

**Abstract No: MO-08**

**Larvicidal activity of chemically synthesized and *Trichoderma longibrachiatum* mediated silver nanoparticles against *Aedes aegypti***

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The mosquito *Aedes aegypti* is a critical vector of infectious diseases, including dengue, chikungunya and yellow fever. Prevention of these diseases is mainly achieved through mosquito population control due to the non-availability of a commercial vaccine except for yellow fever. The use of biogenic nanoparticles to control insect vectors has been studied in several research. Byproducts of the metabolism of organisms, including bacteria, fungus, and plants, which act as reducing and stabilizing agents, can be used in the green synthesis of nanoparticles. This study aims to determine the mosquito larvicidal potential of green synthesized silver nanoparticles using *Trichoderma longibrachiatum* biomass (TI-AgNPs) and chemically synthesized silver nanoparticles (C-AgNPs). Synthesized AgNPs were characterized by ultraviolet-visible spectroscopy (UV-VIS), Transmission Electron Microscopy (TEM) and Scanning Electron Microscopy (SEM). The colour change from pale yellow to dark brown of the solution indicated the formation of AgNPs initially. The surface Plasmon Resonance (SPR) band in the range 415 - 400 nm in the UV-VIS confirmed the formation of TI-AgNPs and C-AgNPs. TEM and SEM images confirmed that TI-AgNPs and C-AgNPs were spherical in shape. Third instar larvae of dengue vector mosquito *Ae. aegypti* were subjected to larvicidal bioassay in a range of concentrations of TI-AgNPs and C-AgNPs (10-50 mg/L). Both types of AgNPs were larvicidal against *Ae. aegypti* larvae. The percentage mortality of the *Ae. aegypti* was found to increase with the increase in tested concentrations of AgNPs. LC<sub>50</sub> value of TI-AgNPs was 16.82 ± 0.17 mg/L whereas C-AgNPs was 22.10 ± 0.71 mg/L for *Ae. aegypti* at 48 h exposure. Hence, TI-AgNPs exhibit higher larvicidal activity than C-AgNPs. TI-AgNPs have the potential to be developed as a green larvicidal treatment for *Ae. aegypti*.

**Keywords:** *Aedes aegypti*, Green synthesis, Larvicidal activity, Silver nanoparticles, *Trichoderma longibrachiatum*