ABSTRACT

The therapeutic applications of manganese oxide nanoparticles (MnO-NPs) synthesized using environmental friendly biological approach was studied. The leaf extract was obtained from *Opuntia littoralis Calflora* and potassium permanganate was used as precursor for manganese oxide nanoparticles synthesis. Ultraviolet-Visible spectroscopy (UV-Vis analysis) and Fourier transform infrared spectroscopy (FTIR) were used for the characterization of synthesized nanoparticles while scanning electron microscope was performed to estimate morphological attributes. The FTIR analysis of leaf extract revealed the existence of alcohol, alkanes, carboxylic compounds, amine, and sulfoxide functional groups. The absorption peak at around 546.72 cm^{-1} was indication of MnO-NPs synthesis, while peaks ranging from 3378.96 to 1030.89 cm^{-1} indicated the existence of hydroxyl group, carboxylic compounds, amines, alkanes, amines and sulfoxide of leaf extract as reducing or capping agents. SEM images showed morphology of MnO-NPs as rounded–shaped with average particle size of 78 nm. Antimicrobial activity of manganese oxide nanoparticles was assessed against three different bacterial pathogens i.e., Gram-positive (B. *subtilus)* and Gram-negative (*Klebsiella pneumonia and Acinetobacter baumanii).* The anti-microbial activity of MnO-NPs towards tested strains was analogous to standard drug i.e. Streptomycin. The lowest concentrations of MnO-NPs to inhibit bacterial growth and kill bacterial strains were determined as 110, 66 and 100 mg for *B. subtilus*, *K. pneumonia and A. baumanii* respectively.