

DYNAMICS OF WHITE WINE OXIDABILITY DEPENDING ON TECHNOLOGICAL FACTORS: SULFUR DIOXIDE, IRON AND COPPER IONS

Ecaterina COVACI, Rodica STURZA, Raisa DRUȚĂ and Iurie SUBOTIN

Faculty of Food Technology, Technical University of Moldova, Chisinau, Moldova

Oxidation and the capacity for sufficient ageing potential of white wines are constant problems for winemakers worldwide. In general, it is accepted that certain grape varieties are especially sensitive to oxidation, suggesting that some of the chemical components key to their sensory attributes are strongly modulated by oxygen exposure. Of all the gases that can be dissolved in wine, oxygen and carbon dioxide can be considered the most important. Oxygen must be considered as a highly reactive chemical agent that has the potential to modify wine by oxidation.

The aim of this project is to carry out a detailed study of sulfur dioxide (SO₂), copper (Cu²⁺) and iron (Fe³⁺) ions distribution and concentrations in wine and their effect on the wine's quality and characteristics throughout different stages of the winemaking process.

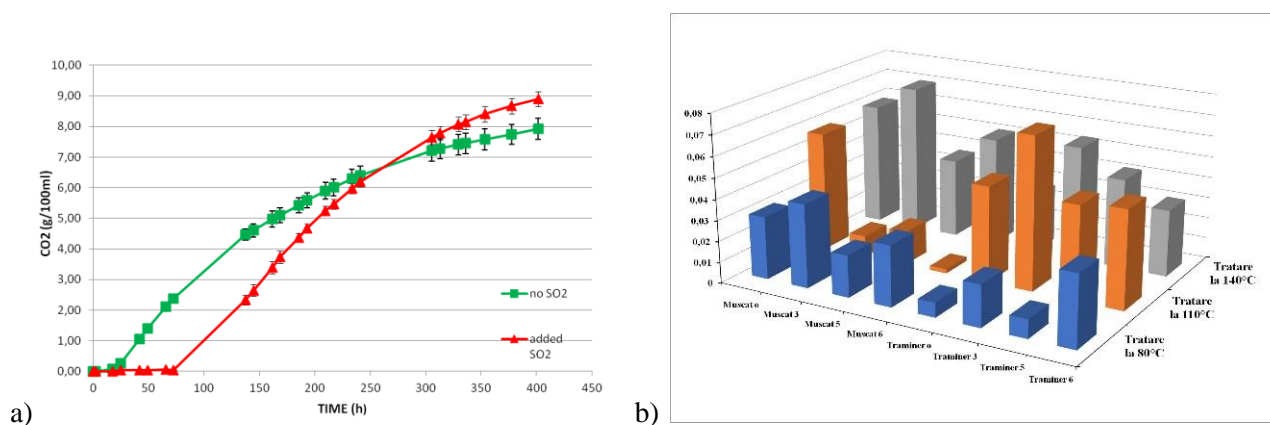


Fig. 1. Description of effects: a) the fermentation kinetics of the grape jus sample in the presence and absence of SO₂ in the fermentative medium and b) the color intensity for the wine samples experimentally oxidized with Iron and Copper ions at different thermal regimes

In laboratory conditions, by monitoring the oxidation processes throughout the technological process 2 dry white aromatic wines were developed. In the dynamics, a series of analyzes on the grapes, must and wine obtained, such as: physico-chemical indices, specific indices (pH, OD_{420 nm}, antioxidant capacity, POM-test, other) were performed.

Generalizing the results of the experimental and applied presented study, it is revealed that the decomposition rates of oxygen in wines described a good correlation with the total concentration of exogenous copper and iron in the wine samples, both for total and residual concentrations compared to decomposition oxygen rates.

The results obtained in this research reveal remarkable new aspects about Cu and Fe speciation in white wine. They open new opportunities for further research on the influence of copper and iron speciation on winemaking.

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