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

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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

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