Captive, Nocturnal free range, diurnal captive and diurnal free range condition.

WT 03:

Statistical analysis of Helminth parasites of House Rat *Rattus rattus* (Muridae: Rodentia) in Hyderabad, Sindh, Pakistan

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ABSTRACT:

In continuation of the ongoing NRPU research project No. 9412 funded by HEC, Islamabad on the Helminth parasites of House Rat *Rattus rattus* Linnaeus, 1758 from human habitations in Hyderabad district, Sindh, a total 72 House Rats were examined. Out of these only 41 House Rats were found positive with cestodes and 21 with nematodes. None of the host was found with trematodes and acanthocephalan. Highest prevalence 56.94% was recorded for cestodes, followed by 29.16% for nematodes. The mean intensity of cestodes was 4.63 and relative density was 2.6, whereas, mean intensity of nematodes was 8.38 and relative density was 2.44. The collected helminths were identified as cestodes; *Hymenolepis diminuta* Rudolphi, 1819 and *Cysticercus fasciolaris* Rudolphi, 1808 and nematodes; *Gongylostrongylus neoplasticum* Fibiger & Ditlevsen, 1914, *Gongylostrongylus peromysci* Kruidenier and Peebles, 1958, *Gongylostrongylus aegypti* Ashour and Lewis, 1986 and *Gongylostrongylus dipodomys* Kruidenier and Peebles, 1958. Previously there is no record on the prevalence of helminth parasites of House Rat *Rattus rattus* from this study area.

WT 04:

A new record of Long horned grasshopper *Hexacentrus unicolor* Servilli 1831 (Hexacentrinae: Tettigonidae: Orthoptera) From Taulka Dadu

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ABSTRACT:

During the preliminary survey of major cropping areas of Dadu a few species of *Hexacentrus unicolor* servilli 1831 were captured which seems a new record for the region. This species is very unique in its morphological appearance and collection of this specimen from Wheat crops is also surprising, this study will conform weather it will proved an major threat the various crops in future or not.

WT 05:

COI gene based phylogenetic studies of Alaudidae (Passeriformes) of Pakistan

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ABSTRACT:

DNA barcode data of birds is currently increasing globally and providing rich source to answer evolutionary questions and rapid species identification means and demanding similar research in Pakistan. Passeriformes are broadly divided into two super orders: Acanthisitti and Tyranni, Alaudidae family belongs to latter. According to recent molecular studies this family of birds consist of 20 genera and 92 species globally with 3 extinct, 2 critical and 3 near threaten species. Molecular phylogeny of this family has been attempted comprehensively globally and has recommended novel arrangements for several species and genera. The aim of this study was to identify

samples genetically and find evolutionary relationship among them. For this purpose phylogenetic tree was reconstructed to find genetic relationship among different species of family Alaudidae by amplification of Cytochrome Oxidase Subunit I of samples collected from different areas of Pakistan. Their preserved skins were used for mitochondrial genome (mtDNA) extraction from selected regions i-e folmer region comprising ~650 bp using universal primers. Sequenced data was analyzed by Bio Edit software 7.0 versions and BLAST was performed on NCBI for identification of species based on the similarity index. Multiple sequence alignment calculated by CLUSTAL W and MEGA7 software used for phylogenetic relationship inference between different species by the neighbor joining (NJ) method. The nucleotide distances between sequence pairs estimated and diversities found using Kimura-two-parameter. Highly similar sequences were clustered together to show less diversities and barcoding was proved to be effective in identifying species of Alaudidae of Pakistan.

WT 06:

Exploring the Wild Avian and Mammalian fauna of Elum Valley of Khyber Pakhtunkhwa

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ABSTRACT:

The present study was carried out in January 2017 to January 2018 to explore the wild Avian and Mammalian fauna of Elum valley district Buner KP. During the research eight species of birds belonging four orders and four families and twelve species of mammals belonging seven orders and eleven families were reported. The bird species are *Alectoris chukar*, *Coturnix coturnix*, *Lophura leucomelanos*, *Columba livia*, *Grus grus*, *Grus leucogeranus*, *Falco tinnunculus* and *Falco cherrug*. The mammalian species are *Naemorhaedus goral*, *Panthera pardus*, *Lepus nigricollis*, *Maccaca mulata*, *Canis aureus*, *Myotis myotis*, *Hystrix indica*, *Sus scrofa*, *Helogale parvula*, *Herpestes edwardsii* *Funumbulus palmarun* and *Manis javanica*. This research also reveals the IUCN status of the avian and mammalian species of Elum valley district Buner KP.

WT 07:

New collection of fossil remains of *Conohyus indicus* from the Siwalik Hills of Pakistan

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ABSTRACT:

New fossil remains of *Conohyus indicus* have been studied from Middle Miocene to Late Miocene rocks of Lower Siwaliks and Middle Siwaliks of Pakistan. The genus *Conohyus* contains relatively small and medium sized tetraconodonts having enlarged third and fourth premolars. It is oldest known genus of subfamily Tetraconodontinae. In Siwaliks the genus *Conohyus* is known by two known species, *C. indicus* and *C.*

sindiensis. It entered the Indian subcontinent in Kamlial and ranges upto Nagri formations. It is poorly known tetraconodont suid from the apex of the Lower Siwaliks and base of the Middle Siwaliks. The collected material consists of fragmentary mandibular and maxillary parts as well as isolated teeth.

WT 08:

Diversity and morphological identification of domestic animals in district Swat

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ABSTRACT:

The morphological identification is a way to identify different animals and their different breeds. Identification is very important for breed conservation and improvement. The domestic animals are multi-purpose because they are a great source of meat, milk, hide, draught, powder, wool and hair. The domestic animals is also important for human culture because they participate in game fighting and religious ceremonies. Morphological identification is one of the method which is used for animal species identification. A total of 200 domestic animals such as cow, goat, sheep, and buffalo were recorded and identified morphologically. The morphological characteristics used for the study include coat color, horn color, horn shape, horn orientation, muzzle color, tail length, ear size, ear orientation, hump size. In this study 50 sheep were identified in which six breeds such as 12% Ramboulet, 10% Afghani, 30% Balkhi, 14% Hashtnagri, 24% Waziri and 10% Australian were recorded. A total of 50 goats were also recorded and four breeds were identified morphologically in which 20% Damani, 24% Kaghani, 24% surguli and 30% Gaddi. The cow was also identified morphologically in which 18% Sahiwal, 22% Achai, 50% Exotic, 10% Red Sindhi and Cholistani breed was not reported. A total of 50 of buffalo was recorded and identified morphologically in which three breeds including 30% Nili ravi, 30% kundhi and 40% Azikheli were recorded. The study show that mostly the Azikheli buffalo, Balkhi sheep, Gaddi sheep and exotic cow are the most common breeds which is identified in Swat. Our findings show that morphological identification is a reliable way to identify domestic animals and their breeds.

WT 09:

Pathology of *Cysticercus fasciolaris* *Taenia pisiformes* Bloch 1780 (Cyclophyllidae: Taeniidae) parasitize liver of infected Rat (*Rattus rattus*) from Jamshoro, Sindh, Pakistan

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ABSTRACT:

A study on the histopathology of cysticercus fasciolaris *Taenia pisiformes* (Cyclophyllidae: Taeniidae) was carried out at the advance laboratory of parasitology of the Department of Zoology, University of Sindh Jamshoro during the year 2018-2019. A total of 10 brown Rats *Rattus rattus* were examined for their helminthes

parasites. Only 03 rats out of 10 were infected with cysticercus fasciolaris *Taenia pisiformes* on liver in the form of bladder. Tissue samples from infected parts of the liver were fixed in bouin's fluid. The series of sections were made by microtome technique and were mounted in canada balsam. In the histopathological findings, infected liver of Rats revealed mononuclear cells such as lymphocytes, macrophages, eosinophilic cells, plasma cells, and polynuclear cellular infiltration in the necrotic area, fatty degeneration and areas of coagulation necrosis of the hepatic cells. The liver had congested blood vessels and congested sinusoids were seen.

WT 10:

Survey of *Treron phoenicopterus* (Latham, 1790) in Sindh, Pakistan

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ABSTRACT:

Distribution of *Treron phoenicopterus* (Yellow Footed Green Pigeon) is unknown in Sindh province of Pakistan. In this context, a comprehensive survey was carried out in different areas: Badin, Hyderabad, and Jamshoro and MirPurKhas districts from January to October, 2021 to determine the status of *T. phoenicopterus*. Present study was carried out in different habitats including urban, suburban, and agricultural areas for the observation of species in question from early morning to late evening. Present study was also focused on recording the nesting behavior of Yellow Footed Green Pigeon. The distribution of *T. phoenicopterus* was recorded from Badin and MirPur Khas districts, however Hyderabad, and Jamshoro districts were found devoid of this pigeon that has rare occurrence worldwide. Yellow Footed Green Pigeon was found preferring agricultural habitats especially where Banyan and figs trees were flourished instead of urban and suburban areas. It is almost arboreal nesting mainly on heightened trees. These birds were rarely seen on the ground as they made nesting and resting sites on the branches of heightened trees. They were observed to feed on various fruits, berries and crops also buds, shoots and various grains. Their nests were made up of materials such as twigs, grasses, leaves, sticks and feathers that they collected from dried branches of trees. Present investigation recorded very rare population of *T. phoenicopterus* in district MirpurKhas during entire study period of ten months.

ETHNOPHARMACOLOGY (EP)

ET 01:

Evaluation of Neem seed oil for the control of *Callosobruchus maculatus* (F.) (Coleoptera: Chrysomelidae) on Mash gram

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ABSTRACT:

The study was conducted at Entomology Laboratory of University of Sindh Jamshoro at 30 °C and 60% relative humidity. The objective was to determine the effective concentration of *Azadirachta indica* for the control of *Callosobruchus maculatus*. The treatment was arranged with four concentrations. Thirty five mix sex 1 day old pulse beetles were introduced to each jar containing 30g Mash gram. Neem seed oil was compared with untreated control. Adult mortality, progeny emergence and percent protection were observed. The result indicated that 100% adult mortality after 72 hours of exposure were observed also oil reduce the *Callosobruchus maculatus* emergence and it provide 100% seeds protection.

ET 02:

***Azadirachta indica* extract enhance functional recovery and extent of neuromuscular junctions re-innervation in mice following sciatic nerve injury**

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ABSTRACT:

Peripheral nerve injuries (PNI) are leading cause of long lasting disabilities, largely due to slow intrinsic growth capacities of axons. Currently, effective treatments are lacking in case of nerve crush injuries, thus current study aims to investigate the regenerative potential of *Azadirachta indica* leaf extract on nerve regeneration. Adult male Swiss albino mice were randomly divided into three groups. Extract of *Azadirachta indica* (AI) leaves were given orally for 28 days (7 days before injury and 21 days after injury). The sciatic nerve crush injury was performed in all three groups. The first group (control group) mice were administered with distilled water. Methanolic extract of AI (MeAI) was administered orally in low and high dose (250mg/kg, 500 mg/kg respectively) to group 2 and group 3, respectively. Behavioral tests (Sciatic functional index (SFI), toe spread assay and pinprick assay) were performed to estimate the motor or sensory functional recovery. In separate batch of experiments, the regenerating sciatic nerves and gastrocnemius muscles from mice were harvested and investigated for the extent of myelination and reinnervation of neuromuscular junctions. Improved motor and sensory functional recovery was observed during the 2nd and 3rd week of crush injury in MeAI treated groups (LD and HD) when compared with vehicle group. The increase in thickness of myelin sheath was observed in MeAI treated groups as compared to vehicle group (myelin thickness in control group < myelin thickness in LD group < myelin thickness in HD group). Similar trend was observed in muscle reinnervation (number of axon fibers in CTL < number of axon fibers in LD < number of axon fibers in HD). Collectively, current study unveils the regenerative potential of *Azadirachta indica* and it may have clinical applications.

