عنوان مقاله:

Assessment of in vitro Antibacterial Efficacy ofPhytosynthesized Selenium Nanoparticles using Polylophiuminvolucratum (Pall.) Boiss. Seeds Extract Against Pathogenic Bacteria

محل انتشار:

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خلاصه مقاله:

Background and Aim : Biosynthesis of nanoparticles is an interdisciplinary application of metalscience and technology through biology. The main reaction of this technique is oxidation orreduction using biomolecules. Biosynthesis of selenium nanoparticles (SeNPs) has gainedsignificant interest due to their distinctive chemical and biological properties that is essential forpotential application in various fields.Methods : In this project the phytosynthesis of selenium nanoparticles using seeds Polylophiuminvolucratum (Pall.) Boiss. extract as a reducing agent by microwave irradiation method and itsantibacterial properties has been reported. Phytosynthesis of selenium nanoparticles wascharacterized by UV-Vis, FT-IR, XRD, TEM, FE-SEM. The antibacterial activity of thesynthesized selenium nanoparticles was tested using both gram positive as well as gram negativebacteria i.e. Staphylococcus aureus and Bacillus cereus respectively.Results : FT-IR spectroscopy revealed that SeNPs were functionalized with biomolecules thathave primary amine group, carbonyl group, OH groups and other stabilizing functional groups. Anabsorption band centered on ۳۳۰ nm was observed, this absorption corresponds to the surfaceplasmon resonance (SPR) of the selenium nanoparticles. The structure and composition ofselenium nanoparticles were analyzed by XRD and showed that the SeNPs are crystalline in nature.The morphological study of selenium nanoparticles using TEM suggests that the nanoparticles arespherical in shape with a diameter ۲۰۰ nm. The synthesized selenium nanoparticles exhibited goodantibacterial potential against gram positive and gram negative bacterial strains.Conclusion : Therefore, in the present project the phytochemical evaluation of Polylophiuminvolucratum (Pall.) Boiss. were found to be a powerful antibacterial agent and this study can becontinued for their structural elucidation and pharmacological activity.

کلمات کلیدی:

Polylophium involucratum (Pall.) Boiss., Bacillus cereus, Se-NPs, SPR, FT-IR,Pharmacological activity.