



ABSTRACT

This research delves into the green synthesis and characterization of nickel oxide nanoparticles (NiO-NPs) derived from Ocimum basilicum (basil) and evaluates their antimicrobial potential against Klebsiella and Escherichia coli bacteria. The study employs a range of analytical techniques, including Ultraviolet-Visible spectroscopy (UV-Vis), Scanning Electron Microscopy (SEM), Fourier Transform Infrared Spectroscopy (FTIR), and antimicrobial assays, to comprehensively examine the physicochemical properties and bioactivity of these nanoparticles. SEM analysis unveils the formation of well-dispersed, spherical NiO-NPs, while FTIR analysis substantiates the presence of bioactive compounds responsible for the reduction of nickel ions. Antimicrobial assays demonstrate the efficacious inhibition of both Klebsiella and Escherichia coli by NiO-NPs. The findings suggest that NiO-NPs synthesized from Ocimum basilicum possess substantial promise for diverse biomedical applications.