Wine-growing origins affect the structure of oligosaccharides in red wines
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Oligosaccharides have been proven as valuable molecules for numerous medicinal and food applications. In wine, these molecules present several physicochemical properties. Moreover, oligosaccharides have been reported a positively relation between some of their monosaccharides and the astringency perception of wines. A terroir can be defined as a grouping of homogeneous environmental units based on the typicality of the products obtained. This notion is particularly associated with wine, being the climate and the soil two of the most important elements of terroir concept.

The aim of this study was check for the first time the characterization of oligosaccharides of Monastrell red wines from different geographical origins by determination of glycosyl–linkages composition.

### EXPERIMENTATION

Monastrell red wines were elaborated with grapes from four different terroirs: Cañada Judío, Albatana, Bullas and Montalegre. Climate and soil data from different terroirs were gathered to properly distinguish them. Cañada Judío terroir is composed of dolomites, loams and sandstorm. Albatana terroir is composed by gravel, sand and slime. Evaporites, volcanites and clay can be found in Bullas terroir. Clay, gravel, mud and gypsum form Montalegre terroir.

Oligosaccharide fractions from wines were isolated after removal of phenolic compounds by polyamide and after by high resolution-size exclusion chromatography and the glycosyl–linkages composition was determined by GC-MS of the partially methylated alditol acetates. Propositions of several families of oligosaccharides from yeasts and grapes have been calculated from glycosyl-linkage data as described in literature. All these data were treated by principal components analysis (PCA) to permit a better understanding.

### RESULTS

![Figure 2](image-url)  
**Figure 2.** Evolution of major oligosaccharide families (relative mole percentage) isolated from Monastrell red wines elaborated with grapes Cañada Judío, Albatana, Bullas and Montalegre terroirs.

![Figure 3](image-url)  
**Figure 3.** Principal Components Analysis of major oligosaccharide families (relative mole percentage) isolated from Monastrell red wines elaborated with grapes Cañada Judío, Albatana, Bullas and Montalegre terroirs.

### CONCLUSIONS

The molar percentage of most residues exhibits marked differences depending on the terroir. The ratio of the terminal to the branched residues for different wines oligosaccharides also varies according to the geographical origin. Moreover, proportions of almost all oligosaccharide families from different terroir wines presents clear differences in terms of relative molar percentage. In summary, our results suggest the great impact of terroir on the different structure of the wine oligosaccharide fraction, which could affect their physicochemical and sensory properties.