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In Vitro α-Amylase and Glucosidase Inhibitory Activity of Extracts of *Myristica fragrans* Seeds

H.M.D.C. Herath[a,c], L. Jayasinghe[b] and W.I.T. Fernando[a]

[a]*Department of Biochemistry, Faculty of Medicine, University of Peradeniya, Peradeniya,Sri Lanka ;* [b] *Natural Products Chemistry, National Institute of Fundamental Studies, Kandy,Sri Lanka;* [c]*Post graduate Institute of Science, University of Peradeniya, Sri Lanka (irushikawit@yahoo.com)*

Inhibition of carbohydrate hydrolyzing enzymes such as α-glucosidase and pancreatic α-amylase is a therapeutic approach for delaying carbohydrate digestion, resulting in reduced postprandial hyperglycemia (PPHG) which is critical for the management of diabetes mellitus. This study was conducted to evaluate α-amylase and glucosidase inhibitory activity of extracts of *Myristica fragrans* seeds.

Dried, ground seeds of *M. fragrans* were extracted sequentially with hexane, EtOAc and MeOH using an ultra sonicator. Extracts at 1 mg/ml concentration were subjected to non-pre-incubation amylase inhibitory assay using starch as the substrate, dinitrosalysilic acid as chromogen and porcine pancreatic α-amylase and to non-pre-incubation glucosidase inhibition assay using 4-nitrophenyl α-D-glucopyranoside as substrate and α-glucosidase from *Saccharomyces cerevisiae.* All extracts studied exhibited amylase and glucosidase inhibitory activity in varying degrees with MeOH extract having the highest α-amylase activity of 54.0%. The hexane and EtOAc extracts had low amylase inhibitory activities of 12.4 and 7.30% respectively. The IC_{50} value for amylase inhibition by MeOH extract was 1.03 mg/ml compared with acarbose (0.008mg/ml). The MeOH extract also showed the highest glucosidase inhibitory activity at 90.9% followed by the EtOAc extract at 71.7%. The activity of the hexane extract was very low at 41.0%. The MeOH extract had an IC_{50} of 8.45μg/ml compared with acarbose (3.51 μg/ml).

The mild amylase inhibition and a strong glucosidase inhibition shown by the methanol extract of *M. fragrans* suggests that its seeds could be a good natural source of glucosidase inhibitor/s and its use as a food additive could be beneficial in the management of diabetic and pre-diabetic patients.