



## Fermented Beverages – Technological and Analytical Approaches

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Last years, efforts have been developed to study fermented beverages, being wine the most important product. Other fermented products and/or their distillates, obtained from various fruits, namely tropical fruits and raspberries, and even from honey (mead) and cheese whey have been studied.

Respecting winemaking, the main goal is to study the technological parameters which may influence the quality of the final product, in order to manage accurately the fermentative processes and to control storage and ageing steps. Accordingly, an integrated continuous system to produce wine, which may associate alcoholic and malolactic fermentations, using immobilized yeasts and bacteria, is intended to be implemented; corn cobs and grape pomace (skins, seeds and stalks) have been used, for this purpose [1]. Another experiment, concerning the application of natural antioxidants to young wines is under study; the objective is to prevent wine oxidation, and therefore the loss of its sensory characteristics, and to reduce the levels of SO<sub>2</sub> applied if possible.

As aroma is one of the most important attributes of fermented beverages, the development and/or adaptation of analytical methodologies to identify and quantify key volatile compounds, has been also an objective. Volatile compounds linked to different origins (varietal, fermentative and post-fermentative) and belonging to various chemical families (terpenes, alcohols, esters, volatile fatty acids, ...) have been studied in final products as well as in raw-materials, namely grapes. Correlation between chemical and sensory analyses has been also considered [2]. For these purposes, liquid-liquid micro-extraction, solid-phase extraction and solid-phase micro-extraction and gas chromatography with flame ionisation, pulsed photometric and mass detectors were used to extract and identify volatile compounds.

### References

- [1] Zlatina Genisheva, Solange I. Mussatto, José M. Oliveira, José A. Teixeira "Evaluating the potential of wine-making residues and corn cobs as support materials for cell immobilization for ethanol production" *Ind. Crops Prod.* (2011) 34: 979-985.
- [2] Mar Vilanova, Zlatina Genisheva, Antón Masa, José M. Oliveira "Correlation between volatile composition and sensory properties in Spanish Albariño wines", *Microchem. J.* (2010) 95: 240–246.