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OR 9

High Precision $^{87}\text{Sr}/^{86}\text{Sr}$ TIMS Analyses in Wines and Their Use as Geological Fingerprint for Tracing Geographic Provenance

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The radiogenic isotopic compositions of inorganic heavy elements such as Sr, Nd and Pb of food chain may constitute a reliable geographic fingerprint being their isotopic ratios inherited by the geological substratum of the territory of production. The Sr isotope composition of geo-materials (i.e., rocks and soils) is largely variable, and it depends upon the age of the rocks and their nature (e.g., genesis, composition). In this study we have developed a high precision analytical procedure for determining Sr isotope in wines at comparable uncertainty level of geological data. With the aim of verifying the possibility to use Sr isotope in wine as a reliable tracer for geographic provenance we performed Sr isotope analyses of 45 bottled wines from four different geographical localities of the Italian peninsula. Their Sr isotope composition has been compared with that of rocks from the substrata (i.e., rocks) of their vineyards. In addition wines from the same winemaker but different vintage years have been analysed, covering as a whole ten years of harvesting, from 2001 to 2010. $^{87}\text{Sr}/^{86}\text{Sr}$ ratios have been determined by solid source Thermal Ionisation Mass Spectrometry following chromatographic purification of Sr in a clean lab. $^{87}\text{Sr}/^{86}\text{Sr}$ of the analysed wines is correlated with the isotopic values of the geological substratum of the vineyards, showing little or no variation within the same vineyard and among different vintages. Large

$^{87}\text{Sr}/^{86}\text{Sr}$ variation is observed among wines from the different geographical areas reinforcing the link with the geological substratum of the production territory. This makes Sr isotopes a robust geochemical tool for tracing geographic authenticity and provenance of wine.