

Effectiveness Assessment of a Brazilian Larvicide on Aedes Control

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Abstract : The susceptibility status of an insect population to any larvicide depends on several factors such includes genetic constitution, environmental conditions and others. The mosquito *Aedes aegypti* is the primary vector of three important viral diseases, Zika, Dengue, and Chikungunya. The frequent outbreaks of those diseases in different parts of Brazil demonstrate the importance of testing the susceptibility of vectors in different environments. Since the control of this mosquito leads to the control of disease, alternatives for vector control that value the different Brazilian environmental conditions are needed for effective actions. The aim of this study was to evaluate a new commercial formulation of *Bacillus thuringiensis israelenses* (DengueTech: Brazilian innovative technology) in the Brazilian Legal Amazon considering the climate conditions. Semi-field tests were conducted in the Institute of Scientific and Technological Research of the State of Amapa in two different environments, one in a shaded area and the other exposed to sunlight. The mosquito larvae were exposed to larvicide concentration and a control; each group was tested in three containers of 40 liters each. To assess persistence 50 third instar larvae of *Aedes aegypti* laboratory lineages (Rockefeller) and 50 larvae of *Aedes aegypti* collected in the municipality of Macapa, Brazil's Amapa state, were added weekly and after 24 hours the mortality was assessed. In total 16 tests were performed, where 12 were done with replacement of water (1/5 of the volume, three times per week). The effectiveness of the product was determined through mortality of $\geq 80\%$, as recommend by the World Health Organization. The results demonstrated that high-water temperatures (26-35 °C) on the containers influenced the residual time of the product, where the maximum effect achieved was 21 days in the shaded area; and no effectiveness of 60 days was found in any of the tests, as expected according to the larvicide company. The test with and without water replacement did not present significant differences in the mortality rate. Considering the different environments and climate, these results stimulate the need to test larvicide and its effectiveness in specific environmental settings in order to identify the parameters required for better results. Thus, we see the importance of semi-field researches considering the local climate conditions for a successful control of *Aedes aegypti*.

Keywords : *Aedes aegypti*, bioassay, larvicida, vector control

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