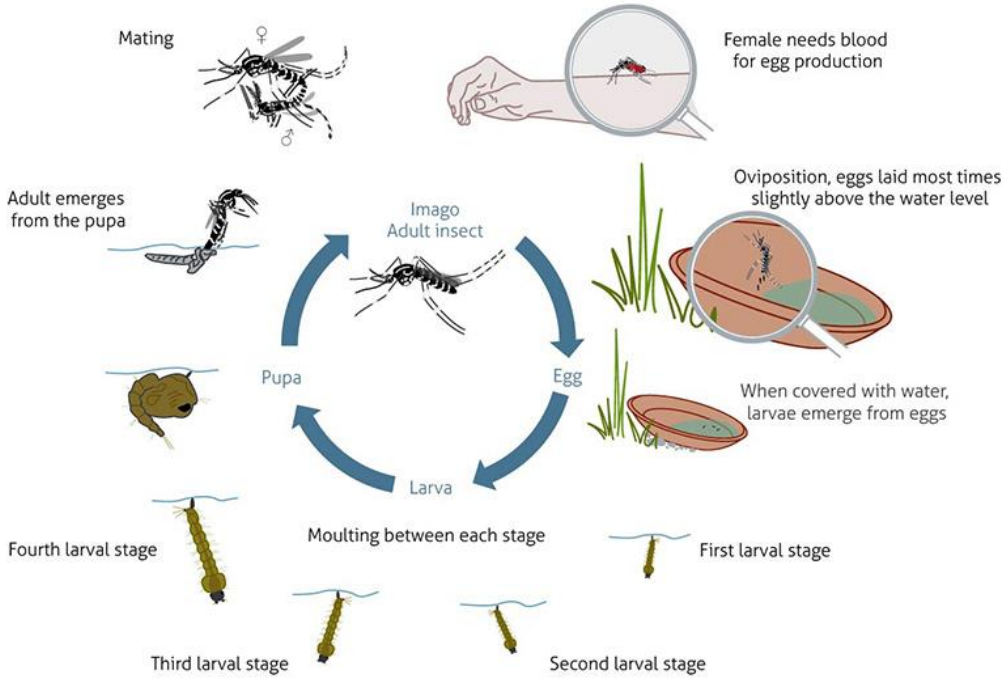
QUAID-I-AZAM UNIVERSITY
ISLAMABAD

INTERNATIONAL CONFERENCE & WORKSHOP

"DENGUE INFECTION IN PAKISTAN & ITS CONTROLLING STRATEGIES"

CONFERENCE:- 17-12-2019, WORKSHOP:- 18-12-2019

Abstract Book



PROGRAM

Day 1, Tuesday, December 17, 2019

INAUGURATION CEREMONY

Venue: Geo Auditorium Department of Earth Sciences, Quaid-i-Azam University Islamabad, Pakistan

08:30 am	Registration & Networking
09:25 am	Guests and Participants to be seated
9:30 am	Arrival of the Chief Guest
9:35 am	Recitation from the Holy Quran by Sobia Bashir
09:40 am	National Anthem
09:50 am	Introduction by Dr. Naveeda Akhtar Qureshi Associate Professor Department of Animal Sciences, QAU
10: 00am	Welcome Address by Prof Dr. Muhammad Ali Shah Vice Chancellor Quaid-i-Azam University
10:10 am	Address by Dr. Arshad Taqi President Pakistan Medical Commission
10:20 am	Plenary Lecture by Prof. Dr. Amy Morison University of California, USA Feasibility of feeding *Aedes aegypti* mosquitoes on dengue virus-infected human volunteers for vector competence studies in Iquitos, Peru.
11:00 am	TEA BREAK

Introduction: Dengue fever, a viral disease transmitting with the bite of infected mosquito *Aedes* spp leads to severe health problems in the developing world, especially Asia and Africa with billions of morbidities in three different forms of dengue fever, it is also reported that over 50 million cases are occurring every year, the frequency is found higher in pregnant ladies and under five years children. In Pakistan it is the major growing dilemma. Considering the current epidemic scenario of dengue infection, it seems that controlling the infection will need some serious measures. Therefore this seminar focused upon Dengue Infection and its vector control from a number of perspectives. We will discuss the latest controlling techniques and diagnostic tools as well as the most up-to-date research and developments. The outcome of the conference would be highlighting current issues and future scenario of mitigating such lethal infection. Overall, this platform will integrate people from different disciplines including medical sciences, researcher students from all fields and industrialists typically involved in pharmaceuticals, pest and disease control. This type of collaboration among the researchers, industrialists and laymen will be helpful in preventing an outbreak of dengue infection in future. Moreover, this conference will provide an opportunity to collaborate with relevant industry involved in disease control and its management.

Background: In Pakistan from last two decades dengue is one of the emerging public health concerns, leaving millions of human lives at risk. The first noxious dengue outbreak in the country was recorded in 2011 Lahore (eastern part Pakistan) with 21685 cases of dengue and 350 deaths. One year after the Lahore, Punjab dengue outbreaks, another massive outbreak was recorded in Swat (northern part of Pakistan) with 6000 confirmed dengue cases and 48 deaths. .In October 2014, 48910 cases of dengue with 566 deaths were recorded. Unprecedentedly, in 2017 another massive dengue outbreak was recorded in the Provincial headquarter Peshawar with 23541 cases of dengue and 108 deaths. According to World Health Organization (WHO) on November 19, 2019, a total of 47,120 confirmed dengue cases, including 75 related fatalities, have been reported.

Interpretation: It is concluded from the current scenario that dengue virus has prevailed in Pakistan. As a result of this event multiple vector controlling techniques should be approached including CRISPER-Cas9 genetic control, Sterile Insect Technique (SIT), *Wolbachia spp.* infected *Aedes sp.* .mosquito etc. The control of dengue vector mosquito (*Aedes.spp*)and elimination of its breeding sites should be emphasized and prioritized which will reduce the risk of Dengue Virus transmission in Pakistan.

This event will cover multiple vector controlling techniques including CRISPER-Cas9 genetic control, Sterile Insect Technique (SIT), *Wolbachia* infected *Aedes spp* mosquito etc. The control of dengue vector mosquito *(Aedes spp.*)and elimination of its breeding sites should be emphasized and prioritized which will reduce the risk of Dengue Virus transmission in Pakistan

Salient Features for Control of DF/DHF Vectors

- Selective integrated mosquito control with community and intersectoral participation.
- Active disease surveillance based on strong health information systems.

- Emergency preparedness.
- Capacity-building and training.
- Intensive research on vector control.

Aims and Objectives

- To talk about the past, present and future perspectives of dengue infection in Pakistan.
- Diagnostic techniques currently under usage; merits and demerits
- To discuss Dengue serotypes; local and global profile
- To discuss Dengue transmission routes and rates and role of environment factors
- To provide information for Dengue control and treatment measures: vector and virus

Mode of presentations

- Poster presentations
- Talk on multimedia

Organizing Committee

Prof. Dr. Muhammad Ali Shah
Patron in Chief
Vice Chancellor
Quaid-i-Azam University

Prof. Dr. Muhammad Shahab
Co Patron in Chief
Dean Biological Sciences
Quaid-i-Azam University

Prof. Dr. Mazhar Qayyum
Dean Biological Sciences
PMAS AAU Rawalpindi

Prof. Dr. Sajid Pervaiz Malik
Chairman
Department of Animal Sciences
Quaid-i-Azam University

Dr. Naveeda Akhtar Qureshi
Chief Organizer
Associate Professor
Department of Animal Sciences
Quaid-i-Azam University

Dr. M Ishtiaq Ali
Director Academics
Associate Professor
Department of Microbiology
Quaid-i-Azam University

Dr. Amina Zuberi
Associate Professor
Department of Animal Sciences
Quaid-i-Azam University

Dr. Umar Masood Quraishi
Associate Professor
Department of Plant Sciences
Quaid-i-Azam University

