

Free Full Text from Publisher

Look Up Full Text

Full Text from Publisher



Save to EndNote online

Add to Mar

1 of 17

Extraction and characterization of bioactive compounds in Vernonia amygdalina leaf ethanolic extract comparing Soxhlet and microwave-assisted extraction techniques

By: Alara, OR (Alara, Oluwaseun Ruth)^[1]; Abdurahman, NH (Abdurahman, Nour Hamid)^[1]; Ukaegbu, CI (Ukaegbu, Chinonso Ishmael)^[2]; Kabbashi, NA (Kabbashi, Nassereldeen Ahmed)^[3]

[View ResearcherID and ORCID](#)

JOURNAL OF TAIBAH UNIVERSITY FOR SCIENCE

Volume: 13 Issue: 1 Pages: 414-422

DOI: 10.1080/16583655.2019.1582460

Published: DEC 11 2019

Document Type: Article

Abstract

The bioactive compounds in Vernonia amygdalina leaf were extracted using ethanol through Soxhlet and microwave-assisted extraction (MAE) techniques. The phytochemical analysis was carried out on the ethanolic extracts using the standard techniques. This analysis revealed the presence of flavonoids, alkaloids, steroids, terpenoids, glycosides, tannins, phenols, saponins, and the absence of anthraquinones. Furthermore, gas chromatography-mass spectroscopy (GC-MS) analysis results revealed the presence of more phytochemicals in the extract obtained through MAE compared to Soxhlet extraction technique, whereby phytol was present in a higher percentage. Fourier transform infrared spectroscopy analysis confirmed the presence of phytochemicals in the extracts. Moreover, the IC50 values of the extracts antioxidant activities were evaluated using DPPH and ABTS assays. There exists a clear correlation between total phenolic content, total flavonoid content and antioxidant activity of the extracts. Therefore, this study suggested that higher phenolic compounds responsible for natural antioxidant could be obtained from V. amygdalina leaf using the microwave-assisted extraction technique.

Keywords

Author Keywords: Vernonia amygdalina leaf; extraction; phytochemicals; scanning electron microscopy; gas chromatography-mass spectroscopy

KeyWords Plus: PHENOLIC-COMPOUNDS; ANTIOXIDANT ACTIVITY; CINEREA LEAVES; OPTIMIZATION

Author Information

Reprint Address: Alara, OR; Abdurahman, NH (reprint author)

Univ Malaysia Pahang, Ctr Excellence Adv Res Fluid Flow CARIFF, Lebuhraya Tun Razak, Gambang 26300, Pahang, Malaysia.

Addresses:

[1] Univ Malaysia Pahang, Ctr Excellence Adv Res Fluid Flow CARIFF, Lebuhraya Tun Razak, Gambang 26300, Pahang, Malaysia

[2] Univ Malaysia Pahang, Fac Ind Sci & Technol, Gambang, Malaysia

[3] Int Islamic Univ Malaysia, BERK, Dept Biotechnol Engn BTE, Kulliyah Engn KOE, Kuala Lumpur, Malaysia

E-mail Addresses: ruthoalao@gmail.com; abrahman@ump.edu.my

Funding

Funding Agency	Grant Number
Universiti Malaysia Pahang, Malaysia	RDU180329

[View funding text](#)

Publisher

TAYLOR & FRANCIS LTD, 2-4 PARK SQUARE, MILTON PARK, ABINGDON OX14 4RN, OXON, ENGLAND

Categories / Classification

Citation Network

In Web of Science Core Collection

0

Times Cited

[Create Citation Alert](#)

30

Cited References

[View Related Records](#)

Use in Web of Science

Web of Science Usage Count

40

Last 180 Days

40

Since 2013

[Learn more](#)

This record is from:

Web of Science Core Collection
- Science Citation Index Expanded

[Suggest a correction](#)

If you would like to improve the quality of the data in this record, please suggest a correction.

