

## Abstract

A green and facile way was used for the synthesis of AuNPs utilizing various parts (flower, leaf, and stem) of the *Thymus linearis* plant. The morphological, optical, size of NPs, functional groups and crystal structures were characterized by utilizing SEM (scanning electron microscopy), UV–Vis spectrophotometer, size analyzer, Fourier transform infrared spectrophotometer and XRD. The phytochemical analysis was done using GC-MS (gas chromatography-mass spectrometry), tons of bioactive phytochemical constituents were found in methanolic and ethanolic (one & 14 days) extracts of flower, leaf, and stem. Results showed that ethanolic and methanolic extract of stem showed the highest antioxidant activity up to 67.34 and 62.73% while values of flower and leaf extracts (methanol and ethanol) are near 60%. Only the extracts of (methanol and ethanol) flower showed positive antibacterial effects against certain bacteria (*B. subtilis* and *E.coli*). The current study revealed that bioactive compounds present in the extracts of *Thymus linearis* act as bio-reductant in the synthesis of AuNPs, thus paving the route for its effective applications in antibacterial, nano-drug delivery systems and in biomedical, etc.