



PHYTOCHEMICAL SCREENING, PROFILING AND EVALUATION OF ANTIOXIDANT AND ANTI-INFLAMMATORY ACTIVITIES OF SELECTED AYURVEDIC MEDICINAL PLANTS USED IN RHEUMATOID ARTHRITIS MEDICATIONS

Senarathna S.C. and Fernando I.R.*

Department of Chemistry, Faculty of Applied Sciences,
University of Sri Jayewardenepura, Sri Lanka
isurika.fernando@sjp.ac.lk

Abstract

Rheumatoid Arthritis (RA) is an inflammatory disorder that mainly affects human's diarthrodial joints of hands and feet. Traditionally, in Ayurvedic medicine, some plant parts including the root of *Boehmeria nivea*, the barks of *Gmelina arborea* and *Oroxylum indicum* are used in the several herbal preparations which are used to treat RA. Therefore, this research was focused on qualitative and quantitative analysis of phytochemicals followed by the determination of antioxidant and anti-inflammatory activities of above-mentioned selected plant parts. Methanol extracts of selected plant parts were prepared using Soxhlet extraction. Qualitative and quantitative analysis of phytochemicals, and evaluation of antioxidant and anti-inflammatory activities were performed using standard methods. Phytochemical screening of three plant extracts confirmed the presence of phytochemicals in different quantities. Among the three plant extracts analysed, bark extract of *Gmelina arborea* demonstrated the highest total alkaloid content of 108.81 ± 0.54 mg caffeine equivalent per 100g of fresh weight of plant materials (FW) whereas *Oroxylum indicum* indicated the highest total flavonoid content of 268.94 ± 12.62 mg catechin equivalent per 100g FW. The root of *Boehmeria nivea* extract indicated the highest total condensed tannin content and total phenolic content of 529.34 ± 30.51 mg catechin equivalent per 100 g FW and 640.34 ± 64.58 mg gallic acid equivalent per 100g FW, respectively. Furthermore, the bark of *Gmelina arborea* indicated the highest antioxidant activity with IC_{50} value of 30.82 ± 2.49 mg L^{-1} and the highest anti-inflammatory activity with IC_{50} value of 119.44 ± 0.25 $\mu g mL^{-1}$. Ascorbic acid and diclofenac sodium were used as reference compounds for the evaluation of antioxidant and anti-inflammatory activities, respectively. The results of the study showed that potent phytochemical contents together with antioxidant- and anti-inflammatory activities in the plant extracts could be used to explore new drugs to treat RA.

Keywords: Anti-inflammatory, Phytochemicals, *Gmelina arborea*, *Boehmeria nivea*, *Oroxylum indicum*