Research Areas: Science & Technology - Other Topics
 Web of Science Categories: Multidisciplinary Sciences

[See more data fields](#)

◀ 1 of 17 ▶

Cited References: 30

Showing 30 of 30 [View All in Cited References page](#)

(from Web of Science Core Collection)

1. [Chemical constituents and antioxidant activity of *Alstonia boonei*](#) Times Cited: 35
 By: Akinmoladun, Afolabi C.; Ibukun, E. O.; Afor, Emmanuel; et al.
 AFRICAN JOURNAL OF BIOTECHNOLOGY Volume: 6 Issue: 10 Pages: 1197-1201 Published: MAY 16 2007
2. [Phytochemical and pharmacological properties of *Vernonia amygdalina*: a review](#) Times Cited: 3
 By: Alara, O.R.; Abdurahman, N. H.; Abdul Mudalip, S. K; et al.
 J. Chem. Eng. Ind. Biotechnol Volume: 2 Pages: 80-96 Published: 2017
[\[Show additional data\]](#)
3. [Soxhlet extraction of phenolic compounds from *Vernonia cinerea* leaves and its antioxidant activity](#) Times Cited: 4
 By: Alara, Oluwaseun R.; Abdurahman, Nour H.; Ukaegbu, Chinonso I.
 JOURNAL OF APPLIED RESEARCH ON MEDICINAL AND AROMATIC PLANTS Volume: 11 Pages: 12-17 Published: DEC 2018
4. [Dataset on LC-Q-TOF/MS tentative identification of phytochemicals in the extract of *Vernonia amygdalina* leaf through positive ionization](#) Times Cited: 1
 By: Alara, Oluwaseun Ruth; Abdurahman, Nour Hamid; Ukaegbu, Chinonso Ishmael; et al.
 DATA IN BRIEF Volume: 21 Pages: 1686-1689 Published: DEC 2018
5. [Optimization of microwave-assisted extraction of flavonoids and antioxidants from *Vernonia amygdalina* leaf using response surface methodology](#) Times Cited: 9
 By: Alara, Oluwaseun Ruth; Abdurahman, Nour Hamid; Olalere, Olusegun Abayomi
 FOOD AND BIOPRODUCTS PROCESSING Volume: 107 Pages: 36-48 Published: JAN 2018
6. [Vernonia cinerea leaves as the source of phenolic compounds, antioxidants, and anti-diabetic activity using microwave-assisted extraction technique](#) Times Cited: 6
 By: Alara, Oluwaseun Ruth; Abdurahman, Nour Hamid; Ukaegbu, Chinonso Ishmael; et al.
 INDUSTRIAL CROPS AND PRODUCTS Volume: 122 Pages: 533-544 Published: OCT 15 2018
7. [Effect of drying methods on the free radicals scavenging activity of *Vernonia amygdalina* growing in Malaysia](#) Times Cited: 1
 By: Alara, OR; Abdurahman, NH; Abdul Mudalip, SK.
 J King Saud Univ - Sci Published: 2017
8. [Phytochemical screening by FTIR spectroscopic analysis of leaf extracts of selected Indian Medicinal plants.](#) Times Cited: 24
 By: Ashokkumar, R.; Ramaswamy, M.
 International Journal of Current Microbiology and Applied Sciences Volume: 3 Issue: 1 Pages: 395-406 Published: 2014
9. [Antioxidant versus anti-diabetic properties of leaves from *Vernonia amygdalina* Del. growing in Malaysia](#) Times Cited: 17
 By: Atangwho, Item J.; Egbung, Godwin E.; Ahmad, Mariam; et al.
 FOOD CHEMISTRY Volume: 141 Issue: 4 Pages: 3428-3434 Published: DEC 15 2013
10. [Preliminary test of phytochemical screening of crude ethanolic and aqueous extract of *Moringa pterygosperma* Gaertn](#) Times Cited: 6
 By: Bargah, R. K.
 J. Pharmacogn. Phytochem. Volume: 4 Article Number: 07-09 Published: 2015
11. [GC-MS analysis of bioactive compounds present in different extracts of an endemic plant *Broussonetia luzonica* \(Blanco\) \(Moraceae\) leaves](#) Times Cited: 9
 By: Casuga, Franelyne Pataueg; Castillo, Agnes Llamasares; Corpuz, Mary Jho-Anne Tolentino
 ASIAN PACIFIC JOURNAL OF TROPICAL BIOMEDICINE Volume: 6 Issue: 11 Pages: 957-961 Published: NOV 2016