Bright eyes makes better bactericide

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An aqueous extract from the root of Catharanthus roseus, a plant commonly known as bright eyes, can be used as both a reducing agent as well as a capping agent for the synthesis of bactericidal silver nanoparticles, according to research published in the *International*

Journal of Nanoparticles. Researchers from India and The Netherlands reveal details in the latest issue of the journal.

C. roseus goes by several names, the quite whimsical "bright eyes" and the more floral Cape periwinkle, graveyard plant, Madagascar periwinkle, old maid, pink periwinkle, rose periwinkle, and others. It is a member of the dogbane family, or Apocynaceae. The plants in this family can be poisonous to dogs, hence the common name.

A root extract of C. roseus specifically contains a range of bitter, nitrogen-containing alkaloids, flavonoids, carbohydrates, amino acids, and various phenolic compounds. V. Subha of the National Center for Nano Science and Nano Technology at the University of Madras, in Chennai, Tamilnadu, India, and colleagues have exploited this rich chemistry to carry out a biotransformation of silver nitrate solution to generate silver nanoparticles.

The team used UV-visible spectroscopy to investigate the products and found that surface plasmon resonance of the nanoparticles reveals a shallow peak at 490 nanometres, consistent with chemical consistency. X-ray diffraction analysis showed their crystalline nature while transmission electron microscopy showed them to be mono-disperse with a size of about 100 nanometres.

Such biotransformations to generate nanoparticles precludes the need for sophisticated technological solutions and separation techniques. It is not only more cost-efficient but avoids many of the hazardous steps in the synthesis involving toxic solvents and other reagents. Critically, the team's tests of efficacy of these biotransformed silver nanoparticles showed them to be more potent against the likes of Escherichia coli, Pseudomonas aeruginosa, and Bacillus subtilis than silver nanoparticles made by more conventional means.

The team suggests that silver nanoparticles manufactured in this way might have utility in human healthcare against bacterial pathogens. Conversely, they might also be used in some form as alternatives to bactericidal sprays for food crops and other financially important plants.

More information: V. Subha et al. Bactericidal effect of silver nanoparticles from aqueous root extracts of *Catharanthus roseus*, *International Journal of Nanoparticles* (2019). DOI: 10.1504/IJNP.2019.104260

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