ET 03:

Seed extracts of *Moringa oleifera* protects mice against rotenone-induced Parkinson disease motor impairments

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ABSTRACT:

Parkinson's disease (PD) is the second most commonly occurring neurodegenerative disease after Alzheimer's disease, which affects 1-3% of the population. The objective of this study was to assess the neuroprotective effect of *Moringa oleifera* seeds (MO) extract in the rotenone induced mouse model of PD. Aqueous (AqMO) and ethanolic (EthMO) extracts of MO seeds were prepared. This experiment was conducted on 5 groups; Control group, Rotenone treated group, AqMO+Rotenone, EthMO+Rotenone and Sinemet+Rotenone. Rotenone at a dosage of 2.5 mg/kg was used to induce PD features. Control group was given 1ml/kg DMSO orally for consecutive 21 days, AqMO+Rotenone received AqMO extract (200mg/kg) and rotenone for 21 days, EthMO+Rotenone received EthMO extract (200mg/kg) and rotenone for 21 days and Sinemet+Rotenone group received sinemet dissolved in water (20 mg/kg) and rotenone. After 21 days of protocol, behavioral tests such as beam walk, pole test, stepping test, open field, tail suspension test and stride length were conducted to observe PD features and restoration of locomotor activities. The rotenone group showed PD features such as bradykinesia, increased immobility time, shorter stride length and weak muscle coordination. However, the MO extract treated groups and sinemet treatment showed protection in rotenone induced motor dysfunctions. Current study reports the delay in PD progression in MO extract treated mice comparing to rotenone treated mice. It suggests that the MO seed extracts could be used as alternative medicine to slower the progression of motor impairments in PD.

ET 04:

***Mucuna pruriens* extract mediates functional recovery in mice following sciatic nerve crush injury**

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ABSTRACT:

Higher incidence of peripheral nerve injuries is among leading causes of long lasting functional impairments in affected population globally. Lack of effective therapeutic treatments and neuroprotective capacities of *Mucuna pruriens* (MP) seed extract lead us to investigate its effect on injured peripheral nerve regeneration. Adult Swiss albino mice were subjected to the left sciatic nerve crush injury and were administrated with aqueous (100mg/kg) and ethanolic (100mg/kg) extracts of *M. pruriens* seeds. Standard behavioral tests such as Pinprick assay, Toe-spreading motor reflex and Sciatic Functional Index (SFI) were used to investigate the functional sensory and motor recovery following crush injury. Mice in treatment groups demonstrated significantly enhanced and earlier sensory motor functional recovery comparing to vehicle control mice. Toe-spreading motor reflex assay indicated significant higher scores during 2nd and 3rd weeks in aqueous MP extract comparing

to the control. A consistent improvements in SFI score of aqueous MP extract treated mice revealed accelerated motor functional recovery comparing to vehicle control mice. Collectively, current study furnishes evidence based data for modulatory effects of MP on peripheral nerve regeneration. Further histological investigations for extent of myelination in regenerating sciatic nerves and re-innervation of neuromuscular junctions is required to validate the behavioral findings.

ET 05:

***Moringa oleifera* seed extracts impart neuroprotection through antioxidant means in rotenone-induced Parkinson disease mouse model**

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ABSTRACT:

Parkinson's disease (PD) results from neurodegeneration of Substantia nigra (SN) dopaminergic neurons and is the second most commonly occurring neurodegenerative disease. Current study aims to investigate the protective potential of *Moringa oleifera* seed (MO) extracts on the rotenone inflicted PD mouse model. Aqueous (AqMO) and ethanolic (EthMO) extracts of MO seeds were prepared. Swiss albino male mice were randomly assigned in Control group (1% DMSO subcutaneously), Rotenone treated group (2.5mg/kg rotenone in 1% DMSO subcutaneously), AqMO+Rotenone (200mg/kg extract, 2.5mg/kg), EthMO+Rotenone (200mg/kg extract, 2.5mg/kg) and Sinemet+Rotenone (20mg/kg extract, 2.5mg/kg). Extract and rotenone were administered for consecutive 21 days on daily basis. The mice were euthanized by cervical dislocation and brains were dissected out to perform biochemical and histological analysis. The biochemical tests included lipid peroxidation (LPO), reduced glutathione (GSH) levels, glutathione-s-transferase (GST), and catalase activity (CAT) determinations. The histological study showed that in rotenone group vacuolation around multipolar cells increased in substantia nigra region, cytoplasmic shrinkage and 85% neurodegeneration was quantified. The mice in EthMO, AqMO and sinemet treated groups showed less degenerative changes in SN brain region. Present study conclude that the active ingredients in MO seed extracts could prevent the extent of oxidative damage in rotenone challenged mice, resulting in potentiated protection of SN and reducing PD progression.

ET 06:

Phytochemical Analysis of Extracts of selected Plants having Anti-microbial activity against Bovine Mastitogens

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ABSTRACT:

Extracts of *Syzygium aromaticum* and *Capsicum annum* in different solvents including acetone, ethanol and n-Hexane were tested against Bovine mastitogens and found effective for their antimicrobial activity. Extracts of these plants were analyzed for their phytochemical composition includes Flavonoids (Myricetin, Quercetin,

Kaempferol) and Phenolic Acids (Sinapic acid, Caffeic acid, Gallic acid) by Reverse-phase High Performance Liquid Chromatograph (RP-HPLC) using Diode-Array Detector (DAD). *S. aromaticum* (acetone), *S. aromaticum* (ethanol) and *S. aromaticum* (n-Hexane) showed highest concentration of Quercetin (80 µg/g), Kaempferol (347029.75 µg/g) and Quercetin (1391.42 µg/g), respectively. *C. annum* (acetone), *C. annum* (ethanol) and *C. annum* (n-Hexane) showed highest concentration of Quercetin (16457.14 µg/g), (393254.28 µg/g) and Kaempferol (6873.96 µg/g) respectively. During anti-mastitis analysis of these extracts, it was observed that *S. aromaticum* (acetone) containing Quercetin showed highest activity against *Staphylococcus aureus* and *Escherichia coli* while *Klebsiella* showed resistance. *S. aromaticum* (ethanol) containing Kaempferol showed highest activity against *E. coli* and *S. aureus* while *Klebsiella* showed resistance. *S. aromaticum* (n-Hexane) containing Quercetin showed highest activity against *S. aureus* while *E. coli* showed intermediate activity and *Klebsiella* showed resistance. However, *C. annum* (acetone) containing Quercetin were ineffective against all the three pathogens. *C. annum* (ethanol) containing Quercetin showed highest activity against *S. aureus* while *E. coli* and *Klebsiella* showed resistance. *C. annum* (n-Hexane) containing Kaempferol showed no activity against any tested pathogen. During study it was analyzed that *S. aromaticum* (acetone) and *C. annum* (acetone) individually were ineffective against *Klebsiella* but when used in combination they showed anti-bacterial activity towards same strain. Results proved that combination of extracts showed synergistic effects against mastitogens which were resistance towards Ciprofloxacin.

ET 07:

Therapeutic applications of garlic and turmeric for the diabetic wound healing in mice

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ABSTRACT:

Diabetes, a serious chronic autoimmune disorder, is usually associated with elevated blood sugar level in the blood. Diabetes involved various complications specifically in delayed wound healing. Natural products have an amazing effect on the healing of different diseases and are being used for centuries. In the current study, diabetes was induced in Swiss albino mice by using alloxan monohydrate. After the successful induction of diabetes in mice, excision wounds were created via a biopsy puncture (6mm). Various plant extracts were applied to the diabetic wounds and checked the healing of the wound. Wound healing effect of silk fibroin (5%), garlic (15%), and turmeric (10%), individually along with their combinations silk fibroin (5%) + garlic (15%), silk fibroin (5%) + turmeric (10%), garlic (15%) + turmeric (10%), and silk fibroin (5%) + garlic (15%) + turmeric (10%) was evaluated by determining the percent wound contraction, healing time, histological analysis and biochemical tests. The level of various biomarkers i.e., MMPs (MMP 2, MMP 9) and IL (IL 1, IL 8) were also observed using biochemical tests. The results indicated that the best compatible silk combination was silk fibroin (5%) + garlic (15%) + turmeric (10%) in which wounds were healed in 13 days with wound contraction: 98.75±0.50%. In

contrast, the wound of the control group (polyfax) healed in 18 days having contraction: $96.66 \pm 0.42\%$. Histological analysis showed that the fibroin combination with both extracts (garlic and turmeric) exhibited an increased growth of collagen fibers, blood vessels with lessened inflammation. These extracts and their combination also maintained the disturbing level of biomarkers. It can be concluded from the current research that the natural products used in combination possess high regenerative and healing capabilities and can be used as an effective remedy in the healing of chronic wounds.

ET 08:

Neuropharmacological effect of *Vigna unguiculata* and *Phaseolus vulgaris* on depression model

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ABSTRACT:

Modern researches are revealing the importance of dietary products on human health. Nature has created many physiological and pharmacological benefits in dietary products. The current study was conducted to evaluate the effect of dietary product *vigna unguiculata* (white beans) and *phaseolus Vulgaris* (red beans) on depression. The white and red beans are purchased from the local market which was then washed, boiled, and dried. After drying they were ground in powder form to make palates of the desired dose. The study was designed on albino rats. Three groups were divided into group I as control, group II as 500mg white beans, and group III as 500mg red beans. The model was prepared for 60 days in which group II and group III were given 500mg white and red beans respectively whereas the control group was given standard feed and water. Forced swimming test was performed for 5 minutes on days 0, 7, 15, 30, 45, and 60 in which struggling times of rats were noted. On day 60 blood samples were taken to check cortisol level and for histology evaluation hippocampus of the brain were withdraw. Our data revealed that there was a strong change in the struggling time of rats in force swimming test after day 30 in both the beans but white beans showed more significant results as compared to red beans. The mean struggling time on the 30th day was 94.7 seconds of white beans and 88.7 seconds of red beans whereas on the 60th day white beans showed 256 seconds while red beans showed 216 seconds. The cortisol levels are 30.9 ng/ml and 35.2 ng gram/ml in red beans male and female respectively while 38 ng/ml and 40 ng/ml in white beans male and female respectively while the control has 20ng/ml and depressed species have 89ng/ml. Histology of both read and white beans of male and female rats showed significant changes in the molecular and polymorphic layer of the hippocampus in the CA3 region and also apoptotic cells reduced as compare to depressed rats. This study determined the benefits of white and red beans on CNS especially on depression which is the most common problem of the living society. Dietary products are highly important and beneficial for humankind and these both beans have shown remarkable changes in the depression model.

