

ABSTRACT

Green synthesis of metallic nanoparticles has become an important research topic, due to its biocompatibility and environment friendly nature. In the present study, biosynthesis of silver nanoparticles was successfully carried out using leave extract of *Litchi chinensis*. Phytochemical screening of leaf extract was performed by standard protocols. Biosynthesized silver nanoparticles were characterized by UV-vis spectroscopy, fourier transforms infrared, X-ray diffraction, energy dispersive spectroscopy and electron microscope. Bio-reduction reaction was confirmed by the surface plasmon resonance of silver nanoparticles at 417 nm through UV-vis spectrophotometer. FTIR analysis revealed that secondary amines and aromatic alkenes present in the photochemicals of leaf extract were responsible for the reduction of silver ions to silver nanoparticles. Crystalline nature of silver nanoparticles was determined by the characteristic peak of x-ray diffraction. The presence of metallic silver atoms was confirmed by energy dispersive analysis. The diameter of silver nanoparticles was noted in the range of 41-55 nm by scanning electron microscopy. Furthermore, human epithelial type 2 cancer cells (HEp-2) were treated with biosynthesized silver nanoparticles using MTT assay. Cell death rate was noted up to 14 % in a dose dependent manner. Antibacterial activity of silver nanoparticles was tested against gram positive *Bacillus subtilis*, *Staphylococcus aureus* and gram negative *Escherichia coli*, *Pseudomonas sp.* by disc diffusion method. It was observed that silver nanoparticles coated on cotton cloths can control the bacterial growth. The study concludes that plant mediated biosynthesis is good alternate for chemical and physical approach. Moreover, biosynthesized silver nanoparticles can be used for medical applications.