

## ABSTRACT

This study gives the formation of AgNPs via green synthesis by using the stem, flower, and leaf extract of the plant *Thymus linearis*. Previously, chemical and physical methods were used, which were found toxic, eco-unfriendly, and expensive. By using Plant extract the synthesis of AgNPs have a prominent place in the research field. Here, an aqueous extract of stem, flower, and leaf of *Thymus linearis* was prepared to synthesize Ag metal nanoparticles. The reaction has proceeded in sunlight and the color of the reaction mixture was changed from red to dark brown which indicates the formation of Ag nanoparticles. All plant sample extract stem, leaf, and flower show the absence of organic chromophore confirmed by UV-Vis spectroscopy. UV-Vis analysis was carried out for 3mM, 5mM, and 10 mM solution of AgNPs of leaf, stem, and flower. In flower 3 mM gives no peak but 5mM and 10 mM gives a peak at 405nm and 403nm gives the identification of formation of AgNPs. Similarly, in stem 3mM give an absorption peak at 391nm and 5 mM gives a peak at 402nm gives the identification of the formation of AgNPs. Same case with leaf 3mM and 10 mM giving 425 nm giving the signal for AgNPs formation the sample having a concentration of 5mM gives no signal. FTIR data give two peaks in a range of 1600-1706  $\text{cm}^{-1}$  and 3000-3600  $\text{cm}^{-1}$  confirmed the presence of reducing agents in the sample of the stem, leaf, and flower and showing no significant change in their NPs of different concentrations. Zeta potential results show the negative value which means the NPs are stable. Zeta sizer gives the diameters of Synthesized AgNPs. XRD data shows it have face centered cubic lattice. The Synthesized AgNPs shows good antibacterial activity against gram-negative bacteria.