



## COMPOSITION OF MOSQUITO SPECIES IN THREE SELECTED VILLAGES IN MAHABUBNAGAR DISTRICT, TELANGANA

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### ABSTRACT

Mosquito prevalence was studied in three areas of Mahabubnagar district of Telangana viz. Mannanur, Janampeta, B Veerapur. Mosquito sampling was done in three selected villages in Mahabubnagar district in all seasons from 2014-2016. Density, Distribution and habitat preferences are studied for three years 2014- 2016. A total of 1787 mosquitoes were collected. Identification was done using identification keys of Christophers (1933) and Barraud (1934). Three genera *Culex*, *Aedes* and *Anopheles* were observed. *Anopheles* contributes 44%, *Culex* 39% and *Aedes* contributes 17%. *Culex quinquefasciatus* is predominant species (16%), while *Aedes albopictus* (15%) and *Culex gelidus* (15%) occupy the second place. *Anopheles culicifacies* contributes 12%, while *Culex tritaeniorhynchus* (8%) and *Anopheles vagus* (8%) contribute equally. *Anopheles subpictus* (7%), and *Anopheles stephensi* (7%) contributed equally, while *Aedes aegypti* is with only 5%. Human dwellings inhabit 50% due to breeding sites; cattle shed have 25%, and rain water ditch have very less, as these are available only in monsoons. *Cx. quinquefasciatus*, *Cx. gelidus* were found in all habitats, while *An. subpictus*, *An. stephensi*, *An. culicifacies*, *Ae. aegypti*, *Ae. albopictus* were found in some of the habitats.

**Key words:** Mosquito diversity, vectors, habitat preference, predominant species, breeding site, seasonal variation, *Culex*, *Aedes* and *Anopheles*

Identifying mosquitoes properly and managing their population levels has great impact on their control. Today mosquitoes are creating a great havoc in lives of mankind by acting as carrier for many diseases. Mosquitoes act as vectors for the transmission of viruses, protozoa, bacteria etc. and causing diseases like malaria, dengue, chikungunya, dengue haemorrhagic fever, filariasis, west Nile virus fever, yellow fever, encephalitis, etc. Mosquitoes are adaptable insects which continue to co-exist with man and transmit many diseases. Annually 2 million people die due to these mosquito-borne diseases while morbidity rates are still higher many times. (WHO, 2009). Mosquitoes breeds in almost all types of lentic bodies. The mosquito population density in an area is one of the major factors responsible for transmission of diseases in a particular area. The efficiency of any vector control method adopted needs a complete understanding of vectors residing in an area and process of seasonal fluctuations in population density under natural conditions. It will help to undertake a more strategic approach to control and implement various economical, efficient and effective mosquito control program. In India, a study on fauna of mosquito species in various areas has already been conducted. This study was carried out to know the mosquito species composition and their

relative abundance in Mahabubnagar, Telangana. The purpose of this work is to study abundance, distribution, diversity, and potential vectors of diseases throughout the study sites.

### MATERIALS AND METHODS

Mahabubnagar district, Telangana (18.1124°N, 79.0193°E) has an area of 2737.96 square kilometers and a population of 919903 (2011 census). Three villages in Mahabub Nagar district are chosen for collection of mosquitoes. In Mahabubnagar, 1) Janampeta of Pebbair Mandal, 2) B. Veerapuram of Itikyal Mandal and 3) Mannanur of Amrabad Mandal are chosen. Janampeta is equipped with well-organized irrigation system, and also two big ponds surround the village. B Veerapuram is very adjacent to river Krishna, and is very small village. Mannanur is an agency area, located in the dense forest range of Nallamalla belt. Mosquitoes were sampled every fortnight, all seasons viz; summer, monsoon, winter from 2014 to 2016. Mouth aspirator and sweep net were used for adult collection, and ladle and sweep net used for immatures. Collection was done around 5:30 to 7 am, and 5:30 to 7 pm. Each mosquito was identified based on morphological keys by hand lens in the field and by binocular and

stereozoom microscope in the laboratory based on keys of Christophers (1933) and Barraud (1934).

**RESULTS AND DISCUSSION**

A total of 1787 mosquitoes collected of the genera *Aedes*, *Anopheles* and *Culex* from Mahabubnagar district, out of which *Anopheles* contributes 44%, *Culex* 39% and *Aedes* contributes 17% with nine species in all. *Culex gelidus* (20%) is predominant; *Anopheles subpictus* (15%) occupies the second place (Fig. 1). Among the habitats human dwellings are the most preferred one (50%) More mosquitoes were captured at cattle shed (25%); with cement tanks preferred by less number of mosquitoes (Fig. 2). *Culex quinquefasciatus* found in all types of habitats; *C. gelidus* also similar with high number found at cattle shed. *Anopheles subpictus* is found in mud pot, human dwellings and cattle shed, most number is collected at cattle shed. *Anopheles stephensi* is found more at human dwellings. *Aedes aegypti* numbers are less. *Culex tritaeniorhynchus* found in all except rain water ditch habitat. *Aedes albopictus* is collected high in cement tank, not found in mud pot and cattle shed. *Anopheles culicifacies* reported in high numbers at human dwellings and not found in rain water ditch and cattle shed. Among the species *Anopheles culicifacies* most dominant followed by *Culex gelidus*. *An. subpictus*, *Cx. quinquefasciatus*, *Cx. gelidus* found in sites, showed 100% distribution, rest of the species show 30% distribution. Mannanur site

