

BIOACTIVITY STUDIES OF SOME PLANTS USED IN TRADITIONAL MEDICINE FOR TREATMENTS OF ASTHMA IN SRI LANKA

K.P.W.B.S.B. Karunathilaka

Post Graduate Institute of Science, University of Peradeniya, Sri Lanka
Department of Chemistry, Faculty of Science, University of Peradeniya

Scientific information on medicinal plants can be used to optimise the therapeutic efficiency and competitiveness of their extracts in the fields of medicine and pharmacy. This research project was undertaken to investigate some pharmacological properties of five medicinal plants that are used in ethnobotanical treatments for Asthma in Ayurvedic medicine: *Acanthus ilicifolius* (Sinhala Name: Katu Ikili), *Euphorbia hirta* (Dadakiriya), *Pogostemon heyneanus* (Kolankola), *Phyllanthus reticulatus* (Wel Kaila), and *Pothos scandens* (Pota Wel). Parts of each plant used in treatments for Asthma were air dried, powdered and then sequentially extracted into hexane, ethyl acetate and methanol.

Since oxidant stress is an important pathogenic factor in the progress of Asthma disease, *in vitro* antioxidant activities (AOA) of above plants were screened using a DPPH radical scavenging assay. The methanol extract of *P. reticulatus* showed the highest AOA at IC₅₀- 8.71 ppm, which was higher than the 13.46 ppm IC₅₀ value obtained for the positive control α -tocopherol. The methanol extract of *P. heyneanus* also showed significant AOA at IC₅₀-14.09 ppm, closely approaching the AOA level of α -tocopherol.

A preliminary phytochemical screening was carried out to determine total polyphenol content as the Gallic Acid Equivalent (GAE) using the Folin-Ciocalteu method. The methanol extract of *P. reticulatus* showed the highest polyphenol content at 0.311g (GAE) per 1 g of crude extract. It is important to note that the AOA% and total polyphenol content of the methanol extract of *P. reticulatus* showed the highest values in both experiments.

All fifteen extracts were further subjected to a brine shrimp (*Artemia salina*) lethality assay to determine lethal concentrations. The ethyl acetate extract of *P. reticulatus* was the most active (toxic) plant extract. It showed a highly toxic LC₅₀ value of 22.81 ppm, which was greater than the LC₅₀ value of 39.62 ppm obtained from the positive control Potassium Dichromate. The hexane extract of *P. reticulatus* was also highly toxic with an LC₅₀ result closer to the positive control at 44.95 ppm. All other extracts showed toxicity values below that of potassium dichromate.

Preliminary antimicrobial susceptibility was tested against three bacterial strains and one fungal strain. For all fifteen plant extracts, a cut-well agar diffusion method was utilized on *Escherichia coli*, and an agar disk diffusion method was utilized on *E. coli*, *Staphylococcus aureus*, methicillin resistant *S. aureus* (MRSA) and *Candida albicans*. Ethyl acetate and methanol extracts of *E. hirta*, hexane and ethyl acetate extracts of *P. heyneanus*, and the methanol extract of *P. reticulatus* were active against both gram positive *S. aureus* and gram negative *E. coli* bacteria. Only the hexane and the ethyl acetate extracts of *P. scandens* were active against MRSA bacteria. Most of the plant extracts tested were active on the *C. albicans* fungus.