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**Physical sciences**

**CHARACTERIZATION OF SEED OILS OF FOUR *GARCINIA* SPECIES TO ASSESS POTENTIAL APPLICATIONS IN COSMETICS AND DIETARY SUPPLEMENTS**

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Sri Lanka has a wide variety of oil-bearing seeds that often end up in waste without proper utilization. On the other hand, plant seed oils have emerged as a promising avenue for application in cosmetics and dietary supplements. However, most of the plant seed oils found in Sri Lanka are not characterized by their chemical compositions. This study aims to characterize seed oils of *Garcinia zeylanica*, *Garcinia xanthochymus*, *Garcinia morella*, and *Garcinia mangostana* by determining fatty acids (FA) composition, constituents in the unsaponifiable matter, and other physical properties. The oil was extracted into hexane using Soxhlet extraction. Ash content of seeds, acid value (AV), iodine value (IV), and smoke point of oils were also determined. Prepared fatty acid methyl esters (FAME) and constituents in unsaponifiable matter were identified and quantified using GC-MS. TGA was performed to assess the thermal behaviour of seed oils. The findings indicated that *G. mangostana* and *G. zeylanica* produced higher oil yields of 53.02% and 48.15%, respectively, compared to the other two. The smoke point varies from  $202.1 \pm 7.1$  °C to  $229.6 \pm 1.5$  °C. The AVs range from  $4.43 \pm 0.56$  to  $27.35 \pm 0.06$  mg KOH g<sup>-1</sup>, while the IVs ranged from  $6.62 \pm 1.32$  to  $13.15 \pm 0.05$  g I<sub>2</sub> per 100 g. The ash content varied from  $1.12 \pm 0.10\%$  to  $4.43 \pm 0.10\%$ . The yield of unsaponifiable matter of these oils ranged from  $0.33 \pm 0.01\%$  to  $3.30 \pm 0.01\%$ . The major FAs in all the oils were long-chain FAs such as Oleic, Stearic, and Palmitic acids. *Garcinia xanthochymus* contained the highest amount of Lanosterol, while *G. zeylanica* contained the highest amounts of Campesterol and  $\gamma$ -Sitosterol. *Garcinia morella* contained the highest amount of Stigmasterol and Squalene. In conclusion, the findings suggest that all four oils exhibit a high potential for use in both dietary supplements and in the cosmetic industry.

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