



Fermented Beverages – process technology and management, volatile compounds, instrumental methods of analysis

José M. Oliveira, Zlatina Genisheva, Mar Vilanova

IBB–Institute for Biotechnology and Bioengineering, Centre of Biological Engineering, Universidade do Minho, Campus de Gualtar, 4710-057 Braga, Portugal.

The authors have been developed their main efforts studying fermented beverages, being wine the most important product [1]. Recently, other fermented products, obtained from various fruits, namely tropical fruits, and even from cheese whey have been studied [2]. The main goal is to study the technological parameters which may influence the quality of the final products, in order to manage the process, accurately. As aroma is one of the most important attributes of fermented beverages, the development of analytical methodologies to identify and quantify key volatile compounds, was also an objective.

Volatile compounds related to different origins (varietal, fermentative, post-fermentative) and belonging to various chemical families (terpenes, norisoprenoids, alcohols, esters, volatile fatty acids, volatile phenols, ...) were studied in final products as well as in raw-materials, namely grapes. Correlation between chemical and sensory analyses has been also considered.

Methodologies used to extract volatile compounds from beverages include liquid-liquid micro-extraction, solid-phase extraction and solid-phase micro-extraction. Gas chromatography with flame ionisation, pulsed photometric and mass detectors was used.

The main results may be summarized as followed: characterization and discrimination of grape varieties based on varietal volatile composition, from *Vinhos Verdes* region and from Galicia (Spain); influence of viticultural and some technological parameters and storage conditions on the volatile composition of grapes and wines; correlation between sensory (aroma) and chemical analysis (volatile compounds); implementation of simple and accurate analytical methodologies to quantify volatile compounds of fermented beverages; characterisation, respecting volatile compounds, of diverse beverages, namely obtained from tropical fruits and from cheese whey.

[1] Vilanova M.· Genisheva Z.· Bescansa L.· Masa A. and Oliveira J.M. “Volatile composition of fermented musts from *Vitis vinifera* Blanco *lexítimo*, *Agudelo* and *Serradelo* cultivars from Betanzos (NW Spain)”, *J. Inst. Brew.* (2009) (in press)

[2] Giuliano Dragone, Solange I. Mussato, José M. Oliveira, José A. Teixeira “Characterisation of volatile compounds in an alcoholic beverage produced by whey fermentation”, *Food Chem.* (2009) **112**: 929-935