 ISSN: 2362-0412

Isolation of Natural Antioxidants: Gallic Acid, Quercetin, and Catechin from the Sri Lankan Endemic Plant, *Garcinia quaesita* Leaves

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Abstract

G*arcinia quaesita* is an endemic plant to Sri Lanka, but no adequate studies have been reported based on the isolation of potential compounds from its leaves. Therefore, natural antioxidants isolated from the Sri Lankan endemic plant will aid in the discovery of new sources of safe and inexpensive natural antioxidants for use in food, nutraceutical, and pharmaceutical preparations. Therefore, this study aimed to isolate and characterize the highly valued antioxidants such as gallic acid, catechin, and quercetin from the leaves of *G. quaesita*. Catechin was extracted with water using the crystallization method and purified by size-exclusion chromatography. Gallic acid and quercetin were extracted using methanol followed by fractionation. The ethyl acetate extract was subjected to size-exclusion chromatography and based on the R_f values, gallic acid, and quercetin were isolated. All the isolated compounds were identified using analytical-HPLC with external standards and confirmed by their melting point and λ_{max} values. The yield percentages of isolated compounds such as gallic acid, catechin, and quercetin based on dried powdered plant leaves were 0.09%, 0.06%, and 0.19%, respectively. The chemical structures were confirmed by spectroscopic analysis using FTIR, ^{1}H NMR, and ^{13}C NMR data. The FRAP and DPPH assays were used to determine the antioxidant capacity. Interestingly, isolated gallic acid has higher antioxidant power based on FRAP and DPPH assays (FRAP value: 4,112.98±42.21 mg Trolox Eq/ g and IC_{50} value; 32.64±0.05 ppm respectively) than that of all other isolated compounds such as catechin and quercetin as well as the references and standards used. In conclusion, gallic acid, catechin, and quercetin are natural antioxidants that have been successfully isolated from the Sri Lankan endemic plant *G. quaesita*. This study is credited as the first to isolate these natural antioxidants from the leaves of *G. quaesita*, and the findings will help the scientific community to explore different applications that can be beneficial to humans.

Keywords*: Antioxidant, Catechin, Gallic Acid, Garcinia quaesita, NMR Techniques, Quercetin.*

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