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UKRAINE

WAX-LIKE SUBSTANCES IDENTIFICATION BY NIR SPECTROSCOPY

Bee products have high nutritional and medicinal value. They exert their positive effects on the human body in the case if they are natural, environmentally friendly, contain no foreign substances and are not subjected to heat treatment and the impact of other external factors. One of the main factors that significantly affect the quality of these products is wax, which put to the beehive for the bee activity.

In view of the foregoing, the important problem is to detect impurities and substitutes in beeswax. Adulterated beeswax significantly reduces the quality of marketable honey and welfare of honey bees. Additional fillers such as paraffin, ceresin, stearic acid, solid fat, microcrystalline wax significantly reduce quality parameters of beeswax and honey in general.

Currently, such methods as high-temperature gas chromatography, Fourier spectroscopy and others are used for determination of the beeswax authenticity. They need using of reagents and long term.

This work was carried out using near-infrared spectrumanalyzer «Infrapid-61». Biochemical composition of waxy samples was determined by recording of the coefficient of diffuse light reflection in the spectral range from 1330 to 2370 nm relative to the standard. Samples of beeswax were obtained from apiaries in Kyiv region (Ukraine) and were stored in a dark place at room temperature before analysis. Investigated samples were special prepared immediately prior to the spectral studies.

The results revealed significant differences in the diffuse reflectance spectra of samples for field in 1880- 2200 nm and made it possible to conduct a qualitative analysis. In particular, it allows the identification of wax and wax-like substances to determine the percentage of impurities such as paraffin and ceresin, and makes it possible to make qualitative conclusions about aging sample. NIR spectroscopy method gives possibility quickly to obtain information regarding counterfeit materials and can be successfully implemented as production control in the manufacturing wax.

KEY WORDS: *beeswax, wax-like substances, NIR spectroscopy*