

ABSTRACT

Firmiana platanifolia, commonly known as Chinese parasol tree, revealed significant therapeutic properties in different studies and also the part of Chinese traditional medicine. The current work was performed to qualitatively and quantitatively analyze the bark extracts in different solvents and then synthesized silver based nanoparticles. Bark samples of *Firmiana platanifolia* was collected from the Botanical Garden of Government College University, Lahore and obtained powder form by the process of nitrogen quenching. Extracts samples was prepared in five different solvents (ethanol, methanol, chloroform, n-hexane, distilled water). These samples was then forwarded for GC-MS of model "GC-MS QP-2010 Shimadzu" and HPLC of model "HPLC LC-20 AT SPD-M20A". UV spectroscopy of these samples were also performed to notify the aromatic contents in each extracts by using Cary 60 UV-Vis spectrophotometer. Phytochemical screening of the extract samples revealed that *Firmiana platanifolia* was naturally enrich source of bioactive compounds such as tannins, saponins, alkaloids, reducing sugars, cardiac glycosides, sterols and triterpenoids and extraction of specific class of compounds greatly varied by the selection of solvent used for extraction. In the second part photo-mediated silver nanoparticles were synthesized from these plant extracts to study how different solvents alter the reaction kinetics, stability and morphology of silver-based nanoparticles. The formation of silver nanoparticles was monitored through UV-Vis spectroscopy. UV-Vis absorbance measurement showed peaks at 445nm, 369nm, 374nm, 417nm and at 430nm to demonstrate the formation of silver-based nanoparticles from the ethanol, methanol, n-hexane and aqueous extract samples respectively. The antioxidant potential of silver-based nanoparticles with their respective plant extract were assessed by the contemporary methods including 2,2-diphenyl-1-picrylhydrazyl (DPPH) assay, 2,2'-azino-bis (3-ethylbenzothiazoline-6-sulfonic acid (ABTS) assay, total phenolic content (TPC) assay and total flavonoid content (TFC) assay. Chloroform extract showed greater DPPH scavenging activity as compared to other extract. While nanoparticles made by methanol extract showed greater DPPH scavenging activity as compared to other samples of nanoparticles. Highest TEAC value during ABTS assay was obtained for n-hexane extracts and silver-based nanoparticles prepared by using n-hexane extract. Methanol and ethanol extract showed significant quantity of TPC and TFC. The antibacterial activity of silver-based nanoparticles were determined by using disc-diffusion method against gram negative *Escherichia coli* and gram positive *Bacillus subtilis* with gentamicin as standard. Silver nanoparticles were more effective against gram negative *E. coli* as compared to gram positive *B. subtilis*. While well-x diffusion method was applied to check the antifungal potential of silver-based nanoparticles synthesized from the aqueous extract of *Firmiana platanifolia* bark against *Aspergillus Niger* using Terbinafine 250mg as standard. No significant results was obtained during antifungal activity. The degradation potential of synthesized silver-based nanoparticles was assessed for methylene blue and methyl orange both in sunlight and UV-lamp. No significant results obtained in UV-lamp for both dyes while after exposure of sunlight better results obtained in photocatalytic degradation of methyl orange.