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Comparative account on chemical compositions and antioxidant potential of essential oils isolated from the leaves of two garcinia varieties grown in Sri Lanka

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Abstract

Sri Lankan flora *Garcinia quaesita* (Rath-Goraka) and *Garcinia zeylanica* (Kaha-Goraka) are indigenous to the country. Nonetheless, there are no adequate reports on chemical compositions (CCs) of essential oils (EOs) of both plants' leaves. The CCs and antioxidative capacity (AC) of isolated EOs from the leaves of both *Garcinia* varieties were investigated in the present study. The hydro-distilling technique with Clevenger type apparatus (plant: water; 1:5 w/v, 3 hours, 100 °C) was used to isolate the EOs, and CCs of the EOs were investigated by GC-MS analysis. The GC-MS data were compared with NIST 08 MS database to identify the CCs of the isolated EOs with a matching value of greater than 90%. AC of isolated EOs was determined by using the FRAP assay following literature protocols with Trolox as the standard. The hydro-distillation process yielded EOs of *G. quaesita* and *G. zeylanica* in the same quantity; 0.12% (v/w) on a fresh leaves weight basis. Based on the GC-MS analysis 33 different CCs have been discovered along with sesquiterpenes which are prominent in EOs. Out of twenty CCs identified in *G. quaesita*, fourteen of which are sesquiterpenes, with Copaene (19.39%) and Alloaromadendrene (12.12%) found in high concentration only in *G. quaesita*, whereas nineteen CCs were identified in *G. zeylanica*, seven of which are sesquiterpenes, with α -Cubebene (9.38%) found to be high only in *G. zeylanica*. Sesquiterpene such as Caryophyllene, and α -Humullene were identified in both *Garcinia* varieties, however, *G. zeylanica* had a greater concentration (12.94% and 11.24%, respectively) than the other. It is apparent that the EO of *G. quaesita* has the highest AC (274.74 \pm 1.32 μ L Trolox Eq/L) at the 5% significant level. In conclusion, even though many CCs were identified, based on the matching value (above 90%) and the NIST database, thirty-three CCs were discovered for the first time from the isolated EOs of *G. quaesita* and *G. zeylanica* leaves. *G. quaesita* EO appears to have more AC than *G. zeylanica* EO. The findings of both isolated EOs revealed that each type has its own character in terms of CCs.

Keywords: Antioxidants, Essential oil, *G. quaesita*, *G. zeylanica*, Hydro-distillation,

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