

Determination of the Botanical Origin of Honey by the Artificial Neural Network Processing of PARAFAC Scores of Fluorescence Data

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Abstract : Fluorescence spectroscopy coupled with parallel factor analysis (PARAFAC) and artificial neural networks (ANN) were used for characterization and classification of honey. Excitation emission spectra were obtained for 95 honey samples of different botanical origin (acacia, sunflower, linden, meadow, and fake honey) by recording emission from 270 to 640 nm with excitation in the range of 240-500 nm. Fluorescence spectra were described with a six-component PARAFAC model, and PARAFAC scores were further processed with two types of ANN's (feed-forward network and self-organizing maps) to obtain algorithms for classification of honey on the basis of their botanical origin. Both ANN's detected fake honey samples with 100% sensitivity and specificity.

Keywords : honey, fluorescence, PARAFAC, artificial neural networks

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