

ABSTRACT

The current study was conducted to investigate the photochemical constituents, anti-oxidant activity of leaves and stem, and also the anti-inflammatory activity of leaves and stem of *Impatiense grandiflora* and biogenic nanoparticles of copper and zinc. To assess anti-inflammatory activity, five concentrations (1mg/ml, 0.5mg/ml, 0.25mg/ml, 0.125mg/ml and 0.06) of plant extract copper and zinc, as well as indomethacin, was prepared in normal saline. Membrane stabilisation, protein denaturation, and protenase inhibitory assays were used to assess anti-inflammatory activity *in vitro*. Total phenolic content (TPC), 1,1-diphenyl-2-picrylhydrazyl (DPPH) Radical Scavenging Activity, 2,2'-azino-bis-3-ethylbenzthiazoline-6-sulphonic acid (ABTS) , and metal chelating activity were all tested using different protocols. The anti-inflammatory results of leaves were 82.3% in membrane stabilization assay, 73.01% in protenase inhibitory assay, and 65.01% in protein denaturation assay at a concentration of 1mg/ml when compared to biogenic nano-particles and standard drug was indomethacin. The highest total phenolic contents, metal chelating activity, DPPH radical scavenging activity (at 0.01% methanolic solvent fraction), and ABTS shown by stem were 60.67%, 27.52%, 83.73%, and 38.78%, respectively. The highest total phenolic contents, metal chelating activity, DPPH radical scavenging activity (at 0.01% methanolic solvent fraction), and ABTS shown by stem were 60.67%, 27.52%, 83.73%, and 38.78%, respectively. This study concluded that *I.grandiflora* leaf extract has superior anti-inflammatory activity when compared to biogenic nanoparticles. It was also discovered that the stem of *I.grandiflora* could be a rich source of natural anti-oxidants capable of eliminating free radicals and controlling disease-mediated diseases.