Dr. Asif Jamal
Assistant Professor
Department of Microbiology,
Quaid-i-Azam University

Dr. Mazhar Iqbal Zafar
Assistant Professor
Department of Environmental Sciences Quaid-i-Azam University

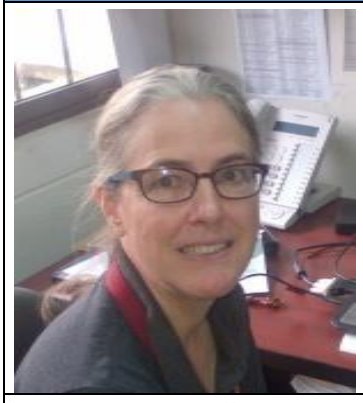
Mr. Shah Fahad Khan
PhD Scholar
Lab Parasitology & Entomology
Quaid-i-Azam University

Syed Aizaz Ali Shah
PhD Scholar
Lab Parasitology & Entomology
Quaid-i-Azam University

SPEAKERS

INAUGURATION CERMOEMONY

Day 1, Tuesday, December 17, 2019



Prof. Dr. Amy Morison
Department of Entomology
University of California, USA
Research Interests :

- Vector-borne disease epidemiology
- Vector-borne-Disease ecology
- Vector transmission dynamics

Prof. Dr. Gul Zaman
Vice Chancellor
University of Malakand
Research Interests :

- Mathematical Biology
- Fluid Mechanics
- Population dynamics
- Mathematical epidemiology and infectious diseases
- ecological modelin

Prof. Dr. Nusrat Jahan
Department of Zoology
GC University, Lahore
Research Interests :

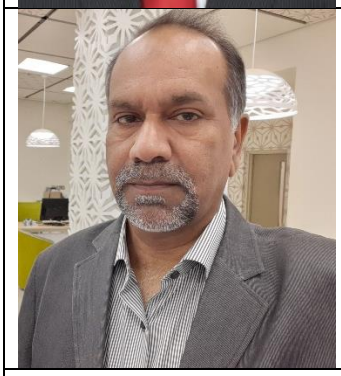
- Molecular Entomology/ Parasitology
- Insulin related Peptides in Mosquitoes
- Differentiation of closely related species of mosquitoes
- Vector-parasite interaction
- Gene expression for apoptosis
- Biological control of mosquitoes in Pakistan

Dr. Wasim Akram
Professor of Entomology/ Focal Person Dengue control Punjab Government
University of Agriculture
Faisalabad, Pakistan
Research interests:

- Urban Entomology with special focus on vector borne diseases and their Management

Prof. Dr. Mazhar Qayyum
Dean, Faculty of Sciences, PMAS-Arid Agriculture University, Rawalpindi, Pakistan
Research Interest :

- Parasitology/Epidemiology
- Microbiology
- Pathobiology



Prof. Dr. Muhammad Zahid Qureshi
Department of Biochemistry,
Qassim University, KSA
Research Interest :

- Biochemistry
- Bio-nanotechnology
- Bioremediation
- Fermentation

Dr. Muhammad Kashif Zahoor
Department of Zoology
GC University Faisalabad
Research Interest :

- Animal genetics
- Molecular Biology
- Entomology

Prof. Dr. Farkhanda Manzoor
Department of Zoology
Lahore College for Women University
Research Interest :-

- Entomology
- Termite control
- Epidemiology and biodiversity

Dr. Shahbaz Ahmad
Department of Entomology
Institute of Agricultural Sciences (IAGS)
Quaid-e-Azam Campus
University of the Punjab
Lahore-54590, Pakistan
Research interest:-

- Integrated pest management (IPM) and ecology
- Pest biology and ecology in vegetable and field crops
- Application of nonchemical alternatives

Prof.Dr. Muhammad Fiaz Qamar
Department of Pathobiology
CVAS Jhang
Research interest:-

- Pathobiology
- Parasitology
- Herbal Pest control

Dr. Saleem Akhtar
Bee keeping &Hil Fruit Pests Research Station
Research interest:-

- Plant Biotechnology and Insect Molecular Biology.
- Insect pest management and DNA barcoding.

Dr. Shahzad Tahir
Senior Medical Officer
District Health Authority, Rawalpindi
Research interest:-

- Dengue fever diagnostic and management

Dr. Shahid Majeed
University of Agriculture Faisalabad
Research interest:-

- Entomology and Biology

Dr. Naveeda Akhtar Qureshi (Volunteers)
Department of Animal Sciences
Quaid-i-Azam University, Islamabad
Research interest:-

- Parasitology/ Entomology
- Epidemiology
- Vector-Borne-diseases

Dr. Uzma Mehreen (Volunteers)
Department of Pathobiology
CVAS, Jhang
Research interest:-

- Herbal Remedies
- Arboviral infection
- *Aedes* mosquito
- Dengue viruses

Mr. Muhammad Arfan Zaman(Volunteers)
Department of Pathobiology
CVAS,Jhang
Research interest:-

- Pathobiology
- Parasitology

Dr. Saleh S. Alhewairini
Department of Plant Production and Protection,
College of Agriculture and Veterinary Medicine,
Qassim University, KSA
Research interest:-

- Plant protection,
- Integrated pest management and biological control

Mr. Muhammad K Rafique (Volunteers)
Department of Pathobiology
CVAS Jhang
Research interest:-

- Pathobiology
- Parasitology

Miss Warda Qamer (Volunteers)
Department of Pathobiology, College of Veterinary and Animal Sciences, Jhang
Research interest:-

- Parasitology

Technical Session-I			
S.No	**Chair: Professor Dr. Amy Morison** **Co-chair: Prof. Dr. Mazhar Qayyum** **Moderator- Dr. Umar Masood Quraishi**		11:25am
1	**Prof. Dr. Gul Zaman** Vice Chancellor University of Malakand	**Modeling the Transmission Dynamics of Dengue Fever with Control Strategies**	11:45am
2	**Prof. Dr. Nusrat Jahan** Department of Zoology GC University, Lahore	**Effect of Locally Isolated *Wolbachia* wAlbB Induced in *Aedes aegypti*to Suppress Dengue Transmission in Pakistan**	12:05 pm
3	**Dr. WasimAkram** Professor of Entomology, University of Agriculture, Faisalabad, Pakistan	**Dengue an ever expanding threat and factor associated with its spread: Where do we stand?**	12:25 pm
4	**Prof. Dr. Muhammad Zahid Qureshi** Department of Biochemistry, Qassim University, KSA	**Nanomaterials – Prospective Insecticides.**	12:45 pm
5	**Dr. Muhammad Kashif Zahoor** Department of Zoology GC University Faisalabad	**CRISPER Cas 9 System "A Strategy for Genetic Control of Dengue Vector (*Aedes aegypti*)"**	01:05 pm
Technical Session-II			
	Chair: Prof. Dr. Nusrat Jahan **Co-chair Dr. Muhammad Kashif Zahoor** **Moderator- Dr. Sabika**		
7	**Prof. Dr. Farkhanda Manzoor** Department of Zoology Lahore College for Women University	**Epidemic Scenario of Dengue Infection in Pakistan**	01:25 pm
8	**Dr. Shahbaz Ahmad** Department of Entomology Punjab University	**Biology and Management of Dengue Mosquito (*Aedes aegypti*)**	01.45 pm
9	**Prof.Dr. Muhammad Fiaz Qamar** Department of Pathobiology CVAS Jhang	**Papaya Leaves Extract to Treat Dengue- A Novel Therapeutic Option**	01:05 pm
10	**Dr. Saleem Akhtar** Bee keeping &Hill Fruit Pests Research Station	**Dengue infection occurrence, spread, current and future management perspectives in district Rawalpindi**	01:25 pm

