

Synthesis of pediculocidal and larvicidal silver nanoparticles by leaf extract from heartleaf moonseed plant, *Tinospora cordifolia* Miers.

Jayaseelan C¹, Rahuman AA, Rajakumar G, Vishnu Kirthi A, Santhoshkumar T, Marimuthu S, Bagavan A, Kamaraj C, Zahir AA, Elango G.

Author information

Abstract

Insecticide resistance and inadequate attention to the application instructions of topical pediculicides are common reasons for treatment failure. Essential oils or plant extracts are good and safe alternatives due to their low toxicity to mammals and easy biodegradability. The present study was carried out to establish the pediculocidal and larvicidal activity of synthesized silver nanoparticles (AgNPs) using leaf aqueous extract of *Tinospora cordifolia* Miers (Menispermaceae) against the head louse *Pediculus humanus capitis* De Geer (Phthiraptera: Pediculidae) and fourth instar larvae of malaria vector, *Anopheles subpictus* Grassi and filariasis vector, *Culex quinquefasciatus* Say (Diptera: Culicidae). We reported the aqueous plant extract and synthesized AgNPs against head lice and vectors. Direct contact method was conducted to determine the potential of pediculocidal activity. The synthesized AgNPs characterized by UV-vis spectrum, scanning electron microscopy, Fourier transform infrared, and X-ray diffraction. Head lice and mosquito larvae were exposed to varying concentrations of aqueous extracts and synthesized AgNPs for 24 h. The results suggest that the optimal times for measuring mortality effects of synthesized AgNPs were 33% at 5 min, 67% at 15 min, and 100% after 1 h. The maximum activity was observed in the synthesized AgNPs against

lice, *A. subpictus* and *C. quinquefasciatus* (LC(50) = 12.46, 6.43 and 6.96 mg/L; $r(2) = 0.978, 0.773$ and 0.828), respectively. The findings revealed that synthesized AgNPs possess excellent anti-lice and mosquito larvicidal activity. These results suggest that the green synthesis of AgNPs have the potential to be used as an ideal ecofriendly approach for the control of head lice and vectors.

PMID: 21212979 DOI: [10.1007/s00436-010-2242-y](https://doi.org/10.1007/s00436-010-2242-y)

[PubMed - indexed for MEDLINE]

MeSH Terms, Substances

LinkOut - more resources

PubMed Commons

[PubMed Commons home](#)

0 comments

[How to join PubMed Commons](#)