

TITOLO: An NMR-based metabolomic approach to identify the botanical origin of honey

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ABSTRACT: NMR can be used in food analysis for origin discrimination and biomarker discovery using a metabolomic approach. Here, we present an example of this strategy to discriminate honey samples of different botanical origins. The NMR spectra of 353 chloroform extracts of selected honey samples were analyzed to detect possible markers of their floral origin. Six monofloral Italian honey types (acacia, linden, orange, eucalyptus, chestnut, and honeydew) were analyzed together with polyfloral samples. Specific markers were identified for each monofloral origin: two markers for acacia (chrysin and pinocembrin), one for chestnut (c-LACT-3-PKA), two for orange (8-hydroxylinalool and caffeine), one for eucalyptus (dehydrovomifoliol), one for honeydew (a diacylglycerilether) and two for linden (4-(1-hydroxy-1-methylethyl)cyclohexa-1,3-diene-carboxylic acid and 4-(1-methylethenyl)cyclohexa-1,3-diene-carboxylic acid). An NMR-based metabolomic approach that used O2PLS-DA multivariate data analysis allowed us to discriminate the different types of honey. Two different classifiers were built based on different multivariate techniques. The high precision of the classification obtained suggests that this approach could be useful to develop generally applicable metabolomic tools to discriminate the origin of honey samples.