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Phytofabrication of silver nanoparticles using indigenous medicinal plants and analysis of their antimicrobial property

Raj Kumari Sanjukta, A Sen, I Shakuntala, Jyoti B Dutta, Jayanti D Roy, Surmani H, Tushar K Dey, Samir Das, K Puro, S Ghatak and B C Das
Indian Council of Agricultural Research Research Complex, India

In the present study, silver nanoparticles were biosynthesized using indigenous medicinal plants of the Northeast India and their antibacterial property were investigated. Plants used for the study were *Houttuynia cordata, Solanum khasianum, Fleminga vestita, Rhododendron spp., Centellia asiatica, Xanthoxylum armatum, Zingiber spp., Curcuma ceasia* and *Curcuma augustifolia.* The anti-oxidant and antibacterial property of the methanolic and hydromethanolic extracts of these plants were analyzed in 96 microtiter plate using DPPH scavenging assay and p-iodonitro- tetrazolium violet dye, respectively. Phytofabrication of silver nitrate solution (1mM) was carried out using these plant extracts by subjecting to magnetic stirrer (45°C) up to 24-72 hrs. The silver nanoparticles formation was initiated after 5 minutes to 2hrs of the reaction. The formation and stability of the reduced silver nanoparticles in the colloidal solution were monitored by UV–Vis spectrophotometer analysis. The initial antibacterial properties analysis was done with silver nitrate as control with agar gel diffusion tests. To determine the antibacterial property of the synthesized nanoparticles microbroth was done in 96 microtiter plate against *E. coli (ATCC 25922), Salmonella Typhimurium (49416), Listeria monocytogenes (Laboratory isolate)* and *Staphylococcus aureus (ATCC 25923).* The optical density of the plate was read at 490nm ((MultiscanGo) at an interval of 1 hr, upto 8 hrs. Antibiofilm assay was also conducted using MTT dye. The surface Plasmon resonance of the synthesized nanoparticles ranged from 420-480 nm. An effective antibacterial property was observed from the phytofabricated silver nanoparticle (1 mg/ml) better than their initial plant extracts (200 mg/ml) alone. Further characterization with Transmission Electron Microscopy (TEM), Scanning Electron Microscope (SEM), Energy Dispersive System (EDS) and Atomic Absorption Spectrophotometer (AAS) will be done. Further studies are needed to fully characterize the toxicity and the antibacterial activity of these particles.

rajkumari.sanjukta@gmail.com