	LUNCH & PRAYER BREAK	01:25---------02:25 pm	
	Technical Session-III		
	Chair: Prof. Dr. Muhammad Zahid Qureshi **Co-chair: Prof. Dr. Farkhanda Manzoor** **Moderator-Dr.Kiran Afshan**		
11	**Dr. Shahzad Tahir** Senior Medical Officer District Health Authority, Rawalpindi	**Dengue Fever diagnosis and Management**	02.25 pm
12	**Dr. Shahid Majeed** University of Agriculture Faisalabad	**Influence of Blood meal on the survival of *Aedes aegypti***	02:45 pm
13	**Prof. Dr. Mazhar Qayyum** Dean Biosciences PMAS-AAU, Rawalpindi	**Epidemiological Concepts: An Understanding of Dengue Viral Infection and Control Strategies.**	3-00 pm
14	**Dr. Naveeda Akhtar Qureshi (Volunteers)** Department of Animal Sciences Quaid-i-Azam University, Islamabad	**Plants as an potential source of insecticides and Stratification Effect**	03:15 pm
15	**Dr. Uzma Mehreen (Volunteers)** Department of Pathobiology CVAS,Jhang	**Anti-Dengue medicinal plants-A review**	03:30 pm
16	**Mr. Muhammad Arfan Zaman (Volunteers)** Department of Pathobiology CVAS,Jhang	**Epidemiology of Dengue in Pakistan-Emerging Prevention Strategies**	03:40 pm
17	**Dr. Saleh S. Alhewairini** Department of Plant Production and Protection, College of Agriculture and Veterinary Medicine, Qassim University, KSA	**Dengue Transmission Roots & Rate And Role of Environmental Factors**	03:50 pm
18	**Mr. Muhammad K. Rafique (Volunteers)** Department of Pathobiology CVAS Jhang	***Wolbachia* sp. infected mosquitoes as novel strategic approach for biological control of dengue infection**	04-00 pm
19	**Miss.Warda Qamer**		04:10 pm

	(Volunteers) Department of Pathobiology, College of Veterinary and Animal Sciences, Jhang		
	Visit to Poster Exhibition 10.0am- 4-0pm		
	Announcement of Result **Poster Exhibition 10:00am to 05:00pm** **Last date for poster Registration:13-12-2019**	**Judges** ➢ **Dr. Kiran Afshan Department of Animal Sciences, QAU** ➢ **Prof. Dr. Muhammad Faiz Qamer Department of Pathobiology, CVAS** ➢ **Dr. Mazhar Iqbal Zafar Department of Environmental Sciences, QAU**	
	CLOSING CEREMONY		04.00
	Concluding Remarks	Vice Chancellor QAU, Prof.Dr.Muhammad Ali	04-10
	Distribution of Shields	Vice Chancellor QAU, Prof. Dr.Muhammad Ali	04.20 pm
	Distribution of Certificates	DFBS, QAU, Prof. Dr. Muhammad Shahab	
	TEA BREAK		5-30
	Venue	**Geo Auditorium, Department of Earth Sciences, QAU**	

PROGRAM

Day 2, Wednesday, December 18, 2019

Workshop 18-12- 2019

Venue: Parasitology Laboratories, Department of Animal Sciences, Quaid-i-Azam University Islamabad, Pakistan

- **Problem Statement**

Dengue virus is a constant threat to human life

- **Aim**

Joining hands to narrow down circle around dengue virus/mosquito.

- **Objectives**

Application of synthesized metal/ metal oxide nanoparticles as insecticide.
Identification of Dengue vector and safety measures

- **Goal**

Development of strategy for the eradication of Mosquito that spreads dengue virus in humans.

Introduction

The dengue virus is spread through a mosquito, *Aedes aegypti* that acts as a primary vector in the transmission of dengue virus from one infected person to the other. These mosquitoes live near humans in tropical and subtropical regions of the world. Almost 40% population of the world is at a risk of dengue infection. Traditionally, mosquitos are controlled by using insecticides in the form of sprays, fumes, etc. but all are hazardous to environment and risk to human health. Further their repeated use develops tolerance and resistance in mosquitoes. Nanotechnology has revolutionized all fields of science including physics, chemistry, biology, engineering, medicine, etc. Recently, Nano materials have been introduced successfully as a better substitute of pesticides. This workshop is an effort in the direction of capacity building through training of postgraduate students in field of Nanotechnology. It includes training sessions including handling, synthesis and application of nanoparticles.

Historical insecticides as Nanomaterial

The promising role of nanotechnology (nanoparticles) in insect pest control have been well studied by several researchers, notably Wakeil & Alkahtani, 2017 discussed the role of biological Nano- particles in IPM to control various insects pests of agricultural importance like *Spodoptera litura* (Cutworm), *S. littoralis*, *Helicover paarmigera*, *Bemisia tabaci*, *Aphis gosspii* etc; Orlando *et al*., 2017 studied the effects of citrus peel oil nano formulations on the *Tuta absulata*. . Elizabeth *et al.* 2018, Tsuji, 2001; Ghormade *et al*., 2011 provided the information on the role of nanoparticles as carrier with different chemical insecticides as well as botanicals. These nanoparticles were obtained from metal source like silver, copper, zinc oxide and titanium dioxide as well as biological nanoparticles like chitosan and silica to control most popular target pests like *S. litura*, *Helicover paarmigera* (cotton bollworm), *Tetranychus urticae*, *Aphis nerii*, *Bactcer adorsalis*, *Achaea janata*, *Acheta domesticus*, *Lygus hesperu* sand some other species of aphids and termites (Kitherian, 2017; Rouhani, *et al*., 2012); Pavitra*et al*., 2018 got promising results through silica nanoparticles against cotton aphid (*Aphis gossypii*) and mealy bug (*Phenococcus solenopsis*). Tunçsoy, 2018 discussed the toxicity of various metal nanoparticles on insects by disrupting biological pathways, membrane permeability, DNA damage, neurotoxicity and oxidative

stress. These findings indicate that the metal/ metal oxide nanoparticles may find potential as pesticide, specifically against dengue mosquito and its parasites.

Schedule for workshop 18-12- 2019

	Lab 1	Lab 2		Lab 3	
Trainer	**Dr.Zahid Qureshi** Qassim University, KSA	**Dr.Naveeda Akhtar Qureshi** Quaid-i-Azam University, Islamabad		**Mr. Muzamil Shah** Mardan Medical Complex, KPK	
Assistant	**Mr. Akif GCUL**	**Mr. Shah Fahad Khan QAU**		**Miss. Bushra Latif NIH**	
Activity	**Nano technology**	**Diagnosis of Dengue vector**		**Laboratory investigations**	
Group 1	**09:30 - 11:30 am**	**Group 3**	**09:30 - 11:30 am**	**Group 2**	
Introduction	09:30 - 10:00	Introduction	09:30 - 10:00	Introduction	09:30 - 10:00
Practical	10:00 - 11:00	Practical	10:00 - 11:00	Practical	10:00 - 11:00
Discussion	11:00 - 11:30	Discussion	11:00 - 11:30	Discussion	11:00 - 11:30
TEA BREAK11:30 - 12:00					
Group 2	**12:00 - 02:00 pm**	**Group 1**	**12:00 - 02:00 pm**	**Group 3**	
Introduction	12:00 - 12:30	Introduction	12:00 - 12:30	Introduction	12:00 - 12:30
Practical	12:30 - 01:30	Practical	12:30 - 01:30	Practical	12:30 - 01:30
Discussion	01:30 - 02:00	Discussion	01:30 - 02:00	Discussion	01:30 - 02:00
LUNCH BREAK02:00 - 03:00 pm					
Group 3	**03:00 - 05:00**	**Group 2**	**03:00 - 05:00**	**Group 1**	
Introduction	03:00 - 03:30	Introduction	03:00 - 03:30	Introduction	03:00 - 03:30
Practical	03:30 - 04:30	Practical	03:30 - 04:30	Practical	03:30 - 04:30
Discussion	04:30 - 05:00	Discussion	04:30 - 05:00	Discussion	04:30 - 05:00

