

ABSTRACT

. Aedes serve as a vector of viruses which cause life threatening diseases such as dengue, chikungunya etc. Current study was aimed to evaluate the efficacy of Fish Scale based Silver Nanoparticles (FS-AgNPs) against dengue vector Aedes aegypti. The extract (FS) obtained from the scales of Tilapia fish (Orochromis niloticus) was used to synthesize AgNPs using rapid green synthesis approach. The collagen present in FS-extract acted as reducing and capping agent. The characterization of FS-AgNPs was done via UV-vis Spectroscopy, Scanning Electron Microscopy and FTIR analysis. Synthesis of nanoparticles was confirmed by UV absorption peaks at 490 nm and presence of different functional groups by FTIR analysis. Larvicidal bioassays were performed at different concentrations of FS-AgNPs (10-40 ppm) against Lab strain and field populations from different localities of Lahore (i.e. Model Town, Misri Shah, Sadar Cantt., Valencia and Walton). Mortality was concentration dependant i.e. higher mortality at higher concentration. Highest mortality was observed in Lab Strain (100%) as expected. LC₅₀ value was highest (18.74 ppm) against larval population of Walton. Toxicity of nanoparticles was also assessed on non-target organism, Tilapia fingerlings. No mortality or behavioral changes were recorded even after continuous exposure for 10 days. It is concluded that FS-AgNPs are effective to control dengue vector Aedes aegypti at young developmental stages, during aquatic phase of its life cycle, and are safe for non-target organisms.

Keywords: Fish scales, Silver Nanoparticles, Mosquito, Aedes