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Comparative Study of Antimicrobial, Antioxidant and Physicochemical Properties of Four Culinary Herbs Grown in Sri Lanka

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Abstract : Culinary herbs have long been considered as significant dietary sources of many potential health-promoting compounds. The present research focused on analysis of antimicrobial, antioxidant and physicochemical properties in selected four culinary herbs namely Murraya koenigii (Curry leaves), Pandanus amaryllifolius (Pandan leaves), Cymbopogon citrates (Lemon grass leaves), and Mentha Piperita (Minchi leaves) obtained from several market sites in Ratnapura District, Sri Lanka. The antimicrobial activity of ethanolic, chloroform and distilled water extracts of culinary herbs were evaluated against the strains of Staphylococcus aureus, Salmonella typhi and Shigella spp. Total phenolic content and the radical scavenging activity (using DPPH assay) of culinary herbs were determined. Four heavy metals (Cu, Cd, Pb and Fe) were analyzed in the selected culinary herbs using the atomic absorption spectroscopy (AAS). Proximate compositions of the selected herbs were analyzed using AOAC official methods. Antimicrobial activity of all selected culinary herbs showed relativity high inhibition zones against S. aureus. Pandan leaves showed the least antimicrobial activity against selected bacterial strains compared with other culinary herbs. Both the highest radical scavenging activity (lower IC50 value) and the total phenolic content (25.57 ±3.54µg GAE/100g) were reported in Mentha piperita extract. The highest concentrations of Cu, Fe and Cd were reported in Curry leaves (29.15 mg/kg), Lemon grass leaves (257.98 mg/kg) and Pandan leaves (6.05 mg/kg) respectively. The heavy metal contents detected in all culinary herbs were below the permitted limits set by WHO/FAO, except Cd. The highest moisture (85.00±0.00%) and fiber (10.66± 2.00%) contents were found in Pandan leaves, while the highest protein (8.94±0.29%), fat (12.3± 2.52%) and ash (3.50± 0.17%) contents were reported in curry leaves. The information obtained from this study highlights the importance of further investigation of other antioxidant, antimicrobial and health promoting compounds of culinary herbs available in Sri Lanka for a detailed comparison.

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