

ROSÉ WINES: IMPACT OF STORAGE CONDITIONS IN TANK ON THE POLYPHENOL COMPOSITION AND COLOR

Color of Rosé wines is an important criterion for consumer choice. This color depends on the concentration of anthocyanins and also of other pigments derived from them. Production conditions (grape variety, winemaking) and storage conditions have an impact on the polyphenol composition, in particular on anthocyanins and other pigments which can be formed by complex chemical reactions. In this work, the effect of conditions of wine storage in tank (temperature, level of sulfite, oxygen exposure) on the color and phenolic composition of Rosé wines was investigated.

MATERIAL & METHODS

Rosé wines were made in four different vine-growing areas: Val de Loire, Provence, Tarn, and Bordeaux. In each region, common practices of storage conditions in tank during six months were compared: temperature regimes (coded 12, 20, VAR (variable)), two levels of sulfite addition, two levels of oxygen exposure (coded NO : normal, HI : high). Polyphenols were quantified by ultra-high-performance liquid chromatography coupled to triple quadrupole tandem mass spectrometry (UHPLC- QqQ-MS) used in multiple reaction monitoring (MRM) mode. This method enabled quantification of over one hundred phenolic compounds in Rosé wines. Color characteristics were determined by several color indices and chromatic coordinates (L^* , a^* , b^*) deduced from absorbance measurements. Three bottles were analyzed for each sample after bottling in the same conditions and after storage during one year at 20°C.

RESULTS & DISCUSSION

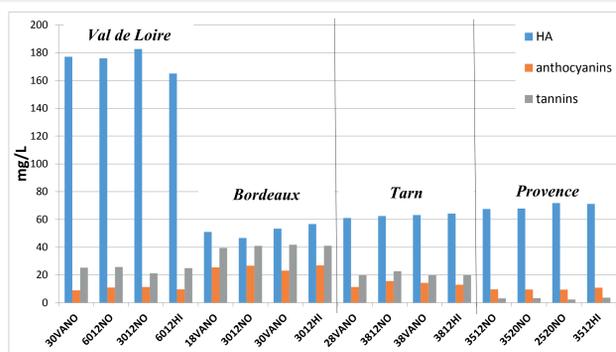
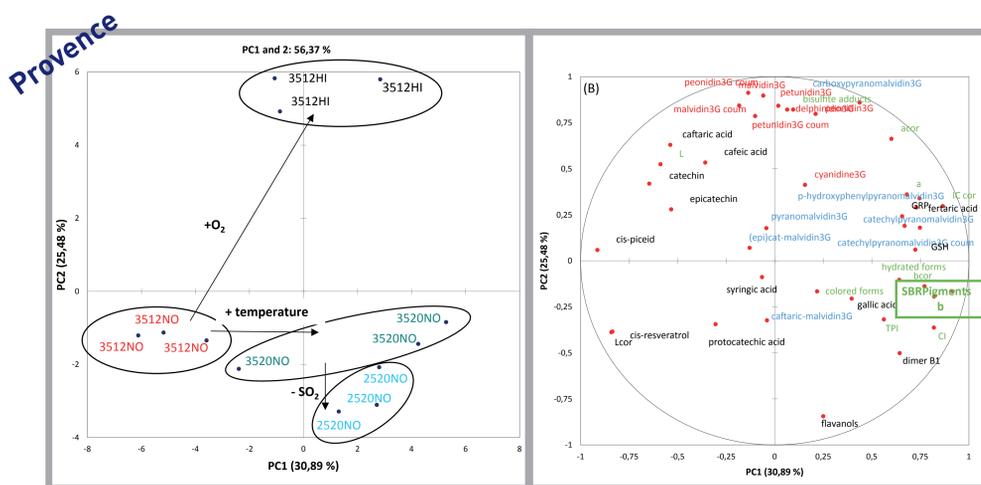


Figure 1. Composition in hydroxycinnamic acids (HA), anthocyanins and tannins of each series of Rosé wines.

The polyphenol composition (quantities and proportions) was different between the four series. The concentrations of the main groups of grape compounds (hydroxycinnamic acids, anthocyanins and tannins) are presented in Figure 1.

A principal component analysis was performed on all the data (color data in green, native anthocyanins in red, derived pigments in blue and the others polyphenols in black) for each trial: Val de Loire, Bordeaux, Tarn and Provence.



A low level of sulfite and a variable temperature regime led to a loss of anthocyanins and the formation of derived pigments. Absorbance at 520 nm due to sulfite bleaching resistant pigments (SBRPigments) and the coordinate b^* (yellow) were correlated, underlining the contribution of these derived pigments to the color of Rosé wines.

CONCLUSION

This study showed that the storage conditions in tank impacted the derived pigment composition of Rosé wines, also depending on the proportions of native compounds (hydroxycinnamic acids, anthocyanins, and tannins) in the wines. In particular, variable temperature regimes and low levels of sulfite led to an increase of colour attributable to a lower extent of sulfite bleaching and an increased formation of sulfite bleaching resistant pigments. The proportion and quantity of the different families of derived pigments (pyranoanthocyanins, carboxypyrananthocyanins, phenyl- and catechylpyrananthocyanins ...) were influenced by the concentration of native compounds combined with the winemaking process (yeasts, storage conditions).

