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Antimicrobial And Biogenic Synthesis Of Selenium Nanoparticles By *Lactobacillus Casei*

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Abstract

Lactic acid bacteria have long been consumed by people in several fermented foods such as dairy products. Selenium has a great potential such as supporting immune system, fertility, antimicrobial and anticancer agent. This study is aimed at characterization, and investigation of the antimicrobial activity of Selenium nanoparticles synthesized by *Lactobacillus casei*. Selenium nanoparticles was biosynthesized using *L. casei* and was characterized using Visual detection, UV-Visible spectrophotometry, Fourier Transform Infra-red spectrophotometry (FTIR), Scanning Electron Microscope (SEM), Transmission Electron Microscope (TEM), Energy Dispersive X-ray (EDX) and X-ray Diffraction (XRD) analysis. The antimicrobial activity of the synthesized selenium nanoparticles using *Lactobacillus casei* (LC-SeNPs) was done using agar well diffusion method. There was a change in colour from light yellow to ruby red. The broad band for LC-SeNPs ranged from 250 - 450 nm and a strong plasmon resonance peak was at 350 nm. Hydroxyl, esters, aldehyde, amine, phenol, and alkyl aryl, ether are present and responsible for the efficient stabilization and bio-reduction. The SeNPs were spherical and aggregated with varying shapes and size ranged from 20 – 100 nm. The XRD reveals that the SeNPs was crystallographic. LC-SeNPs exhibited an effective inhibitory activity ranging from 10 – 25 mm. Also, biosynthesized SeNPs by *L. casei* is ecofriendly, nontoxic and highly applicable in medicine.

Key Words: *Lactobacillus casei, Selenium nanoparticles, Biosynthesis, Zone of inhibition, Energy Dispersive X-ray*