

Document details

[Back to results](#) | 1 of 1[Export](#) [Download](#) [Print](#) [E-mail](#) [Save to PDF](#) [Add to List](#) [More...](#)[Full Text](#) [View at Publisher](#)

Food Research International

Volume 65, Issue PC, November 01, 2014, Pages 394-400

Supercritical carbon dioxide extraction of highly unsaturated oil from Phaleria macrocarpa seed

(Article)

Azmir, J.^a, Zaidul, I.S.M.^a, [Sharif, K.M.^a](#), Uddin, M.S.^a, Jahurul, M.H.A.^b, Jinap, S.^c, Hajeb, P.^c, Mohamed, A.^d [✉](#)^aFaculty of Pharmacy, International Islamic University Malaysia, Kuantan Campus, Kuantan, Pahang, Malaysia^bDepartment of Food Science and Nutrition, Faculty of Applied Sciences, UCSI University, Kuala Lumpur, Malaysia^cFood Safety Research Centre (FOSREC), Faculty of Food Science and Technology, Universiti Putra Malaysia, Serdang, Selangor, Malaysia[View additional affiliations](#)

Abstract

[View references \(33\)](#)

Good quality oil with high unsaturated fatty acids was found in the seed of a medicinal plant Phaleria macrocarpa (Mahkota dewa). Different parts especially fruit flesh of this plant are being traditionally used as important folk medicine whereas seed of this plant is usually neglected. In this study, the oil was extracted from P. macrocarpa seed using supercritical carbon dioxide. The extraction parameters were optimized by central composite design (CCD) of response surface methodology (RSM). Due to the non-linearity of the extraction process, artificial neural network (ANN) was also applied for predicting the oil yield. The optimum conditions obtained from RSM were 72°C, 42MPa and 4.5ml/min CO₂ flow rate where the oil yield was 52.9g per 100g of dry sample and coefficient of determination (R²) was 0.99. The ANN and RSM prediction showed similar R² of 0.99 and ANN has lower average absolute deviation (AAD) of 0.25% compared to RSM (AAD of 0.31%). Five fatty acids were identified by gas chromatography-mass spectroscopy (GC-MS) analysis of the oil. The amount of oleic acid (18:1) was found to be highest (43.56%) among all the fatty acids. The total unsaturated fatty acid was 73.62% and saturated fatty acid was 26.38% in the P. macrocarpa seed oil. © 2014 Elsevier Ltd.

Author keywords

[Artificial neural network](#) [Fatty acids](#) [Phaleria macrocarpa seed oil](#) [Response surface methodology](#)

Metrics

[View all metrics](#)

4 Citations in Scopus

60th Percentile

0.75 Field-Weighted Citation Impact



PlumX Metrics

Usage, Captures, Mentions, Social Media and Citations beyond Scopus.

Cited by 4 documents

[Supercritical fluid extraction of coriander seeds: Kinetics modelling and ANN optimization](#)Zeković, Z. , Bera, O. , Đurović, S. (2017) *Journal of Supercritical Fluids*[The effects of process technology on the physicochemical properties of peony seed oil](#)Qu, J. , Zhang, F. , Thakur, K. (2017) *Grasas y Aceites*[Extraction of soursop \(Annona muricata\) Seed oil by supercritical CO₂: Kinetic, fatty acid and sterol profiles | Extracción con CO₂ Supercrítico de aceite de semillas de guanábana \(Annona muricata\): Cinética, perfil de ácidos grasos y esteroides](#)