For further information please contact:

Dr.Naveeda Akhtar Qureshi **nqureshi@qau.edu.pk** **+92-331-5898409**
Mr. Shah Fahad Khan **shahfahad707@gmail.com** **+ 92-302-5270707**
Mr. Syed Aizaz Ali Shah **zzoologist@gmail.com** **+92-333-4132812**

Contents

Plenary Lecture

Feasibility of feeding *Aedes aegypti* mosquitoes on dengue virus-infected human Volunteers for vector competence studies in Iquitos, Peru

Amy Morrison

University of California USA

Comprehensive, longitudinal field studies that monitor both disease and vector populations for dengue viruses have been carried out since 1999 in the Amazonian city of Iquitos, Peru. In addition, to five large scale vector control intervention trials, ongoing data collection has allowed the evaluation of Ministry of Health emergency vector control using indoor ULV space sprays with pyrethroids in concert with larviciding through multiple campaigns, as well as characterize local DENV transmission dynamics through two and one novel DENV serotype and strain invasions into the city. Our research group has also been conducting contact cluster investigations on DENV infected and febrile control individuals since 2008. These studies demonstrated that attack rates were consistent between houses where cases were first detected and recently visited contact houses independent of distance between these locations. Furthermore, contact cluster investigations allow us to identify viremic individuals across the spectrum of disease outcomes including in apparent infections. Using DENV positive individuals captured through these and other febrile surveillance protocols, we exposed laboratory reared (F_2) *Ae. aegypti* mosquitoes directly on their arms or legs, and obtained blood samples with and without EDTAfor exposure of mosquitoes in an artificial membrane feeder. After a pilot study comparing feeding methods and focus groups assessing acceptability of mosquito feeds, we initiated a direct feeding protocol exposing participants (151 feeds in 106 participants).A total of 58 pilot study participants, with viremias ranging from 1.3×10^2 to 2.9×10^6 focus-forming units per mL of serum, participated in one or more feeding methods. DENV infection and dissemination rates were not significantly different following direct and indirect-EDTA feeding; however, they were significantly lower for mosquitoes that fed indirectly on blood with no additive. Relative to direct feeding, infection rates showed greater variation following indirect-EDTA than indirect-no additive feeding. Dissemination rates were correlated across all feeding methods. No differences were detected in DENV infection or dissemination rates in mosquitoes fed directly on participants with different dengue illness severity. We have evaluated insecticide treated curtains and a novel lethal ovitrap (Attractive Lethal OviTrap =

ALOT) for dengue control. Only the ALOT traps showed a significant impact on dengue incidence corresponding to a modest decrease in vector densities and a shift of the mosquito population age structure in the trap area to younger mosquitoes. Recent evaluations of indoor ULV interventions with pyrethroids suggest that ULV campaigns that reduce *Ae. Aegypti* for at least 3 weeks through multiple fumigation cycles can mitigate DENV transmission during the same season. We argue that *Aedes aegypti* control should focus on interrupting transmission rather than long term suppression at operationally unachievable levels and that emergency control applied in at area-wide scales rather than reacting to individual DENV cases.

Abstract: 1

TITLE: MODELING THE TRANSMISSION DYNAMICS OF DENGUE FEVER WITH CONTROL STRATEGIES

Prof. Dr. Gul Zaman

Vice Chancellor, University of Malakand. Pakistan

Email:talash74@yahoo.com

Abstract: We propose an epidemic model for the dynamics of dengue fever transmission. The threshold quantity i.e., the basic reproductive number will be calculated to discuss the local as well as global dynamics of the proposed model. By using the stability theory, we will find out stability condition. Moreover, we will also discuss the sensitivity analysis of the basic reproductive number to find out the most sensitive parameters. We will also develop a control mechanismto optimize dengue epidemic on the basis of sensitivity analysis. Finally to support our analytical findings, we present a large scale numerical simulations. From this analysis, we investigate the effect of those parameters, which are the key for the spreading of vector related disease and its control.

Keywords: Transmission, Dengue, Control, Strategies

Abstract: 2

TITLE: EFFECT OF LOCALLY ISOLATED WOLBACHIAW ALBB INDUCED IN *AEDES AEGYPTI* TO SUPPRESS DENGUE TRANSMISSION IN PAKISTAN

NusratJahan[1] and Muhammad SajjadSarwar[2]

[1]Department of Zoology, GC University, Lahore, Pakistan,

[2] Department of Zoology, University of Okara, Pakistan

Email:dr.nusratjahan@gcu.edu.pk

Abstract: *Wolbachia sp.* is an intracellular endosymbiotic bacterium which occurs naturally in many invertebrates with a broad range of insect species. In recent decade *Wolbachia* has got muchimportance due to its potential of altering host reproductive processes and to suppress indirectlyvector borne human diseases such as dengue, Zika etc. One of the most common phenotypic effectsof *Wolbachia* on its host population is through cytoplasmic incompatibility (CI) which occurs when non-infected females mate with infected males resulting no offspring. In addition *Wolbachia* inhibit pathogenreplication and cause shortening of the life span in mosquito vectors. Dengue is becoming anepidemic in Pakistan with over 400 deaths since 2006. Dengue situation in Pakistan is alarming withtremendous risk of epidemics in future. Lack of effective vaccine and antiviral drugs make it urgentto find the novel alternate approaches for dengue control in Pakistan. The current study involvesdetection and molecular characterization of local strain of Wolbachia from *Ae. albopictus* using PCR by targeting the wsp, 16S rRNA and ftsZ genes. The *Wolbachiaw AlbB* isolated from wild collected *Ae. albopictus* was successfully induced in dengue vector *Ae. aegypti*via embryonicmicroinjection. *Wolbachia* presented strong CI effect with no egg hatching in crosses between*Wolbachia* infected males and wild uninfected

females. In addition *Wolbachia* infected femalesreduced life span significantly as compared to wild females. Reduction of the life span and 100%CI effect with complete suppression of dengue vector population are promising features of this*Wolbachia* strain to be used as biological control agent and block dengue transmission inPakistan.

Keywords: *Aedes Aegypti,* Transmission**,** vector, mosquito, Pakistan

Abstract: 3

TITLE: DENGUE AN EVER EXPANDING THREAT AND FACTOR ASSOCIATED WITH ITS SPREAD: WHERE DO WE STAND?

Prof. Dr. Waseem Akram
University of Agriculture, Faisalabad, Pakistan
Email:areeba14@yahoo.com

Abstract: Mosquitoes and mosquito borne diseases pose a serious threat to human population throughout the globe. Pakistan in particular Punjab has over the years since 2011 faced outbreaks of dengue that have resulted in exponential increase in the number of cases with well managed mortality. The combined efforts and development of SOP's together with international experiences helped to manage the disease at 22000 cases out of the total suspected 0.6million and deaths to around 375 in 2011. The hard hit areas included Lahore, Rawalpindi and Faisalabad where circulation of serotypes DEN1, 2, 3 and 4 along with some concurrent infections were reported. Even to this day the disease has been a major health concern of co-morbidity and mortality not only in Punjab but also in other provinces of Pakistan. In 2019 the disease has again appeared as a major vector borne issue in Rawalpindi with more cases of DHF and DSS. Islamabad had huge number of cases ever reported before. Moreover Sindh and KPK have raised alarms beside Baluchistan which has also documented its cases. Various tools, interventions and strategies were designed immediately during the 2011 outbreak and these have been polished during the years to minimize the overall disease burden, cost on the program and involvement of the people for a collaborative program that ultimately brings long term prospects in managing the disease.Dengue in Punjab spreads from end February to mid May and then in June (monsoon) to end November with major population of the *Aedes aegypti* and *Ae. albopictus* breeding in the indoor premises in containers that are used for storage of water and in open pools formed from rain water, solid waste deposits, uncovered junk yards, basements and grave yards in the outdoors.Our dengue control program includes a revised version of IVM strategies that depends on inter-departmental linkages, mass public awareness administered through indoor and outdoor surveillance teams followed by case response in 24 hours time. Furthermore the entire dengue control program is bridged up through a technological sound dengue portal android system that counts *each and every breeding spot, patient, hospital, indoor and outdoor surveillance data and the case response done against each of the confirmed case during the low disease season and suspected to confirmed patients during the high disease times so as to minimize the infection chances.* The entire data is uploaded on the dengue tracking dash board for analysis and monitoring at all forums. The dengue operation is catalyzed by induction of extra human resource for third party validation. Thus the success in the dengue control program reflects a commitment based strategy that is geared up by a strong political monitoring system, bureaucratic bridging and the technocratic involvement in Punjab that has ultimately brought the

