

Green synthesis of silver nanoparticles using euphorbia confinalis stem extract, characterization and evaluation of antimicrobial activity

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Abstract

Silver nanoparticles were synthesized using *Euphorbia Confinalis* stem extract which is an eco-friendly and cost effective method compared to other synthesis protocols like chemical and physical methods. *Euphorbia Confinalis* which is used traditionally for therapeutic uses was responsible for capping and reducing silver ions to silver nanoparticles. Silver was of a particular interest for this process due to its evocative physical and chemical properties. The silver nanoparticles synthesized were quantified and characterized using visual examination of the color changes, UV-Visible spectroscopy, Scanning Electron Microscopy, Transmission Electron Microscopy, Dynamic Light Scattering and Fourier Transform Infrared spectroscopy. The antimicrobial activity of the synthesized nanoparticles was done by agar disc diffusion method tested against *Escherichia coli* (Gram-Negative) and *Staphylococcus aureus* (Gram-Positive). The synthesis of silver nanoparticles was confirmed by color change of AgNO_3 to reddish brown upon addition of the *Euphorbia Confinalis* stem extract. The UV-Vis spectrum showed broad absorption band at 433nm corresponding to that of Surface Plasmon Resonance of silver nanoparticles. The FTIR analysis showed the presence of aromatic, aliphatic and amines and these observations suggested the presence and binding of organic compounds with silver nanoparticles.