Mosquito species distribution (2014-2016)

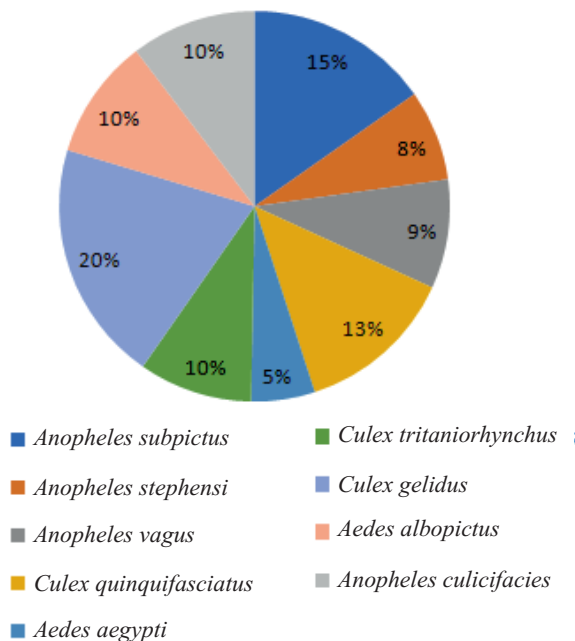


Fig. 1. Mosquito species distribution (2014-16)

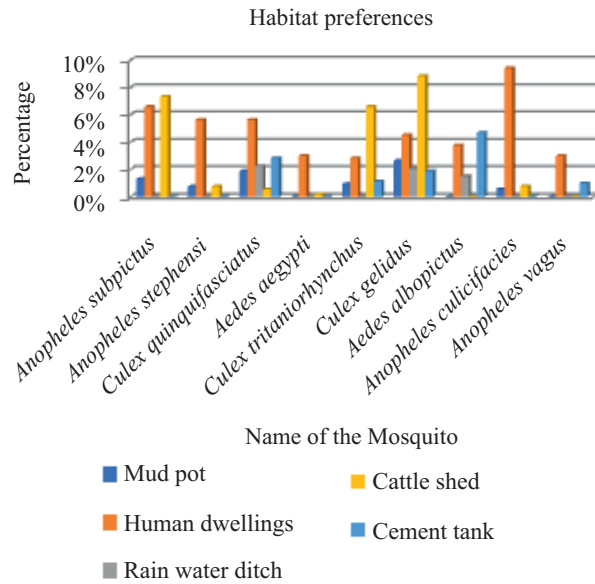


Fig. 2. Showing habitat preferences by mosquitoes

was with *Anopheles subpictus* high in 2016, compared to 2015 and 2016; and was the dominant one. *Anopheles stephensi* populations shown upward trend i.e. increased from 2014-2016 (Fig. 3). Janampeta is located at extremities of the two ponds which are very big. Mosquitoes find plenty of breeding sources because of the availability of the water source. The village has good irrigation facility; only *Anopheles* and *Culex* reported from this place, with *Cx. gelidus* most dominant. Veerapur is located on the bank of the river Krishna, well irrigated facility, good water sources which act as breeding source for mosquitoes. A total of 1787 mosquitoes were collected. Identification is done by following identification keys of Christopher and Barraud. Three genera and 9 species have been reported so far in these sites. Human dwellings and cattleshed are the most preferred. *An. subpictus*, *Cx. quinquefasciatus*, *Cx. gelidus* are most dominant with 100% distribution. In Mannanur in 2014 *An. vagus*, in 2015 *Ae. albopictus*, in 2016 *An. subpictus* are the dominant species. In

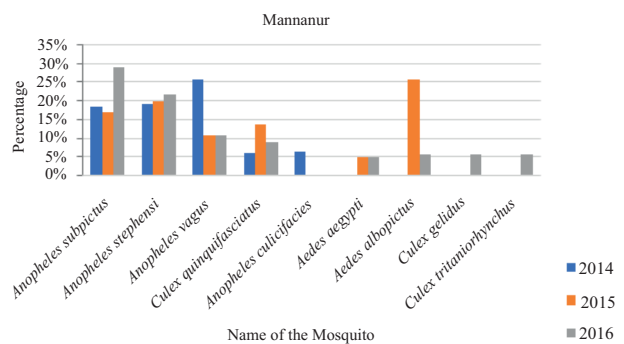


Fig. 3. Density of mosquitoes

Janampeta in 2014 *Cx. gelidus*, are dominant species. In B. Veerapur in 2014 *Cx. quinquefasciatus*, in 2015 and 2016 *Ae. albopictus* are dominant (Fig. 4, 5).

