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## ***AEDES* AS A VECTOR OF DENGUE: A POSSIBLE THREAT TO OUR LIVES**

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### **ABSTRACT**

Currently there are more than 3000 mosquito species in the world grouped in 39 genera (Reinert 2000, Reinert 2001) out of which three genera, *Anopheles*, *Aedes* and *Culex*, are the primary vectors for pathogens owing to their obligate haematophagy. These serve as obligate intermediate hosts for numerous diseases that collectively represent a major cause of human mortality and morbidity worldwide. The pathogens carried by mosquitoes mainly include the malarial parasite (*Plasmodium*), filarial (*Wucheria* and *Brugia*), arboviruses (Yogesh and Patole, 2000) dengue, yellow fever, and mosquito-borne encephalitis (William *et al*, 1991).

The generally considered day time biting mosquitoes are great pests and dangerous carriers of dengue fever. The dengue virus causes severe headache, rashes, light sensitivity, aching muscles throughout the body and sometimes death. A hemorrhagic fever syndrome (more deadly) occurs when a secondary infection occurs with a different strain of dengue.



Asian Tiger *Aedes albopictus/ aegypti* are generally associated with the spread of dengue fever; biting around the ankles and knees close to the ground in the daytime, rarely at night. Any source of stagnant water such as in the automobile tires, open containers, trash cans, holes in the tree trunks, broken vases, which gather rainwater, are an excellent breeding place for the tiger mosquito. It is interesting to note that the eggs of *Aedes* can survive well in the absence of water. The study on the eco-biology of the *Aedes* mosquito has defined the survival potentials of *Aedes* on different water quality, the effect of dissolved oxygen (DO), electric conductivity (EC), and pH on breeding, behaviour and human diseases transmission. Key physical/chemical/biological characteristics of a particular habitat relevant for different species of mosquitoes have been measured to develop appropriate environmental management strategies for disease vector control in developing countries.



Synthetic chemicals and insecticides used for control of vectors are causing irreversible damage to the eco-system, as some of them are non-degradable in nature. Some repellents of synthetic origin may cause skin irritation and affect the dermis thus become unsafe for public use. Because of unpleasant smell, oily feeling to some users and potential toxicity, some prefer to use natural insect repellent products. The plant products are reported to inhibit chemically-induced molting activity in mosquito's larvae, they are also reported active as insect repellents and antifeedants and disrupt insect growth and inhibit their reproduction.

Situation in Pakistan has deteriorated over the past years; solid steps are needed to bring the hygiene conditions to our life styles. Vectors are breeding every where and so are the microorganism, the entire picture is ultimately leading to worst situation where this year dengue and in the years to come other dipterous related diseases will be there to welcome us. Keeping in

view the existing situation there is a need to make short and long term planning by including our environment as the major concerns of the future issues.

Our research team has initiated the work and we will be developing strategies to forecast the out breaks of mosquitoes and disease onset. These steps will help in better management of mosquitoes through the development of potent plant extracts.

Eggs



Adult



**Aedes tarsal claw and pulvillar pad as carrier of Yellow fever and dengue fever**

### **PROFILE OF DR. WASEEM AKRAM**

I started my career as lecturer of entomology in 1992. To-date I have produced a number of students at MSc level. My major field has been Biodiversity and Eco-biology. I worked as post Doc fellow in the Chonbuk National University, South Korea from 2002-2003. I was selected in Long Term Foreign Scientist Program on open competition basis and served in the Chonbuk National University (CBNU) Korea, supported by KOSEF from 2003 to 2006. During

my stay in Korea I produced 17 International Papers, attended 8 International conferences, symposia, and lectures, and presented papers recognized with cash prizes.

I worked in Korea on the Asian tiger *Aedes albopictus*, studied the eco-biology of this species a potential vector of dengue disease, as well as of other species of the same genera. I was also involved in the laboratory rearing and management of *Culex*, known as potential vector of human diseases. I was the in-charge of Medical Entomology courses in the CBNU Korea. I participated in a project on other mosquito species and produced PhD thesis on the potent plant extracts of *Gingko biloba* against the control of *Ochlerotatus togoi*, a rock pool breeding species also known to cause important diseases in human beings in Korea. It is also known to occur in coastal areas of Pakistan as well. In January 2006 I was honored by being elected as the Associate Editor of *Entomological Research*, published by the Blackwell Publishing Asia Pvt. Ltd.

I joined back the department in February 2006 and since then I have been working on the development of my Laboratory especially for the *Aedes* mosquitoes. I am in the approved list of HEC supervisors, and currently holding three HEC PhD students and three MSc students, who will be working on various aspects of *Aedes* mosquitoes. I have written articles both in Urdu as well as in English on the Dengue mosquitoes in Pakistan and the future planning.