# Abstract

The study is aimed on the antimicrobial potential of NiO-nanoparticles (NPs) fabricated employing eco-friendly green synthesis approach. The extract was prepared from leaves of *Opuntia littoralis calflora* and NiO-NPs were synthesized from nickel sulphate precursor. The produced NPs were optically characterized via UV-Visible and Fourier transform infrared (FTIR) spectroscopic techniques however; the structural characteristics were analyzed via Scanning electron microscopy (SEM). The maximum absorption for NiO-NPs solution was seen at 294 nm in the UV-Vis spectrum. The FTIR results of leaf extract validated the existence of – OH groups of carbohydrates, N-H groups of amines, and ionized carboxylate groups ($COO^-$). The sharp peak at 613.50 $cm^{-1}$ in the FTIR spectrum confirmed the formation of NiO-NPs. SEM visuals validated spherical morphology of NiO nanoparticles. The antimicrobial activity of NiONPs was performed against two strains of gram positive bacteria (*B. subtilis* and *S. aureus*) and one strain of gram negative bacteria (*E. coli*). The zones of inhibition obtained against *S. aureus* were 15.5, 17.3, and 20 mm, against *B. subtilis* were 17.5, 20, and 20 mm, and against *E. coli* were 14.5, 15.8, and 17 mm (for 20 µL NiO NPs, 40 µL NiO NPs, and 50 µL Rifampicin, respectively). Hence, the bacterial growth inhibition by NiO-NPs was similar to positive control i.e. Rifampicin. The obtained MIC and MBC values were 1 and 1.5, 1.25 and 1.75, and 1.75 and 2 mg against *B. subtilis*, *S. aureus*, and *E. coli*, respectively.