

EFFECTIVENESS OF BOTANICAL NANOPARTICLES AGAINST ROOT-KNOT NEMATODE (*MELOIDOGYNE INCOGNITA*)

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Worldwide, the root-knot nematode (*Meloidogyne* spp.) is an invasive plant pathogen that could destroy up to 64% of the yield. Management strategies mainly depend on the use of synthetic nematicides that have adverse effects on human and the environment. Therefore, current study investigated the effectiveness of leaf extracts of *Conyza dioscoridis* and *Urtica urens* that were prepared as silver nanoparticles (Ag-NP) as nematicidal alternatives. The characterization and size confirmation of the Ag-NP were done by UV-Vis spectrophotometry and the scanning electron microscopy (SEM). The phytochemical contents of crude extracts and the nano formulations were analyzed using gas chromatography-mass spectroscopy (GC-MS). Results revealed that silver nanoparticles of *C. dioscoridis* and *Urtica urens* extracts had great nematicidal activity against the 2nd stage juvenile (J2) and eggs of *Meloidogyne incognita*. Also, the Ag-NP showed similar nematicidal effect to the reference nematicides. The GC-MS analysis revealed the increase of certain metabolites due to the formulation of the Ag-NPs. Aromadendrene, 1-hydroxy-1,7-dimethyl-4-isopropyl-2,7-cyclodecadiene, 6-epi-shyobunol, 4-hexylacetophenone, β -isocomene, caryophyllene, β - and α -selinene, α -cadinol, berkheyaradulen (*It's a sesquiterpene hydrocarbon that is detected in many plant species; Chrysanthemum boreale, chamomile oil, and many others,*) and bis-(2-ethylhexyl)phthalate were increased more than 2.5-folds in the Ag-NP compared to the extract. Therefore, the green synthesis of metal nanoparticles might be a safe, effective and affordable nematicide alternatives.

BIOGRAPHY

Atef Mohamed Khedr Nassar finished his BSc. and MSc. degrees at Alexandria University, Egypt and the PhD. degree at McGill University, Canada. He is working as an associate professor of Pesticide Chemistry and Toxicology, at Department of Plant Protection, Faculty of Agriculture, Damanhour University, Egypt. He is involved in studying the adverse effects of pesticides to humans and non-target organisms. In addition, he is trying to find new alternatives to pesticides including nano-formulations of pesticides and natural products to reduce the amount of pesticides applied into the environment. He published many research articles in peer-reviewed and highly impacted scientific journals in the field of pest management and pesticides residue analysis and toxicology.

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