

Evaluating the Effect of 'Terroir' on Volatile Composition of Red Wines

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Abstract : The zoning methodology currently recommended by the OIVV as official methodology to carry out viticulture zoning studies and to define and delimit the 'terroirs' has been applied in this study. This methodology has been successfully applied on the most significant and important Spanish Oenological D.O. regions, such as Ribera de Duero, Rioja, Rueda and Toro, but also it has been applied around the world in Portugal, different countries of South America, and so on. This is a complex methodology that uses edaphoclimatic data but also other corresponding to vineyards and other soils' uses. The methodology is useful to determine Homogeneous Soil Units (HSU) to different scale depending on the interest of each study, and has been applied from viticulture regions to particular vineyards. It seems that this methodology is an appropriate method to delimit correctly the medium in order to enhance its uses and to obtain the best viticulture and oenological products. The present work is focused on the comparison of volatile composition of wines made from grapes grown in different HSU that coexist in a particular viticulture region of Castile-Lion cited near to Burgos. Three different HSU were selected for this study. They represented around of 50% of the global area of vineyards of the studied region. Five different vineyards on each HSU under study were chosen. To reduce variability factors, other criteria were also considered as grape variety, clone, rootstocks, vineyard's age, training systems and cultural practices. This study was carried out during three consecutive years, then wine from three different vintage were made and analysed. Different red wines were made from grapes harvested in the different vineyards under study. Grapes were harvested to 'Technological maturity', which are correlated with adequate levels of sugar, acidity, phenolic content (nowadays named phenolic maturity), good sanitary stages and adequate levels of aroma precursors. Results of the volatile profile of the wines produced from grapes of each HSU showed significant differences among them pointing out a direct effect of the edaphoclimatic characteristic of each UHT on the composition of the grapes and then on the volatile composition of the wines. Variability induced by HSU co-existed with the well-known inter-annual variability correlated mainly with the specific climatic conditions of each vintage, however was most intense, so the wine of each HSU were perfectly differentiated. A discriminant analysis allowed to define the volatiles with discriminant capacities which were 21 of the 74 volatiles analysed. Detected discriminant volatiles were chemical different, although most of them were esters, followed by were superior alcohols and fatty acid of short chain. Only one lactone and two aldehydes were selected as discriminant variable, and no varietal aroma compounds were selected, which agree with the fact that all the wine were made from the same grape variety.

Keywords : viticulture zoning, terroir, wine, volatile profile

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