

Abstract 60 – Paper ID: 101**Recent trends in the application of Nanotechnology in pharmaceutical and natural products**Abhishek Pujari¹, Vinutha Asundi¹, Rashmi S.¹¹Department of Biotechnology, Manipal Institute of Technology Bengaluru, Manipal Academy of Higher Education, Karnataka, India

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Abstract

Over the decades it has been observed that pathogenic bacteria are resisting against antibiotics. Through this study, silver nanoparticles have been developed as a promising candidate for antibacterial agents in the medical field. Compared to bulk materials, extremely small sized nanoparticles exhibit different or enhanced properties. While various physical and chemical methods exist for nanoparticle synthesis, there is always a need for developing environmentally friendly synthesis processes. Plant-mediated nanoparticle synthesis is a highly innovative method that surpasses conventional chemical and physical methods, representing a truly green chemistry technology. Large-scale synthesis of this material is environmental friendly, cost effective and easily scalable. Furthermore, this method eliminates the necessity of excessive energy, harmful chemicals and high temperature. In the present study the agar well diffusion method is used to assess the antibacterial activity of Ag nanoparticles by *Polyalthia longifolia* and *Phyllanthus acidus*. Pure culture of *Bacillus subtilis*, *Escherichia coli* and *Staphylococcus aureus* were obtained from the Department of Botany, Manasagangotri, University of Mysore. The change in color of the solution confirms the formation of silver nanoparticles. The formation of metal ions during the exposure of plant extract to AgNO₃ was followed by UV–Vis spectroscopy. The extracts of *Polyalthia longifolia* and *Phyllanthus acidus* leaves were capable of producing Ag nanoparticles extracellularly and they were quite stable in the solution. The stock solution tested against *Escherichia coli*, *Staphylococcus aureus* and *Bacillus subtilis* showed antibacterial activity successfully with a zone of inhibition 16.3 mm, 16 mm and 26 mm respectively. In medical applications of antibacterial activity green synthesis of silver nanoparticle proven to be excellent candidates. Further it can be exploited for disease management strategies.

Keywords: Green synthesis, Antibiotic, *Polyalthia longifolia*, *Phyllanthus acidus*