Temephos resistance in field Aedes (Stegomyia) albopictus (Skuse) from Selangor, Malaysia

ABSTRACT

Larvae of Aedes albopictus obtained from dengue endemic areas in Selangor, Malaysia were evaluated for their susceptibility to operational dosage of temephos (1 mg/L). Larval bioassays were carried out in accordance to modified WHO standard methods. Biochemical microassay of enzymes in Ae. albopictus was conducted to detect the emergence of insecticide resistance and to define the mechanisms involved in temephos resistance. The 50% mortality lethal time (LT50) for Ae. albopictus tested against temephos ranged between 58.65 to 112.50 minutes, with resistance ratio ranging from 0.75 – 1.45. This study addressed the fluctuation of time-related susceptibility status of Ae. albopictus towards insecticide. Significant difference on the weekly enzyme levels of non-specific esterase's, mixed function oxidases and glutathione S-transferases was detected ($p < 0.05$). No significant correlation was found between temephos resistance and enzyme activity ($p > 0.05$). Only glutathione Stransferases displayed high level of activity, indicating that Ae. albopictus may be resistant to other groups of insecticide. The insensitive acetylcholinesterase was detected in some field collected Ae. albopictus populations, indicating the possibility of emergence of carbamate or other organophosphate resistance in the field populations. Continuous resistance monitoring should be conducted regularly to confirm the efficacy of insecticides for dengue control.