

Potential of bio fabricated *Annona glabra* – silver nanoparticles to control *Aedes aegypti* and *Aedes albopictus*

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Bio synthesized silver nanoparticles using *Annona glabra* leaf extract (An-AgNPs) as the reducing and stabilizing agent were assessed as a novel larvicide against dengue vector mosquito larvae. The fresh leaves of *A. glabra* were crushed well and heated with distilled water under 70 °C for 1 hour. The supernatant was mixed (10% and 20% v/v of total volume) with 5 mM AgNO₃ to synthesize An-AgNPs. Formation of An-AgNPs were confirmed by the color change and by appearance of SPR peak in the Uv-vis spectrum and characterized by Dynamic Light Scattering (DLS), Scanning Electron Microscopy (SEM) and Fourier Transform Infrared spectroscopy (FTIR). The larvicidal activity of An-AgNPs was assessed against the third instar larvae of *Ae. aegypti* and *Ae. albopictus*, under the laboratory conditions (2 -10 mg/L). The change of solution color from yellow to dark brown/black and the SPR band at 435 nm confirmed the formation of An-AgNPs. According to SEM; An-AgNPs were spherical in morphology. FTIR analysis detected that An-AgNPs are capped and stabilized with biomolecules of *A. glabra* leaf [1739 (C=O stretching), 1366 (CH₂ bending) and 3500-3200 (N-H and O-H stretching) and 1217 cm⁻¹ (C-O stretching)]. The LC₅₀ of An-AgNPs (10%) and An-AgNPs (20%) against the third instars larvae of *Ae. aegypti* after 24 hours were 5.29 and 2.43 mg/L and of *Ae. albopictus* were 3.02 and 2.51 mg/L respectively. The LC₅₀ of An-AgNPs (10%) and An-AgNPs (20%) against the third instars larvae of *Ae. aegypti* after 48 hours were 1.51 and 1.17 mg/L and of *Ae. albopictus* were 1.14 and 2.10 mg/L respectively. The LC₅₀ of leaf crude plant extract against the third instars larvae of *Ae. aegypti* after 24 and 48 hours were 5.9455 and 3.5485 mg/L and for the third instars larvae of *Ae. albopictus* were 5.0040 and 2.7346 mg/L respectively. This study shows that An-AgNPs is efficient in controlling mosquito larvae.

Keywords: *A. aegypti*, *A. albopictus*, *A. glabra*, Larvicidal activity, Ag nanoparticles

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