

# Antibacterial Activity of Silver Nanoparticles Prepared using Callus Extract of *Saussurea lappa*

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**Abstract**—Silver nanoparticles were biofabricated using callus extract of mature leaf explant of *Saussurea lappa* regenerated on MS medium supplemented with 2.0 mg/l of 2,4-D + 2.0 mg/l of BAP. The silver nanoparticles were synthesized when aqueous solution of callus was mixed with silver nitrate (1 mM). The change of colour of reaction mixture to blackish brown colour visually confirmed the formation of silver nanoparticles. The nanoparticles were characterized and tested for antibacterial activity using disc diffusion method. UV-Vis spectroscopy showed the sharp band at around 414 nm, FTIR spectrum analysis showed peaks between 1000–2000  $\text{cm}^{-1}$  which confirmed the presence of proteins and other ligands required for the synthesis and stabilization of silver nanoparticles. TEM micrograph confirmed the synthesis of spherical shaped silver nanoparticles in the average size of 11.81 nm. The experiment confirmed that the silver nanoparticles showed the enhanced antibacterial activity as compared with the streptomycin and  $\text{AgNO}_3$  solution with the same concentration showing the comparatively larger zone of inhibition.

**Keywords:** *Saussurea lappa*; Callus; silver nanoparticles.