

Abstract:

The study is dedicated on the anti-microbial application of copper oxide nanoparticles (CuO-NPs) fabricated using eco-friendly biological protocol. CuO-NPs were fabricated from leaf extract of *Opuntia littoralis* and copper sulphate pentahydrate. The characterization of NPs was done through various techniques such as UV-Vis, FTIR and SEM. The synthesized CuO-NPs displayed characteristic peak at 290 nm. The absorption peak around 588.93 cm^{-1} was credited to CuO-NPs. The FTIR spectra of leaf extract revealed the presence of various groups such as hydroxyl, carboxylic compounds, amines, alkanes, amines and sulfoxide in the leaf extract showed the value between $3378.96\text{-}1030.89\text{ cm}^{-1}$. Images from SEM displayed morphology of NPs as spherical shaped with 80 nm as average particles size. Anti-microbial property was evaluated against three bacterial strain including gram-positive (*B. subtilis*) and gram-negative (*K. pneumoniae* and *A. baumannii*) bacteria with inhibition zones 33, 30 and 35 mm, respectively. The activity of NPs was compared to a drug called Ampicillin. The lowest required concentration of NPs to cease the growth of bacteria was determined to be 120, 102, 70, 160, 132 and 135 mg for *B. subtilis*, *K. pneumoniae* and *A. baumannii*. Biologically synthesized CuO-NPs exhibited promising anti-microbial activity compared to Ampicillin.