

α -Glucosidase Inhibitors from Mace (*Myristica fragrans*)

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Diabetes mellitus (DM) is a non-communicable chronic metabolic syndrome and a growing health problem throughout the world. DM is characterized by hyperglycemia which results from defects in insulin secretion, insulin resistance or both. Alzheimer's disease (AD) is the most common type of dementia among elderly population. Recent studies have shown patients with AD have reduced expression of insulin and neuronal insulin receptors. Currently available therapies for DM include administration of insulin and various oral antidiabetic agents, such as metformin, α -glucosidase inhibitors. Spices have a long history of both culinary use and of providing health benefits. Present study is focused on investigating α -glucosidase inhibitory activity of mace (*Myristica fragrans*) a spice used in Sri Lankan cuisine.

Dry, powdered fruit aril of *M. fragrans* was extracted with *n*-hexane, dichloromethane, ethyl acetate and methanol which were screened for anticholinesterase activity *in vitro* using slight modifications to Ellman's method. Ethyl acetate and methanol extracts showed the highest inhibition and they were combined and chromatographed over silica and Sephadex LH-20 to afford six compounds; malabaricone C (1), 3'-methyl-5'-pentyl-furylarylic acid (2), a fatty acid (3), licarin A (4), elemicin (5) and 5'-methoxylicarin B (6). Compounds 1- 6 were screened for anticholinesterase and α -glucosidase inhibitory activity. Compound 1 exhibited the highest anticholinesterase activity with IC₅₀ of 2.08±0.10 ppm and α -glucosidase inhibitory activity of 27% (at 100 ppm). Compounds 2 and 3 showed α -glucosidase inhibitory activity of IC₅₀ 51.02±0.01 ppm and 46.74±0.01ppm respectively (IC₅₀ of the positive control acarbose was 265.3±0.13 ppm), while anticholinesterase activity of compounds 2 and 3 were 14.09% and 27.72% (at 100 ppm) respectively. In conclusion the compounds 1, 2 & 3 have potential to be used as source of antidiabetic agents and anticholinesterases.