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Isolation and identification of lipase inhibitors from *Trigonella foenum-graecum* seeds

W.I.T. Fernanado[1*], L. Jayasinghe[2], H. Araya[3], Y. Fujimoto[2, 3], A.M.K.C. Attanayake[1], H.K.I. Perera[1] and R. Sivakenesan[1]

[1]Department of Biochemistry, University of Peradeniya, Sri Lanka, [2]National Institute of Fundamental Studies, Kandy, Sri Lanka, [3]School of Agriculture, Meiji University, Kawasaki, Japan
[*]irushikawit@yahoo.com

The use of spices as food additives has been practiced widely since ancient times. Apart from enhancing the taste and flavor of food, spices have been widely believed to exert medicinal properties. Obesity has become a worldwide health problem and identification of plant materials and their compounds as natural anti-obesity agents has become a need. The present study describes the detailed bioassay guided fractionation for the crude methanol extract of *Trigonella foenum-graecum*, in search of lipase inhibitors as anti-obesity agents.

During our previous studies methanol extract of *Trigonella foenum-graecum* showed the highest lipase inhibitory activity. Therefore, it was subjected to solvent-solvent partitioning using hexane, ethyl acetate, methanol and water. Identification and quantification of lipase inhibitory activity in the fractions was accomplished using DMPTB as the substrate and porcine pancreatic lipase as the enzyme. Water fraction was having the highest lipase inhibitory activity and chromatographic separation of water fraction over combination of chromatography over sephadex LH-20, reverse phase silica and reverse phase HPLC furnished two compounds as Compound 1 and 2.

All the fractions (*n*-hexane, ethyl acetate, methanol and aqueous fractions) had inhibitory effects on the lipase activity and the highest inhibitory potency was observed for the aqueous fraction of *Trigonella foenum-graecum* (70.11%).Quantitative analysis of lipase inhibitory activity revealed that compound 1 (60.27%) and 2 (33.77%) to have inhibition of the lipase enzyme. Subsequently compound 1 was identified as vicenin1 (apigenin 6-C-xylosyl-8-C-glucosyl) and compound 2 as isoschaftoside (apigenin 6-C-α-L-arabinopyranosyl-8-C-β-D-glucopyranoside) by detail analysis of NMR and MS studies. This study has identified two lipase inhibitors from *T. foenum-graecum* seeds by bioassay guided purification. Vicenin 1 and isoschaftoside could be considered as moderate lipase inhibitors. This is the first isolation and identification of lipase inhibitors from *T. foenum-graecum* seeds.

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