Determination of nutritional parameters of bee pollen by Raman and infrared spectroscopy.

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Streszczenie

Vibrational spectroscopy was applied to determine macronutrient levels, total polyphenols (TPs) content, antioxidant activity, pH and color parameters in bee pollens. Raman, attenuated total reflection and diffuse reflectance spectra in the mid- and near-infrared regions were recorded for the homogenized pollen granules. Combining spectral data and the results of reference analyses, partial least squares (PLS) models were constructed and validated. The relative standard errors of prediction (*RSEP*) were calculated for the calibration and validation sets. Regarding macronutrient analysis, the latter were found to be in the 1.7–2.3%, 2.5–3.6% and 2.6–3.3% ranges for protein, reducing sugars and fat determination, respectively. These errors amounted to 3.1–3.5% for TPs and 2.2–3.4% for antioxidant activity quantification, respectively, whereas they were found to be in the 1.5–2.3% and 1.6–3.2% ranges for pH and the color parameters' determination.

Słowa kluczowe

Bee pollen, Nutrients, Quantitative analysis, Raman spectroscopy, NIR spectroscopy, IR-spectroscopy, Chemometrics

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