

Abstract

The antibiotic resistance is one of the major obstacles that medical science faces today. To tackle this issue, recent exploitation and manipulation of nanoparticles has drawn our attention to develop novel approaches using nanoparticles. In the current study, silver nanoparticles (AgNPs) were synthesized and capped with selected amino acids, such as tyrosine, tryptophan, arginine and glycine. The characterization was performed using UV-vis spectrometry and Fourier transform infrared spectroscopy (FTIR). Antimicrobial activity of these AgNPs and their conjugates were tested against four strains of bacteria, two gram-positive, viz: B. subtilis and S. aureus and two gram-negative, viz: E. coli and P. aeruginosa using disc diffusion method and well diffusion methods. It was found that amino acid capped AgNPs showed enhanced antibacterial activity. Zones of inhibition of amino acid capped silver nanoparticles of tyrosine (8mm and 8.2mm) of tryptophan (9mm and 8 mm) arginine (6.5mm and 6.3mm) and glycine (6mm and 6.7mm) against B. subtilis and S. aureus respectively. It is concluded that conjugated AgNPs of tyrosine and tryptophan showed enhanced antibacterial potential as compared to arginine and glycine.

Keywords: silver nanoparticles, conjugated amino acids, B. subtilis, E. coli, S. aureus, P. aeruginosa