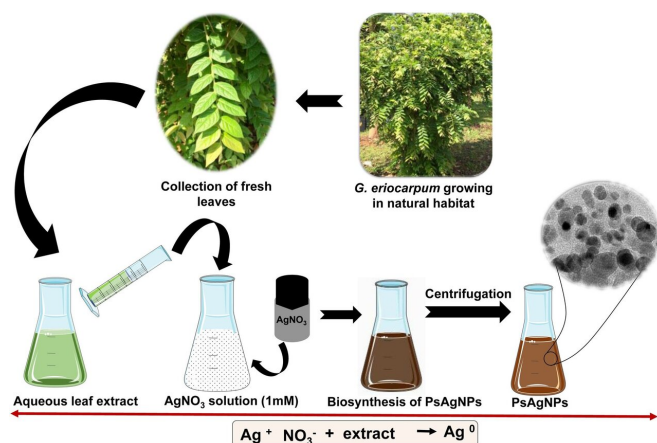


Biosynthesized silver nanoparticles are promising for pest management

25 September 2020, by Zhang Nannan



Green synthesis route of PsAgNPs using aqueous leaf extract of *G. eriocarpum* growing in Xishuangbanna Tropical Botanical Garden. Credit: Sandhya Mishra

In recent years, a green synthesis approach involving plants has gained great attention with the aim of generating environment-friendly nanoparticles encompassing a vast range of applications.

It is obvious from previous reports that very limited efforts have been used to test the efficiency of synthesize silver nanoparticles (AgNPs, but more specifically, biosynthesized AgNPs) against [termites](#), therefore there are significant knowledge gaps about the key role and probable mechanisms of action of AgNPs against termites.

In a study published in *Journal of Hazardous Materials*, researchers from the Xishuangbanna Tropical Botanical Garden (XTBG) provided evidence for the novel future application of biosynthesized silver nanoparticles (PsAgNPs) based nanoformulation for pest management.

The researchers reported the synthesis of AgNPs using leaf extract of *Glochidion eriocarpum*, a

traditional medicinal plant. They provided evidence from laboratory-based experiments showing activities of AgNPs against termites and molecular docking analysis disclosing details of interactions between AgNPs and [digestive enzymes](#).

The choice and no-choice bioassays confirmed strong repellent and antifeedant activity of PsAgNPs. Moreover, PsAgNPs exposure caused visible morphological changes in termites. Molecular docking simulation indicated possible attenuation of endoglucanase and bacteria-origin xylanase, digestive enzymes from termite gut, through partial blocking of the catalytic site by AgNPs.

"Our preliminary study suggests promising potentials of PsAgNPs for pest management in forestry and agriculture sectors to prevent damages to living trees, wood, crops, etc. More extensive research is recommended to elucidate the environmental compatibility of PsAgNPs," said Prof. Yang Xiaodong, principal investigator of the study.

More information: Sandhya Mishra et al. Interaction mechanism of plant-based nanoarchitected materials with digestive enzymes of termites as target for pest control: Evidence from molecular docking simulation and in vitro studies, *Journal of Hazardous Materials* (2020). DOI: [10.1016/j.jhazmat.2020.123840](https://doi.org/10.1016/j.jhazmat.2020.123840)

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