EP 09:

Protective potential of pomegranate extract in nickel intoxicated mice

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ABSTRACT:

Nickel is an essential trace metal. It is heavy metals found in land, water that enters in living organisms and accumulates in organs and produces toxicity. Pomegranate peel (PP) are intensively used as a natural therapeutic agent. Punica granatum have always been used to treat inflammation, edema, and bacterial infections. To know the therapeutic effects of pomegranate peel extract against Nickel intoxication in mice. Adult male mice were divided into 8 groups. Control group was kept without any treatment. Dose groups were treated with Nickel Chloride: D-I 8mg/kg of Nickel Chloride, D-II 15mg/kg of Nickel Chloride, D-III 30mg/kg. (D-I+ AD) 8mg/kg of Nickel Chloride and the 500mg/kg. (D-II+ AD) 15mg/kg of Nickel Chloride and 500mg/kg of pomegranate (D-III+AD) 30mg/kg of Nickel Chloride and 500mg/kg of pomegranate. Mice was given PPE (500 mg/kg) by utilizing gastric tube through all the test time frame. The sperm count, sperm abnormalities and testosterone level of mice in Dose + Antidote groups did not showed significant difference as compared with control but all the Dose groups exhibit significant difference as the values significantly decreased ($p < 0.001$) Histopathology of lung showed emphysema, pneumonia, fibrosis and acute and chronic inflammation in Dose groups, Dose III + antidote also show inflammation. Testes show histological alternation in all Dose groups in form of tubular degeneration, exfoliation, severe vacuolization, azoospermia and inflammation. Results were subjected to one way ANOVA. Testosterone level, sperm count and sperm abnormalities of the dose groups were noted that showed decreased in level when compared to control. The testes and lungs from dose groups revealed structural alterations in the lungs and testes as compared to control. Nickel Chloride causes structural changes in the lungs and testes that consequences changes in function and contributed to infertility. On the other hand PPE had the ability to prevent these changes, increasing the number of sperm and decreasing sperm abnormalities and also increases the sperm count. : Punica granatum peel extract treatment renders protection against biochemical and histological changes in mouse testes and lungs.

EP 10:

Evaluation of anti-scorpion venom potential of native plant extracts using mice model

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ABSTRACT:

Hottentota tamulus (Fabricius, 1798) (Scorpiones: Buthidae) is the most common and venomous scorpion species found in Punjab, Pakistan which has a high risk of

morbidity and mortality. Prazosin is extensively used for the treatment of scorpion envenomation. Several medicinal plants have been reported to have anti-scorpion venom activity. However, there is scarcity of scientific evidences that prove that plants extracts have anti-scorpion venom activity. The aim of present study was to evaluate the anti-venom activity of native plant extracts i.e. *Mangifera indica*, *Acyranthes aspera*, *Allium sepa* and *Ginkgo biloba* using albino mice as a model. The methanolic or aqueous extract of plants was mixed with LD99 of *H. tamulus* individually and the mixture was injected in mice intraperitoneally. The response was recorded till 7 days after treatment. *A. aspera* and *A. sepa* completely neutralized the effect of scorpion venom. But, neutralization effect of *G. biloba* was comparatively less (83.3%). However, *M. indica* (leaves and flowers) was found to have no neutralizing effect against scorpion venom. The extracts of plants were analyzed by GC-MS for the detection of their major components. The major compounds found in *Acyranthes aspera*, *Allium sepa* and *Ginkgo biloba* were Oleanolic acid, cyclopropane, Lupeol acetate, a cholesterol, palmitic acid and Stearic acid respectively. It is concluded from the study that *A. aspera* and *A. sepa* completely neutralize the effect of venom and could be used in future to design anti-scorpion venom drug.

PHYSIOLOGY (PS)

PS 01:

Efficacy of the synthesized biomolecules coated chitosan nanoparticles against polycystic ovary syndrome induced mice

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ABSTRACT:

Polycystic ovary syndrome (PCOS) is a complex metabolic disorder with 5-20% estimated global prevalence. The objective of this study was to determine the hormonal, biochemical and histological changes in PCOS induced mice after treating with *Ocimum. Sanctum*(OS) leaves extract, zinc oxide (ZnO) and chitosan nanoparticles (CHNPs). A single dose of 2mg/kg Estradiol valerate (EV) in 0.2ml olive oil was administered intraperitoneally to mice for PCOS induction. The induction was confirmed by microscopic examination of vaginal smear of mice with prolonged vaginal cornification and cystic development. This experiment was conducted on ten groups; Negative Control (NC-Normal), Positive Control (PC-PCOS untreated), Vehicle Control (VC-PCOS induced DMSO treated), Standard Control (SC-Metformin treated), Low Dose Sanctum (LDS-250mg/kg), High Dose Sanctum (HDS-500mg/kg), ZnO Sanctum Low dose (ZNSL-50mg/kg), ZnO Sanctum High dose (ZNSH-100mg/kg), CH-Sanctum Low dose (CHSL-50mg/kg) and CH-Sanctum High dose (CHSH-100mg/kg). The mice groups were administered orally with respective doses for consecutive 21 days and then euthanized for blood serum and ovaries collection. The Liver function test (LFT) showed the significant reduction in bilirubin and ALP level after treatment with CHSH when compared with PC. The kidney function test (RFT) results showed the manageable range of urea and creatinine. The hormonal ratio was in 1:3 with LH and FSH when treated with CHNPs. In treatment with CHSL dose cyst were disappeared and regaining of corpus luteum was observed, while in case of CHSH defined follicles, zona pellucida and clear oocyte was observed. Collectively, current experimental data furnishes the protective role of *O. sanctum*, ZnO and CHNPs against PCOS induced mice through enhanced absorption of bioactive components in managing metabolic and hormonal balance by eugenol and quercetin in plant extract.

PS 02:

Evaluation and analysis of polycystic ovarian syndrome (PCOS) and its metabolic complications in females of district Jamshoro

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ABSTRACT:

Polycystic ovary syndrome is a condition involving rare, irregular, or elongated menstrual periods, and often presences of excess male hormone (androgen) levels. The ovaries develop frequent small collections of fluid is called follicles so ovaries may fail to regularly release eggs. The main objective of this study is to evaluate and analyze the condition of polycystic ovarian syndrome (PCOS) and the complications

associated with it in females by observing the patients in District Jamshoro. A wide-ranging study was conducted on PCOS among women of reproductive age. The collection of data in different hospitals of Jamshoro. About 20% of women of reproductive age are initiated to have polycystic ovaries (PCO) during ultrasound investigations and approximately 10% have symptoms of polycystic ovary syndrome (PCOS), which is associated with multiple risk factors for metabolic disorder. During. A questionnaire with twenty-five queries was precisely developed to detect the symptoms and complications including obesity, acne, hirsutism, hyperglycemia, irregular menstruation, sleep apnea, hyperandrogenism, and infertility. Apart from this, this research also found a co-relation of PCOS with depression and anxiety in diagnosed patients, signifying the necessity for reviewing the psychological health assessment and management guidelines of women with PCOS. It also assisted in spreading awareness among women of reproductive age to get a proper medical check-up at least once every three months for the sake of their healthy life.

PS 03:

Relationship of dietary habit with obesity in young adults

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ABSTRACT:

Obesity is medical condition in which excess body fat accumulate to an extent that it may have negative effect on human health. People are generally considered obese when their body mass index (BMI) is over 30 kg/m², a measurement obtained by dividing a person's weight by the square of the person's height, the range 25–30 kg/m² is defined as overweight. The aim of study is to explore the relation between obesity with dietary habit in young adults. For this purpose a cross sectional study was designed between December, 2020 to January, 2021. According to data 241 subjects participate in this research whose belong to different fields of study at LCWU. By statistical analysis our result revealed that the prevalence of obesity in young adults. The risk factor that increasing the chance of obesity is the more consumption of rice ($\chi^2 = 13.7, p = 0.01$), fast food ($\chi^2 = 37.03, p = 0.001$), soft drinks ($\chi^2 = 18.7, P = 0.01$) and fried food ($\chi^2 = 15.21, P = 0.012$). The outcome of this study indicated that the majority of the students indicated 138 (57.26%) were Underweight of 25 (10.37%) Normal weight, 64 (26.55%) were overweight, and 13 (5.39%) were obese. Therefore our result shows that there is positive relationship between prevalence of obesity and unhealthy eating habits in young adults.

PS 04:

Simultaneous administration of prebiotics & iron fortificants does not affect liver function tests in iron deficient female sprague dawley rats

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ABSTRACT:

Iron deficiency is one of the biggest public health challenges faced by the communities worldwide. It is documented that in many cases, advanced liver disease leads to iron deficiency anemia. The objective of the current research was to determine if simultaneous administration of prebiotics and iron fortificants affect the ALT, AST, ALP and Bilirubin levels (Liver Function Tests) in iron deficient female Sprague Dawley rats. To serve this purpose, n = 126 female Sprague Dawley rats aged 6 to 8 weeks were obtained from the National Institute of Health, Islamabad. Two iron fortificants including Ferrous sulphate and Sodium Iron EDTA and two prebiotics namely Inulin and Galacto-oligosaccharides were used to prepare fortified feeds for the rats. After inducing iron deficiency in rats, fortified feeds were fed to the rats for a period of 12 weeks whereby iron fortificants and prebiotics were given in different dosages. Blood samples were collected from overnight fasted rats at baseline, 30th, 60th and 90th days of the trial and Liver Function Tests were conducted as per their respective protocols. It was observed that none of the parameters (ALT, AST, ALP and Bilirubin) were affected during the trials. The study concluded that there was no effect of simultaneous administration of prebiotics and iron fortificants on Liver Function Tests of iron deficient female Sprague Dawley rats.

PS 05:**Biological efficacy of ZnO nanoparticles using *Azadirachta indica* in experimentally induced diabetic mice**

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ABSTRACT:

Diabetes mellitus is a metabolic disease which is characterized by hyperglycemic condition (high blood sugar levels). According to world health organization 1.5 million people died every year. Many of the conventional drugs are not reliable against diabetes mellitus due to their low bioavailability and uncontrolled release. Nanotechnology is one of the most recent technologies paving a reliable way in diagnosis and treatment of diabetes mellitus. With the aid of nanotechnology, biosynthesis of nanoparticles is a widely accepted biomimetic process for the production of biocompatible and biodegradable nanoparticles. *Azadirachta indica* (Neem) is a medicinal plant and used for bio synthesizing ZnO nanoparticles by using zinc acetate dihydrate and sodium hydroxide. These are characterized by scanning electron microscopy (SEM), X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), UV-vis spectroscopy and photoluminescence analysis (PL). ZnO nanoparticles show antidiabetic activity when administrated in different concentrations to alloxan induced diabetic mice.

PS 06:**Histo-morphometric analysis of hepatic impairments induced by Dibutyl Phthalate in rabbit model**

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ABSTRACT:

Di Butyl Phthalate (DBP) has been used as a plasticizer since 1930s. Toxic effects of orally administered DBP were observed in various models including rabbit model. This study was designed to evaluate histo-pathological effects on the liver of rabbits. To check toxicity and histo-pathological parameters, serum liver function test and histological sections of liver were examined. DBP dose dependent increase in weight of rabbit was observed. DBP caused disorganization and degeneration of hepatocytes. Control group and positive control group B showed well organized hepatocytes in the liver. Group treated with low dose (200mg/kg b.w) showed central vein dilation, hepatic tissue damage and increase kupffer cells number. Histological sections of liver of group treated with high dose (600mg/kg b.w) have ruptured hepatocytes and central vein congestion. Besides this, histo-morphometric analysis of liver section of control and treated groups was also performed in which significant differences were observed when DBP treated groups were compared with normal control group. Bilirubin, aspartate aminotransferase (AST), alanine transaminase (ALT) and alkaline phosphatase (ALP) level of liver functions tests were significantly high in treated groups (D-1 and D-3) when compared with level of control group and positive control group. In conclusion hepatic impairment is induced due to oral administration of DBP.

