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Terahertz time-domain attenuated total reflection spectroscopy applied to the rapid discrimination of the botanical origin of honeys

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Abstract

A new technique to identify the floral resources of honeys is demanded. Terahertz time-domain attenuated total reflection spectroscopy combined with chemometrics methods was applied to discriminate different categorizes (Medlar honey, Vitex honey, and Acacia honey). Principal component analysis (PCA), cluster analysis (CA) and partial least squares-discriminant analysis (PLS-DA) have been used to find information of the botanical origins of honeys. Spectral range also was discussed to increase the precision of PLS-DA model. The accuracy of 88.46% for validation set was obtained, using PLS-DA model in 0.5-1.5 THz. This work indicated terahertz time-domain attenuated total reflection spectroscopy was an available approach to evaluate the quality of honey rapidly.

Keywords: Terahertz time-domain system; Honey; Botanical Origin; PLS-DA; Spectral range selection

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1. Introduction

Honey is the natural sweet food produced by honeybees by blending the sweetened sap collected from flowers with metabolic gastric enzymes [1]. It contains nutritionally important

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