Abstract

There is a continuous decrease in the remedial potential of existing antibiotics due to its unregulated, over and misuse, leading to the emergence of multiple drug resistance (MDR). Clinical efficacies of many synthetic antibiotics have been reduced by bacterial resistance, so, the pharmaceutical industry is looking for some alternative antibacterial agents. In this regard, plant extracts based nanobiomaterials have recently gained popularity as novel bacetricidal compounds for the treatment of various infectious diseases. Keeping in view the critical nature of the issue, current study was conducted to investigate the antibacterial and antioxidant role of natural spice cinnamon conjugated silver nanoparticles (Cn-AgNPs). Cn-AgNPs were synthesized using natural light and characterized using UV spectrometry, SEM, and FTIR. Cn-AgNPs were prepared at different concentrations (4mg/ml and 8mg/ml) and their antibacterial activity was determined by agar well diffusion method. Excellent activity and significant zone of growth inhibition was observed at higher concerntration of Cn-AgNPs 6mg/ml against *P. aeruginosa* (16.67±1.15) and smallest zone of growth inhibition was observed against *A. boumanii* (9.33±1.53). The stability of Cn-AgNPs was analyzed at different temperature and pH. Significant zone of growth inhibition were observed at 85°C against *S. aureus* (11.18 ±0.10). At pH 11 highest zone of inhibition were observed against *B. subtilis* (8.5 ±0.23) and *E. coli* (8.5 ±0.6). The antioxidant potential of Cn-AgNPs was assessed at both (4mg/ml and 6mg/ml) concentration of nanoparticles by DPPH assay. Highest free radical scavenging activity was observed at 6mg/ml (76 ±2.33). It is concluded that Cn-AgNPs have ability to fight against bacteria and scavenge free radicals.