PS 07:**Nanomaterials of *Cinnamomum zeylanicum* for the treatment of polycystic ovary syndrome**

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ABSTRACT:

Polycystic ovary syndrome (PCOS) is a common endocrine disorder in young women and leads to metabolic problems associated with the onset of infertility. The objectives of this study was to study the histopathological changes in ovaries of PCOS induced mice after treating with plant extract, nanoparticles and chitosan nanoparticles. Methanolic plant extract was used to prepare nanoparticles. The preparation of chitosan nanoparticles by ionic gelation method using methanolic extract *C. zeylanicum* (CZBE) bark was done and the synthesized Cinnamon zeylanicum chitosan nanoparticles (CZCNPs) were characterized by FTIR and XRD. Histopathological and vaginal smear were done which confirmed the development of poly cysts in the ovary. The present study shows the protective role of biomolecule coated chitosan nanoparticles that improve the ovulatory function in estradiol valerate (EV) induced PCOS female mice. The positive effect of the synthesized nanoparticles against PCOS induced mice were proved in histopathological analysis. The PCOS ovaries contain atretic follicles with irregular estrus cycles. It was also observed that the granulosa cell layer was also reduced in the cyst containing ovaries and destroyed oocytes when they were compared with the normal control group. Cinnamon loaded nanoparticles low dose (50mg/kg) show that the formation of oocyte was started and the high dose (100mg/kg) show the regaining of corpus luteum. The cinnamon loaded chitosan nanoparticles low dose (50mg/kg) show the formation of oocyte, formation of zona pellucida and zona granulosa was also observed in this group. Cinnamon loaded chitosan nanoparticles high dose (100mg/kg) show the dissolution of cysts. This study concluded that cinnamon loaded chitosan nanoparticles treatment revert the

estrus cycle back to normal cycle in PCOS induced mice.

PS 08:

Biological effects of chitosan nanoparticles on polycystic ovary syndrome induced mice

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ABSTRACT:

Polycystic ovary syndrome (PCOS) is an endocrine metabolic disorder with more than 20% global prevalence that leads toward infertility at reproductive age. The objective of this study was to determine the hormonal, biochemical and histological changes in PCOS induced mice after treating with *Moringa oleifera* (MO) leaves extract, zinc oxide (ZnO) and chitosan nanoparticles (CHNPs). The present study was conducted on PCOS induced female albino mice. A single dose of 2mg/kg Estradiol valerate (EV) in 0.2ml olive oil was administered intraperitoneally to mice for PCOS induction. The induction was confirmed by microscope examination of vaginal smear of mice. This experiment was done on ten groups; Negative Control (NC, Normal), Positive Control (PC-PCOS untreated), Vehicle Control (VC, PCOS induced DMSO treated), Standard Control (SC, Metformin treated), Low dose Moringa treated (LDM-250mg/kg), High dose Moringa treated (HDM-500mg/kg), ZnO Moringa low dose (ZNML-50mg/kg), ZnO moringa high dose (ZNMH-100mg/kg), CH-Moringa low dose (CHML-50mg/kg) and CH-Moringa high dose (CHMH-100mg/kg). The mice groups were administered orally with respective doses for consecutive 28 days and then euthanized for blood, serum and ovaries collection. The Kidney function test (RFT) results showed the manageable range of urea and creatinine. The hormonal ratio of LH and FSH was 1:3 when treated with CHNPs. In treatment with CHML dose cyst were disappeared and regaining of corpus luteum was observed, while in case of CHMH defined follicles, zona pellucida and clear oocyte was observed. The most significant difference was detected in chitosan loaded nanoparticles with high dose. Collectively, current experimental data furnishes the protective role of *M. oleifera*, ZnO and CHNPs against PCOS induced mice through enhanced absorption of bioactive components in managing metabolic and hormonal imbalance by quercetin in plant extract.

PS 09:

Impact of imidacloprid on feeding behavior and physiology of domestic pigeon (*Columba livia domestica*)

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ABSTRACT:

Excessive use of synthetic pesticides has become a major cause of population decline of farmland birds. Synthetic pesticides harm the birds either directly or indirectly. The eating of pesticide coated seeds not only causes mortality in birds but also affects the survival of insectivorous birds through their toxic constituents in food. Present study

was designed to evaluate the impact of imidacloprid on feeding behavior and physiology of birds, using domestic pigeon as a model bird. Twenty five mature birds were divided into five groups. Control group was provided with imidacloprid untreated seeds. However, experimental groups were fed with imidacloprid treated seeds. Another choice and no choice experiment was performed to record the avoidance behavior of pigeons. For this purpose, experimental groups were given choice either to feed on imidacloprid treated seeds or untreated seeds. Birds showed feed aversion behavior from imidacloprid treated seeds and preferred eating untreated seeds. However, experimental birds which were only allowed to feed on imidacloprid treated seeds, showed a significant increased level of superoxide dismutase (SOD) enzyme activity than control group. Moreover, a significant increase in the level of Aspartate Aminotransferase (AST) and Alkaline Phosphatase (ALP) was observed than the control. However, there was non-significant increase in the level of Alanine aminotransferase (ALT), Bilirubin, Creatinine and Blood urea nitrogen (BUN) in treated birds. The examined tissues of heart, liver and kidney revealed histomorphological alterations in treated groups as compared to control. It is concluded that imidacloprid treated seeds induced oxidative stress and damaging effects in heart, liver and kidney of exposed pigeons. Thus use of imidacloprid should be prohibited in agricultural fields.

PS 10:

Biological effects of chitosan nanoparticles on polycystic ovary syndrome induced mice

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ABSTRACT:

Polycystic ovary syndrome (PCOS) is an endocrine metabolic disorder with 4-20% expected global prevalence which cause infertility at reproductive age. The objective of this study was to determine the hormonal, biochemical and histological changes in PCOS induced mice after treating with *Moringaoleifera* (MO) leaves extract, zinc oxide (ZnO) and chitosan nanoparticles (CHNPs). The present study was conducted on PCOS induced female albino mice. A single dose of 2mg/kg Estradiol valerate (EV) in 0.2ml olive oil was administered intraperitoneally to mice for PCOS. The induction was confirmed by microscope examination of vaginal smear of mice. This experiment was done on ten groups; Negative Control (NC, Normal), Positive Control (PC-PCOS untreated), Vehicle Control (VC, PCOS induced DMSO treated), Standard Control (SC, Metformin treated), Low dose Moringa treated (LDM-250mg/kg), High dose Moringatreated (HDM-500mg/kg), ZnOMoringa low dose (ZNMML-50mg/kg), ZnOmoringa high dose (ZNMH-100mg/kg), CH-Moringa low dose (CHML-50mg/kg) and CH-Moringa high dose (CHMH-100mg/kg). The mice groups were administered orally with respective doses for consecutive 21 days and then euthanized for blood serum and ovaries collection. The Kidney function test(RFT) results showed the manageable range of urea and creatinine. The hormonal ratio was in 1:3 with LH and FSH when treated with CHNPs. In treatment with CHML dose cyst were disappeared and regaining of corpus luteum was observed, while in case of CHMH defined follicles, zona pellucida and clear oocyte was observed. The most significant difference was detected in chitosan loaded nanoparticles with high dose. Collectively,

current experimental data furnishes the protective role of *M. oleifera*, ZnO and CHNPs against PCOS induced mice through enhanced absorption of bioactive components in managing metabolic and hormonal imbalance by quercetin in plant extract.

POSTER PRESENTATIONS

PO 01:

The disproportionate vulnerability of women to toxicants

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ABSTRACT:

The modern era led by industrialization has exposed the inhabitants of the earth to a plethora of toxicants that negatively impact them and manifest in the form of acute and chronic toxicity. A combination of socio-cultural and physiological factors leaves the female population disproportionately vulnerable to the harmful effects of toxicants. This article aims to spread awareness about toxicity affecting women by highlighting examples from history and the present day. The past shows the occurrences of toxicities such as thalidomide mediated teratogenicity that caused congenital defects like amelia and diethylstilbestrol, an endocrine disruptor that caused reproductive toxicities in female offspring. In the present day, the extremely flourishing beauty industry houses a myriad of toxic exposure opportunities both for occupational exposure as well as exposure of the average consumer. Long-lasting cosmetics have been found to contain high levels of per and poly-fluoroalkyl substances, environmental and metabolic degradation resistant chemicals that accumulate to reach toxic doses causing hormone disruptions, weakened immune system, and low birth weight in humans. Instant henna tattooing and hair dyes contain paraphenylenediamine that causes severe dermatitis and maybe carcinogenic. The fast-growing nail industry uses several chemicals with known short-term toxicity like headaches, nausea, and skin irritation and often has a less well-regulated workplace in regards to toxic exposure as compared to some male-dominated industries. Nail salons frequently use the Toxic Trio (formaldehyde, dibutyl phthalate, and toluene) that have been linked to reproductive toxicity, immunotoxicity, and cancer. Thus, the vulnerability of women to toxic exposure and its effects is in evidence, the awareness of which should surely incentivize individual women to make judicious, intelligent purchases and worker welfare unions to campaign at the administrative level for appropriate workplace safety regulations.

PO 02:

A meta-analysis on relation of obesity with occurrence of gastrointestinal cancer

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ABSTRACT:

Obesity is found to be a leading risk factor for many types of cancer especially gastrointestinal cancer (GI cancer). Numerous studies have been performed to examine the relation between obesity and different types of gastrointestinal cancer. However, involvement of obesity in overall gastrointestinal cancer risk is not very clear. Therefore, a meta-analysis was performed to investigate the association of obesity and overall gastrointestinal cancer risk. A thorough systematic search was performed on Google Scholar and PubMed and relevant studies were identified and scrutinised. A random effect model was used to calculate the correlation using risk ratio RR at 95% confidence interval. A total of 56 studies were included in our meta-

analysis. The pooled risk ratio calculated showed a significant relation between obesity and gastrointestinal cancer risk (RR = 1.742, 95%, CI =1.54 - 1.96, P < 0.001). Subgroup analysis was also performed for different types of gastrointestinal cancer that is oesophageal cancer, stomach cancer, liver cancer, pancreatic cancer and colorectal cancer. The pooled risk ratio for each type of gastrointestinal cancer was found to be for oesophageal cancer RR = 2.376, for stomach cancer RR = 1.131, for liver cancer RR = 1.976, for pancreatic cancer RR = 1.474 and for colorectal cancer RR = 1.428. Publication bias was assessed by funnel plots and there was observed no significant bias in our study. Our study suggested that obesity is significantly associated with risk of gastrointestinal cancer especially oesophageal cancer. However further investigations and clinical trials are required to make an impactful and conclusive statement about this association.

