

عنوان مقاله:

Facile green synthesis of silver doped ZnO nanoparticles using Tridax Procumbens leaf extract and their evaluation of antibacterial activity

محل انتشار:

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خلاصه مقاله:

Silver and zinc oxide are well known for both antimicrobial and pro-healing properties. ZnO is a biocompatible and bio-safe material that possesses photo-oxidizing and photocatalysis impacts on chemical and biological species. ZnO nanomaterials can interact chemically as well as physically to exhibit antibacterial activities. Chemical interactions of the ZnO nanomaterials with bacterial cells lead to the photo-induced production of reactive oxygenated species (ROS), formation of H_2O_2 , and release of Zn^{2+} ions. In contrast, physical interaction can show biocidal effects through cell envelope rupturing, cellular internalization or mechanical damage. Here, we present a green method using Tridax Procumbens leaf extract to synthesize Ag doped ZnO nanoparticles (NPs) to explore the synergistic antibacterial properties of Ag and ZnO nanoparticles against certain gram positive and gram negative bacterial strains. The newly synthesized Ag doped ZnO NPs were characterized by X-ray diffraction (XRD) to study the crystalline structure, composition and purity. Transmission electron microscopy (TEM), Scanning electron microscopy (SEM) and Dynamic Light Scattering (DLS) technique was used to study particle size, shape, and morphology. The XRD and UV studies confirmed the ZnO phase. The absorbance peak around 618 cm^{-1} - 749 cm^{-1} in the FTIR spectrum referred presence of silver. The surface morphological studies also supported the FTIR result. The synthesized sample exhibited enhanced antibacterial activity irrespective of all tested microorganisms than the standard antibiotic used. The maximum size distribution of particle is found to be around 60 nm from the DLS technique.

کلمات کلیدی:

Zinc oxide nanoparticles, Green synthesis, Tridax Procumbens, Antibacterial Study, Gram positive and gram negative bacteria

