

Exploring *in vitro* antioxidant and anti-inflammatory activities of fresh fruit of *Garcinia quaesita*

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Garcinia quaesita which is locally referred to as “Rath Goraka”, is an endemic species growing wild in the wet and intermediate zones of Sri Lanka. This species has been in use for a long period of time in Sri Lankan traditional medicine to treat various disease conditions. Decoctions of the fruit rind are used for rheumatism, wounds and swelling. Dried fruit rind has been used as a condiment in Sri Lankan cuisine. In this study, we primarily investigated the total phenolic content (TPC), total flavonoid content (TFC), *in vitro* antioxidant and anti-inflammatory activities of aqueous ethanol (1:1) extract of freshy fruit of *Garcinia quaesita*. Results showed that the extract contained a TPC of 3053.25 (± 30.07) $\mu\text{g GAE mL}^{-1}$ and TFC of 443.19 (± 4.76) $\mu\text{g CE mL}^{-1}$. Further, analysis of antioxidant activity of the extract using 2,2-diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging assay showed a % inhibition between 35.13 % - 61.59 % for the concentration range 31.25 $\mu\text{g/mL}$ to 500 $\mu\text{g/mL}$; whereas the ascorbic acid standard possessed a % inhibition between 91.00 % - 96.05 % in the same concentration range. Moreover, *Garcinia*

quaesita extract at 1 mg/mL showed a higher percentage of inhibition against heat-induced haemolysis (70.62% ± 2.14) than the standard (*O*-Acetylsalicylic acid) (53.66% ± 3.36) in the human red blood cell (HRBC) membrane stabilization method. The *p* value ($p < 0.05$) in the one-way ANOVA test indicated that there was a significantly difference between the anti-inflammatory activity of fresh fruit extract of *Garcinia quaesita* and the standard. The results of Pearson’s correlation analysis showed that there was a positive correlation between TPC, TFC, radical scavenging antioxidant activity and anti-inflammatory activities of the fleshy part of the fruit of *Garcinia quaesita*. Therefore, it can be suggested that the polyphenolic compounds, flavonoids, and other biologically active metabolites present in the aqueous ethanol extract of the fresh fruit of *Garcinia quaesita*, in combination, are responsible for producing strong antioxidant and anti-inflammatory effects.

Keywords: *Garcinia quaesita* fruit, Total phenolic content, Total flavonoid content, Antioxidant activity, Anti-inflammatory activity

Acetylcholinesterase inhibitory activity of *Psychotria sarmentosa*, *Olax zeylanica* and *Hoya ovalifolia*

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Alzheimer’s disease is the most prevailing neurodegenerative disease and is becoming one of the major human health concerns today. Medicinal plants are known to produce a broad range of bioactive compounds and thus become an excellent source for the discovery of novel anti-acetylcholinesterase active drugs. *Psychotria sarmentosa*, *Olax zeylanica* and *Hoya ovalifolia* are used in traditional medicines of Sri Lanka to treat various

diseases including cognitive disorders. The objective of this study was to evaluate acetylcholinesterase (AChE) inhibitory properties of the organic extracts of the selected medicinal plants. Different parts of the plants (leaves, roots and bark) were air dried and powdered samples were extracted with methanol/dichloromethane mixtures to yield the total organic extracts. AChE inhibitory activity of the extracts was assessed using the

Ellman's method in 96-well microplates and all the tests were done in triplicate. The highest AChE inhibitory activity was shown by the leaf extract of *H. ovalifolia* with an IC₅₀ value of 85.6±0.6 µg/mL. Furthermore, the leaf extract of *P. sarmentosa* and root extract of *H. ovalifolia* exhibited good activities with IC₅₀ values of 315.1±0.6 µg/mL and 339.9±0.9 µg/mL, respectively. Galantamine (IC₅₀ 1.57 ± 0.01 µg/mL) was used as the standard

acetylcholinesterase inhibitor. According to the current investigation it could be concluded that *H. ovalifolia* and *P. sarmentosa* possess good anti-cholinesterase activity and can be used to isolate novel anti-acetylcholinesterase compounds.

Keywords: Acetylcholinesterase, *Psychotria sarmentosa*, *Olax zeylanica*, *Hoya ovalifolia*

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Extraction, analysis, and comparison of volatile oils from leaves and fruit peels of *Citrus sinensis* by using two different extraction techniques

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Essential oils from the Citrus family are commonly used in aromatherapy, to relieve anxiety and pain. In the traditional systems of medicine, it is also used as an anti-inflammatory and antiseptic agent. Microwave-assisted hydro-distillation (MAHD) is a modern technique which uses the microwave for the extraction of essential oils from aromatic and medicinal plants. The aim of this study is to analyze the chemical composition of the essential oils of leaves and fruit peel of *Citrus sinensis* (Sweet orange) by Gas Chromatography (GC) and Gas Chromatographic–Mass Spectrometry (GC-MS) techniques, extracted using MAHD and hydro-distillation (HD) methods. The fresh leaves and peels were separately subjected to MAHD (microwave power 250W for 5 min followed by 500W for 55 min.) required less time (1.0 h) compared to HD (5.0 h) to obtain the yield of essential oils from leaves (MAHD: 0.089% and HD: 0.30%) and peels (MAHD: 0.40% and HD: 0.53%), respectively. Out of 73 compounds identified from MAHD leaf oils, Citral (18.02%), Sabinene (17.25%),

Linalool (16.75%) and 3-Carene (10.42%) were major compounds. Among 34 compounds from HD leaf oils, the major compounds were Sabinene (42.93%), 3-Carene (22.16%) and D-Limonene (7.33%). Out of 52 compounds, D-Limonene (84.21%) and Linalool (2.17%) were identified as major compounds from *Citrus sinensis* fruit peel from MAHD whereas HD has given D-Limonene (91.69%) and Linalool (3.39%) as major compounds from 39 compounds. There was an obvious difference in the quality of essential oils extracted and the rapid heating process yielded essential oil with higher amounts of more valuable oxygenated compounds. Saving time, energy, and plant material were some advantages of MAHD however there was a reduction in extraction yield in the MAHD technique compared with HD.

Keywords: Hydro-distillation, Microwave-assisted hydro-distillation, Gas Chromatography, Mass Spectrometry.