disease toll to low levels. We see dengue control and prevention as one of the major concerns in Pakistan during the current outbreak in 2019 with the disease expanding its geographical boundaries to 36 district of Punjab with 28 districts having cases in double figure besides its spread in Sind, KPK and Baluchistan. Therefore there is strong need to develop a comprehensive plan at the national as well as at the international level to link the scientist through their research out puts and tested strategies so as to check the spread of the disease and identify the factors playing a major role in disease outbreak.

Keywords: Dengue, *Aedes* mosquitoes, IVM strategy, serotypes

Abstract: 4

TITLE: NANOMATERIALS – PROSPECTIVE INSECTICIDES

Muhammad Zahid Qureshi and Saleh S Alhewairini

Qassim University, Saudi Arabia

Email:dr.zahidqureshi@gcu.edu.pk

Abstract: Field of nanotechnology is growing rapidly for the last two decades. It has revolutionizedall fields of science including physics, chemistry, biology, agriculture, engineering,medicine, and many others. I shall not be wrong if I say, “nanotechnology is a science ofevery science”. Nanomaterials have unique characteristics due to their extremely smallsize. Successful use of some metal nanoparticles as antibacterial agents has openedavenues for their promising role in pest control management systems. In Pakistan, likemany other Asian countries, control over dengue virus has become a challenge. It isspread by a mosquito Aedes aegypti that acts as a primary vector in the transmission ofdengue virus from one infected person to the other. These mosquitoes live nearhumans in tropical and subtropical regions of the world. Almost 40% population of theworld is at a risk of dengue infection. Traditionally, mosquitos are controlled by usinginsecticides in the form of sprays, fumes, etc. but all are hazardous to environment andare risk to human health. Further their repeated use develops tolerance and resistancein mosquitos. Metal nanoparticles are effective at very minute concentration, action isquick and their mode of action don’t allow organisms to develop resistance afterrepeated exposure. Metal nanoparticles are recommended for their use as insecticidesto control mosquitoes like some other mites and insects.

Keywords: Nanomaterials, Insecticides, Nanotechnology, Transmission,

Abstract: 5

TITLE:CRISPR-CAS9 SYSTEM: A STRATEGY FOR THE GENETIC CONTROL OF DENGUE VECTOR, *AEDES AEGYPTI*

Muhammad Kashif Zahoor*, Aftab Ahmad[1], Humara Naz Majeed[2], Muhammad Zulhussnain and Kanwal Rania

**Department of Zoology, Government College University Faisalabad, Pakistan*
[1]Centre of Department of Biochemistry/US-Pakistan Center for Advance Studies in Agriculture and Food Security (USPCAS-AFS), University of Agriculture Faisalabad, Pakistan
[2]Department of Biochemistry, Government College Women University, Faisalabad, Pakistan

Email:kashif.zahoor@gcuf.edu.pk*

Abstract: *Aedesaegypti*is considered as major threat due to its vector role for transmitting destructive dengue virus (DENv). Various control measures have been devised to date but the disease has not been still properly managed. Efforts to eliminate through insecticide result in mosquito resistance and environmental as well as human respiratory concerns. In addition, due to the prevalence of multiple serotypes, plus a single*Aedes*mosquito harbors more than one serotype makes the dengue disease more serious issue. Therefore,*Aedesaegypti*needs to genetically modify to suppress its number using an approach, Clustered Regularly Interspaced Short Palindromic Repeats/CRISPR-associated sequence 9 (CRISPR/Cas9) via genome editing. The male-determining factor M factor is located on Y-chromosome and is being focused recently to produce genetically modified*Aedes aegypti*males. The production of only males would permit *Aedes aegpti*, to feed only on nectar rather to feed on human blood by females under normal conditions. The research project will be thus, conducted to focus on genetic modification of *Ae. aegypti* targeting single and multiplex gene editing involved in sex differentiation pathway such as *Sxl*, *Tra*, *dsx*, *fru* and their physically linked partners through using CRISPR/Cas-9 system first time in Pakistan. Plasmid phsp70-Cas9 containing the coding sequence (CDS) of Cas9 will be obtained from Addgene. The candidate genes (*AeSxl*, *AeTra*, *Aedsx*, *Aefru*) targeting, guide sequences containing cDNAs will be inserted in the plasmids and the plasmid will be mixed to microinject the embryos. The genetically edited males will be allowed to mate with normal females (G_0), and then next generation will be monitored for maleness in females (G_1). This work will not only offer a detailed exploration into the use of CRISPR-Cas9 in *Aedes aegpti*, but will also provide a foundation for the control through converting the female mosquitoes into harmless males.

Keywords: CRISPR-CAS9, Genome editing, *Aedes aegpti*, M-factor, sex-determination-pathway

Abstract: 6

EPIDEMIOLOGICAL ASPECTS OF DENGUE VIRUS INFECTION; A PROSPECTIVE STUDY OF PATIENTS AT HEALTH CARE CENTERS IN PAKISTAN

Naveeda Akhtar Qureshi[1*], Irfan Hussain[1], Muhammad Afzal[1], Amy C. Morrison[2]

[1]Department of Animal Science, Faculty of Biological Science, Quaid-i-Azam University 45320 Islamabad, Pakistan

[2]Departments of Entomology, University of California, Davis One Shields Ave., Davis, CA 95616

[1]Department of Animal ScienceParasitology Lab, Department of Animal Science, Faculty of Biological Science, Quaid-i-Azam University 45320 Islamabad, Pakistan

Email: naveedaqresh@gmail.com*

Abstract: Dengue is most widespread and clinically important systemic arboviral infection of human transmitted through *Aedes* mosquitoes. The current global distribution of the risk of DENV infection and its public health burden poorly recognized. In view of the key role dengue surveillance plays in the dissemination of the viruses, it is evident that alone passive surveillance will not reveal necessary facts required for the prediction of an outbreak in a given setting and the suggestion for an active surveillance system has been encouraged by the WHO. Therefore, we aimed to undertake situation analysis with respect to virological, epidemiological and serological of dengue/DHF in study areas for confirmation of etiology of the infection and the identification of the infective virus serotypes and their corresponding genotypes. A total of 914 DENV infected blood samples were collected from patients at health care centers in different geographic regions of Pakistan along with the brief questionnaire regarding the patient gender, residence, clinical manifestation and travel history. The Punjab indicated highest prevalence 417 (58%) followed by Khyber Pakhtoonkhwa and Sindh with overall 204 (29%) and 69 (10%) of the total sero-positive cases. While the number of DENV positive samples are least in Baluchistan 21(3%). The seasonal determination survey demonstrated that the post monsoon was most period (n=426, 60%), followed by the monsoon period (n=259, 36.42%) confirmed serologically positive. Our study revealed that all the serotypes of dengue were dominant in positive sample of dengue virus infection collected during the period of Jan 2014. Genotypes of serotypes DEN2, DEN3 and DEN4 were subtype cosmopolitan, Asian II and subtype III, respectively.

