

**ROLE OF BRACKISH WATER BREEDING *Aedes aegypti* AND
Aedes albopictus IN TRANSOVARIAN TRANSMISSION OF DENGUE VIRUS**

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Dengue fever (DF) is an important emerging viral disease in humans caused by dengue viruses (DENV), and transmitted by the mosquito vectors, mainly *A. aegypti* and *A. albopictus*. In the nature, transmission of DENV is maintained by transovarian transmission (TOT) in which an infected female is able to transmit the DENV to next progeny. Although *A. aegypti* and *A. albopictus* are fresh water breeders, they were reported to undergo pre-imaginal development in waters with a salinity of up to 18 ppt and 16 ppt, respectively, in Jaffna and Batticaloa areas of Sri Lanka in recent times. Based on this finding, it was hypothesized that brackish water breeding vector mosquitoes can also transmit the disease and thus the present study was aimed to determine the susceptibility of brackish breeding *A. aegypti* and *A. albopictus* to DENV and their capacity of TOT of DENV.

Field survey was carried out in inland and coastal localities of Jaffna district to collect *A. aegypti* and *A. albopictus* larvae and they were reared in the laboratory. Self mating colonies of both species were established by gradually adapting them to 0 ppt (fresh water) and 10 ppt (brackish water) salinity. Adults from these established colonies were used for subsequent infectivity studies using membrane feeders in the laboratory. Infectivity studies were carried out using published protocols with slight modifications. Infected mosquitoes and their F1 progenies (larvae and adult females and males) were tested for the presence of DENV using commercially available Dengue NS1 antigen (Ag) detection strips. The experiment with DENV -1 showed that , 33% and 60% of *A. aegypti* and *A. albopictus* respectively that were adapted in brackish water and 46.7% and 33.3% of control *A. aegypti* and *A. albopictus* were fully engorged. All the pools of infective blood-fed brackish water adapted and fresh water *A. aegypti* and *A. albopictus* and all pooled F1 larvae and adults of infected mosquitoes showed positive for NS1 Ag. In the experiment with DENV-2, 62.5% and 37.5% of *A. aegypti* and *A. albopictus* respectively that were adapted in brackish

water and 37.5% and 42.5% of control *A. aegypti* and *A. albopictus* were fully engorged. Although no positive result was obtained with *A. aegypti* adapted in brackish water as well as control for the presence of NS1 Ag, the F1 progeny were found to be positive. Positive result was also obtained for brackish water adapted *A. albopictus* to have infection in salivary gland and midgut. All the pooled extracts of F1 larvae and female and male adults were positive for NS1 Ag.

The finding shows for the first time that the brackish water breeding *A. aegypti* and *A. albopictus* can transmit DENV and this will have an impact on the disease transmission globally in general and particularly in Sri Lanka as the country has a huge coastal area with high population density.