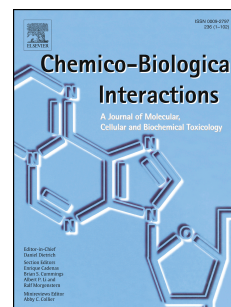


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Mechanism of plant-mediated synthesis of silver nanoparticles – A review on biomolecules involved, characterisation and antibacterial activity

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Mechanism of plant-mediated synthesis of silver nanoparticles – A review on biomolecules involved, characterisation and antibacterial activity

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Abstract

Engineering a reliable and eco-accommodating methodology for the synthesis of metal nanoparticles is a crucial step in the field of nanotechnology. Plant-mediated synthesis of metal nanoparticles has been developed as a substitute to defeat the limitations of conventional synthesis approaches such as physical and chemical methods. Biomolecules, such as proteins, amino acids, enzymes, flavonoids, and terpenoids from several plant extracts have been used as a stabilising and reducing agents for the synthesis of AgNPs. Regardless of an extensive range of biomolecules assistance in the synthesis procedure, researchers are facing a significant challenge to synthesise stable and geometrically controlled AgNPs. In the past decade, several efforts were made to develop Plant-mediated synthesis methods to produce stable, cost effective and eco-friendly AgNPs. More than hundred different plants extract sources for synthesising AgNPs were described in the last decade by several researchers. Most of the reviews were focused on various plant sources for synthesis, various characterization techniques for characteristic analysis, and antibacterial activity against bacterial. There are many reviews are available for the plant-mediated synthesis of AgNPs as well as antibacterial activity of AgNPs but this is the first review article mainly focused on biomolecules of plants and its various parts and operating conditions involved in the synthesis. Apart from, this review includes the characterisation of AgNPs and antibacterial activity of such nanoparticles with size, shape and method used for this study.

Keywords: AgNPs; Plant-mediated synthesis; Characterisation; Antibacterial activity; mechanistic pathway

1. Introduction

Nanotechnology encompasses the designing of materials at nanoscale level to achieve exclusive properties, which can be suitably employed for the required applications[1].

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