Keywords: Dengue, DEN4, virological

Abstract: 7

EPIDEMIC SCENARIO OF DENGUE INFECTION IN PAKISTAN

Prof. Dr. Farkhanda Manzoor
Department of Zoology
Lahore College for Women University
Email: doc_farkhanda@yahoo.com

Abstract: Dengue fever is mosquito borne disease widespread throughout the world, as there is no safe affordable and effective vaccine available. For the purpose to control the vector-borne diseases vector control is effective method. However, Dengue Fever (DF) is less widespread in the temperate than in tropic countries. The life cycle of pathogens will be delayed by the cold weather in temperate climate. Shorter life span mosquitoes usually die before pathogens become infective. Climate is mostly favorable for the breeding of mosquitoes in Pakistan. *Aedes aegypti* (Linnaeus)and *Aedes albopictus*(Skuse)are the important vectors of dengue feverin tropical and subtropical regions of the world. Major diseases like dengue fever, Dengue Hemorrhagic Fever (DHF) are spread by *Ae. aegypti* which is vector of arboviruses. Neurotoxic insecticides are either neuro inhibitory or neuro excitatory. The behavioral effects of neuro excitation on organism are tremors, hyperactivity and rigid paralysis but in the case of neuro inhibition immobility and flaccid paralysis occur. The mortality is caused due energy depletion and neuromuscular fatigue. In Pakistan major strategy to prevent and control vector borne diseases like dengue fever and malaria etc. is use of insecticides during dengue outbreak in 2011 insecticides used were reportedly not effective. Although some previous studies indicated that there is high level of resistance to some commonly used insecticides but the level of resistance was not studied for *Aedes*population at Lahore. According to WHO standards and control program, there is continuous need to monitor insecticide resistance.So keeping this in view and to improve the control program against *Aedes aegypti* present study was conducted to determine the efficacy of different groups of insecticides against laboratory and field strains of larvae and adults.

Keywords: Dengue, Epidemic, Infection, Malaria, Pakistan

Abstract: 8

TITLE: BIOLOGY AND MANAGEMENT OF DENGUE VECTOR (MOSQUITO)

Shahbaz Ahmad,

Institute of Agricultural Sciences, University of the Punjab Lahore, 545900

Email: Shahbaz.iags@pu.edu.pk

Abstract: Dengue fever, a very old disease, has reemerged in the past 20 years with an expanded geographic distribution of both the viruses and the mosquito vectors, increased epidemic activity. It is a febrile illness caused by a flavi virus transmitted by *Aedes aegypti or Aedes albopictus* mosquitoes during a blood meal. Dengue is pervasive in more than 100 countries in tropical and subtropical regions and causes an estimated 400 million infections annually worldwide. Infection with DENV provides long-term protection against disease caused by reinfection with that

particular type, supporting the feasibility of developing an effective vaccine. Aedes mosquitoes are visually distinctive because they have noticeable black and white markings on their body and legs. Unlike most other mosquitoes, they are active and bite only during the daytime. The peak biting periods are early in the morning and in the evening before dusk. The total *Aedesaegypti* life cycle lasts 8-10 days at a room temperature, depending on the level of feeding. It lives in urban habitats and breeds mostly in man-made containers. Female *Ae. aegypti* frequently feed multiple times between each egg-laying period. Once a female has laid her eggs, these eggs can remain viable for several months, and will hatch when they in contact with water.There is no any specific treatment for dengue fever. Dengue vector can be controlled by using precautionary measures and safe use of pesticides.

Keywords: Management, Dengue, Vector, Mosquito

Abstract: 9

TITLE: PAPAYA LEAVES EXTRACT TO TREAT DENGUE- A NOVEL THERAPEUTIC OPTION

Muhammad Fiaz Qamar*, Uzma Mehreen[1], Muhammad Arfan Zaman

[1]Department of Pathobiology, Section Parasitology, College of Veterinary and Animal Sciences Jhang.

Email: fiaz.qamar@uvas.edu.pk*

Abstract: Dengue is a viral disease that today influences an immense number of people in over 125 countries and is liable for a sizable number of deaths. Without a successful antiviral medication to treat the disease various treatments are being investigated. Studies have indicated that the juice of the leaves of the *Carica papaya* plant from the family Caricaceae could help to enhance the platelet levels in these patients. This study depicts some of the published studies on this topic. For the treatment of Dengue fever, the aqueous extract of *C.papaya* was prepared in water. 25 mL of this aqueous extract was administered to a patient infected with Dengue fever twice daily i.e. morning and evening for five consecutive days. Before the extract administration, the blood samples from patient were analyzed. Platelets count (PLT), White Blood Cells (WBC) and Neutrophils (NEUT) decreased from 176 × 103/μL, 8.10 × 103/μL, 84.0% to 55 × 103/μL, 3.7 × 103/μL, and 46.0%. Subsequently, the blood samples were rechecked after the administration of leaves extract. It was ascertained that the PLT count increased from 55 × 103/μL to 168 × 103/μL, WBC from 3.7 × 103/μL to 7.7 × 103/μL and NEUT from 46.0% to 78.3%. Patient feelings and blood reports showed that *Carica papaya* leaves aqueous extract exhibited potential activity against Dengue fever. Albeit a large number of studies and case reports published in literature lack adequate information, some of the studies do raise the capability that this treatment could be a significant option in the future. Further large scale studies could establish the usefulness or ineffectiveness of this natural product in the treatment of dengue & the various parts of this important species can be moreover utilized as a strong natural candidate against viral diseases.

Keywords: *Carica papaya* leaves, treatment, Dengue,

Abstract: 10

TITLE: DENGUE INFECTION OCCURRENCE, SPREAD, CURRENT AND FUTURE MANAGEMENT PERSPECTIVES IN DISTRICT RAWALPINDI

Dr*Saleem *[1] Akhtar and Faisal Hafeez[2]

[1]Honey Beekeeping and Hill Fruit Pests Research Station Rawalpindi

[2] Entomological research institute, Ayub agricultural research institute Faisalabad-Pakistan

Email:saleemakhtar.ento@gmail.com*

Abstract: Rawalpindi is situated in the northwest of the Punjab province. District administrative area is spread over seven tehsils including Taxila, Rawalpindi, Gujar Khan, Kallar Syedan, Kahuta, Kotli Sattian and Murree. Population wise, Rawalpindi is the third biggest city of the country. In the past decade, the city has expanded to an area of 528km2 with a population count of 5.406 million. The continuous expansion of the city and movement of people around the country have enhanced the level of spread of the disease. The experimental surveys and collection records have shown that there are four dengue vector mosquito species viz *Aedes aegypti, A. albopictus, A. unilineatus* and *A. W-albus* that carry two viral strains DENV-1, DENV-2, in the area. The disease has increased in severity. Not only dengue fever infection occurs more frequently the cases of dengue hemorrhagic fever DHF have reached to 7-10%. These factors have raised alarms for future diseases management. Since 2015, 11,714 confirmed cases of dengue disease have been officially recorded. Whereas the correct number of asymptomatic and tolerant patients, carrying infection in their blood may be many folds. The vertical transmission of virus in vector, vector species diversity, vector abundance, weather and geographic topology are major issues. Study revealed that disease starts from non-planned, over populated slum areas and then spreads in whole city. The indiscriminate strategic vector management, early season surveillance, may reduce the occurrence and spread of the disease

Keywords: Dengue, *Aedes*, Mosquito, Virus, DENV

Abstract: 11

TITLE: DENGUE FEVER DIAGNOSIS AND MANAGEMENT

Dr. Shahzad Tahir (Senior Medical Officer)

District Health Authority, Rawalpindi

Abstract: Dengue fever is caused by four virus strains DV1, DV2, DV3 and DV4. Itsalso called as bone breaking fever. There are around 100 million cases ofdengue fever every year. Dengue vector originated from Africa and now itoccurs in tropics and subtropics around the world. There are four types andfour types are serology observed in patients. There may be one or more viralstrains in circulation during epidemics. There is possibility that 95% patientsremain asymptomatic while only 5% infected people develop symptoms. Afriction of the symptomatic patients develops hemorrhagic fever (HF).Clinically defined as Simple dengue fever (DF), Dengue hemorrhagic fever (DHF)(plasma leak <5%) and Dengue Shock Syndrome(DSS) (plasmaleak >5%). The fever longevity may range from 2 to 10 days intervals. Thesituation may turn worse in subsequent infections even up to 2% cases organ failure leads to death of the

patient. Patient mortality chances are rated inrelation to organ failure one organ 40% chances of patient death, two organfailure 80% and three organ failure leads to more than 99% chances of patientexpiration. Clinical course may be divided into three phases Febrile Phase,Critical Phase and Recovery Phase. If the patient is not feeling well after feverrelive then it is considered alarming situation. Because it may be early sign ofpatient situation complication and they may be Low pulse pressure <20 mm, Low urine output, delayed capillary filling and Tender hepatomegaly. Whilelab reports showing Increasing hematocrit, Edema of the gall bladder, ascitesor pleural effusion, Low albumin, Low cholesterol and acute fall in plateletcount may lead to patient loss.

