

GREEN SYNTHESIS OF HIGHLY STABLE SILVER NANOPARTICLES USING JUSTICIA GENDERUSSA

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ABSTRACT

Bio-inspired, highly stable silver nanoparticles were synthesized through green route by using Methanolic Leaf Extract of *Justicia genderussa* (MLE of JG) leaves as reducing as well as capping agent. Washed leaves, air-dried at room temperature, were coarsely powdered and extracted with absolute methanol for 20 hours. The resulting extract was filtered and the properties of the phyto chemical fraction were analyzed. The total phenols and flavonoids contents and the DPPH scavenging activity of phytochemical fractions were measured. Phytochemical fraction added about 1mg/ml to 1mM of AgNO₃ solution changed from colorless aqueous silver ions (Ag⁺) to yellowish red color. The UV/Vis spectrophotometer exhibits an absorbance peak of 480nm characteristic of silver nanoparticles. Scanning Electron Microscope (SEM) analysis reveals that the biosynthesized silver nanoparticles are predominantly spherical and of 482 nm size. In Dynamic light scattering (DLS)-silver nanoparticles were distributed from 11-20nm with average size of 16nm. X-Ray Diffraction (XRD) patterns revealed the crystalline nature of silver nanoparticles with FCC cubic structure. Fourier Transform Infrared Spectroscopy (FTIR) showed the capping of the Au nanoparticles. Atomic Force Microscope (AFM) micrograph shows size of silver nanoparticle is 10-15 nm. This green route appears to be an eco-friendly, benign and cost effective method of synthesizing silver (Au) nanoparticles that finds biocompatible medical applications.