

Comparative analysis of the main plant components of Megha Vac Recovery and Megha Primal Intake for their antidiabetic and antioxidant potential

A. C. H. Elaphatha¹, N. Jayathilaka¹, K. N. Seneviratne¹, U. S. Gunawardhana²,

M. D. J. Abeygunawardena², N. Gunawardhana², P. A. Paranagama^{1*}

¹Department of Chemistry, Faculty of Science, University of Kelaniya, Sri Lanka

²Meghal Palace (Pvt) Ltd, 37th Floor, West Tower, World Trade Centre, Colombo 01, Sri Lanka

*priyani@kln.ac.lk

Megha Vac Recovery (MVR) and Megha Primal Intake (MPI) food supplements contain several plant components, including Ginger (*Zingiber officinale*), Garlic (*Allium sativum*), Coriander (*Coriandrum sativum*), Sweet Flag (*Acorus calamus*), Malabar Nut (*Justicia adhatoda*), Holy Basil (*Ocimum sanctum*), and Cocoa (*Theobroma cacao*), with cocoa included only in MVR. This study aims to evaluate the contributions of these individual plants to the supplements' antioxidant and antidiabetic properties. Water (WE) and ethanol extracts (EE) of the plants were analyzed for phytochemical content, antioxidant, and antidiabetic activities. All experiments were performed in triplicate, and one-way analysis of variance (ANOVA) was used for statistical significance. Among the plants, cocoa showed the highest ($p < 0.05$) phenolic content, with 5.96 ± 0.19 mg/g (gallic acid equivalents, GAE) in WE and 7.28 ± 0.26 mg/g GAE in EE. Other plants had comparatively lower phenolics, and similar patterns were observed for flavonoid and condensed tannin levels. In antioxidant tests, WE of sweet flag, ginger, and cocoa had IC_{50} below 5 μ g/mL in the DPPH (2,2-diphenyl-1-picrylhydrazyl) assay, slightly higher than the positive control, ascorbic acid (3.38 ± 0.11 μ g/mL), indicating strong antioxidant potential. In the ABTS (2,2'-azino-bis (3-ethylbenzothiazoline-6-sulfonic acid)) assay, all plants showed less than 40%

inhibition of ABTS radicals at 1 mg/mL concentration. Regarding antidiabetic activity, WE of all plants showed higher IC_{50} values for α -amylase inhibition compared to acarbose (17.18 ± 0.26 μ g/mL). However, EE of cocoa, garlic, and holy basil had IC_{50} values of 8.16 ± 0.38 μ g/mL, 13.18 ± 0.68 μ g/mL, and 16.62 ± 1.52 μ g/mL, respectively, demonstrating stronger α -amylase inhibitory effects. Except for EE of sweet flag, garlic, and WE of cocoa, others exhibited stronger α -glucosidase inhibition than acarbose (153.48 ± 3.81 μ g/mL). These findings show that Cocoa exhibited the highest phytochemical content among all plants studied. Overall, these plant components displayed moderate antioxidant activity and notable antidiabetic potential, contributing to the effectiveness of the food supplements.

Keywords:

Antidiabetic activity; Antioxidant activity; Plants; Supplements

Acknowledgement:

This research is funded by Meghal Palace (Pvt) Ltd, Colombo, Sri Lanka.