Abstract: 12

TITLE: INFLUENCE OF BLOOD MEAL ON THE SURVIVAL OF AEDESAEGYPTI

*Shahid Majeed *, Jamil Ijaz, Muhammad Zubair and Muhammad Sufian*
Department of Entomology, University of Agriculture, Faisalabad, Punjab, 38000, Pakistan

Email: shahid.majeed@uaf.edu.pk*

Abstract: The tropical and subtropical regions of the world are over burden by various acute mosquito-borne viral infections including dengue. It was estimated that dengue was responsible for the global economic burden of US$8.9 billion in 2013. Other than, chemical control, modern mosquitoes control approaches include *wolbachia* based techniques and sterilized insect technology (SIT), needs mass rearing of mosquitoes population for release in the field. The current study based to improve the mass production of *Aedes aegypti* by using the artificial blood feeder (ABF). In this study, we have observed the survival, fecundity and oviposition of *Ae. aegypti* on the blood of humans, cow, albino rat and chicken as well as eight blood groups of humans i.e. (A^{+ve}, A^{-ve}, B^{+ve}, B^{-ve}, AB^{+ve}, AB^{-ve} ,O^{+ve} ,O^{-ve}) in the ABF. Meanwhile, this study provided the first optimized custom based artificial blood feeder in Pakistan. The anthrophophilic behavior of *Ae. aegypti* represent by producing maximum number of eggs (454) and minimum number of eggs (195) while feeding on human and chicken blood respectively. Similarly, the gonotrophic cycle based upon protein exist in blood serum, this study depict that the level of protein is higher in human, cow and rat blood compared to chicken blood, which resulted in lower number of eggs production in *Ae. aegypti* during oviposition. Meanwhile, the developmental period of *Ae. aegypti* was completed in shorter time (264 hours) and longer time (344 hours) fed on human and crow blood respectively. In addition, *Ae. aegypti* prefer to feed on O^{+ve} and O^{-ve} blood groups compared to A^{+ve}, A^{-ve}, B^{+ve}, B^{-ve}, AB^{+ve}, AB^{-ve}. *Ae. aegypti* also lay significantly a greater number of eggs on O^{+ve} and O^{-ve} compared to other blood groups. This study provides the fitness advantage of *Aeaegypti* by selecting the better blood meal to accommodate their progeny.

Keywords: *Aedes aegypti*, Human Blood, Mosquitoes, Behavior

Abstract: 13

TITLE: EPIDEMIOLOGICAL CONCEPTS: AN UNDERSTANDING OF DENGUE VIRAL INFECTION AND CONTROL STRATEGIES.

Prof. Dr. Mazhar Qayyum

Dean Biosciences,PMAS-AAU, Rawalpindi

Email: mazhar_dr@yahoo.com

Abstract: Epidemiology of infectious disease deals with the occurrence, transmission, pathogenesis, life cycle, distribution, treatment and control of any disease within any population. It helps to trace the origin and manner of dissemination of an infectious disease epidemic. As it is vital learn about pathogen about its biology. Emerging and reemerging of infections and pathogens are foremost world trepidation. Epidemological control measures are directed toward reducing or eliminating infection sources. The control of infection is increasing attention in recent years due to the number of individuals involved, increasing cost and the length of treatment. Therefore an understanding of any viral infection is prerequisite in developing control strategies.

Keywords: Epidemiology, Infectious disease, control, Dengue

Abstract: 14

TITLE: PLANTS AS POTENTIAL SOURCE OF INSECTICIDES AND STRATIFICATION EFFECT

Naveeda Akhtar Qureshi*, Adnan Yousaf Zai and Attiya Iqbal

Department of Animal Sciences, Quaid-i-Azam University, Islamabad

Email: nqureshi@qau.edu.pk*

Abstract: *Skimmia laureola*, ethanolic extract, collected from Swat situated at different altitudes i.e1200 (SLA) and 800 (SLB) feet was subjected for its larvicidal potential and characterization by FTIR,phytochemical analysis,UV-VS and GC-MS. A bioassay was designed using concentrations 100 to 500 ppm, with a difference of 100 taking 25 larvae per container per concentration of both SLA and SLB with control. The SLA showed 89.2 and 99.4% mortality at 400 and 500 ppm respectively as compared to the percentage mortality of SLB 84.8 and 92.8%. The FTIRof SLA revealed the presence of hydroxyl, alkanes, Nitro, carbonyl, ether and Aliphatic Fluro-compounds with 19 peeks while SLB showed 16 peaks of different wavelengths for functional groups. The phytochemical screening showed the presence of phenols, tannins, flavonoids, steroids, terpenoids, glycosides; carbohydrates and saponins in SLB while SLA having all the phyto-compounds excluding saponins and carbohydrates. The UV-VS results indicates the strong peaks with maximum absorbance at 662.5 nm with absorbance of 0.27 in SLA while SLB showed a strong peak at 664.65 nm with absorbance of 0.8. The GC-MS analysis showed the presence of 15 compounds in SLA while 17 in SLB. It is concluded that *S.*

laureola have larvicidal potential against *C. quinquefasciatus* which varies with altitudes along with its chemical composition.

Keywords: Plants, Insecticides, Stratification, Phyto-compounds

Abstract: 15

TITLE: ANTI-DENGUE MEDICINAL PLANTS-A REVIEW

Uzma Mehreen*, Tahir Hussain, Zohaib Shahid, Warda Qamar, Muhammad Fiaz Qama

Department of Pathobiology, Section Parasitology, College of Veterinary and Animal Sciences Jhang.

*Email: *uzma.mehreen21@gmail.com*

Abstract: Dengue fever is a major cause of mortality and morbidity around the world belongs to the family Flaviviridae. Having four serotypes that spread by the bite of infected Aedes mosquitoes. It causes a wide spectrum of illness from mild asymptomatic illness to severe fatal dengue hemorrhagic fever/dengue shock syndrome (DHF/DSS), Dengue fever can be controlled by the number of the anti-dengue medicinal plants and home remedies used for the treatment of dengue. For example, Neem, Coriander, Tulsi, Fifteen basil leaves , Papaya juice , *Carica papaya* leaves extract, Root of the cassia tree, Chirayata, dhatura, Fenugreek leaves, Bloodwort, Devil's tree , Pomegranate juice/ black grape juice , Goat milk (believe to help in increasing platelets counts), Porridge, Ginger water, Coconut water, Vegetable juice. Carrot, Cucumber, and green leafy vegetables juice, Fruit juices such as watermelon, guava, kiwi, papaya, and other fruits rich in vitamin C, These can be easily obtained from nature and also low cost and free from any side effects. There is a need to discover all the more such herbal formulations, which are being reported appropriately, rehearsed at the local level and approve them experimentally to confirm mechanism level, adequacy, and safety.The herbal formulations being utilized by communities are the low hanging fruits which may provide alternative or adjuvant therapy if proper approval, esteem expansion, and product advancement steps are pursued. Further laboratory investigations and ethnobotanical surveys are needed to establish the potential of identified species in contributing to dengue control.

