Correlation of FT-IR Fingerprint and alpha-Glucosidase Inhibitory Activity of Salak (Salacca zalacca) Fruit Extracts Utilizing Orthogonal Partial Least Square

By: Saleh, MSM (Saleh, Mohammed S. M.)[1]; Siddiqui, MJ (Siddiqui, Mohammad Jamshed)[1]; So'ad, SZM (So'ad, Siti Zaiton Mat)[1]; Roheem, FO (Roheem, Fatimah Opeyemi)[1]; Saidi-Besbes, S (Saidi-Besbes, Salima)[2]; Khatib, A (Khatib, Alfi)[1]

View ResearcherID and ORCID

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Abstract

Salak fruit (Salacca zalacca), commonly known as snake fruit, is used indigenously as food and for medicinal applications in Southeast Asia. This study was conducted to evaluate the alpha-glucosidase inhibitory activity of salak fruit extracts in correlation to its Fourier transform infrared spectroscopy (FT-IR) fingerprint, utilizing orthogonal partial least square. This calibration model was applied to develop a rapid analytical method tool for quality control of this fruit. A total of 36 extracts prepared with different solvent ratios of ethanol-water (100, 80, 60, 40.20, 0% v/v) and their alpha-glucosidase inhibitory activities determined. The FT-IR spectra of ethanol-water extracts measured in the region of 400 and 4000 cm 1 at a resolution of 4 cm(-1). Multivariate analysis with a combination of orthogonal partial least-squares (OPLS) algorithm was used to correlate the bioactivity of the samples with the FT-IR spectral data. The OPLS biplot model identified several functional groups (C-H, C=O, C-N, N-H, C-O, and C=C) which actively induced alpha-glucosidase inhibitory activity.

Keywords

Author Keywords: alpha-glucosidase inhibitory activity; fingerprint; Fourier transform infrared spectroscopy; salak fruit
KeyWords Plus: ANTIOXIDANT ACTIVITY; INFRARED-SPECTROSCOPY; METABOLOMICS; SNAKE; PREDICTION; KINETICS; NMR

Author Information

Reprint Address: Siddiqui, MJ (reprint author)

IIUM, Kulliyyah Pharm, Dept Pharmaceut Chem, Kuantan 25200, Pahang, Malaysia.

Addresses:

[1] IIUM, Kulliyyah Pharm, Dept Pharmaceut Chem, Kuantan 25200, Pahang, Malaysia

[2] Univ Oran1, Dept Chim, Fac Sci Exactes & Appl, Lab Synth Organ Appl, BP 1524 El Mnaoueur, Oran 31000, Algeria

E-mail Addresses: ksm20085@hotmail.com; siddiquijamshed@hotmail.com; dszaiton@iium.edu.my; bukolami_fatty@yahoo.com; salima_saidi@yahoo.fr; alfikhatib@iium.edu.my

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