

DETECTION OF KNOCKDOWN RESISTANCE (*kdr*) MUTATIONS IN SRI LANKAN *Aedes aegypti* POPULATIONS

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Dengue is a serious arboviral disease in Sri Lanka with an increasing number of dengue fever cases reporting every year. The control of primary vector *Aedes aegypti* solely depends upon the source reduction for breeding and the application of insecticides to the vector populations. However, increase of reported number of cases suggests the inefficiency of current control strategies and possibility of emerging resistance to currently used insecticides. Early detection of *kdr* mutations which confer resistance to pyrethroid insecticides is important in management of resistance in vector populations. Polymerase chain reaction was carried out to detect the presence of three *kdr* mutant alleles F1534C, V1016I and V1016G in 207 *Ae. aegypti* mosquito samples collected from eight districts (Colombo, Jaffna, Galle, Kandy, Puttalam, Trincomalee, Hambanthota and Batticaloa) in Sri Lanka. The data revealed the presence of F1534C mutant allele in Sri Lankan *Ae. aegypti* populations for the first time. The mutant allele was found to be wide spread in the island. It was interesting to note that mutant C allele frequency was highest among mosquito populations in Jaffna district (0.148) closely followed by populations in Colombo district (0.143). The lowest was recorded in mosquitoes collected from Kandy district (0.043). However, the present study was not able to record the presence of V1016I or V1016G mutant alleles in the studied mosquito populations. The spread of the mutant allele throughout the country poses a threat of higher resistance development for pyrethroid insecticides. In Sri Lanka pyrethroids are extensively used for vector control measures as a routine practice and as an emergency measure in the event of an epidemic situation. Unplanned and the long term insecticide applications could have led to resistance development thus more strategic and diverse tools should be applied for the control of the vector.

Keywords: *Dengue, Aedes aegypti, Insecticide resistance, knockdown resistance (kdr), F1534C*

Acknowledgments: Financial assistance by the university grant ASP/01/RE/SCI/2016/37, and Center for Biotechnology, University of Sri Jayewardenepura