

EFFECTS OF PIPERONYL BUTOXIDE ON ORGANOPHOSPHOROUS  
TEMEPHOS TOXICITY AND INVOLVEMENT OF ESTERASES IN TEMEPHOS  
RESISTANCE TO *Aedes Aegypti* (DIPTERA: CULICIDAE)

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Resistance to insecticides remains a major problem for the successful control of *Aedes aegypti*, which is currently one of the most widespread disease vectors in the world. The organophosphorous insecticide temephos (TE) has been used to control pyrethroid-resistant populations of *A. Aegypti*. Piperonyl butoxide (PBO) has been used as a synergist of insecticides to control insects. PBO is known to inhibit the bio-activation of organophosphorous insecticides. A study was conducted to evaluate the effect of PBO on TE toxicity to *A. Aegypti* using a filter paper bioassay technique. These bioassays in both the susceptible and TE-resistant L4 larvae of *A. Aegypti* strains revealed that at low concentrations (1% and lower), PBO significantly synergized TE toxicity. We demonstrated that enhanced esterase activity was associated with survivability of L4 larvae of *A. Aegypti* exposed to TE alone. Results of biochemical assays suggest that PBO had significant effect on the esterase activity in the *A. Aegypti*. The observed synergistic effect of PBO at lower concentrations on TE toxicity to *A. Aegypti* could be explained by reduced esterase activity due to PBO inhibition.

Keywords: Esterases; PBO; TE; *Aedes Aegypti*.

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