ISSS 2017

23rd International Symposium on Separation Sciences

September 19-22, 2017
Vienna, Austria

organized by

ISBN 978-3-9504017-7-6

COMPREHENSIVE TWO-DIMENSIONAL GAS CHROMATOGRAPHY COUPLED WITH TOF-MS, A POWERFUL TOOL FOR THE ANALYSIS OF WINE AND OLIVE OIL VOLATILE PROFILE

Silvia Carlin[a,b], Urska Vrhovsek[a], Panagiotis Arapitsas[a], Katja Suklje[c], Igor Lukic[d], Ivana Horvat[d] and Fulvio Mattivi [a,e]

[a] Fondazione Edmund Mach, Research and Innovation Centre, Department of Food Quality and Nutrition, San Michele all'Adige (TN), Italy
[b] Department of Agricultural, Food, Environmental and Animal Sciences, University of Udine, Via delle Scienze 208, 33100 Udine, Italy
[c] National Wine and Grape Industry Centre, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2678, Australia
[d] Institute of Agriculture and Tourism, K. Huguesa 8, 52440 Poreč, Croatia
[e] Center Agriculture Food Environment, University of Trento, San Michele all'Adige, Italy

Comprehensive two-dimensional gas chromatography (GCxGC) has emerged as a powerful analytical technique for unraveling the volatile composition of complex matrices. This work will present three applications of GCxGC Tof-MS in the fields of wine and olive oil, aimed to identify biomarkers which could be used in the quality control.

In the first study this analytical technique was used to monitor, during shelf life in realistic condition, the headspace profile of aromatic compounds in white wines, through an analysis of untargeted metabolomics. The aim of this study was to assess the impact of the exposure to the light on large number of white wines bottled in bottles of different colors on their aromatic profiles.

In the second study an investigation of Shiraz wine volatile composition from four vineyards located in the Riverina region of Australia was performed by accessing wines made from sequentially harvested grapes. Shiraz wines were vinified from 60 kg grape triplicates. Following a berry ripening model the first harvest (H1) was 12 days from the plateau of berry sugar accumulation and the second harvest (H2), 24 days after the plateau. These results indicate significant modulation of wine volatiles as a consequence of harvest dates, by altering lipoxygenase derived compounds and yeast metabolism, irrespective of vineyard cultural practices, within the same warm to hot climatic region.

In the third study the volatile composition of EVOO from five olive cultivars was investigated with GCxGC Tof-MS in association with multivariate analyses. A possible varietal differentiation according to the profiles of volatile compounds was affirmed by PCA and potential cultivar-specific biomarkers were identified.