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GREEN BIOSYNTHESIS OF ZnO NANOPARTICLES USING AGRO-WASTE AND THEIR ANTIBACTERIAL AND ANTIOXIDANT ACTIVITY

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Metal oxide nanomaterials have gained a lot of attention during last decades due to their potential applications in wastewater treatment, energy storage, sensors, food packaging, etc. To date, these materials have been synthesized by different chemical and physical techniques. However many of them employ environmentally unfriendly solvents and toxic chemical compounds. To tackle this problem, use of renewable biomass such as plants and fungi as reducing or stabilizing agents in green synthesis has been considered as more sustainable option compared to toxic chemical compounds. These biological substances also behave as capping agent, which control the size and the shape of the nanoparticles. In this work, ZnO nanoparticles (NPs) have been prepared *via* simple, low cost and ecofriendly method using citrus fruit peel and extracts, *Agaricus bisporus* powder and extract as biological reducing agents. Zinc nitrate and zinc acetate were used as source of zinc ions. Structural and optical properties were investigated by X-ray diffraction analysis (XRD), Zeta potential, Fourier Transform Infrared (FTIR) spectroscopy, UV-visible (UV-vis) spectroscopy and Photoluminescence spectroscopy (PL). Morphological features were characterized by Field Emission Scanning Electron microscopy (FESEM) and High Resolution Transmission Electron Microscopy (HRTEM). Antibacterial and antioxidant activity was tested and evaluated.

Keywords: ZnO, Green synthesis, Citrus extract, Agaricus bisporus, Antibacterial

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