

Tree hole mosquitoes in Western and Eastern Ghats, Tamil Nadu, India

Mosquitoes are most dangerous tiny insects killing 7.25 million people in the world annually. They serve as carrier of deadliest pathogens causing dengue, malaria, chikungunya, filariasis, West Nile virus, zika, Japanese encephalitis, etc. Nearly everyone knows that mosquitoes breed in places like swamps, ponds, plastic containers, rice fields, and irrigated pastures, but as its name implies, the mosquitoes breed naturally in water-holding places, crotches, and stumps associated with many kinds of trees. Each year as such cavities are filled by rains and melting snow water, the eggs laid by females begin to hatch.



Fig. 1.

Many research reports highlight the influence of seasonal variations on distribution of mosquito species in many breeding places but in tree holes are fully neglected. Tree holes provide a unique specialized type of ecological habitat which is different from the usual breeding places of mosquitoes. Tree hole habitats (phytotelmata) are small natural containers formed by living or dead plant parts when rainwater is collected in bark depressions.

Altogether survey tours were carried out between June, 2014 to May, 2015 viz., Monsoon (Jun-Oct), Winter (Nov-Feb) and Summer (Mar-May) around six hill ranges viz., Anaimalai hills (Coimbatore), Kodaikanal hills (Palani), Yercaud hills (Salem), Kolli hills (Namakkal), Sitheri hills (Dharmapuri) and Megamalai (Theni) are well known tourist places in Western and Eastern Ghats. Since the studies were confined to Tamil Nadu. During the survey, we mostly concentrated forest fringe villages and tourist places. The people visit these tourist places from all over the world frequently. Study areas are acting as a suitable place for vector borne disease transmission from one place to another place. Undoubtedly the tree holes might be crucial role in propagation of mosquito species in the forest ecosystem. Understanding tree hole breeding mosquito's distribution and ecological requirements of larval mosquito populations are important for managing potential breeding habitats and also for predicting vector-borne disease prevalence. Due to the climatic variability recorded in the different hills areas, it has large differences in the average

temperatures and precipitations registered between the different categories of the natural tree holes studied. A total of 2,642 tree hole mosquitoes (immature and adults) were collected viz., 30 different species belonging to 9 genera. The genus *Aedes* was the most dominant represented by 6 species of 880 individuals followed by *Culex* (6 species) 560 individuals. *Delonex regia* harboured maximum number of tree hole mosquito (immatures and adults) individuals (650) followed by *Delonex elata* (417), and least mosquitoes were *Kaya senegalensis* (29).



Fig. 2.

Researchers have long looked for associations between rainfall variability and mosquito abundance and mosquito-borne disease incidence. While it is convenient to use rainfall amount as an explanatory hydrologic variability, the physical effects of precipitation on environmental conditions are multiple, and the responses of different mosquito species and mosquito-borne pathogens to these effects are varied. Rainfall has two principal influence on the mosquito life cycle: 1) the increased near-surface humidity associated with rainfall enhances mosquito flight activity and host-seeking behaviour, and 2) rainfall can alter the abundance and type of aquatic habitats available to the mosquito for the deposition of eggs (oviposition) and the subsequent development of the immature stages.

The knowledge on biodiversity of mosquitoes in an area provides adequate information on population diversity, distribution pattern and preferential habitat selection which will help to evolve a suitable strategy for the meaningful suppression of the mosquito population.

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