

Phytomediated Synthesis and Characterization of Silver Nanoparticles from the Leaf Extracts of *Begonia Malabarica* Lam and its Antimicrobial Activity

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ABSTRACT

Development of biologically inspired phytomediated synthesis of silver nanoparticles is evolving into an important branch of nanobiotechnology. In the present investigation, we report the phytomediated synthesis of silver nanoparticles (AgNPs) employing the leaf extract of *Begonia malabarica* Lam. (Begoniaceae). The synthesized Ag-NPswere characterized by UV-visible, X-ray diffraction (XRD), Fourier-transform infrared (FT-IR), Scanning electron microscopy (SEM), and Energy dispersive X-ray (EDX). Formation of silver nanoparticles was confirmed by the change of colour from pale yellow to dark brown in colour. These results authenticated that the appearance of AgNPs was analyzed by UV-visible spectrum around the peak 420 nm. XRD (X-ray diffractometer) demonstrated the formation of crystalline AgNPs with FCC structure having an average crystalline size of 24 nm from XRD profile. FT-IR analysis revealed the presence of different functional groups in the synthesized AgNPs. Antimicrobial activity of the synthesized silver nanoparticles was evaluated against Gram positive and Gram negative bacteria such as *Bacillus subtilis*, *Staphylococcus aureus*, *Streptococcus faecalis*, *Klebsiellapneumoniae*, *Pseudomonas aeruginosa*, *Escherichia coli* and fungus *Candida albicans*. Both the leaf extract of *Begonia malabarica* and synthesized silver nanoparticles from the leaves of *Begonia malabarica* showed moderate antimicrobial activity.

Keywords: Phytomediated synthesis, characterization, *Begoniamalabarica*, silver nanoparticles, Antimicrobial activity,

Introduction

The growth of nanotechnology is rapid in the areas of research and development that holds tremendous applications for the society, industry and medicine (1). Nanotechnology mainly deals with the formulation of experimental process for the synthesis of nanomaterials using different systems with their wide applications. The use of metal nanoparticles has received extensive attention in present century due to their remarkable properties and wide range of the applications (2). They can be synthesized by several physical, chemical and biological methods (4-6).Use of toxic chemical synthesis greatly limits their biomedical applications