Abstract

Metallic nanoparticles are of particular importance in nanotechnology because of their distinct electrical, magnetic, biochemical, and mechanical characteristics. Silver nanoparticles (Ag NPs) were created using the current study's bio-reduction approach. As part of ongoing attempts to create silver nanoparticles (Ag NPs) using green chemistry, we present here a simple bottom-up "green" method for producing Ag NPs by utilizing psyllium gel. FTIR, scanning electron microscopy (SEM), energy dispersive X-ray (EDX) spectroscopy, and UV-Vis spectroscopy was used to characterize the produced Ag NPs. Ag NPs crystallized in a spherical structure and existed in an average diameter of 49-69 nm, according to the results of several characterizations. We have discovered a process for creating anti-microbial products that are economical, simple to use, and cost-effective. Derived or synthesized nanoparticles showed antibacterial efficacy against Gram-positive (*Bacillus subtilis*) and Gram-negative (*Escherichia coli*) bacterial infections. Additionally, the combined effects of several antibiotics and Ag NPs against the above-mentioned bacterial pathogens were assessed. According to the observations, Ag NPs combined with antibiotics have a stronger antibacterial impact than Ag NPs used alone and can thus be utilized to treat infectious disorders brought on by microorganisms.