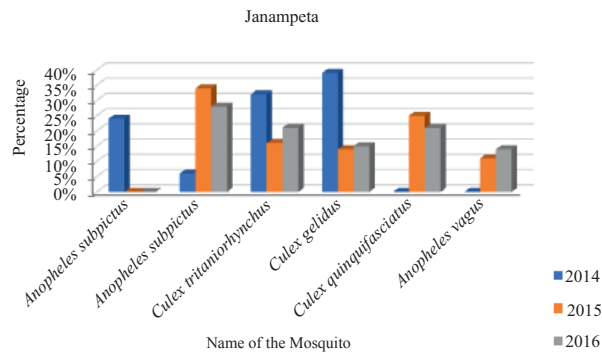


Fig. 4. Janampeta

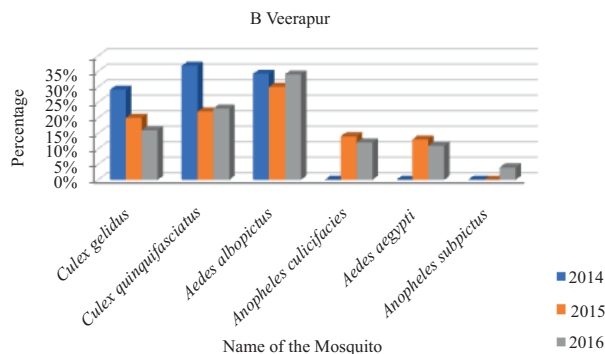


Fig. 5. Veerapur

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#### REFERENCES

Alemayehu Midekisa, Belay Beyene, Abere Mihretie, Estifanos Bayabil, and Michael C. Wimberly. 2015. Seasonal associations of climatic drivers and malaria in the highlands of Ethiopia. *Parasites and Vectors* 8(1): 339.

Bhattacharyya, Dibya, Rajavel, Aladu Natarajan, Ramalingam, Mohapatra, Pradyumna, Jambulingam, P Mahanta, Jagadish, Prakash, Anil. 2014. Faunal richness and the checklist of Indian mosquitoes (Diptera: Culicidae). *Check List* 10(6): 1342-1358.

Chandrasekar S, Sundaravadivelan C, Sevarkodiyone SP, Mariselvan M. 2012. Study on the density of mosquitoes in a dry area from Keela Arunachalapuram, Vilathikulam Taluk, Tamil Nadu, India. *IJES* 2(4): 2197-2202.

L J Kanhekar, R Ravikumar, R K Meena, R S Sharma, A K Sharma and S V Enkatesh. 2016. Population dynamics of *Aedes aegypti* and *Aedes albopictus* in Jagdalpur city, Bastar district of Chhattisgarh state, India. *IJMR* 3(6): 40-44.

Ma Adeleke, C F Mafiana, A B Idowu, S O Sam-Wobo, O A Idowu. 2010. Population dynamics of indoor sampled mosquitoes and their implication in disease transmission in Abeokuta, south-western Nigeria *J V BD* 47: 33-38.

Manzoor, Farkhanda & Nasir Farkhanda Manzoor, Aniq & Fazal, Sabiha. 2013. Population dynamics of different mosquito species at Lahore College For Women University Campus, Lahore. *Journal of Mosquito Research. JMR* 3(12): 82-88.

Naheed Ali, Shumaila Noreen, Khalid Khan, Sobia Wahid. 2015. Population dynamics of mosquitoes and malaria vector incrimination in district Charsadda, Khyber Pakhtunkhwa (KP) Pakistan. *Acta Tropica* 141 Part A: 25-31.

Patricia N. Okorie, K O K. Popoola, Olayemi M Awobifa, Kolade T Ibrahim, George O Ademowo. 2014. Species composition and temporal distribution of mosquito populations in Ibadan, South western Nigeria. *Journal of Entomology and Zoology Studies* 2(4): 164-169.

Rydzanicz K, E Lonc. 2003. Species composition and seasonal dynamics of mosquito larvae in the Wroclaw Poland area. *JVE* 28(2): 255-266.

S Anbalagan, V Arunprasanna, M Kannan, S Dinakaran, M Krishnan. 2015. Spatio-temporal dynamics of mosquitoes in stream pools of a biosphere reserve of Southern Western Ghats, India. *Acta Tropica* 152: 228-236

Satarupa Paul, Amit Chattopadhyay, Pranab Kumar Banerjee. 2015. Studies on seasonal abundance and molecular characterization of *Anopheles subpictus* and *Anopheles vagus* based on ITS2 sequence variability. *IJMR* 2(3): 131-135.

Tantely L M, Cêtre-Sossah C, Rakotondranaivo T, Cardinale E, Boyer S. 2017. Population dynamics of mosquito species in a West Nile virus endemic area in Madagascar. *Parasite*, 24(3)

Wermelinger E D, Benigno C V, Machado R N M, Cabello P H, Meira A M, Ferreira A P, Zanuncio J C. 2012. Mosquito population dynamics (Diptera: Cclicidae) in a eutrophised dam. *Brazilian Journal of Biology* 72(4): 795-799.

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