

MICROBIAL SYNTHESIS OF SILVER NANOPARTICLES AND ITS EFFECT ON PLANT GROWTH PROMOTING BACTERIA

Anmol Bhargava, Dipjyoti Chakraborty

Department of Bioscience and Biotechnology, Banasthali Vidyapith, Rajasthan, India

Email id:anmolbhargava1997@gmail.com

cdipjyoti@banasthali.in

Nanotechnology is the science of synthesis of nanomaterials which has gained enormous consideration worldwide because of its various applications such as target drug delivery, biomedicine, environmental remediation, and antimicrobial progress. Globally, the significance and demand for environment-friendly technologies have grown, which has accelerated the advancement of techniques for creating nanoparticles utilizing biological agents. Biogenic synthesis of metal nanoparticles is a more reliable method than any other green synthesis process due to their high growth rate, ease of cultivation, and ability to grow in ambient temperature, pH, and pressure conditions. Silver nanoparticles are the most vital nanomaterials among other metallic nanoparticles due to their unique properties in various fields. The present study shows the microbial synthesis of silver nanoparticles from plant growth-promoting bacteria (PGPR). The synthesized silver nanoparticles were visually confirmed by color change from colorless to reddish brown. Further, synthesized silver nanoparticles were characterized and confirmed by UV-Vis Spectrophotometric analysis showing an absorbance peak at 440nm. Fourier transform infrared spectroscopy (FTIR) analysis confirms the components responsible for the prolonged stability of silver nanoparticles. The external morphology of synthesized silver nanoparticles was tested using the FE-SEM technique. The effect of synthesized silver nanoparticles was tested on the growth curve of plant growth-promoting bacteria using the macro dilution method. It was observed that biogenic silver nanoparticles promote the growth of PGPR. Additionally, it can be a highly effective replacement for traditional and chemical approaches for plant growth promotion.

Keywords; Silver Nanoparticle; Biogenic synthesis, Growth curve