

Volatome Analysis for the Quality Determination in Virgin Olive Oil

Elettra Marone², Mancuso S¹, Fiorino P¹ and Taiti C¹

¹Università di Firenze, Italy

²Università di Teramo, Italy

The quality of commercial virgin olive oils is guaranteed by chemical and organoleptic (Panel Test, PT) analyses.

The aim of this research was to transform VOCs perceived by the human olfactory sense in a meaningful spectra profile useful to distinguish oil trade classes (EVOO/ Not EVOO), and to grade EVOO, based on the intensity of the main positive (fruity) attribute using a fast and not expensive VOCs test, also useful to promote at consumer's level the sense of quality by smell and lack of defective odors.

Extensive surveys were carried out on 150 olive oil samples from different countries, processed as monocultivar or blend, acquired to producers or in the stores. Samples were analyzed by a PTR-ToF-MS as its high resolution coupled to a rapid screening power of samples, easy to handle and without any manipulation, while a PT recognized as EVOO 68/150 samples, characterized by different "fruity" flavor intensity.

A principal component analysis (PCA) of the whole PTR-ToF-MS data clustered the samples in two main groups, including the 68 samples classified by the PT as EVOO, without any defective odor, and the 82 classified as not EVOO, respectively, with only a few partially overlapped.

A PLS-DA model correctly classified EVOO/Not EVOO spectra as resulted by PT, confirming the high confidence level (95%) in utilizing analytical spectral data in helping PT.

A Fuzzy Clustering applied to the spectral data confirmed the 3 group of EVOO recognized by the Panelists, allowing to grade the samples by "fruity intensity" (1-3 = light, 4-6 = medium, 7-9 = intense).

In conclusion, throughout adequate DB the high quality of each oil sample can be predicted in any step of commercial chain of virgin olive oils processing, by a rapid and convenient way, so to define and preserve the high quality products.

Biography:

Elettra Marone completed her Ph.D. in Productivity of crops. Researcher (Arboriculture), Faculty of Biosciences and Technologies for Agriculture, Food and Environment, University of Teramo, Italy. Current her teaching: Crop Production for the Agro-food Chain, Master of Science in Food Science & Technology (English). Academician, Accademia Nazionale dell'Olio e dell'Olio. She is a Member of : ISHS, SOI, ACS, National Board for Olive Oil Tasters, Florence. Current research: Quality of temperate and tropical fruits for trade and consumers. Genetic characterization and VOCs in *Coffea*. Environment/ olive productivity, olive oil traceability and quality: VOCs biosynthesis and evolution, flavors/off-flavors. Oleuropein in olive cultivar leaves. Olive pomace for quality and healthiness of milk/dairy products.