PO 03:

Identification nucleotide sequence variations in leptin gene in two indigenous Pakistan sheep lohi and koka breeds

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ABSTRACT:

Leptin is a hormone encoded by leptin (LEP) gene and is secreted by white adipose tissue. Multiple functions in humans as well as in animals such as milk and meat production, growth, reproduction, body energy balance and immunity are regulated by leptin. Various studies have been conducted evaluating genetic polymorphisms in LEP gene in various important livestock species including sheep, goat, cattle and buffalo. However limited work has been reported on LEP gene polymorphisms in Pakistani sheep breeds. This study was conducted to identify the genetic variations in LEP gene in two important indigenous Lohi and Koka sheep breeds. The blood samples of the selected breeds were collected from various Government and private tracts of Sindh and Punjab provinces of Pakistan. The genomic DNA was extracted and quantified through a standard protocol. The 5' untranslated region (UTR), two exons (E2 and E3) and 3'UTR of LEP gene was sequenced of two sheep breeds. The LEP gene in sheep was consisted of 913 bp of 5'UTR, two exons (exons E2 [144 bp] and E3 [360 bp]) and 1587 bp of 3'UTR. The LEP gene was polymorphic in both sheep breeds. The newly identified genetic variations in LEP gene in sheep can be screened in the larger sheep population for the association studies and marker assisted selection.

PO 04:

Role of *CTLA-4* gene in development of rheumatoid arthritis

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ABSTRACT:

Rheumatoid Arthritis (RA) is an autoimmune disease which is characterized by the pain, inflammation, joint stiffness, destruction of synovial joints, cartilage and bones.

Therefore, the current study was conducted to identify the susceptibility of *CTLA-4* gene in Rheumatoid Arthritis patients of Pakistani population. For this, a case control study was conducted based on 30 patients (7 males, 23 females) and 30 control (7males, 23 females). Blood samples from patients with Rheumatoid Arthritis were taken from the Mayo Hospital Lahore Punjab, Pakistan. Genomic DNA was isolated from blood through manual extraction. Primers were optimized and genotyping was done by Polymerase Chain Reaction which was followed by DNA sequencing and restriction fragment length polymorphism. As a result of polymorphism of G into A was identified on rs4553808 polymorphic site on *CTLA-4* gene. According to the World Health Organization criteria all the patients were clinically diagnosed with Rheumatoid Arthritis and assessed for clinical parameters. Patients were with mean age of 52.4 and 51 years for males and females respectively. Male patients were overweight having 29.86 BMI value and female patients were obese having 30.1 Body Mass Index value which indicate that they were at high risk of disease development. Age of diagnosis of patients for males and females were 50.57 years, 45.69 years, in which 9 patients have positive family history 6 were males and 3 were females. A significant association was detected between allelic and genotypic frequencies of rs4553808 and onset of RA ($p=0.001$). In conclusion rs4553808 was significantly associated with onset of Rheumatoid Arthritis in Pakistan population and females are at higher risk. Further studies should be conducted on large scale to evaluate the association of *CTLA-4* polymorphism with Rheumatoid Arthritis.

PO 05:

Interaction between *MMP9* Polymorphism and Myocardial Infarction

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ABSTRACT:

Myocardial Infarction is the most common type of coronary heart disease. Current study was conducted to identify the susceptibility of the *MMP-9* gene among families affected with myocardial infarction in the Pakistani population. A family clustering study based on 5 families having myocardial infarction patients was conducted. Blood samples from patients and their family members were collected for further genetic analysis. Patients were with a mean BMI of ± 30.2 kg/m². The mean age for diagnosis of disease was ± 50 years. Genomic DNA was isolated from the blood through manual extraction. Primers were optimized and genotyping was done by polymerase chain reaction (PCR) which was followed by DNA sequencing and restriction fragment length polymorphism (RFLP). As a result of polymorphism, A into G and C into T conversions were identified on rs17576 and rs3918242 polymorphic sites on the *MMP-9* gene respectively. In conclusion smoking, hypertension, diabetes and polymorphism of rs17576 and rs3918242 were significantly associated with the onset of MI in the Pakistani population and males were at higher risk. Further studies should be conducted on large scale to evaluate the association of *MMP-9* polymorphism with MI.

PO 06:

Antibacterial and bacteriostatic potential of coelomic fluid and body paste of *Pheretima posthuma* (Vaillant, 1868) (Clitellata, Megascolecidae) against ampicillin resistant clinical bacterial isolates

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ABSTRACT:

Pheretima posthuma (Vaillant, 1868), a native earthworm of Pakistan and Southeast Asia, has wide utilization in vermicomposting and bioremediation process. In this study, *P. posthuma* coelomic fluid (PCF) and body paste (PBP) was evaluated as antibacterial agent against ampicillin (AMP) resistant five Gram positive and four Gram negative clinical isolates. The antibacterial effect of different doses (i.e. 25-100 µg/ml) of PCF and PBP along with AMP and azithromycin (AZM) (negative and positive controls, respectively) were observed through disc diffusion and microdilution methods. All nine clinical isolates were noticed as AMP resistant and AZM sensitive. Antibacterial effects of PCF and PBP were dose dependent and zone of inhibitions (ZI) against all clinical isolates were between 23.4 ± 0.92 to 0 ± 00 mm. The sensitivity profile of PCF and PBP against clinical isolates was noticed as 44.44 and 55.56%, respectively. Both PCF and PBP showed bacteriostatic (BTS) action against *S. aureus*, *S. pyogenes*, *K. pneumonia*, *N. gonorrhoeae*. Moreover, the cumulative BTS potential of PCF and PBP against all isolates was 66.67 and 55.56%, respectively. The MICs of PCF and PBP were ranged from 50-200 µg/ml against selected isolates. The bacterial growth curves indicated that PCF and PBP inhibited the growth of all isolates at their specific MIC concentrations. However, PBP has better antibacterial potential compared to PCF against selected isolates. Therefore, it is concluded that both PCF and PBP of *P. posthuma* possess antibacterial and BTS potential against ampicillin resistant clinical isolates. This organism might be considered as a second choice of antibacterial agents and can further be utilized in pharmaceutical industries for novel drug manufacturing by prospecting bioactive potential agents.

PO 07:

Biological synthesis, characterization and antibacterial activities of silver nanoparticles against human pathogens

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ABSTRACT:

Biogenic synthesis of silver nanoparticles (AgNPs) is more eco-friendly and cost-effective approach as compared to the conventional chemical synthesis. Biologically synthesized AgNPs have been proved as therapeutically effective and valuable compounds. In this study, the four bacterial strains *Escherichia coli* (MT448673), *Pseudomonas aeruginosa* (MN900691), *Bacillus subtilis* (MN900684) and *Bacillus licheniformis* (MN900686) were used for the biogenic synthesis of AgNPs. Agar well diffusion assay revealed to determine the antibacterial activity of all biogenically synthesized AgNPs showed that *P. aeruginosa* AgNPs possessed significantly high ($P < 0.05$) antibacterial potential against all tested isolates. The one-

way ANOVA test showed that that *P. aeruginosa* AgNPs showed significantly ($P < 0.05$) larger zones of inhibition (ZOI: 19 to 22 mm) compared to the positive control (rifampicin: 50 μ g/mL) while no ZOI was observed against negative control (Dimethyl sulfoxide: DMSO). Minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) concentration against four test strains also showed that among all biogenically synthesized NPs, *P. aeruginosa* AgNPs showed effective MIC (3.3- 3.6 μ g/mL) and MBC (4.3-4.6 μ g/mL). Hence, *P. aeruginosa* AGNPs were characterized using visual UV vis-spectroscopy, X-ray diffractometer (XRD), fourier transform infrared (FTIR) and scanning electron microscopy (SEM). The formation of peak around 430 nm indicated the formation of AgNPs while the FTIR confirmed the involvement of biological molecules in the formation of nanoparticles (NPs). SEM revealed that the NPs were of approximately 40 nm. Overall, this study suggested that the biogenically synthesized nanoparticles could be utilized as effective antimicrobial agents for effective disease control.

PO 08:

Expression Deregulation of RAD51 acts as a biomarker in leukemia

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ABSTRACT:

RAD51 gene encodes a protein that catalyzes the main reaction of HRR pathway during double-strand breaks (DSBs) repair and when a replication fork encounters DNA damage, permits replication resume. Variable expression levels of RAD51 have been observed in multiple human tumors. Current study was directed to evaluate expression deregulation of RAD51 in leukemia patients. In present study 170 leukemic blood cancer samples along with healthy individual blood samples as controls were assessed. For expression analysis of RAD51, q-RT PCR was performed in leukemic patients for selected gene. Data analysis showed RAD51 ($p < 0.001^{**}$) was significantly down regulated in patients as compared to healthy controls. Spearman correlation analysis was performed in order to associate the expression deregulation of RAD51 gene with clinicopathological parameters and significant negative correlation was observed between RAD51 and multiple types of leukemia. ROC analysis was performed in order to assess diagnostic value of RAD51 gene leukemic patients. The AUC for, RAD51 was 0.879 (95% CI: 0.797- 0.960; $p < 0.0001^{***}$). Our finding suggests that deregulation RAD51 gene can act as prognostic markers in leukemia patients.

PO 09:

Biological efficacy of ZnO nanoparticles using *Azadirachta indica* in induced diabetic mice

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ABSTRACT:

Diabetes mellitus is a metabolic disease which is characterized by hyperglycemic condition (high blood sugar levels). According to world health organization 1.5 million people died every year. Many of the conventional drugs are not reliable

against diabetes mellitus due to their low bioavailability and uncontrolled release. Nanotechnology is one of the most recent technologies paving a reliable way in diagnosis and treatment of diabetes mellitus. With the aid of nanotechnology, biosynthesis of nanop articles is a widely accepted biomimetic process for the production of biocompatible and biodegradable nanoparticles. *Azadirachta indica* (Neem) is a medicinal plant and used for bio synthesizing ZnO nanoparticles by using zinc acetate dihydrate and sodium hydroxide. These are characterized by scanning electron microscopy (SEM), X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), UV-vis spectroscopy and photoluminescence analysis (PL). ZnO nanoparticles show antidiabetic activity when administrated in different concentrations to alloxan induced diabetic mice.

PO 10:

Characterization of Venom Components of Indian Red Scorpion *Hottentota tamulus*

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ABSTRACT:

Animal venom and toxins are the potential bioresources and therapeutic tools in biomedical applications. In the present study, scorpions were collected from hilly areas of Azad Jammu & Kashmir (Bhimber). Scorpions were kept alive in separate plastic containers and fed with grasshoppers. Water was sprayed periodically to maintain humidity. The venom was extracted by electrical stimulation of the telson. The venom was collected at the tip of the Micropipette and shifted to a microfuge tube. The venom was dissolved in double-distilled water and stored at -20°C. SDS-PAGE of venom components showed the presence of prteins known to present in venom. The soluble venom from the scorpion *Hottentota tamulus* were fractionated by high-performance liquid chromatography. LCMS analysis revealed the presence of 70 distinct molecular mass components which range from 163 to 979.5220 Da. The mass fingerprint by LC-MS identified ten peptides that matched with the theoretical masses of already reported putative peptides.

PO 11:

Study of bacterial pathogens and physicochemical parameters of water of river Sutlej at Head Islam

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ABSTRACT:

The present study was conducted to isolate and characterize bacteria from water samples collected from upstream, mid-stream and down-stream points of Head Islam in River Sutlej, City Hasilpur, district Bahawalpur. Initial isolation of bacteria was carried out using nutrient agar plates. Isolated bacteria were identified on the basis of morphological and biochemical tests. Identification was confirmed by growing bacteria on selective media. Physicochemical parameters like pH, temperature, TDS, colour, odour, TSS, TS, DO and total hardness was observed to evaluate the quality of

river water. Antibiotic resistance test was done to observe the resistance of bacteria against different antibiotics. Pathogenicity of bacterial isolates was done by blood agar test. Out of 9 only 6 strains showed alpha and beta haemolysis while 3 strains showed gamma or no haemolysis. Different nanoparticles and plant extracts were prepared to check the antibacterial activity against these pathogenic bacteria. Optimum pH and optimum temperature were also observed. Ribotyping of bacteria was done by amplifying 16s rRNA gene. The antibiotic meromem showed maximum effect on bacteria measuring size of zone of inhibition 1.6 cm. Bacterial strains showed maximum resistance against antibiotic cefixem. The physicochemical parameters showed that the quality of water is good enough for drinking purpose according to the accepted value given by WHO but we should monitor the pollution level in river so that water borne diseases may not cause due to the presence of bacteria in water.

