

Green Synthesis of Silver Nanoparticles from *Tectona grandis* Seeds Extract and Formation of Silver Nanoparticles-Alginate Composite Beads

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Abstract—Silver nanoparticles have found eminence applications in various fields due to their activity against many drug resistant pathogens. Green synthesis of nanoparticles is not hazardous and is eco-friendly as compared to chemical synthesis. The present studies for the first time utilizes *Tectona grandis* (teak) seeds extract for reduction of 1mM silver nitrate solution to silver nanoparticles. The method proved to be very simple, cost efficient and convenient. Synthesis of silver nanoparticles was confirmed by visual detection in which the colorless solution gets changed to brown colored solution. Further characterization was done by UV-visible spectroscopy, XRD, FTIR analysis, SEM/EDS. The prepared silver nanoparticles were entrapped in calcium alginate beads to produce Nano Incorporated beads. Adsorption reduction beads were also prepared using in situ reduction of Ag⁺ by seed extract solution. The prepared beads were checked for their antimicrobial activity against *E. coli*, *Pseudomonas aeruginosa*, *Bacillus cereus* and *Bacillus subtilis*.

Keywords: silver nanoparticles, green synthesis, calcium alginate beads, antimicrobial.