

Green Synthesis of Silver Nanoparticles from Citrus aurantium Aqueous Pollen Extract and Their Antibacterial Activity

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Abstract : Pollen extract of in vitro plants raised of Citrus aurantium as reducer and stabilizer was assessed for the green synthesis of silver nanoparticles (AgNPs). The synthesis of AgNPs was performed at room temperature assisting in solutions by reduction takes place rapidly for 10 min. Surface plasmon resonance (SPR) peaks in UV-Vis spectra indicated the formation of polydispersive AgNPs. Silver ions concentration, pH, temperature and reaction time were optimized in the synthesis of AgNPs. The nanoparticles obtained were characterized by UV-Vis spectrophotometer, transmission electron microscopy (TEM). X-ray diffraction (XRD) and Fourier transform infrared (FTIR) spectroscopy techniques. The synthesized AgNPs were mostly spherical in shape with an average size of 15 nm. XRD study shows that the AgNPs are crystalline in nature with face-centered cubic (fcc) geometry. It shows the significant antibacterial efficacy against Gram-positive (Staphylococcus aureus) and Gram-negative bacteria (Escherichia coli) by disk diffusion method using Mueller-Hinton Agar.

Keywords : green synthesis, Citrus aurantium, silver nanoparticles, antibacterial activity

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