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Investigation of in vitro antioxidant and alpha-amylase inhibitory activities of *Garcinia quaesita Pierre* fruit seed

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Garcinia quaesita is a traditional, endemic plant with remarkable medicinal value found in Sri Lanka. *Garcinia quaesita Pierre*, locally known as Rath Goraka, is a tropical fruit tree that thrives in regions with warm and humid climates. This plant's culinary and medicinal qualities make it remarkably potential for future exploitation. The main objective of this research was to investigate the total phenolic content (TPC), total flavonoid content (TFC), in vitro antioxidant, and alpha-amylase inhibitory activities of hexane, ethyl acetate, and ethanol extracts of *G. quaesita* fruit seed. Folin -Ciocaltue method was used to determine the total phenolic content. An aluminum-chloride colorimetric assay was used to determine the flavonoids. The constituents in the dried seeds of the *G. quaesita* were extracted using sequential Soxhlet extraction using hexane, ethyl acetate, and ethanol respectively. Crystals were observed to form within the hexane and ethyl acetate extracts after allowing them to stand for a week following extraction. Each extract was evaporated to dryness to obtain seed oils. The crystals and the seed oils were purged with nitrogen and stored at -20 ºC until further use. The total phenolic content was expressed as mg Gallic Acid Equivalents per gram (mg GAE/g). Results showed that the ethanol extract exhibited a significantly higher TPC (205.13±7.99 mg GAE/g) compared to the ethyl acetate extract (82.79±5.10 mg GAE/g). Total flavonoid content was expressed as mg Catechin Equivalents per gram (mg CE/g). Similarly, for the TFC assay, the ethanol extract showed a significantly higher value (56.30±3.07 mg CE/g) compared to the ethyl acetate extract (17.81±1.41 mg CE/g). Results indicated that the ethanol extract has significantly higher antioxidant activity (IC_{50} value of 95.08±3.58 µg/mL) compared to the BHT (butylated hydroxytoluene) standard (IC_{50} value of 118.94±4.84 µg/mL) while the ethyl acetate extract has moderate antioxidant activity (IC_{50} value of 288.51±1.01 µg/mL) in the 1,1-diphenyl-2-picrylhydrazyl (DPPH) assay. The alpha-amylase inhibitory assay was carried out to study the anti-diabetic activity of the extracts. Results showed that the ethyl acetate extract of *G. quaesita* fruit seed has moderate alpha-amylase inhibitory activity (IC_{50} value of 97.80 ±0.39 µg/mL) compared to acarbose (IC_{50} value of 63.47±0.12 µg/mL). On the other hand, the ethanol extract showed a relatively lower alpha-amylase inhibitory activity (IC_{50} value of 160.59 ±2.16 µg/mL). The p-value (p=0) in the one-way ANOVA test indicated that there was a significant difference between the alpha-amylase inhibitory activity of *G. quaesita* fruit seed extracts and the standard(acarbose). Pearson's correlation analysis results showed a strong positive correlation between TPC, TFC, and radical scavenging antioxidant activity of *G. quaesita* fruit seed extracts. Therefore, it can be suggested that the combination of polyphenolic compounds, flavonoids, and other biologically active metabolites present in fresh fruit seeds of *G. quaesita* extract is responsible for its robust antioxidant properties.

Keywords: *Garcinia quaesita* fruit seed, Total phenolic content, Total flavonoid content, Antioxidant activity, Alpha-amylase inhibitory activity

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