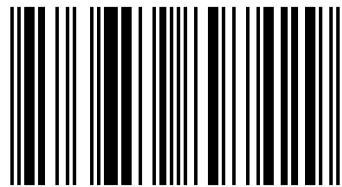


Natural resources should be subjugated in a smart way, which is elemental for the development of a sustainable society. The modern century has been considered the century of biology. Biological elucidations are necessary to build up sustainable solutions to the many global challenges such as depletion of resources, lifestyle diseases, climate changes, food supply etc. Recent years Biotechnology toolbox primarily used for the development of new processes for solving today's needs of energy and raw material supply without further exploitation of the earth's resources, thereby saving resources and preserve nature's balance for future generations. Identifying its strategic significance, many countries are now inventing and executing integrated plans for using biotechnology for industrial regeneration, job creation and social progress.

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Sustainable Biotechnology

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978-3-659-89742-9

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GREEN SYNTHESIS OF SILVER NANOPARTICLES USING FRESH PEAL EXTRACT OF PUNICA GRANATUM AND ITS EFFECT ON SELECTED PATHOGENIC BACTERIA

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Absract

The applications of nanoparticle are tremendous due to its unique properties compared to bulk. In contrast to chemical and physical methods of nanoparticle synthesis, biological methods exhibit several advantages. The present study demonstrates the green synthesis of silver nanoparticles using the fresh peal extract of Punica granatum (Pomegranate). The Pomegranate extract added silver nitrate solution turned to brown colour after 2hours of incubation at 60°C, which is the indication of the nanoparticle formation. The Pomegranate derived silver nanoparticles showed maximum absorbency 3.5 in 418-425nm. This study also demonstrated the effect Pomegranate derived silver nano-particles on S. aureus, P. vulgaris, P. aeruginosa and E. coli. The all test bacteria were resistant to the Pomegranate derived silver nanoparticles.

Keywords: Nanoparticles, Punica granatum, silver, absorbency

Introduction

Nanotechnology is a burning field for the researchers which primarily focused on the design, synthesis and manipulation of structure and size of the particles with dimensions smaller than 100 nm. The applications of nanoparticles are immense due to its unique characteristics such as mechanical, electronic, optical, chemical, magnetic properties (Mukherjee *et al.* 2001 and Kajbafvala *et al.*, 2012) which differ significantly with bulk materials. The metallic nanoparticles such as copper, titanium, magnesium, zinc, gold and alginate have a strong bactericidal activity due to their large surface-area-to-volume ratio (Gu *et al.*, 2003 and Ahmad *et al.*, 2005).

Recently the research on silver nanoparticles has more concerned in applied sciences due to their unique properties like magnetic and optical polarizability, electrical conductivity and antimicrobial activities as compare with other metal nanoparticles (Evanoff Jr *et al.*, 2005). Silver have already been used in industrial

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