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Larvicidal efficacy of silver nanoparticles synthesized biologically using *Swietenia mahagoni* (L.) Jacq. leaf extract against *Anopheles stephensi*, *Culex quinquefasciatus* and *Cx. vishnui* group

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Mosquito borne diseases are a global crisis, particularly in developing countries. Non-availability of apposite vaccines against these diseases has lead to sole dependence on the vector managerial steps for dropping the incidences. In the present study, we tried to evaluate the larvicidal potential of biologically synthesized silver nanoparticles (Ag NP) using aqueous leaf extracts of *Swietenia mahagoni* (L.) Jacq. against third instar larvae of *Anopheles stephensi*, *Culex quinquefasciatus* and *Culex vishnui* group. Aqueous extract of leaves reduced the aqueous silver ions to produce stable Ag NP. The characterization of synthesized nanoparticles was done through UV-Vis spectrum, Transmission electron microscope (TEM), X-ray diffraction (XRD) and Fourier transform infrared (FTIR) spectroscope. Third instar larvae of three mosquito species namely *An. stephensi*, *Cx. quinquefasciatus* and *Cx. vishnui* group were exposed to different concentrations of synthesized nanoparticles for 24, 48and 72 h. TEM measured the range of nanoparticle size as 8-9 nm whereas XRD measured as 6 nm. Cent percent mortality of larvae of *An. stephensi* was recorded at 80 ppm at 48 h. About 96 and 80% mortality of *Cx. vishnui* group and *Cx. quinquefasciatus* larvae respectively were noted at 80 ppm after 72 h of exposure. The result of regression analysis proved that the mortality rate (Y) was positively correlated with the period of exposure (X) and regression coefficients were close to one. Toxicity study on non-target species showed no injurious activity during experimental period. Results indicate, possibly a first report on mosquito larvicidal effect of Ag NP synthesized using *S. mahagoni* leaf extract which may be used to effectively control the larval forms of three important vector mosquitoes.

Keywords: Encephalitis, Elephantiasis, Lymphatic filariasis, Malaria, Mosquitoes, West Indian mahogany, Vector control