Insights into the stable isotope ratio variability of hybrid grape varieties

The wine industry faces the consumer's increasing demand for a sustainable and environmentally-friendly production [1]. This demand has been shared and boosted by the European Union within the European Green Deal in the Farm to Fork strategy that aims to reduce a 50% the pesticide utilisation in farming systems. Among the agronomical approaches so far proposed, the use of mould resitant hybrid varieties - based on crossings of *Vitis vinifera* with other Vitis spp [2]- with a high tolerance to the attack of vine patogens is gaining the vinegrowers attention and the production area is continuously increasing. The analysis of stable isotope ratio is the reference method to fight against counterfeiting in the wine industry, also thanks to the establishment of annual official reference databases in which the isotopic ranges of variability are reported [3]. This study aims to characterise and determine whether there is a varietal variation in the stable isotopic ratio of European *Vitis vinifera* to modern hybrid varieties. Wine samples produced with seven white varieties (Aromera, Bronner, Helios, Johanniter, Muscaris, Solaris, Souvignier Gris) and seven red varieties (Baron, Cabernet Cortis, Cabernet Cantor, Cabernet Carbon, Monarch, Prior, Regent) grown in two experimental plots sited in the north Italian region of Trentino were analysed for the stable isotopic ratio. Results were compared to the ratio isotopic ratio of the wines obtained from *Vitis vinifera* varieties of the same production area. The analyses were carried out by isotopic ratio mass spectrometry (IRMS) and site-specific natural isotopic fractionation by nuclear magnetic resonance (SNIF-NMR), according to the official methods of the International Organisation of Vine and Wine (OIV). The comparison shows the tendency of some hybrid varieties to deviate from the regional averages in their stable isotope ratios. In particular, Monarch, Cabernet Carbon and Cabernet Cantor among the red varieties and Solaris, Helios and Souvignier Gris among whites, stood out with values that differed considerably from the regional stable isotope standard values of wines derived from *V. vinifera*. The study investigates for the first time hybrid varieties from an isotopic point of view.

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Keywords: stable isotope; snif-nmr; irms; hybrid; grape