



ALPHA AMYLASE AND ALPHA GLUCOSIDASE INHIBITORY ACTIVITY OF SELECTED PLANT EXTRACTS

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Type 2 diabetes is an endocrine and metabolic disease defined by elevated blood glucose level (hyperglycemia). Current studies have revealed that phenolic and flavonoids present in plants can inhibit key enzymes such as alpha glucosidase and alpha amylase which are linked to hyperglycemia. Therefore the purpose of this study was to determine the inhibitory potential against alpha glucosidase and alpha amylase by leaves of *Tricosanthes dioica* (Padwal), *Moringa oleifera* (Murunga), *Costus speciosus* (Thebu), and fruits of *Averrhoa carambola* (Kamaranga). Plant materials were dried, powdered and refluxed with 75% ethanol and fractionated with ethyl acetate. Finally obtained 75% ethanol extract, ethyl acetate and aqueous layers. Each layer was tested for the total phenolic content and expressed as Gallic acid equivalence. The percentage reducing activity was measured with FRAP assay, using BHT as the positive control. Finally IC₅₀ values of alpha amylase and alpha glucosidase inhibition activities were determined using biochemical assays. Among four plants *T. dioica* 75% ethanol extract (51 mg/g) has the highest amount of phenolic content and the ethyl acetate layer of *C. speciosus* (3 mg/g) has the lowest. The highest reducing power was shown by *A. carambola* 75% ethanol extract (711). The lowest value was in *C. speciosus* (146) ethyl acetate layer. Most samples showed higher reducing power compared with standard BHT (317). In determination of IC₅₀ value of alpha amylase, ethyl acetate layer of *A. carambola* (57 µg/g) showed the lowest value and the highest IC₅₀ value was obtained for *T. dioica* aqueous layer (1227 µg/g). The lowest IC₅₀ value of alpha glucosidase was in *M. oleifera* (281 ng/g) aqueous layer and the highest value was for the ethyl acetate extract *T. dioica* ($9.08 \times 10^5 \pm 1.11 \times 10^4$ ng/g). Considerable inhibitory potential against alpha glucosidase was not shown by *T. dioica*, aqueous layer. In the present study the selected plant materials have high phenolic contents and percentage reducing power. It also revealed excellent inhibitory potential against alpha glucosidase and alpha amylase in vitro.

Keywords: *post prandial, glucosidase, amylase, blood sugar*