



## Phytomediated Synthesis of Silver Nanoparticles using *Dicrostachyscinerea* leaf extract and evaluation of its Antibacterial and Photo catalytic activity of Textile dye

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**Abstract:**The biosynthesis of nanoparticles have usual increasing attention due to the growing demand to produce secure, cost-effective and environmentally friendly technologies for nanomaterials synthesis. The acquainted study explains the green synthesis, characterization and their potential effect against harmful bacteria, photo catalytic degradation of dye used in the textile dyeing industry, of silver nanoparticles (AgNps) synthesized by using aqueous leaves extract of *Dicrostachyscinerea* plant. Formation of silver nanoparticles was supervised by UV-Visible Spectroscopy. The biomolecules responsible for the formation of AgNps was confirmed by using Fourier Transform Infrared Spectroscopy. The crystalline structure of synthesized silver nanoparticles from *Dicrostachyscinerea* was identified by using X-ray Diffraction studies. Scanning Electron Microscopy images depicted Nano-sized Particles. The Elemental analysis of AgNps was carried out by Energy Dispersive Spectroscopy. The average size of the particles was calculated by using X-ray diffraction data, and Transmission Electron Microscopy images. The anti bacterial activity of silver nanoparticles was performed by using zone inhibition method and the photocatalytic activity of degradation of textile dye by using sunlight irradiation. The UV-Vis spectroscopy was exhibited exact peak at 406nm and the size of nano particles were identified as 24nm from the X-ray diffraction data and Transmission electron microscopic images. The shape of the nanosized silver nanoparticles was identified as spherical using scanning electron microscopy. The synthesized silver nanoparticles displayed efficient antibacterial activity against gram positive and gram negative bacteria, and it has exhibited photocatalytic activity for degradation of textile dye Green Pls. From the present study it is concluded that the formed silver nanoparticles are stable and showed significant antimicrobial activity, against four different harmful bacteria and also act as silver nanocatalyst for degradation of textile dye Green pls.

**Keywords:** Green biosynthesis, Silver Nanoparticles, *Dicrostachyscinerea*, X-ray diffraction, SEM-EDX, TEM, Antibacterial Activity, Zone inhibition method, Photocatalytic Activity, Green Pls.