

Abstract

This present study gives the new green approach for the synthesis of AgNPs by using Pleurospermum candollei seeds. The other mode of synthesis such as physical and chemical methods used, which were establish toxic, expensive and eco-unfriendly. Through using the fresh plant extract synthesis of the AgNPs have taken prominent place in field of research field. The whole reaction was carried in the presence of sunlight until the color of AgNO_3 and extract mixture changed from light yellow to dark brown. All seeds extract and powder sample shows the absence of any organic chromophore which was confirmed through UV-Vis spectroscopy. The UV-Vis analysis was done for AgNPs solution at various interval of time and check the absorbance peak, which gives at 432 nm, which provides the identification of formation of AgNPs. The FTIR analysis gives varies peaks in a range of at 3329, 2972, 1600-1706 and 1036 cm^{-1} that confirmed the occurrence of reducing agents in the sample. The sharp peak exhibited at the 467 cm^{-1} that is due to the Ag-O bond. The SEM analysis revealed silver nanoparticles exhibit in spherical shape. XRD analysis shows face centered cubic lattice. The synthesized AgNPs showed potential wound healing activity, which indicated through histological study of specimen, and showed re-epithelialization, occurred without any tissue loss and the AgNPs act as a potential wound healing agents. The AgNPs showed 17.5, 15.2, and 16.2 and 14.3 mm and the plant extract showed ZOI of 13.2, 10.4, 12.8 and 11.1 ± 0.02 mm against gram-negative E.coli and P.aeruginosa and gram-positive bacteria B.cereus and S.aureus respectively. At the same time, the AgNPs showed antifungal activity and ZOI of 17.5, 15.2, 14.2 and 16.7 ± 0.02 mm against Aspergillus niger, A.terreus, and A.fumigatus and C.albicans respectively. The plant extract also shows ZOI as 9,11,7.8, and 9.8 mm against A.niger, A.terreus, A.fumigatus and C.albicans respectively. It clear from the ZOI value that the AgNPs are more effective against all used fungal strain.

Key Word: Nanoparticles, Silver, Pleurospermum candollei, Antibacterial, antifungal, Antimicrobial, Wound healing