ABSTRACT

The topic of research work is the "synthesis of silver nanoparticles by the hydrogel of *Asteracantha longifolia* and their biological applications." In this study, the silver nanoparticles are synthesized by the green method, and the effect of salt concentration and hydrogel concentration is observed. In the first method, the salt concentration effect was studied in which different concentrations of salt were prepared and mixed with the constant composition of the gel. In the second method, different concentrations of gel were mixed with the constant composition of the silver nitrate salt. Both methods produced silver nanoparticles and the formation was analyzed by the UV-VIS spectrophotometer. Nanoparticles produced by both methods showed the maximum absorption at their λmax value 430nm. These particles were characterized by FT-IR and SEM techniques. Both techniques showed the presence of fine and good-quality nanoparticles of silver which were stabilized by the hydrogel. Antibacterial and antifungal silver nanoparticles were experimented on the two species of bacteria which were *Escherichia. Coli.* and *staphylococcus aureus.* The former bacteria showed a high inhibition zone and the latter one showed a smaller diametric inhibition zone. The inhibition zone was showed by *Escherichia coli* was 21mm and by *Staphylococcus aureus* was 18mm. the inhibition zone showed by *Aspergillus nigar* was 15mm. the antibacterial and antifungal activity showed by the bacteria and fungus was good and efficient.