**ABSTRACT**

The green approach for the synthesis of Ag@Au nanoparticles by solar energy heating is a versatile method in nano–phyto-technology, owing to the incredible factors like reliability, stability, green energy usage, economical, quick process and eco-friendly. The present study has a firm intention to prepare Ag@Au NPs using *Artocarpus heterophyllus* fruit latex (AHL). The crude extract of AHL showed the random presence of bioactive constituents like alkaloids, flavonoids, phenolics, anthraquinones, tannins and proteins in phytochemical screening. These bioagents act as capping and self-reducing agents in the formation and stabilization of nanoparticles. The synthesized bimetallic nanoparticles are analyzed using UV–Visible, FT-IR and FESEM. Morphological analysis reveals spherical Ag@Au NPs of size 15 nm mean particle size. Significant antioxidant activity (73%) is noticed for Ag@Au NPs for a lower dosage of 0.025 mg/mL as compared to crude extract, which has the same efficiency at a higher concentration. This is due to the synergistic effect of latex bioactive components and the noble metal ions in bimetallic nanoparticles on dilution. The Ag@Au NPs shows higher antibacterial activity against G -ive strain *K.pneumonia* and negligible efficiency on all G + ive strains. An amazingly total absence of antibacterial efficiency is found for the crude latex extract. The lower LC50 value and the higher percentage mortality ascertain the cytotoxicity of Ag@Au NPs than fruit latex extract. This study quantitatively proves the superior collective effect of bimetallic nanoparticles and latex bio-constituents.