PO 12:

Association between lead exposure and expression variation of ALAD and antioxidant genes in construction site workers

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ABSTRACT:

Oxidative stress is considered as one possible mechanism involved in lead toxicity. To test this hypothesis, expression variations of aminolevulinic acid dehydratase (ALAD), superoxide dismutase 2 (SOD2), and 8-oxoguanine DNA glycosylase 2a (OGG1-2a) genes was studied in a cohort of 100 exposed roadside construction workers along with age and gender matched 100 unexposed controls with real-time polymerase chain reaction (PCR). qPCR analysis showed significant down-regulation in ALAD ($p < 0.0001$), SOD2 ($p < 0.0001$), and OGG1-2a ($p < 0.0001$) gene in exposed workers compared to unexposed controls. Additionally, a positive spearman correlation was observed between ALAD versus SOD2 ($r = 0.402$, $p < 0.001$), ALAD versus OGG1-2a ($r = 0.235$, $p < 0.05$), and SOD2 versus OGG1-2a ($r = 0.292$, $p < 0.05$). This study showed that lead exposure induces oxidative stress, alter the mRNA expression of antioxidant genes, which is accompanied by expression variation of lead-related gene, and ultimately affect the DNA integrity of exposed workers.

PO 13:

**Mitochondrial sirtuins genetic variations and gastric cancer risk:
Evidence from retrospective observational study**

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ABSTRACT:

The purpose of the present study was to analyze the role of selected polymorphisms of SIRT3 and SIRT5 in gastric carcinogenesis (GC). For this study, 500 blood samples of GC patients and 500 blood samples of healthy individuals were collected. Six selected polymorphisms of mitochondrial sirtuins were analyzed for analysis using Tetra-Arms PCR followed by DNA sequencing. Mutant allele frequencies of selected polymorphisms [rs3782116 ($p < 0.0001$), rs6598072 ($p < 0.0001$) and rs11246020 ($p < 0.0001$), rs938222 ($p = 0.0136$), rs3757261 ($p = 0.0005$) and rs2841511 ($p = 0.0015$)] were observed significant higher in GC patients vs controls. Haplotype analysis was performed, and 51 haplotypes were generated using haploview software. Among these haplotypes, eleven haplotypes were found associated with a significantly increased risk of GC. Furthermore, SNP-SNP interaction showed a significant correlation between studied SNPs and GC risk. Kaplan Meier analysis showed that mutant allele frequencies of selected polymorphisms are linked with a significant decrease in survival of GC patients. It can be concluded that selected SNPs may be associated with enhanced risk of GC and hence can be potential prognostic markers for prognosis and predisposition of GC.

PO 14:**Prevalence and Association of Anthropometric indices of growth with Vaccination status in Children Less than 5-Year of Age**

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ABSTRACT:

Children in low- and middle-income countries under 5 years of age constitute the most vulnerable group. Hence, attention to their health issues is very important. Childhood vaccination protects the children from infectious diseases, improves health status and thus helps in promoting the growth of children. This systematic review and meta-analysis aimed to determine the prevalence of anthropometric indices of growth and to quantify the association with vaccination status of children under 5 years of age. Databases Google Scholar, PubMed and PakMedinet were searched in June 2021 for studies that included participants under 5 years of age. The studies were conducted in developing countries and reported quantitative data. The systematic review with meta-analysis was conducted, determining pooled prevalence using random effect model. The association of anthropometric indices of growth with vaccination status of children was presented as odds ratios with 95% confidence interval. Of the total 283 studies, fourteen studies were selected for final analysis, majority of which were cross-sectional. Childhood vaccination was found to affect anthropometric outcomes, that are height-for-age, weight-for-age and weight-for-height, considered in this review. The pooled prevalence of stunting, underweight and wasting was found to be 36.2%, 15.8% and 5.7% in vaccinated children while 43.3%, 16.3% and 9.5% in non-vaccinated children, respectively. Combining data of all studies, stunting (OR=1.460,95% CI:1.275-1.473), underweight (OR=0.982,95%CI:0.743 – 1.298) and wasting (OR=1.443,95%CI: 1.204 – 1.729) were found to be significantly associated with poor vaccination status (p value < 0.001). There is limited but growing evidence that childhood vaccination has protective role in child physical growth. Efforts should

be made to make vaccination programs more accessible in developing countries to improve growth parameters of children.

PO 15:

Emerging Health Risk of Aspergillosis and Mucormycosis in COVID-19 Patients; a Systematic Review and Meta-analysis.

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ABSTRACT:

Fungal infections have increased in number since the onset of this lethal pandemic. The aim of this study is to assess risk factors and case fatality in COVID-19 cases with aspergillosis or mucormycosis. Systematic review and meta-analysis was done according to PRISMA guidelines. Data bases used were Google scholar, Pakmedinet, PUBMED and MEDLINE. My inclusion criteria was original articles and abstracts on aspergillosis or mucormycosis in COVID-19 patients from 1st January 2020 to 15th June, 2021. 2 researchers independently screened the articles of basis of title and abstract. Any discrepancy was solved by discussion. 21 case reports and case series of mucormycosis in COVID-19 patients were identified and mean age was 56.3 years (36 males and 12 females). The most common comorbidity was diabetes and site was Rhino orbital mucormycosis. Case fatality of 48 combined cases was calculated to be 52%. 19 articles of aspergillosis were included. Diabetes was the most common comorbidity in cases. The number of male cases were more than females. Incidence of aspergillosis in critically sick COVID-19 patients was calculated to be 9.3%. Case fatality was calculated to be 51.2%. Case fatality from aspergillosis and mucormycosis in Covid-19 cases is quite high. Incidence of aspergillosis in critically sick COVID cases is around 9.2%. Screening can be a beneficial tool for decreasing the morbidity and mortality.

PO 16:

Prebiotics & enhanced iron absorption

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ABSTRACT:

The objective of the current narrative review was to determine if prebiotics can help enhance the absorption of minerals such as iron. Original research articles and review articles on the aforementioned topic were searched from research databases from last 15 years. Several recent research trials have suggested that prebiotics not only improve the gut health, but also improve the absorption of various minerals such as iron (Parikh and Bos 2018). It has been suggested that prebiotics specifically Inulin and Galacto Oligosaccharides (GOS) exhibit iron absorption increasing capabilities (Baye et al. 2017). This particular characteristic exhibited by both of these prebiotics can be exploited to treat iron deficiency anemia in humans which is one of the biggest public health issues worldwide (Sundberg 2011). Though the exact mechanism behind increased iron absorption by prebiotics is still unknown, some of the possible mechanisms have been postulated. The possible increased absorption effect may be

attributed to osmotically active sugars which are produced during the process of fermentation, when prebiotics are ingested. These sugars actually increase the passive absorption of metals such as iron and also produce weak organic acids, which exhibit properties that facilitate the absorption of minerals. Production of these weak organic acids naturally decreases the luminal pH which helps in the conversion of ferric form (Fe³⁺) of iron into the more readily bioavailable ferrous form (Fe²⁺) (Miyada et al. 2012). It has likewise been hypothesized that prebiotics are fermented in the colon and this generates short chain fatty acids such as acetate, propionate and butyrate (Yeung et al. 2005). These SCFAs (short chain fatty acids) can induce increased proliferation of epithelial cells which eventually enhances the surface area for absorption thereby enhancing absorption of iron (Bauer et al. 2006). Moreover, it is also thought that expression of genes involved in regulation of iron absorption is also increased if prebiotics are fed along with iron. Another possible mechanism could be the anti-inflammatory effects of the colon which decrease the concentration of circulating Hepsidin (Parikh and Bos 2018).

PO 17:

Efficacy of the synthesized biomolecules coated chitosan nanoparticles against polycystic ovary syndrome induced mice

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ABSTRACT:

Polycystic ovary syndrome (PCOS) is a complex metabolic endocrine disorder with 20% estimated global prevalence. The objective of this study was to determine the hormonal, biochemical and histological changes in PCOS induced mice after treating with *Ocimum. Sanctum* (OS) leaves extract, zinc oxide (ZnO) and chitosan nanoparticles (CHNPs). A single dose of 2mg/kg Estradiol valerate (EV) in 0.2ml olive oil was administered intraperitoneally to mice for PCOS induction. The induction was confirmed by microscopic examination of vaginal smear of mice with prolonged vaginal cornification and cystic development. This experiment was conducted on ten groups; Negative Control (NC-Normal), Positive Control (PC-PCOS untreated), Vehicle Control (VC-PCOS induced DMSO treated), Standard Control (SC-Metformin treated), Low Dose Sanctum (LDS-250mg/kg), High Dose Sanctum (HDS-500mg/kg), ZnO Sanctum Low dose (ZNSL-50mg/kg), ZnO Sanctum High dose (ZNSH-100mg/kg), CH-Sanctum Low dose (CHSL-50mg/kg) and CH-Sanctum High dose (CHSH-100mg/kg). The mice groups were administered orally with respective doses for consecutive 28 days and then euthanized for blood serum and ovaries collection. The Liver function test (LFT) showed the significant reduction in bilirubin and ALP level after treatment with CHSH when compared with PC. The kidney function test (RFT) results showed the manageable range of urea and creatinine. The hormonal ratio was in 1:3 with LH and FSH when treated with CHNPs. In treatment with CHSL dose cyst were disappeared and regaining of corpus luteum was observed, while in case of CHSH defined follicles, zona pellucida and clear oocyte was observed. Collectively, current experimental data furnishes the protective role of *O. sanctum*, ZnO and CHNPs against PCOS induced mice through enhanced absorption of bioactive components in managing metabolic and hormonal

balance by eugenol and quercetin in plant extract.

