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Antibacterial Potential and Characterization of Selenium Nanoparticles Synthesized by *Saccharomyces cerevisiae*

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Abstract

Nanometals are special group of materials with broad area of applications. Selenium nanoparticles (SeNPs) are of great importance especially when synthesized biologically with an eco-friendly organism. This study was aimed at characterization and antibacterial activity of Selenium nanoparticles synthesized by *Saccharomyces cerevisiae*. Selenium nanoparticles was synthesized by *S. cerevisiae* filtrate and characterized using Visual detection, UV-Visible spectroscopy, Scanning Electron Microscopy, Transmission Electron Microscopy, Fourier Transform Infrared Spectroscopy, Energy Dispersive X-Ray and X-Ray Diffraction. Antibacterial activities of the synthesized SeNPs were evaluated using agar well diffusion method. Biosynthesis of SeNPs by *S. cerevisiae* filtrate was characterized by a strong plasma resonance peak at 350 nm and had a broad band between 350 – 450 nm. There were colour changes from golden yellow to ruby red. The nanoparticles were spherical and rod like in shape with size ranging from 20 – 100 nm. Hydroxyl, aldehyde, amine and esters groups were responsible for the formation of SeNPs. There were strong signal from Se atom in the nanoparticles and weaker signals from Oxygen. The nanoparticles were crystallographic in nature. The Gram negative bacteria were more susceptible to the SeNPs than the Gram positive bacteria. The biological synthesis of SeNPs with *S. cerevisiae* induces the inhibition of pathogenic organisms.

Key Words: *Nanometals, Biological synthesis, Antibacterial activities, Saccharomyces cerevisiae filtrate, Selenium nanoparticles (SeNPs).*