Keywords: Herbal Remedies, Arboviral infection, *Aedes* mosquito, Dengue viruses

Abstract: 16

TITLE: EPIDEMIOLOGY OF DENGUE IN PAKISTAN-EMERGING PREVENTION STRATEGIES

Muhammad Arfan Zaman*, Uzma Mehreen, Muhammad Fiaz Qamar

Department of Pathobiology, Section Parasitology, College of Veterinary and Animal Sciences Jhang.

Email:arfan.zaman@uvas.edu.pk*

Abstract: Dengue is a critical vector-borne viral human disease over the tropical and subtropical areas of the world. Right around 128 countries are known to dengue flare-up, about 100 billion dengue cases are accounted worldwide and in excess of 390 million humans with the possibility of infection yearly. Pakistan is a subtropical country and a primary hotspot for various vector-borne diseases. Four dengue serotypes are available in Pakistan and flowing the entire year with a peak outbreak between (September-November) during post-monsoon periods. In Pakistan, the dengue epidemic is a significant threat since 2005, following millions of people at risk, till 2016 almost 71649 dengue cases are accounted for with 757 deaths. There are a few factors, for example, climatic change, urbanization, socioeconomic activity, travel, miscommunication and shortage of surveillance. Worst dengue outbreak occurred in Pakistan during 2011 with 21685 dengue reported cases (350 deaths). There are a few vaccines as preventive measures and antiviral agents to fix the dengue fever, which are under clinical preliminaries yet their outcomes, have not been accounted or affirmed yet. Dengvaxia is the only licensed vaccine to anticipate dengue fever in some South American countries yet it isn't affirmed by other regulatory authorities worldwide. However, specific treatment is needed to overcome the deadly impact of dengue fever. Since this disease has influenced a large number of peoples and very little invention has been made in this field; therefore, improvement in dengue treatment is required for the safety and prosperity of dengue patients. In addition, research ought to be started to find out the reasons behind this expansion of dengue virus into before non-endemic territories for this purpose preventive and control measures might be taken, furthermore assure the collaboration between agencies involved in dengue control and researcher should share the accessible data on dengue and mosquito vector in Pakistan.

Keywords: Dengue, Epidemic, Infection, Vaccines

Abstract: 17

TITLE: DENGUE TRANSMISSION ROOTS & RATE AND ROLE OF ENVIRONMENTAL FACTORS

***Dr. Saleh S. Alhewairini** and Muhammad Zahid Qureshi**

Department of Plant Production and Protection, College of Agriculture and Veterinary Medicine, Qassim University, KSA

*E.mail: **ssalhowirini@yahoo.com

Abstract: Dengue fever, is an acute vector-borne viral disease transmitted by the mosquito *Aedes aegypti* which is highly domesticated.Some 2 to 3 billion people of the world's population

in tropical and subtropical countries are at constant threat of dengue infection. Around fifty million dengue infections occur worldwide annually, resulting in the hospitalization of 5, 00,000 people of which approximately 90% are children aged less than five years, and about 2.5% of affectees fail to survive. According to a report of World Health Organization (WHO) regions of Africa, America, Eastern Mediterranean, South-East Asia and Western Pacific., South-East Asia and Western Pacific regions are the most seriously affected regions of the world. Epidemics of dengue are increasing in frequency. During epidemics, infection rates among those who have not been previously exposed to the virus are often 40% to 50% but can also reach 80% to 90%. Seasonal variation and environmental factors are key factors in the spread of this epidemic. Initially this disease was recognized to be associated with the urban regions but now there are many reports from the rural areas. Pakistan is also one of the effected countries during the past decade but efficient vector control programs have limited the spread of this disease to some extent. There is a need for individual and community participation in the control program that needs more information as to the knowledge, attitudes and practices of the populations at risk, which suggests a role for social scientists.

Keywords: Dengue, Rate, Environment, Factors, Pakistan

Abstract: 18

WOLBACHIA INFECTED MOSQUITOS AS NOVEL STRATEGIC APPROACH FOR BIOLOGICAL CONTROL OF DENGUE FEVER

Muhammad Kamran Rafique *, Syed Ehtisham-ul-Haque, Majid Ali Nasir,MuhammadFiazQamar,

Department of Pathobiology, University of Veterinary and Animal Sciences, Lahore, Pakistan

(Jhang Campus)

Email: kamran.rafique@uvas.edu.*

Abstract: In tropical and subtropical areas of world, dengue is a serious and significant publichealth issue, where approximately 400 million infections are estimated to prevail each year.The causative agent of dengue infection is flavi virus dengue virus, which has four serotypes(DENV-1–4) transmitted to human beings by mosquitoes, especially Aedes aegypti. Theseviruses cause a systemic, enfeeble, and mostly self-limiting illness, which without carefulmanagement can lead to hypovolemic shock and subsequently deaths. There are multiplestrategies like technical approach (using mosquito nets, wearing long cloths, disposing tires,removing stagnant water pockets & Drain covering etc.) and chemical approach (larvicide's spray, fumigation and mosquito repellent) which have been adopted at mass level to combatdengue infection through its vector control. Inspite of these practical measures, in WHO diary,from July to November 2019, a total of 47,120 cases of dengue fever have been confirmed,including 75 deaths that reported from the four provinces of Pakistan (Khyber Pakhtunkhwa,Punjab, Baluchistan, and Sindh), Islamabad, and Azad Jammu &Kashmir. In the absence of alicensed vaccine or therapeutic drug, dengue preventive efforts are limited to exhort its mainmosquito vector, *Aedes aegypti*. Therefore, a novel pragmatic and biological approach has beenintroduced in world to prevent dengue infection by controlling its vector. Use of the intracellular bacterium *Wolbachia pipientis* to abstain mosquito populations was introducedabout

50 years ago, nevertheless, only in the past decade has its use as a potential agent ofdengue control attained substantial interest. In biological approach, *Wolbachia pipientis* infected *Aedes aegypti* female mosquitos are used not only to inhibit dengue virus transmissionbut also shorten the lifespan of female mosquitos. It is recommended that biologicalassociation between Wolbachia and female host mosquitos (*Aedes aegypti*) should beintroduced which are very beneficial to prevent dengue infection.

Keywords: *Wolbachia pipientis*; Dengue, *Aedes aegypti*; Biological control

Abstract: 19

TITLE: A BRIEF VIEW OF DENGUE CONTROL

Warda Qamar* , Muhammad Arfan Zaman , Muhammad Fiaz Qamar , Uzma Mehreen, Zohaib Shahid

[1] *Department of Pathobiology, College of Veterinary and Animal Sciences, Jhang, Sub-campus*

University of Veterinary and Animal Sciences, Lahore-Pakistan

Email: wardaqamar17@gmail.com*

Abstract: Dengue fever is a re-emerging public health problem with half of the worldpopulation being at risk of infection. Till now, dengue fever is believed to becaused by five different serotypes. Main mode of transmission is through vector(mosquito). Nevertheless, non-vector mode of transmission has also been reported.It involves mucocutaneous transmission, needle stick in patient care andlaboratory accident, blood transfusion, bone marrow transplant, organ transplant, intrapartum and perinatal transmission and breastfeeding. Very recent,transmission through sexual contact has been reported. It's a new hurdle in controlof Dengue virus. For effective control, all the possible routes for the transmissionof Dengue infection should be checked. Moreover, discovery of other sylvaticstrains as DENV-5 in future may further impede the Dengue Vaccine Initiative.Integrated control system is the key of sustainable dengue virus. Further,epidemiological and ecological studies are needed to detect additional sylvaticdengue strains and transmission routes. In the nutshell, developing vaccination andcreating awareness are only way to success against dengue in Pakistan as well aselsewhere in world.

Keywords: Dengue, Sexual transmission, Strains discovery, Awareness, Control