

Do *Chenopodium ambrosioides*-synthesized silver nanoparticles impact *oryzias* melastigma predation against *aedes albopictus* larvae?

ABSTRACT

The green synthesis of nanopesticides has been recently proposed to improve the efficacy of mosquito control programs. However, limited efforts shed light on the impact of sub-lethal doses of nanopesticides on behavioral traits of mosquito biocontrol agents. We described the synthesis of silver nanoparticles (AgNP) at room temperature using the aqueous extract of *Chenopodium ambrosioides*, and their high toxicity against the invasive mosquito *Aedes albopictus*. LC50 calculated on young instars ranged from 13 ppm (first instar larvae) to 19 ppm (pupae). LC50 calculated on adults was 14 ppm. The chemical composition of the *C. ambrosioides* extract was characterized by GC–MS analysis. The production of AgNP was confirmed by the surface Plasmon resonance band illustrated in UV–Vis, FTIR spectroscopy, EDX, XRD, TEM, and Zeta Potential analyses. In the field, a single treatment of AgNP (10 9 LC50) led to complete elimination of larval populations within 72 h. Sub-lethal doses of the reducing extract and AgNP magnify predation rates of *Oryzias melastigma* fishes against *A. albopictus* larvae. Overall, this study highlights the concrete potential of *C. ambrosioides*-synthesized AgNP to develop effective and cheap tools to control young instars and adults of the invasive mosquito *A. albopictus*.

Keyword: Biological control; Biosafety; Larvivorous fishes; Nanobiotechnology; Nanocrystals