PO 18:

Evaluation of antibacterial activity of vitamin C against human bacterial pathogens

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ABSTRACT:

Now a day's multidrug resistance phenomenon has become the main cause for concern and there has been an inadequate achievement in the development of novel antibiotics to treat the bacterial infections. Therefore, there is a need to search for novel adjuvant, and vitamin C is one such promising adjuvant. The present study was aimed to elucidate the antibacterial effect of vitamin C at various temperatures (4°C, 37°C and 50°C) and pH (3, 8, and 11), against Gram-positive and Gram-negative bacteria at various concentrations (5-20 mg/ml). Agar well diffusion method was used to evaluate the antibacterial effect of vitamin C. Growth inhibition of all bacterial strains by vitamin C was concentration-dependent. Vitamin C significantly inhibited the growth of Gram-positive bacteria: *Bacillus licheniformis* (25.3 ± 0.9 mm), *Staphylococcus aureus* (22.0 ± 0.6 mm), *Bacillus subtilis* (19.3 ± 0.3 mm) and Gram-negative bacteria: *Proteus mirabilis* (27.67 ± 0.882 mm), *Klebsiella pneumoniae* (21.33±0.882 mm), *Pseudomonas aeruginosa* (18.0 ± 1.5 mm) and *Escherichia coli* (18.3 ± 0.3 mm). The stability of vitamin C was observed at various pH values and various temperatures. Vitamin C showed significant antibacterial activity at acidic pH against all bacterial strains. Vitamin C remained the stable at different temperatures. It concluded that vitamin C is an effective and safe antibacterial agent that can be used in the future as an adjunct treatment option to combat infections in humans

PO 19:

Antibacterial activity of biologically active Streptomyces

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ABSTRACT:

Microbial diseases are continuously increasing every year and becoming big global threat to human and wildlife health. There are more than 300 known diseases transmitted by bacteria, fungi, viruses and mosquitoes etc. So, search for new novel bioactive compounds from actinomycetes to control these pathogens and their resistance mechanisms is the need of hour. 14 actinobacterial strains were isolated from six soil samples on the basis of morphological, biochemical and differential media characterization. Actinobacterial strains AB1, AB7, GB6, GB7 and GB8 were subjected to antibacterial activity against pathogens by cross streak and agar well diffusion methods. The ethyl acetate extract was dissolved in DMSO and used to perform secondary screening. In primary screening, all actinobacterial strains showed excellent zone of inhibition (10-27mm) against all the pathogens. In secondary screening, all the strains showed excellent zone of inhibition (ZI) (upto 14mm) against *P. aeruginosa*. Against other pathogens ZI was also good (upto 11 mm). These

findings indicated that actinobacterial isolates have the ability to produce bioactive compounds with potent activity against Gram positive and-negative pathogenic bacteria.

PO 20:

Study of bacterial pathogens and physicochemical parameters of water of river Chenab at Marla Headwork

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ABSTRACT:

Water is vital to our existence in life but water sources are at risk of contamination from enormous sources of contaminants e.g extensive agricultural industrial activities, domestic wastes, leakages from landfills, pit latrine and urbanization results into the contamination of aquifer. There are varieties of microbes Play an essential role for contamination of water and results in a variety of outbreaks of diseases and death. The most notorious waterborne bacteria are campylobacter, shigella, salmonella, V.cholerae, Clostridium, Mycobacterium and E.coli. This research work was conducted to isolate and characterize bacteria from the water samples collected from the upstream, midstream and downstream points of Marla Headwork of Chenab River ,City Sialkot, District Sialkot, The identification was carried out by performing different physicochemical test like pH, temperature, TDS, colour, odour, TSS, TS, DO and total hardness was observed to evaluate the quality of river water. After testing 3 water samples , 4 pathogenic bacterial strains was isolated using blood agar test the bacterial isolates show Alpha and beta hemolysis. Ribotyping of bacteria was carried out by amplifying 16s RNA gene. Effect of Various parameters such as temperature, pH, antibiotics, plant extract and Nano particles were also studied. Optimum temperature for all bacterial is 37°C, 20°C and 34°C and Optimum pH was 7, 6 and 8 . Strain S2 show maximum growth at 34°C where as strain S1 show the maximum growth at 6 pH . Different antibiotics with different potency were applied to check the resistance of bacterial strains against them Among these antibiotics Cefixime gave more sensitivity against S2 and S4 strains and proved as more effective antibiotic while Meronem gave least sensitivity against these strains and proved as less effective antibiotic . Three Nano particles with same concentration were applied to bacterial strains, All strains were not sensitive to these Nano particles. Nanodrops also carried out which show the maximum DNA in strain S3.

PO 21:

Bacterial laccases mediated decolourization and degradation of Reactive blue -19

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ABSTRACT:

Rapid industrialization and high demand of textile products poses a serious threat to both the environment and human health. Nowadays, rapid industrialization is a major concern in developing countries because of slow biodegradability, toxic, mutagenic, and carcinogenic characteristics of industrial textile wastewater. The conventional

physicochemical approaches are not efficient to eliminate all types of industrial effluents so in this aspect bioremediation is a cost-effective and environmentally acceptable method of remediation of industrial textile wastewater. The bioremediation of industrial waste can be made more efficient by using ligninolytic laccase enzymes, which are extracted, from bacteria. Bacterial laccases actually belongs to the multicopper oxidases family and is engaged in the crosslinking of monomers, which is important in the degradation of a variety of industrial pollutants. The present research was employed to assess the decolorization and biodegradation efficiency of textile reactive dyes by using laccase producing bacterial strains. Dye used in this study was RB-19. Three locally isolated laccase producing bacterial strains namely IZ, AY1 and AY2 showed significant biodegradation activity against RB-19. The decolorization of RB-19 resulted in change in color of RB-19 from blue to light green color. Under optimum conditions biodegradation efficiency of RB-19 by using laccase producing bacterial strains was 72% with IZ, 89% with AY1 and 91% with AY2 after 48h. UV Visible spectroscopy and Fourier-transform infrared spectroscopy (FTIR) confirmed the biodegradation of RB-19.

PO 22:

Investigating antibacterial and antibiofilm and biofilm inhibitory activity of herbs against pathogenic catheter associated bacteria

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ABSTRACT:

The aim of study was to assess the antibacterial and antibiofilm activity of essential oil (EO) of *Nigella sativa* and extract of *Thymus vulgaris* against different bacteria isolated from contaminated catheters viz. *Klebsiella* sp. (OK360618), *Proteus mirabilis* (OK360619), *Staphylococcus aureus* (OK360620), *Pseudomonas aeruginosa* (OK360621), *Escherichia coli* (OK360622) and *Enterococcus* sp.(OK360623) EO of *N. sativa* and extract *T. vulgaris* were prepared using steam distillation and soxhlet apparatus, respectively. Antibacterial activity of EO of *N. sativa* and extract *T. vulgaris* was determined using agar well diffusion method. *P. aeruginosa* (OK360621) was resistant against lincomycin, erythromycin, rifampicin, and ciproflaxin. Antibiofilm and biofilm inhibitory activity of EO and extract was evaluated through crystal violet assay in test tube. Results showed that maximum zone of inhibition formed was against *S. aureus* (OK360620) i.e. 30 ± 0.6 ef with EO of *N. sativa*. Percentage antibiofilm and biofilm inhibitory activity on catheters of extract and EO reported was maximum for *S. aureus* i.e. 89.67 ± 0.0 e and 94.17 ± 0.0 e, respectively EO and extract, respectively.

PO 23

Preparation of *Citrullus colocynthis* extract against gram-positive bacteria

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ABSTRACT:

Plants are using as a source of remedies for the treatment of many diseases. In present study, *Citrullus colocynthis* used as an anti-bacterial remedy, which belongs to the family *Cucurbitaceae*. In the present study, antibacterial efficiency of *Citrullus colocynthis* extract studied against four strains of Gram-positive bacteria *Bacillus subtilis*, *Staphylococcus aureus*, *Streptococcus faecalis* and *Streptococcus pyogenes*. The results showed that the extract from *C. colocynthis* inhibits the growth of bacteria in different concentrations, and the concentration were 25mg/ml, 50mg/ml, 75mg/ml and 100mg/ml. As the concentration of extract increased, the zone of inhibition also increased. This study was helpful for understanding the antibacterial activity of *Citrullus colocynthis* fruit extract against different gram-positive bacteria. It was suggested from our study that the extract of *Citrullus colocynthis* may be used in medicines to cure bacterial diseases.

PO 24:

Histopathology and Toxicity of Zinc Oxide Nanoparticles on Mice Gut and its Microbiota

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ABSTRACT:

Humans are exposed to Zinc oxide nano-particles (ZnO NPs) through their food, drinks, consumer products and many other resources including biomedical applications. A number of researches reported the antibiotic potential, as well as toxicity of ZnO NPs, which questioned its usage. The present *in vivo* study investigated the potential toxicity of ZnO NPs on Microanatomical structures of gut along with gut microbial community by using mice *Mus musculus* (age 5-6 weeks, body weight 18±1g) as representative animal. Furthermore, orange juice was analyzed for its protective effect against probable ZnO NPs toxicity. Genetically closely related mice were randomly assorted into four groups (n=3, each mouse was maintained in a separate plastic cage). Group I (Dose group) was orally exposed with 0.1 ml/day of ZnO NPs (dosage as 25mg/kg of body weight). Group II (Antidote group) was orally exposed to 1ml of orange juice solely (1:1 solution in distilled water to reduce sour taste). Group III (Dose + Antidote group), both these things were administered orally with same dosage and volumes as mentioned above to analyze the protective effect of orange juice against ZnO NPs. Group IV (Control group) was treated with 1ml of distilled water as placebo to neutralize the handling and stress effects. These groups were treated in the same way routinely for 14 days in the same conditions. For 'Growth Rate Analysis' the weight of each mouse was used to be measured after every three days. 'Feed and Water Consumption Analysis' was also performed by measuring their consumed amounts after every three days. All the mice were sacrificed on 15th day in sterile conditions near a flame and complete small intestine was taken from each mouse. One-inch of initial portion from each duodenum was

carefully cut-off and its microtomy was performed to make 'Histopathological Analysis' for which four parameters were selected as (i) villi length, (ii) crypts' or intestinal glands' depth, (iii) abundance of stem cells per crypt and (iv) thickness of the duodenal muscular layer. For 'Gut Microbial Analysis' complete gut contents were taken from each complete small intestine in separate sterile Eppendorf tubes then serial dilutions of these samples by taking equal initial volumes were spread on nutrient agar media on bacteria culture plates (by using laminar air flow) which were then incubated at 37°C for 24 hours. CFU/ml (Colony Forming Units/ml) were recorded as parameter of toxicity on gut microbiota. Both the total CFU/ml and individual CFU/ml for each individual type of bacterial colony were recorded for better evaluation. Investigation for mice growth rate through weight analysis suggested that ZnO NPs treated mice gained less weight plus consumed less feed and water against control, but when orange juice was co-administered with ZnO NPs, weight gain of mice, food and water intake were improved to a great extent and became comparable with the control. Protective effect of orange juice in case of feed and water consumption rate may be not actually a protection because the alveoli of intestine were damaged (Histological results) due to excessive daily intake of orange juice owing to which surface area to absorb nutrients was reduced which caused more appetite for food and water in growing mice. Histological analysis suggested that ZnO NPs also caused Histopathological lesions in duodenal tissue by reducing the total surface area for nutrients absorption. Villi length, depth of crypts and number of stem cells per crypt were reduced due to ZnO NPs whereas orange juice was proved as a protective agent against ZnO NPs and significantly raised the values of these three parameters. While the fourth parameter of histology i.e. thickness of the duodenal muscular layer did not get any significant harm due to ZnO NPs. Microbial investigation suggested that ZnO NPs have adverse effects against gut microbial community. Total five bacteria were recognized in gut contents whereas the abundance of four bacteria out of these five was reduced due to ZnO NPs. Orange juice was proved as protective against this disturbance only for one kind of bacteria. Therefore about 80% of the gut microbes got damage due to ZnO NPs and only 25% of the disturbed bacteria were protected against ZnO NPs by using orange juice. At the same time this study showed that the excessive use of orange juice can damage the villi and intestinal epithelium, so, excessive use of orange juice should also be avoided beside ZnO NPs. Decrease in gut microbial community's abundance and total surface area of small intestine are two possible reasons among many others for decreased growth rate due to ZnO NPs, which may lead to poor health conditions while the orange juice can cope with the conditions to a certain extent.

