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Effect of Different Extraction Methods on Physicochemical Properties of Gac Fruit (*Momordica Cochinchinensis*) Pulp and Peel Oil

Siti Anis Habibah Aminuddin[a], Eng-Keng Seow[abc*]

Structured Abstract

Background: Gac fruit (*Momordica cochinchinensis*) is an underutilized fruit where its pulp and peel are often discarded as compared to its aril and seeds. Fewer studies were conducted on its pulp and peel as compared to its arils and seeds. This study provides insights into the comparison for crude oil yield and compositions of palmitic and steric acid of the crude oil extracted using three different extractions, including maceration, ultrasound-assisted extraction (UAE) and enzymatic-assisted extraction (EAE). The pH, refractive index, colour measurement, total phenolic content (TPC), DPPH radical scavenging activity and iron reducing antioxidant power of FRAP assay were also studied.

Methods: The crude oil from Gac fruit pulp and peel were extracted using maceration, ultrasound-assisted extraction (UAE) and enzymatic-assisted extraction (EAE). Maceration was conducted for a total of 6 hours with agitation at room temperature. UAE was conducted at 40 kHz and extraction time of 30 min. While EAE was conducted using 0.15% w/w pectinase for 1 hour at 60℃. In this study, percentage of yield, palmitic acid and stearic acid concentration, pH, refractive index, colour measurement, TPC, DPPH and FRAP were conducted.

Results: This study shows that UAE produce more crude oil yield as compared to maceration and EAE. The results indicate that oil extracted using maceration produces lighter colour of crude oil as compared to other extracted samples. In terms of fatty acids, UAE crude oil yield higher concentration of palmitic acid than other methods but shown no significant difference in stearic acid between samples. UAE and EAE crude oil showed higher refractive index and pH value. While in terms of TPC and DPPH, UAE has significant difference as compared to maceration and EAE. Lastly, FRAP values did not show any significant difference between methods and pulp and peel.

Conclusion: In conclusion, the findings of this study indicated that utilization of UAE can have a higher yield of crude oil with a higher composition of palmitic acid, refractive index, total phenolic content and DPPH. Whereas using maceration, it produced a lighter color of crude oil with lower fatty acids value. While using EAE method able to produce significant amounts of oils.

Keywords: Gac, Crude Oil, Ultrasound, Maceration, Enzymatic

*Correspondence: ekseow@uitm.edu.my

[a] School of Industrial Technology, Faculty of Applied Sciences, Universiti Teknologi MARA, Shah Alam, Malaysia

[b] Food Science Research Group, Universiti Teknologi MARA, Shah Alam, Malaysia

[c] Integrative Pharmacogenomics Institute (iPROMISE), Universiti Teknologi MARA Cawangan Selangor Puncak Alam Campus, Puncak Alam, Malaysia