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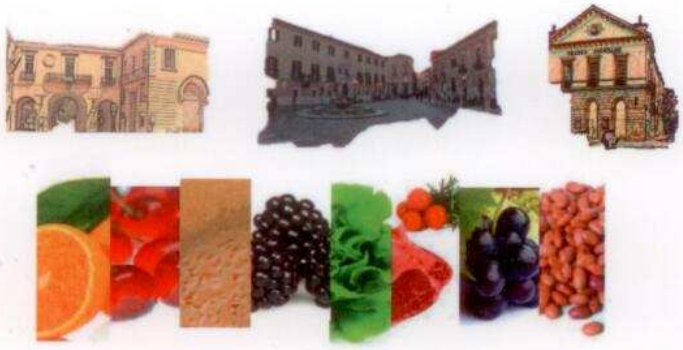
BOOK OF ABSTRACTS



OR37 - PROFILING OF APPLE VOLATILE COMPOUNDS BY SOLID PHASE MICROEXTRACTION AND COMPREHENSIVE TWO-DIMENSIONAL GAS CHROMATOGRAPHY WITH QUADRUPOLE MASS SPECTROMETRY

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A previous optimized SPME-GC-MS method, developed to study apple headspace (Aprea et al., 2012), was adapted for a two-dimensional gas chromatograph based on a differential flow modulator (Agilent's Capillary Flow Technology) coupled to a quadrupole mass spectrometer (GCxGC-MS). Two combinations of column set were tested (1: apolar–polar; 2: polar-apolar).

Volatile compounds were sampled by solid phase micro-extraction in the headspace of homogenized apple. Three varieties of apple (Fujion, Dalinette, Crimson Crisp) previously characterized by a trained sensory panel were used (Corollaro et al., 2013).

The combination of both column sets, allowed the tentative identification, based on mass spectra and literature linear retention index, of about 90 volatile compounds. Each column set brought to the identification of about 60 compounds. The polar-apolar combination favored the identification of more alcohols while the apolar-polar combination was more efficient in separating terpenes, acids and aldehydes.

Multivariate data analysis allowed sample separation according to the different variety and highlighted the volatile compounds which characterize them.

Results are in agreement with sensory descriptive analysis, provided by the trained panel, of the same apples. For example Crimson Crisp, described by the panel as the most aromatic (with highest score for banana and pear descriptors) is characterized by higher amount of butyl and hexyl esters generally associated to fruity flavors.

The preliminary results, of this first trial, indicate that the changes made to the GC method to adapt it to the new GCxGC-MS system allow the identification of the mains volatile compounds in the headspace of apple and their usefulness to discriminate varieties.

References

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