

Status of insecticide resistance in mosquito vectors of Dengue fever, *Aedes aegypti* and *Aedes albopictus* in Sri Lanka

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Characterization of populations of *Aedes aegypti* and *Aedes albopictus* with respect to resistance and resistance mechanisms will be useful in implementing vector control programs and in designing insecticide resistance management programs. In this study *Aedes aegypti* and *Aedes albopictus* populations in three areas, Colombo, Kurunegala and Matara (more than 100 mosquitoes in each case) were exposed to DDT, malathion, propoxur and permethrin. When exposed to WHO recommended concentrations of resistance detection, the percentage survival of adult *Ae. aegypti* from Colombo, Kurunegala and Matara, were respectively, 47%, 52%, 30% for DDT, 84%, 59%, 68% for propoxur and 11%, 38, 26% for malathion. Similarly, adult *Ae. albopictus* populations showed percentage survivals of 45%, 62% 64% for DDT, 43%, 29%, 48% for propoxur and 51%, 25%, 8% for malathion in Colombo, Kurunegala and Matara. The percentage survival with permethrin in all populations except in *Ae. albopictus* from Colombo was low (less than 20%). Biochemical assays indicated that the resistance observed in *Aedes aegypti* and *Aedes albopictus* was due to altered Acetylcholine esterase enzyme (AChE) insensitive to inhibition with insecticides, elevated Glutathione s – transferase enzyme activity (GST) and esterase based detoxication. With biochemical assays run on 200 to 225 mosquitoes from each study area the resistance of both species was characterized based on GST specific activity, % remaining AChE activity and specific activity of esterases. The frequency distribution patterns (% population vs, enzyme activity) among different populations of the two species varied. Mosquitoes with high levels of AChE and GST activity found to be present indicated that there is a high probability that resistance of *Aedes aegypti* and *Aedes albopictus* could increase if organophosphorus and carbamate insecticides are used against them.

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