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Coupled Isotopic and Raman Study of the Oenological Food Chains of Red and White Wines from the Same Vineyard for Defining the Fingerprint Relevant for the Geographic Traceability

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An integrated isotopic and Raman experimental study on grapes, grape juices, musts, and wines from the Pitigliano wine area to investigate the possible contamination of $^{87}\text{Sr}/^{86}\text{Sr}$ ratios in white wines during the winemaking process has been performed.

Recently high precision Sr-isotopes TIMS analyses have shown that Red wines keep the $^{87}\text{Sr}/^{86}\text{Sr}$ values of the vineyard substratum (i.e., Barbaste et al. 2002; Almeida & Vasconcelos, 2004; Boari et al. 2008; Marchionni et al. 2013; Durante et al. 2015). Indeed, neither biological processes nor wine fermentation and aging are able to change the $^{87}\text{Sr}/^{86}\text{Sr}$ values through the oenological food chain from grapes to red wine. The same apparently it appears to be not true for white wines (Marchionni et al. 2013, Petrini et al. 2015).

This study focuses on the role of additives used during white wine making process and the atmospheric supply in changing the $^{87}\text{Sr}/^{86}\text{Sr}$ values. Atmospheric water and aerosol might also affect the final $^{87}\text{Sr}/^{86}\text{Sr}$ ratio of wines and then give ambiguous values.

During the last year, samples of grape, must, red and white wine, additives, soils and geologic bedrocks have been collected, prepared and analysed for $^{87}\text{Sr}/^{86}\text{Sr}$ ratios.

The results show a correlation between the values of grape/wine and their respective bedrocks and a change in the Sr isotopic ratio in wine after the addition of yeast and bentonite; so some additives could represent a problem for this technique oriented to the geographical traceability of wine.

In the future the study will be extended to the investigation of the role and influence of water in the absorption of the isotopic signature from the soil.

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