

## **LONG LASTING *Aedes* CONTROL IN BREEDING SITES THROUGH AN INSECTICIDE COATING WITH DUAL EFFECT: LABORATORY AND SEMI-FIELD TRIALS**

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**Abstract** In this study we aim to determine the lethal and residual effect of a dual-action insecticide coating (INESFLY SATIS) applied in the interior parts of water tanks on *Aedes aegypti* under laboratory and semi-field conditions. Contact with treated surfaces during oviposition targets gravid females' longevity due to an adulticide (alpha-cypermethrin) and reproductive capacity due to the IGR (pyriproxyfen) exposure, while larval development is affected by the pyriproxyfen released from the coating to the water. 20 to 50 gravid females of susceptible and pyrethroid resistant *Ae. aegypti* strains were released for 24 hours in free flying chambers including water containers treated and untreated with the insecticide coating as oviposition sites. Mortality was recorded at 24 hours and 48 hours post-exposure. The effect of pyriproxyfen on larval development was evaluated by exposing groups of 15 larvae and 15 pupae to water from the treated containers for adult emergence recording.

In laboratory trials, average females' mortality at 48 hours for 6 assays conducted during 45 days was 93.8% and 19.1% for the susceptible and pyrethroid resistant strains respectively. Reduction in oviposition was similar for both strains in comparison with controls (71.4% susceptible, 75.6% resistant). In the semi-field trials, no adult emergence was observed in larvae exposed to treated tanks after 9 months, while at 12 months post treatment the inhibition of emergence was 80% for both susceptible and resistant strains. The adulticidal effect exerted to the susceptible strain remained above 80% until 60 days after treating the containers and dropped to 53% at month 6. After 60 days of tank treatment, the adulticidal effect achieved with the resistant strain at 48 hours post-exposure was 6.8% and increased to 62% at 96 hours. At 6 months post-treatment, mortalities below 10% were observed at 96 hours follow-up. Although adult mortality is limited in the resistant strain, complete adult emergence inhibition is preserved as well as in the susceptible strain, and renewal of the *Aedes* population is prevented. The insecticide coating showed a high efficacy on mortality of immature and adult stages and lead to a significant reduction in oviposition, so becoming a promising new control tool for *Aedes* mosquitoes.

**Key words** *Aedes*, control, insecticide, coating, tank