



Document details

1 of 1

[Export](#) [Download](#) [More... >](#)

Food Research

Volume 3, Issue 6, December 2019, Pages 727-733

Fourier Transform Infrared Spectroscopy (FTIR) coupled with multivariate calibration and discriminant analysis for authentication of extra virgin olive oil from rambutan seed fat (Article) [\(Open Access\)](#)

Nurwahidah, A.T., Rumiyyati, Riyanto, S., Nurrulhidayah, A.F., Betania, K., Rohman, A.

View additional authors

Save all to author list

^aFaculty of Pharmacy, Universitas Gadjah Mada, Yogyakarta, 55281, Indonesia^bInternational Institute of Halal Research and Training, International Islamic University Malaysia, Gombak, Selangor 53100, Malaysia^cInstitute of Halal Industry and Systems, Universitas Gadjah Mada, Yogyakarta, 55281, Indonesia

View additional affiliations

Abstract

The adulteration practice in pharmaceutical industries, especially in fats and oils used as a vehicle in some pharmaceutical products must be identified to assure its quality. In this study, Fourier Transform Infrared Spectroscopy (FTIR) in combination with chemometrics techniques of multivariate calibration and discriminant analysis (DA) were used for the authentication of extra virgin olive oil (EVOO) from rambutan seed fat (RSF). EVOO, RSF, and the mixture of EVOO-RSF were scanned using FTIR spectrophotometer at mid-infrared region (4000-650 cm^{-1}). The results showed that normal FTIR spectra at wavenumbers region of 1446.8-1409.7 cm^{-1} and 2368.6-1769.9 cm^{-1} combined with principle component regression (PCR) offered the best quantitative model for prediction of RSF levels in EVOO. The coefficient of determination (R^2) values obtained for the relationship between actual values of RSF and predicted values were of 0.9955 and 0.9915 in calibration and prediction models, respectively. The errors in calibration and prediction models were relatively low, accounting of 2.17% and 3.68%, respectively. The classification model between unadulterated or pure EVOO and adulterated EVOO with RSF was successfully carried out using DA at wavenumbers of 3100-1000 cm^{-1} without any samples mistakenly classified into the wrong group. FTIR spectroscopy in combination with chemometrics offered effective tools for authentication of EVOO against the adulteration practice. © 2019 The Authors.

SciVal Topic Prominence

Topic: Oils and fats | Oils | Oil adulteration

Prominence percentile: 96.798



Author keywords

[Authentication](#) [Discriminant analysis](#) [Olive oil](#) [PCR](#) [Rambutan seed fat](#)

Indexed keywords

 EMTREE drug terms: [arachidic acid](#) [erucic acid](#) [extra virgin olive oil](#) [linoleic acid](#) [oleic acid](#) [palmitic acid](#) [palmitoleic acid](#) [stearic acid](#)

Cited by 1 document

Khudzaifi, M. , Retno, S.S. , Rohman, A.

The employment of FTIR spectroscopy and chemometrics for authentication of essential oil of curcuma mangga from candle nut oil

(2020) Food Research

View details of this citation

Inform me when this document is cited in Scopus:

[Set citation alert >](#)[Set citation feed >](#)

Related documents

Find more related documents in Scopus based on:

[Authors >](#) [Keywords >](#)

EMTREE medical terms:

adulteration Article calibration chemometrics contamination discriminant analysis
flame ionization detection Fourier transform infrared spectroscopy limit of quantitation
lipid composition measurement accuracy Nephelium lappaceum nonhuman
polymerase chain reaction predictive value principal component analysis
quantitative analysis Sapindus validation process

Chemicals and CAS Registry Numbers:

arachidic acid, 506-30-9; erucic acid, 112-86-7; linoleic acid, 1509-85-9, 2197-37-7, 60-33-3, 822-17-3; oleic acid, 112-80-1, 115-06-0; palmitic acid, 57-10-3; palmitoleic acid, 373-49-9; stearic acid, 57-11-4, 646-29-7

Funding details

Funding sponsor	Funding number	Acronym
	185/UN1/DITLIT/DIT-LIT/ LT/2018	

1

The authors thank the Ministry of Research, Technology and Higher Education, Republic Indonesia for partial financial assistance during this study via Hibah Penelitian Unggulan Perguruan Tinggi (PUPT) 2018 with contract number: 185/UN1/DITLIT/DIT-LIT/ LT/2018.

ISSN: 25502166

Source Type: Journal

Original language: English

DOI: 10.26656/fr.2017.3(6).182

Document Type: Article

Publisher: Rynnye Lyan Resources

 Rohman, A.; Faculty of Pharmacy, Universitas Gadjah Mada, Yogyakarta, Indonesia;

© Copyright 2019 Elsevier B.V., All rights reserved.

About Scopus

What is Scopus

Content coverage

Scopus blog

Scopus API

Privacy matters

Language

日本語に切り替える

切换到简体中文

切换到繁體中文



Русский язык


Customer Service

Help

Contact us

ELSEVIER

[Terms and conditions](#)  [Privacy policy](#) 

Copyright © Elsevier B.V.  All rights reserved. Scopus® is a registered trademark of Elsevier B.V.

We use cookies to help provide and enhance our service and tailor content. By continuing, you agree to the use of cookies.

