



ONE-YEAR AGING OF A SANGIOVESE RED WINE IN TANKS OF DIFFERENT MATERIALS:

EFFECT ON CHEMICAL AND SENSORY CHARACTERISTICS

Valentina Canuti, Francesco Maioli, Monica Picchi,
Lorenzo Guerrini, Alessandro Parenti, Bruno Zanoni
valentina.canuti@unifi.it

AIM

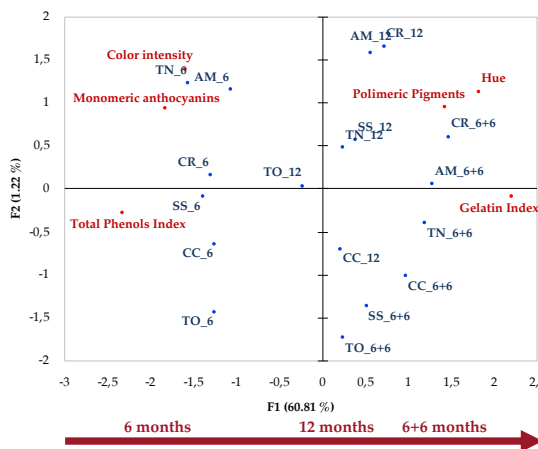
The aim of this study was to evaluate how the different tank materials could affect the chemical and sensory characteristics of a Sangiovese red wine during one-year aging. In particular, the impact of earthenware raw amphora (AM), uncoated concrete (CR), epoxy-coated concrete (CC), new oak barrel (TN), used oak barrel (TO), and stainless steel (SS) tank on wine color stability was investigated. At six months aging, a part of the wines in each tank was bottled to compare the effect of bottle aging with the tank aging.

METHODS

A Sangiovese red wine from 2018 harvest was aged for twelve months in different tank materials in industrial scale (5 hL) and in triplicate. Phenolic composition, color indices and acetaldehyde content were monitored monthly during twelve months aging. At six, twelve and six months of bottle aging, the wines were also characterized for volatiles, phenolics, elementals profile, tartaric stability and for quantitative descriptive analysis. Wine bottle in glass bottle (GB) at the beginning of the experimental was used as reference.



Biplot (axes F1 and F2: 75.03 %)



After six months aging, phenols, color indices, elemental and volatile compounds differentiated the wines according to the tank materials. Wine aged in new and used oak barrels showed the highest content of polymeric pigments and color indices, together with the wine aged in earthenware raw amphorae, that showed also the highest hue. After twelve months, the wines aged in new and used oak barrels were still the highest in polymeric pigments followed by the earthenware raw amphorae and uncoated concrete tanks. Moreover, the same wine aged six months in uncoated concrete tank and then six months in glass bottle showed the highest content of polymeric pigments (1) (Figure 1).

Figure 1. Phenolic composition and color indices: distribution of wines according to the time of aging (_6: six months; _12: twelve months; _6+6: six months in tank and six months in bottle)

RESULTS

Concerning the elementals composition (2), the uncoated concrete wine was very high in sodium while the earthenware raw amphora enriched the wine in calcium, iron and aluminum both after six and twelve months (data not shown). The volatile profiles differentiate the wine according to the tank materials: acetaldehyde content, that has an important role in color stabilization, was the highest in wine aged in used oak barrel at six months, while at twelve months in wines aged in earthenware raw amphora and uncoated concrete, and in bottle for earthenware raw amphora and used oak barrel (Figure 2).

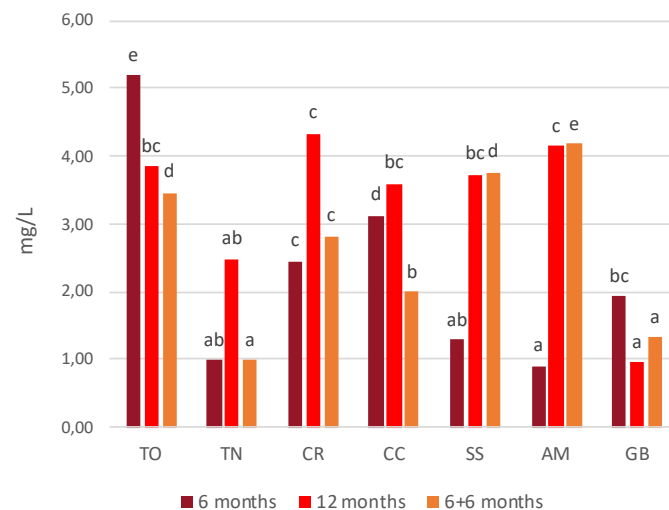


Figure 2. Acetaldehyde content (mg/L) in wines according to the time of aging

Biplot (axes F1 and F2: 71.97 %)

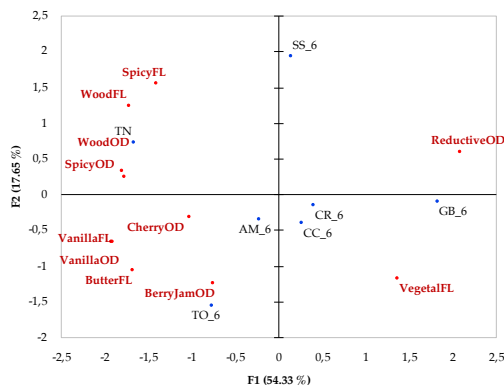


Figure 3. Figure 1. Sensory analysis of wines after six months aging

Sensory analysis evidenced that the six months aged wines were separated in two groups: i) the wine in new and used barrels; ii) the wines aged in stainless steel, epoxy-coated and uncoated concrete, and earthenware raw amphora. After twelve months, the wines aged for six months in tanks and six months in bottles were separate according to the tank materials, while the twelve months tanks aged wines seemed to maintain the same characteristics that they showed at six months aging, and were more similar between them (3) (Figure 3).

CONCLUSIONS

The results of this study give new information about the oenological use of different tank materials for the red wine aging with particular interest on wine color stability.

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