A preliminary checklist of Mosquito Fauna of Lahore: Pakistan Farkhanda Manzoor¹ and Rabia Butt

A survey of mosquito fauna was carried out at Lahore city from January to September 2014. During the study, 12 different mosquito species viz., *Anopheles annularis, An. pulcherrimus, An. stephensi, An. nigerimus, Culex vagans, Cx. theileri, Cx. sitiens, Cx. quinquesfasciatus, Cx. tritaeniorhychus, Cx. pipiens, Aedes albopictus* and *Ae. aegyptii* were collected using different traps.

Study areas

1. Lawrence Garden

Habitat: Lawrence Garden has high vegetation like ponds, marshes and ditches.

2. Lahore College For Women University (LCWU)

<u>Habitat</u>: The habitat of LCWU is warm and marshy with abundant vegetation.

3. Kot lakh pat

Habitat: Kot Lakh Pat has semi open large bodies of water with some floating vegetation in open sunlight. Habitat includes large open marshes large stream pools.

4. Multan road

<u>Habitat:</u> Multan road has depressed marshy and boggy lands. It has a high vegetation.

Materials and methods

The study was conducted in different types of habitats within Lahore city. The mosquitoes were collected employing different traps and installation of traps was chosen according to their different ecological characters and to be as far as possible from one another.

Sampling methods

Traps were placed 1.5 m above the ground and were activated 30 nights per months from January to September 2014. The traps were operated between 18.00 and 06.00 hrs and they were emptied at regular intervals. Specimens were transferred to the previously prepared tubes from the traps at the end of each day and stored in the dry ice boxes. The specimens were brought to the laboratory for identification.

Results and Discussion

A total of 9343 mosquitoes comprising of 6352 females and 2991 males were collected during January to September 2014 after installing traps in different habitats. Taxonomic identification revealed 12 species of mosquitoes belonging to three genera based on Mosquito Fauna of Pakistan by Aslamkhan (1971a,b) (1972).

List of Mosquitoes occurring in Lahore

- 1. Anopheles annularis
- 2. Anopheles pulcherrimus
- 3. Anopheles stephensi
- 4. Anopheles nigerrimus
- 5. Culex vagans
- 6. Culex theileri
- 7. Culex sitiens
- 8. Culex quinquesfasciatus
- 9. Culex tritaeniorhynchus
- 10. Culex pipens
- 11. Aedes albopictus
- 12. Aedes aegyptii

Anopheles species Meigen, 1818

1. *Anopheles annulari* Van der wulp, 1884. <u>Habitat:</u> It is commonly found in still water bodies with high vegetation like ponds, swamps, rice fields marshes and ditches.

<u>Vector</u>: They are mainly zoophilic. But may bite human in the presence of cattle. It is an important malaria vector for *Plasmodium vivax* in many countries.

2. *Anopheles pulcherrimus* Theobald, 1902. <u>Habitat:</u> Larvae are found in warm, sunny, sluggish habitats with abundant submerged vegetation where adequately warm, rice fields are used. Females readily bite human and animals.

Vector: It is a secondary malaria vector.

3. Anopheles stephensi Liston, 1901.

<u>Habitat:</u> Larvae of *An. stephensi* breed in various mock containers in homes and collections of water associated with construction sites and other industrial locations. In rural areas, *An. stephensi* larvae utilize freshwater pools, stream margins and stream beds, catch basins, leaching canals, wells and domestic water-storage containers. Larvae have also been found in domestic wells, transparency water tanks, room coolers, cisterns and roof gutters, but greater numbers of larvae are typically found outdoors compared with indoors. In urban areas, *An. Stephensi* is found the whole year, but is most abundant in the summer months (between June and August), which coincides with the crest period of malaria transmission.

<u>Vector:</u> *An. stephensi* is recognized as an important vector of malaria in urban areas. There are three known types of *An. stephensi* including the classic form which is an competent vector of urban malaria, the intermediate form, which is typically found in

Department of Zoology, Lahore College for Women University, Lahore. Email: ¹doc_farkhanda@yahoo.com rural villages and periurban areas, but very little is known about its vector status, and the *An. stephensi mysorensis* form which is restricted to rural areas with poor vectorial capacity due to its highly zoophilic behavior.

