New research provides a rapid and non-destructive method for identifying honey's botanical origin

June 14 2023

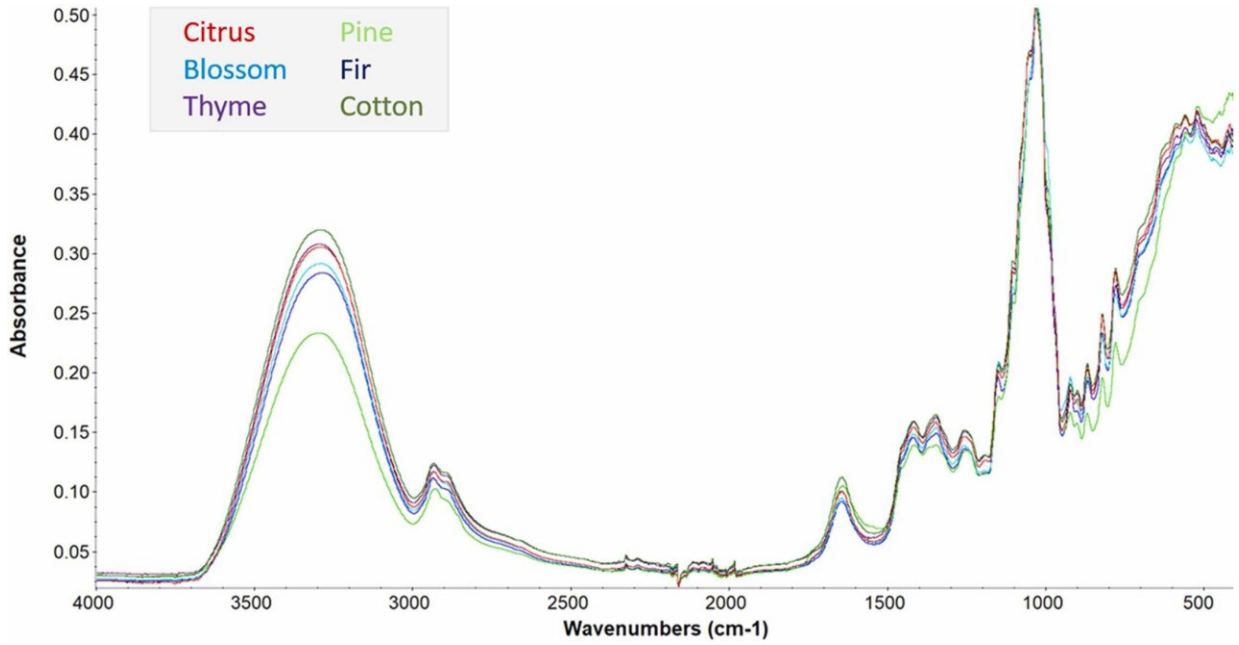
Credit: CC0 Public Domain

Researchers at the University of Chemistry and Technology in Prague have developed a rapid, non-destructive method using attenuated total

reflectance Fourier transform infrared spectroscopy (ATR-FTIR) to identify the botanical origin of honey. This method, which efficiently categorizes honey based on origin, has implications for honey pricing and marketability, aiding in more precise and cost-effective product differentiation.

The study, published in the *Journal of Food Composition and Analysis*, successfully demonstrates a workflow to swiftly identify the botanical origin of honey, a task that has traditionally necessitated extensive high-end analysis.

Honey's botanical origin influences not only its market price but also its organoleptic properties and potential health benefits, making it a critical factor in consumer choice. This breakthrough comes as a boon to industry stakeholders, who can now categorize honey in a more precise and cost-effective manner.



Indicative FTIR spectra for each of the analyzed honey matrices. Each color

represents a different matrix as it is displayed in the legend. Credit: *Journal of Food Composition and Analysis* (2023). DOI: 10.1016/j.jfca.2023.105276

The researchers tested 22 different pre-processing methods and combinations, including scatter correction methods and spectral derivation methods, using both supervised and non-supervised tools. Their efforts revolved around optimally projecting a diverse array of 51 honey samples from five different botanical origins: blossom, honeydew, cotton, thyme, and citrus.

The study's pivotal finding suggests the most efficient data pre-processing method is the combination of multiplicative scatter correction followed by Savitzky-Golay first derivation. This procedure resulted in excellent recognition (87–100%) and prediction (81–100%) ability when applied in binary models.

The findings highlight the significant yet often overlooked effect of spectral data pre-processing before the application of advanced chemometrics. This novel approach will pave the way for rapid and efficient identification of honey's botanical origin, thereby providing a much-needed enhancement in the world of honey production and marketing.

More information: A.S. Tsagkaris et al, Investigating the impact of spectral data pre-processing to assess honey botanical origin through Fourier transform infrared spectroscopy (FTIR), *Journal of Food Composition and Analysis* (2023). DOI: 10.1016/j.jfca.2023.105276

Provided by University of Chemistry and Technology Prague

Citation: New research provides a rapid and non-destructive method for identifying honey's botanical origin (2023, June 14) retrieved 28 April 2024 from https://phys.org/news/2023-06-rapid-non-destructive-method-honey-botanical.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.