

Mosquito Breeding Habitat Diversity and Distribution of Species in Selected Areas in the Districts of Kurunegala, Gampaha, Kegalle and Kandy in Sri Lanka

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Sri Lanka has been suffering from mosquito-borne diseases since ancient times with the high prevalence of malaria, filariasis and Japanese Encephalitis (JE). As a result of successive efforts in control programs, Sri Lanka has received remarkable achievements. However, with all these successful efforts some arbovirus infections majorly the dengue has increased rapidly over last few decades. Some control programs only target the specified vectors for that disease and report of other vector species is ignored. The prevalence of different mosquito species from surveillance has been limitedly document is Sri Lanka which is grossly inadequate in providing evidence for potential health risks. The present investigation attempts to cater for this knowledge gap by documenting the prevalence of mosquito species in four selected districts of Sri Lanka. Entomological surveys were conducted from a total of 160 temporary and permanent mosquito breeding habitats identified in selected areas, in the districts of Kurunegala, Kegalle, Kandy and Gampaha from June 2017 to October 2018. Mosquito immature stages were sampled using standard dipping, siphoning or pipetting methods according to the nature of breeding habitat and collected specimen were identified up to the species level. Chi-square test of independence was used to evaluate the significance in the distribution of different mosquito species among different breeding sites in the studied districts. The diversity indices for breeding habitats were subjected to a Kruskal Wallis test followed by Dunn's Multiple Comparison to identify the significance in the variations of diversity indices across breeding sites and studied districts. A total of 4663 mosquito larvae belonging to seven genera and fifteen species of mosquitoes were collected from natural and artificial water holding macro and micro habitats located in study sites. The relative distribution of different mosquito species differed significantly among the four studied districts ($\chi^2=143.248$; $df= 33$; $P < 0.001$). Mosquito assemblages in the districts of Gampaha and Kandy indicated a similarity of 83.16%, while the district of Kegalle shared a similarity of 75.45% with the above cluster. A total of 21 permanent/temporary key breeding sites were found from the study areas. As suggested by the Kruskal Wallis statistics ($P < 0.05$ at 95% of significance), all the diversity indices for immature stages of mosquitoes varied significantly across different breeding sites recorded during the study. Meanwhile, none of the diversity indices indicate significant differences in terms of locality. The highest values of Pielou's Index (2.01 ± 0.6), Menhinik's Index (3.34 ± 0.83) and Margelef Index (0.59 ± 0.19) and highest species richness (4.0 ± 2.82) in terms of mosquito larvae were shown by paddy fields within the studied four districts. Findings of the current study would be useful to identify the entomological potential for disease transmission and facilitate implementation of appropriate vector control interventions.

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