Abstract

Serious economic and environmental damage results from antibiotic resistant bacterial strains causing a threat to public health. In the current study tailored nanoparticles (NPs) capable of enhanced bactericidal potential are synthesized with various sizes and shapes. Chemical reduction method was opted for the synthesis of silver nanoparticles (AgNPs) and silver nanoprisms (AgNPrs), which was later conjugated with clarithromycin. UV-Vis spectroscopic peak was recorded at 415nm for silver nanoparticles and 645 nm for silver nanoprisms. Surface composition and optical properties of the nanoparticles was assessed by Fourier-transformed infrared spectroscopy (FTIR) and photoluminescence spectroscopy (PL). Bactericidal efficacy of these newly synthesized silver nanomaterials in free and conjugated state with clarithromycin was evaluated against *Pseudomonas aeruginosa* (gran-negative) and *Bacillus subtilis* (gram-positive) bacterial strains. Silver nanoparticles, conjugated silver nanoparticles, silver nanoprisms and their conjugates antibacterial activity were recorded, 8-10 mm, 11-15 mm, 12-13 mm and 16-18 mm (Zone of inhibition) respectively for disk diffusion assay. The results of well diffusion method for bactericidal potential silver nanoparticles, conjugated silver nanoparticles, silver nanoprisms and conjugated silver nanoprisms are 9-12 mm, 11-13 mm, 11-13 mm and 15-18 mm respectively. Enhanced antibacterial activity was depicted by clarithromycin conjugated silver nanoprisms (AgNPrs) as compared to silver nanoprisms (AgNPrs) in free state.