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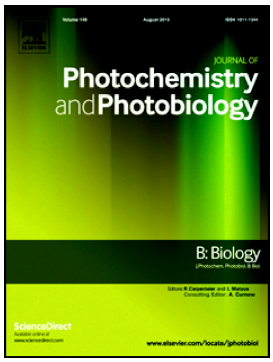

Biogenic synthesis, optical, catalytic, and in vitro antimicrobial potential of Ag-nanoparticles prepared using Plam date fruit extract

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Biogenic synthesis, optical, catalytic, and in vitro antimicrobial potential of Ag-nanoparticles prepared using Palm date fruit extract

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Abstract

Silver nanoparticles (AgNPs) have been synthesized via green route using an aqueous extract of Plam date fruit pericarp extract. The appearance of the yellow color and the surface resonance plasmon (SRP) band at around 400-450 nm in UV-Visible spectroscopy initially reveals the formation of AgNPs. The particle size, crystalline nature, and size distribution was confirmed by scanning electron microscopy (SEM), transmission electron microscopy (TEM), selected area electron diffraction (SAED) ring patterns, energy dispersive X-ray spectroscopy (EDX), dynamic light scattering (DLS) techniques. The particles size ranged ca. 3 nm to 30 nm and are spherical in shape. The microbial activity of biogenic AgNPs was tested on clinical multiple drug resistance Staphylococcus aureus, Escherichia coli and Candida albicans reference strain. Zones of inhibition growth increases with [AgNPs]. The results suggest that the particle tested in this study certainly mediate the inhibition of bacterial and fungus growth. To overcome the serious problems related to environment like discharge of hazardous chemicals to water bodies, AgNPs have been found to be very important in the catalytic degradation of 4-Nitrophenol. The rate of degradation strongly depends on the sun light exposure. Based on the chemical and kinetic studies, an attempt has been made to elucidate the mechanism of AgNPs formation.

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