

Characterization of Biogenic Silver Nanoparticles by *Salvadora persica* Leaves Extract and its Application Against Some MDR Pathogens *E. Coli* and *S. Aureus*

Authors : Mudawi M. Nour

Abstract : Background: Now a days, the multidisciplinary scientific research conception in the field of nanotechnology has witnessed development with regard to the numerous applications and synthesis of nanomaterials. Objective: The current investigation has been conducted with the main focus on the green synthesis of silver nanoparticles from the leaves of *Salvadora persica* and its antibacterial activity against MDR pathogens *E. coli* and *S. aureus*. Methodology: Silver nanoparticles (AgNPs) were prepared after addition of aqueous extract of *Salvadora persica* leaves. The UV-Vis spectrophotometer, Transmission Electron Microscopy (TEM), zeta potential and Scanning Electron Microscopy (SEM) were employed to detect the particle size and morphology, besides Fourier transform infra-red spectrometer (FTIR) analysis was performed to determine the capping and stabilizing agents in the extract. Antibacterial assay for the biogenic AgNPs was conducted against *E. coli* and *S. aureus*. Results: Color change of the mixture from yellow to dark brown is the first indication to AgNPs formation. Furthermore, 420 nm was the peak value for UV-Vis spectroscopy absorption of the mixture. Besides, TEM and SEM micrographs showed wide variability in the diameter of smaller NPs aggregated together with spherical shapes, and zeta sizer showed about 153.3 nm as an average size of nanoparticles. Microbial suppression was noticed for the tested microorganisms. Furthermore, with the help of FTIR analysis, the biomolecules that act as capping and stabilizing agents of AgNPs are proteins and phenols present in the plant extract. Conclusion: *Salvadora persica* leaves extract act as a reducing and stabilizing agent for the synthesis of AgNPs, keeping its ability to suppress the MDR pathogen.

Keywords : green synthesis, FTIR, MDR pathogen, *salvadora persica*

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020