PO 25:

Preparation and characterization of *Azadirachta indica* (Neem) leaf extract Nano-emulsion as Anti-bacterial agent

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ABSTRACT:

The appearance of drug-resistant bacteria in the community is a crucial development, and is associated with increased healthcare costs, antibiotic use, morbidity and mortality. Natural oil Nano emulsions have potential for antimicrobial applications. In the present study, we determined the antibacterial activity of *Azadirachta indica* (Neem) oil nano emulsions against drug-resistant pathogenic bacteria *Escherichia coli* and *Staphylococcus aureus*. To evaluate antibacterial potential, the agar well diffusion assay was used to make colonies of Gram-positive and Gram-negative bacteria. Aqueous extract of leaves was used to synthesize water based nano emulsions by using Tween 80 as surfactant. These functionalized nano emulsions used for targeted drug delivery with enhanced therapeutic efficacy and minimal side effects. Ultrasonic waves were used for applying shear to micro-scale droplets and altering them to Nano-scale. Various techniques used for characterization of synthesized nanoparticles by using DLS, photoluminescence, UV-Visible spectrophotometer. UV-Visible spectrophotometer showed absorbance peak in range of 214 nm. Leaf extract nano emulsions of *A. indica* (Neem) exhibited a potent antibacterial activity against various strains of bacterial pathogens.

PO 26:

Expression Deregulation of RAD51 acts as a biomarker in leukemia

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ABSTRACT:

RAD51 gene encodes a protein that catalyzes the main reaction of HRR pathway during double-strand breaks (DSBs) repair and when a replication fork encounters DNA damage, permits replication resume. Variable expression levels of RAD51 have been observed in multiple human tumors. Current study was directed to evaluate expression deregulation of RAD51 in leukemia patients. In present study 170 leukemic blood cancer samples along with healthy individual blood samples as controls were assessed. For expression analysis of RAD51, q-RT PCR was performed in leukemic patients for selected gene. Data analysis showed RAD51 ($p < 0.001^{**}$) was significantly down regulated in patients as compared to healthy controls. Spearman correlation analysis was performed in order to associate the expression deregulation of RAD51 gene with clinicopathological parameters and significant negative correlation was observed between RAD51 and multiple types of leukemia. ROC analysis was performed in order to assess diagnostic value of RAD51 gene leukemic patients. The AUC for, RAD51 was 0.879 (95% CI: 0.797- 0.960; $p < 0.0001^{***}$). Our finding suggests that deregulation RAD51 gene can act as prognostic markers in leukemia patients.

PO 27:

Evaluation of different sunflower (*Helianthus annuus* L.) genotypes for yield and its related characters

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ABSTRACT:

The present study was carried out to evaluate high yield genotypes of sunflower at Oilseed Research Institute, Tando Jam in NUSYT lines during spring 2016. The experiment was laid out in randomized complete block design (RCBD) with three replications. Meanwhile, the yield associated traits were studied i.e., days to flower initiation, days to maturity, plant height (cm), head diameter (cm) and Seed yield (kg/ha) were observed significantly different at $P \leq 0.01$ probability level. Whereas, number of plants/plot and 100 seed weight (g) was non-significant. SF-16001 and SF-16002 showed maximum days to flower initiation and days to flower completion. Whereas, SF-16003 line produced maximum days to maturity, plant height (cm), head diameter (cm) and seed yield (kg/ha) as compared to both check varieties. In this context, variation was observed in sixteen sunflower lines compared with two check varieties. Hence, it can be concluded that early maturing and flowering genotypes have directly effect on seed weight and yield. So, it is suggested to be subjected further evaluation under agro climatic conditions through the selection method.

PO 28:

Using PCR-RFLP of *cyt-b* gene for domestic cats identification in district Swat

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ABSTRACT:

Identification of domestic animal species is very crucial because they live nearby us. Various morphological markers are used for the purpose but these are not enough to identify within species. However, genetic markers can be used for this purpose. Present study is based on mitochondrial genome analysis. In present study cytochrome-b gene (1,140 base pair) located on H-strand in mitochondrial genome is used as a genetic marker for the identification of domestic cats. DNA was extracted from hair follicles of 50 domestic cats in District Swat and PCR was performed in the presence of a pair of *cyt-b* primers to amplify a conserved sequence of 358-bp and cleaved through BsuRI and AluI restriction enzymes. A 358-bp PCR amplicons showed two bands 273-bp and 74-bp for BsuRI and three bands 190-bp, 148-bp and 120-bp for AluI endonucleases upon electrophoresis by using agarose gel. Our study showed that *Felis catus* could be successfully identified by PCR-RFLP approach.

PO 29:

Organic manure efficacy on vermire mediation and phytoremediation of heavy metals

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ABSTRACT:

Heavy metals contamination raised significant concerns throughout the world. The aim of current research was to remediate heavy metals i.e. cadmium, lead, and chromium from artificial contaminated soil via vermiremediation and phytoremediation, and to evaluate the impact of organic manure (cow dung and buffalo dung) on both remediation techniques. *Eisenia fetida*, *Pheretima lignicola* and *Spinacia oleracea* were used. Results revealed that *E. fetida* tolerated heavy metals concentration (Pb; 280 mg), Cd; 150 mg, and Cr; 860 mg) compared to *P. lignicola*. The growth and reproduction of *Eisenia fetida* was efficient in the cow dung manure compared to buffalo dung. Similarly, seed germination and growth of *Spinacia oleracea* was better in cow dung media compared to buffalo dung. Bioaccumulation factor showed that that *E. fetida* showed higher accumulation of heavy metals in their tissues when vermi + phytoremediation was jointly applied (9.50 ppm of Pb, 24.166 of Cd, and 6.695 of Cr). Fourier-transform infrared spectroscopy and comet assay revealed that heavy metals had no genotoxic effect on the *Eisenia fetida* and *Spinacia oleracea*. It was concluded that both *Eisenia fetida* and *Spinacia oleracea* are appropriate for heavy metals remediation in cow dung manure.

PO 30:

Prevalence of influenza A virus and risk assessment in birds in Kasur Pakistan

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ABSTRACT:

Influenza A viruses have a severe effect on bird health and cause heavy economic losses. These viruses are very important for veterinary and human public health due to their zoonotic potential. Humans who have close contact with birds are at high risk of acquiring influenza. There is dire need of continuous monitoring of such zoonotic viruses in poultry, pet and wild birds for understanding their epidemiology. Data related to prevalence of influenza viruses and associated risk factors is not sufficiently known in the locally bred fancy birds of Pakistan. This study was designed to engage RT-PCR based detection of Influenza A virus (IAV) in live fancy birds and to identify risk factors associated with infections from this virus. Different live fancy bird stalls/shops (n=100) were identified in district Kasur. From each fancy live bird stall/shop, an oropharyngeal swab of each bird was collected. Data related to epidemiology and risk factors for Influenza A virus in fancy birds was also collected. Samples were suspended in universal transport media and kept in a liquid nitrogen

container and transported to Epidemiology and Microbiology Laboratory (One Health Research Group), Discipline of Zoology, Department of Wildlife and Ecology, University of Veterinary and Animal Sciences, Lahore, Ravi Campus, Pattoki. Two oropharyngeal swab samples of each fancy bird species were pooled. These pooled samples (n=50) were analyzed by RT-PCR to detect the IAV through a standardized protocol. Statistical package for social sciences (SPSS) version 21.0 was used for data analysis. Chi-square test was used to check the association between different risk factors with positive samples. P-value of ≤ 0.05 was considered significant. A total of 4 (8%) of 50 fancy birds pooled samples were positive for IAV. The prevalence of IAV varied greatly in various studied locations. The results showed higher prevalence in female birds (8.3%) as compared to male birds (7.7%). The overall results were found to be highly significant ($p < 0.05$), when recorded for prevalence of IAV and sex. There was a statistically significant difference in avian infection status across the two different seasons, summer and autumn ($p < 0.05$). In the summer, a prevalence of 7.7% was observed, however, in autumn it increased to 8.3%. Equal prevalence was observed in adult and juvenile birds. The result of our study revealed that IAV is circulating and persisting in district Kasur fancy birds. There is a need for screening of these fancy birds before purchase to minimize transmission of virus to humans.

PO 31:

Effect of housing systems on the growth and blood indices of American Pekin ducks

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ABSTRACT:

The experiment was conducted to check the effect of different housing system of American Pekin ducks on growth, blood biochemistry and cellular immunity. The experiment was conducted for a period of three months in the integrated Fish Farming Unit at Department of Fisheries and Aquaculture, UVAS Ravi campus Pattoki. Hundred 3 days old ducks were stocked in three different housing system designed i.e intensive system (T1), free range (T2) and integrated system (T3). In free range system, the ducks were allowed to roam around the nearby surroundings whereas in intensive system ducks were fed on 32% CP food (Sadique Feed Mills Limited) twice a day in morning and evening. In integrated system duck were allowed to interact with water bodies of fish ponds and feed on the integrated unit with one time artificial feed. Growth studies revealed best results in intensive system as compared to the integrated system ($P \leq 0.0001$) but counter currently the growth of fish replaced the lower values. Results of cellular immunity showed higher serum albumin, phagocytic activity, phagocytic index and white blood cells count values in T3 than T1 and T2 treatments but there was no significant difference among these treatments. Similarly, globulin, AG ratio, total protein, cholesterol, glucose meat cholesterol and triacylglycerol values vary significantly higher in T3 that indicated that revealed although the ducks gain maximum weight in intensive housing system but with respect to blood chemistry and cellular immunity best results were reported in integrated housing system.

PO 32:

**Prevalence & predictors of stunting in children under 5 years of age:
a Systematic review and Meta-analysis**

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ABSTRACT:

Stunting in children under five years of age is a major health problem in many middle and low-income countries around the world. The aim of the study was to describe the prevalence and predictors of stunting in children under five years of age. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA Checklist 2020) was used for data reporting and analysis. Databases: Medline, PubMed, Google scholar and PakMedinet were searched for publications from January 2016 to May 2021. Author also performed literatures search using direct websites of local journals. Random effect model was employed to generate a pooled prevalence and was presented as percent and 95% confidence interval (CI). Total fifteen studies were selected for systematic review. Out of these, nine studies were selected to estimate pooled prevalence. In children under five years of age, the overall pooled prevalence was 39.11% (95% CI: 33.017 to 45.394). A significant heterogeneity with $I^2 = 99.39\%$, $p < 0.0001$ was found among the studies. Remaining 6 studies had prevalence of stunting divided in two groups, children's age either <2 years or 2-5 years of age. In this systematic review, the pooled prevalence was 39.11% and regarding predictors, mother's education was one of the most frequent predictors (80%), weight of the baby at birth 60%, breast feeding and socio-economic status with 53.3%.

PO 33:

Anti-cholestatic effect of extract of *Berberis lycium*

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ABSTRACT:

Cholestasis is defined by the disruption in bile flow which results in elevation of bile acids level in liver and blood. Cholestasis can either be genetic or acquired. The former is caused by mutations in the genes involved in the synthesis and excretion of bile acids, while the latter is because of the side effects of systemically administered drugs, and physical blockage by stones or carcinoma. This study is aimed to evaluate the anti-cholestatic effect of *Berberis lycium*. The mouse models of cholestasis were generated by administration of α -naphthylisothiocyanate (ANIT) and the animals were treated with extract of *B. lycium* via oral gavage. Blood of the mice were collected for estimation of ALT, AST, ALP, and bilirubin. The liver sections were collected for histopathological analysis. Furthermore, expression of genes involved in bile acid synthesis and excretion was determined. The results of this study will be presented in this conference.