4. Anopheles nigerimus Giles, 1900.

Habitat: Swamp and valley species that prefers deep, cool, semi-open large bodies of water with some developing or floating vegetation in open sunlight to temperate shade. Habitats include canals, large open marshes, large stream pools and rice fields. <u>Vector:</u> Most probably malaria and filariasis vector.

5. Culex vagans Wiedemann, 1828

<u>Habitat:</u> These are found in depressed marshy and boggy lands

6. Culex theileri Theobald, 1903.

Habitat: Adults were collected resting in vegetation and were attracted to human bait near sunset and to CDC traps set in secondary forests, and along edges of swamps and rivers. Larvae are reported from stagnant water.

<u>Vector</u>: It is the principal vector of Rift Valley fever virus.

7. Culex sitiens Wiedemann, 1828.

<u>Habitat:</u> Larvae are found in brackish, salt and fresh groundwater habitats and some artificial containers in coastal areas. Females feed mainly on birds and pigs, but will bite human.

<u>Vector</u>: Possible vector of Japanese B encephalitis. It has been found naturally infected with *Brugia malayi* filariasis.

8. Culex quinquesfasciatus Say, 1823

<u>Habitat:</u> It is typically closely associated with human habitation, particularly urban.

<u>Vector</u>: This species is a vector of avian malaria, a primary vector of *Wuchereria bancrofti* filariasis.

9. Culex tritaeniorhychus Giles, 1901.

Habitat: Larvae are found in many temporary, semipermanent and everlasting ground water habitats that are sunny and contain vegetation. Habitats include, but are not limited to, ground pools, streams, swamps, and low-salinity tidal marshes. Females are chiefly cattle and pig biters, but will feed on human in their absence. <u>Vector:</u> Primary vector of Japanese B encephalitis in the oriental region.

10. Culex pipiens

<u>Habitat</u>: The *Culex pipiens* is considered to be the most common mosquito in urban and suburban areas <u>Vector</u>: It is a vector of some diseases, such as Japanese encephalitis, meningitis, and urticaria. In the US, it can spread West Nile virus.

Aedes species Meigen, 1818.

11. Aedes aegypti Skuse, 1894.

<u>Habitat</u>: Breeds almost in artificial containers, *Ae. albopictus* is an destructive are opportunistic feeder and breeds in both natural and artificial containers, helping in its migration of suburban and rural areas while accordingly making it more hard to control than other peri domestic mosquitoes.

Aedes aegypti originates from Africa, but is now distributed globally in tropical and subtropical areas. <u>Vector:</u> Aedes aegypti has a global distribution in the tropics and subtropics where it is the main vector of both dengue and yellow fever viruses. It is at its peak in rainy season that was a long period from April to July and a short is about from August to September. Aedes aegypti and Ae. albopictus are the most important yellow fever and dengue virus vectors in most of the world. Although Ae. aegypti preferentially feeds on human.

12. Aedes albopictus: Linnaeus, 1762.

Habitat: The Asian tiger mosquito, Aedes albopictus (Skuse), was first identified in the United States in Texas in 1985. After a year, the Asian tiger mosquito was found in Florida at a tire deposit site near Jacksonville. Since that time, this species has increase quickly throughout the eastern states, including all of Florida's 67 counties. The arrival of Aedes albopictus has been linked with the cry off in the abundance and distribution of the yellow fever mosquito, Aedes aegypti (Linnaeus). _ Vector: Aedes albopictus is known to be a trained vector of more than 30 viruses. Of these 30 only a few are known to manipulate humans; they are eastern equine encephalitis (EEE), Cache Valley virus, dengue, St. Louis and La Crosse encephalitis viruses. Despite being featured as the vicious tiger mosquito.

References

Aslamkhan, M. (1971a). The Mosquitoes of Pakistan. I. A Checklist. *Mosq. Syst. Newsletter*, 3:147-159.

Aslamkhan, M. (1971b). A redescription of *Aedes* (*Aedimorphus*) *punctifemoris* (Ludlow) from Pakistan. *Biologia*, 17:61-65.

Aslamkhan, M. (1972). The Mosquitoes of Pakistan. II. Mosquitoes originally described from Pakistan. *Mosquito Systematics*, 4:98-102.

www.wrbu.org/speciespages_non-ano/non-ANO_A.../ CXqui_hab.htm