



ORIGINAL ARTICLE

Mycosynthesis of silver nanoparticles bearing antibacterial activity



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Abstract Mycosynthesis of silver nanoparticles was achieved by endophytic *Colletotrichum* sp. ALF2-6 inhabiting *Andrographis paniculata*. Well dispersed nanoparticles were characterized using UV–Visible spectrometry with maximum absorption conferring at 420 nm. FTIR analysis revealed possible biomolecules reducing the metal salt and stabilization of nanoparticles. XRD analysis depicted the diffraction intensities exhibiting between 20 and 80 °C at 2theta angle thus conferring the crystalline nature of nanoparticles. Morphological characteristic using TEM revealed the polydispersity of nanoparticles with size ranging from 20 to 50 nm. Synthesized nanoparticles exhibited bactericidal activity against selected human pathogens. Nanoparticles mode of action was carried out to reveal DNA damage activity. Thus the present investigation reports facile fabrication of silver nanoparticles from endophytic fungi.

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1. Introduction

Nanotechnology is emerging field of science which involves synthesis and development of materials at nanoscale (Naveen et al., 2010). It has opened new avenues by intersecting with interdisciplinary field of science for innumerable applications (Morones et al., 2005). These nanomaterials are used in various fields such as electronic devices, sensor technology, signal enhancers, optical sensors, biomarkers, magnetic, catalysis, optical polarizability, electrical conductivity, antimicrobialac-

tivity and drug delivery to tumor cells (Nilsson et al., 2007; Duncan, 2011; Costa-Fernandez et al., 2006; Schrand et al., 2008; Naz et al., 2014; Shiraishi and Toshima, 2000; Ning et al., 2008; Sondi and Salopek-Sondi, 2004; Aliosmanoglu and Basaran, 2012; Syed et al., 2013). Hence nanoparticle research has gained tremendous interest especially use of silver nanoparticles has myriad applications in biomedical sector with large number of products already in market such as ointments, dressing materials and packaging materials (Sadowski et al., 2008). Silver nanoparticles are reported to bear antimicrobial property against array of pathogenic microorganisms. Mode of action of silver nanoparticles as per the scientific records suggests that silver nanoparticles have different mode of action for instance they are known to interact with the thiol groups of vital enzyme, cause pit on the cell wall and damage the DNA of the organism (Baker and Satish, 2012b).

In future decades much more applications of silver nanoparticles are expected to be reported but one of the major

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