

Abstract No: 126

Physical Sciences

IN-VITRO ANTI-OBESITY ACTIVITY OF A POLY-HERBAL MIXTURE USED IN SRI LANKAN TRADITIONAL MEDICINE

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Obesity is announced as an epidemic in the 21st century by the World Health Organization (WHO). The prevalence of obesity has much concern because of its relationship with other noncommunicable diseases in the body. People tend to use synthetic drugs (mainly statins) to prevent obesity because of their quick response. However, due to the side effects associated with these drugs, attention towards natural remedies has increased as they can be more effective with fewer side effects. This study aimed to determine the pancreatic lipase inhibitory activity of a poly-herbal mixture comprised of leaves of *Murraya koenigii* (Curry Leaves), cloves of *Allium sativum* (Garlic), dried rinds of *Garcinia quaesita* (Rath Goraka), and seeds of *Piper nigrum* (Black Pepper), which have been showing well promising anti-diabetic effects and with the poorly explained anti-obese effect. Collected, authenticated, and dried plant parts were mixed in different ratios (1:1:1:1, and each component doubled and tripled separately). Solvent extraction was performed using water, acetone 1:1, and water: acetone 1:9 solvent systems. The anti-obesity effects of the plant extracts were observed using the *in-vitro* pancreatic lipase enzyme inhibitory assay, and the IC₅₀ values were calculated. Orlistat drug shows the least IC₅₀ value ($4.25 \pm 1.95 \text{ mg mL}^{-1}$) as the positive control. It was observed that there was no significant difference ($p > 0.05$) between IC₅₀ values obtained from the plant extracts prepared by water: acetone 1:9 solvent system when *M. koenigii* ($35.11 \pm 4.55 \text{ mg mL}^{-1}$), *P. nigrum* ($45.79 \pm 4.83 \text{ mg mL}^{-1}$), and *G. quaesita* ($68.17 \pm 4.18 \text{ mg mL}^{-1}$) component is doubled separately compared to Orlistat. Similar results were obtained only for the water: acetone (1:1) extract when the *G. quaesita* ($44.21 \pm 6.15 \text{ mg mL}^{-1}$) component is doubled. Obtained IC₅₀ values were significantly higher for individual plant extracts and plant mixture prepared using a 1:1:1:1 component ratio and also with a further increment of plant species separately in the polyherbal mixture compared to the positive control. According to the above empirical data, it can be concluded that the maximum inhibitory activity of the polyherbal mixture could be obtained when the correct ratio of each plant part and the solvents are used.

Financial assistance from the National Research Council. (Grant No. NRC-TO-2019) is acknowledged.

Keywords: Anti-obese, Inhibition, Orlistat, Pancreatic lipase, Poly-herbal mixture