

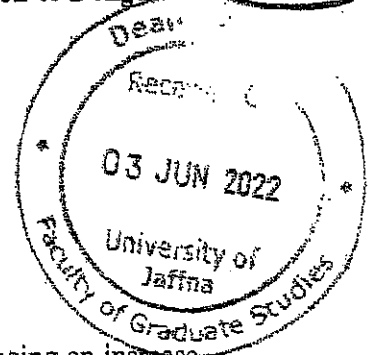
***Aedes* Larval Bionomics, Circulating Serotypes and A Risk Map in Relation to Dengue Transmission in Jaffna District.**

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ABSTRACT

Jaffna district, which is in the Northern Province of Sri Lanka has been experiencing an increase in the number of dengue infections in recent years. Therefore, it is important to investigate larval bionomics of *Aedes* vectors and identify the emergence of different dengue virus serotypes and development of a dengue risk map to understand the changing epidemiology of dengue. The habitats of preimaginal stages of *Aedes* mosquitoes were surveyed, and ovitrap collections were carried out in selected localities in Jaffna district. *Aedes* larval productivities were analyzed against habitat characteristics, rainfall and dengue incidence. Adults emerging from collected larvae were tested for dengue virus (DENV). Blood sample was collected from NS1 positive patients admitted to the Jaffna Teaching Hospital. Realtime PCR was carried out to identify the DENV serotype. The DENV positive samples were sent for sequencing and the results were analyzed. Dengue risk related spatial-temporal factors were analyzed via multi criteria analysis and a GIS-based dengue risk map was created. *Aedes aegypti*, *Ae. albopictus*, *Ae. vittatus* were collected and identified from their natural habitats and ovitraps. For the first time the presence of *Aedes cogilli* was identified in Sri Lanka. DENV serotype 2 was detected in *Ae. aegypti* collected from ovitraps in the city of Jaffna. High Breteau, house and container indices of 5.1, 5.1 and 7.9%, respectively, were observed in the field habitat surveys and ovitrap indices of up to 92% were found in Jaffna city. Of the 563 patients recruited during 2018-2019 DENV serotypes could only be identified in 219 samples. All four DENV serotypes were identified in both years with the predominance of DENV2 accounting for 56% of all cases in 2018 and DENV1 emerging as the dominant serotype in 2019. Higher number of infections were found in the ages between 20-29 years. There were no significant differences in clinical or laboratory features between the different serotypes. DENV1 genotype I and DENV3 genotype I were identified for the first time in Jaffna district. Dengue risk map identified Nallur MOH area as a very high-risk area. Circulation of all four DENV serotypes and *Aedes* larval indices in populated areas of the peninsula showed a high potential for dengue epidemics. Therefore, the outcome of the present study related to *Aedes* survey, circulation of DENV serotypes, and availability a dengue risk map is essential to develop dengue control measures in Jaffna district.

Key words: Dengue, *Aedes*, serotype, risk map



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