

Investigation of anti-inflammatory and antibacterial activities of *Mimosa pigra* L. seed extracts

W. G. A. Anuhas, K. C. Weerasiri*

College of Chemical Sciences, Institute of Chemistry Ceylon, Rajagiriya 10107, Sri Lanka

* kush.weerasiri@gmail.com

The growing trend of antibiotic resistance and adverse side effects associated with synthetic drugs has driven global interest toward plant-derived bioactive compounds for drug development. This study evaluates the anti-inflammatory and antibacterial potential of seed extracts of *Mimosa pigra* L., an invasive species common in tropical regions. The seeds were extracted via sequential maceration using three solvent systems: hexane, ethyl acetate, and methanol. Total phenolic content (TPC) and total flavonoid content (TFC) were examined based on the Folin–Ciocalteu and aluminium chloride colorimetric methods, respectively. Anti-inflammatory activity was assessed using the human red blood cell (HRBC) membrane stabilization assay, and antibacterial activity by agar well diffusion against *Staphylococcus aureus* and *Escherichia coli*. The highest phenolic content was observed in the methanolic extract (62 mg GAE/g), whereas the ethyl acetate extract exhibited the highest flavonoid content (223 mg QE/g). The ethyl acetate extract demonstrated the strongest anti-inflammatory activity ($IC_{50} = 1471$

mg/L), while hexane and methanol extracts showed comparatively lower activity ($IC_{50} = 1698$ mg/L and 1865 mg/L, respectively). In antibacterial assays, the ethyl acetate extract showed the highest activity, with inhibition zone diameters of 16 mm for *S. aureus* and 13 mm for *E. coli*. The hexane extract showed comparatively lower activity (12 mm for *S. aureus* and 10 mm for *E. coli*), while the methanol extract showed no response against both bacterial strains. The enhanced bioactivity of the ethyl acetate extract may be due to its elevated flavonoid content, a group of abundant phytochemicals in the *Mimosa* genus. These findings demonstrate that *Mimosa pigra* seed extracts possess notable biological activities, and continuing studies may support their potential application in natural drug discovery.

Keywords:

Mimosa pigra, Phytochemicals, Anti-inflammatory, Antibacterial