

Nutraceutical properties of *Garcinia zeylanica* fruit rinds and leaves

L. M. O. D. K Lansakara and B. M. Jayawardena*

Department of Chemistry, Faculty of Science, University of Kelaniya, Sri Lanka

*Email: bimali@kln.ac.lk

Garcinia L. (Family Clusiaceae) is a large genus distributed mainly in tropical evergreen areas of South-east Asia and Africa. It consists of about 180 species, of which ten species are observed in Sri Lanka including five endemic species. There is an interest on the endemic species *Garcinia zeylanica* as it can be used in indigenous medicine to treat type 2-diabetes and obesity. Among diverse therapeutic strategies, gastrointestinal alpha-glucosidase and alpha-amylase inhibitors are widely used in the treatment of patients with type 2-diabetes as they are enzymes involved in carbohydrate metabolism. In the search for alternative powerful less toxic enzyme inhibitors, analysis of the secondary metabolites from plants plays an appreciable role. In the past few years, various species of *Garcinia* has been studied thoroughly due to their anti-cancer, anti-HIV, anti-inflammatory, anti-bacterial, anti-acne, and neurotropic activities *etc.* The aim of the current study was to evaluate several bioactivity parameters including qualitative and quantitative measurement of total titratable acidity, total free hydroxy citric acid (HCA), total polyphenolic content, total flavonoid content and *in vitro* antioxidant potential by reducing potential of *G. zeylanica* fruit rinds and leaf extracts. *In vitro* antidiabetic potential was evaluated through alpha amylase and alpha glucosidase inhibitory activities.

Aqueous, ethanolic and methanolic extracts of dried fruit rinds were obtained by Simple distillation, Soxhlet distillation, Pressure method and Microwave digestion method in order to determine the most efficient extraction method by evaluating total acidity by titration. Refluxing for 6 hours at 60°C with 90% Ethanol was identified as the most efficient method. Total titratable acidity observed for fruit rinds (25.65% \pm 0.29 w/w as HCA eq.) was higher than leaves (18.37% \pm 0.29 w/w as HCA eq.). According to HPLC analysis free HCA concentration in fruit pericarp was 92 μ g/mL and 35 μ g/mL in leaves. Each sample was tested for total polyphenols, total flavonoids, reducing power and inhibitory potential against alpha amylase and alpha glucosidase. Total polyphenolic content was higher for leaves (11.28 \pm 1.04 mg/GAE g) than fruit pericarp (8.25 \pm 1.07 mg/GAE g) and higher flavonoid content was also observed for leaves (9.84 \pm 1.71 mg/ QE g) than fruit pericarp (4.29 \pm 1.96 mg/QE g). Highest reducing potential was observed for leaves (80.01 \pm 0.89 %) indicating higher antioxidant activity. According to IC₅₀ values higher inhibitory potential against alpha amylase (1.88 μ g/ml) and alpha glucosidase (5.40 μ g/ml) is also observed for *G. zeylanica* leaves. Hence, the results of this study suggest that the selected species has a considerable bioactivity including *in vitro* antioxidant activity, inhibitory potentials against alpha amylase and alpha glucosidase enzymes which play a major role in humans controlling metabolic disorders, mainly type 2-diabetes.

Keywords: α -amylase, α -glucosidase, *Garcinia zeylanica*, Hydroxycitric acid