

PP 14

***In-vitro* Investigations on Antioxidant and Anti-diabetic Activities of Selected Medicinal Plants in Sri Lanka**

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Background: Scientific investigations of biological activities of plant extracts are important to develop formulations for diabetes mellitus as it is a major health concern in the world. Therefore, it is beneficial to investigate the antioxidant and anti-diabetic activities of medicinal plants which were less evaluated for their anti-diabetic activities.

Objectives: To evaluate *in-vitro* antioxidant activities, Total Phenolic Content (TPC) and anti-diabetic activities of the fruits of *Garcinia* sp. and *Bunchosia armeniaca*, leaves of *Plectranthus zatarhendi*, roots of *Hibiscus furcatus* and seeds of *Gossypium* sp.

Methods: Plant parts which were collected from the field or from grown pots in Sri Lanka were forwarded for plant authentication at the National Herbarium, Peradeniya Botanical Gardens, Sri Lanka. Series of different concentrations of aqueous (AE) and 1:1 dichloromethane: methanol [organic (OE)] extracts of plants were subjected to estimation of TPC using Folin-Ciocalteu reagent method, antioxidant activity by 2,2-diphenyl-1-picrylhydrazyl (DPPH) assay, carbohydrate digesting enzyme inhibitory activity assays. Data were analysed using GraphPad prism 8.4.2. (679) version software and results were expressed as simple descriptive statistics.

Results: *Garcinia* sp. OE showed the highest DPPH inhibition (IC_{50} , 0.12 ± 0.0 mg/mL) followed by AE of *P. zatarhendi* and OE of *P. zatarhendi*. The highest TPC was found in the AE of *P. zatarhendi* (2.43 mg GAE/g) followed by OE of *P. zatarhendi* and OE of *Garcinia* sp. OE of *Garcinia* sp. showed the highest α -amylase and α -glucosidase enzymes inhibitory activities with IC_{50} , 1.99 ± 0.0 mg/mL and 1.76 ± 0.0 mg/mL, respectively. All other selected plant extracts showed less carbohydrate digesting enzyme inhibitory activities ($IC_{50} > 5$ mg/mL). The acarbose showed IC_{50} , 0.19 ± 0.0 mg/mL and 0.01 ± 0.0 μ g/mL against α -amylase and α -glucosidase enzymes, respectively.

Conclusions: It is concluded that the OE extracts of *Garcinia* sp. showed the highest *in-vitro* antioxidant and anti-diabetic activities. However, the highest TPC was observed with the AE of *P. zatarhendi*.

Keywords: *Anti-diabetic, Antioxidant, Garcinia sp., Total Phenolic Content*

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