

Potential of a new multi-isotopic dilution method for geographical origin discrimination: application to wine

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Wine traceability has become of primary important for consumers as well as for producers. One of the most powerful tools to link wines to their geographical origin is the use of isotopic ratios of three non-traditional elements (Sr, Pb and B) mainly thanks to its very high precision. However, this approach is long and expensive which makes it difficult to use on a daily basis. In this study, a mix of 22 major and trace elements measurable by ICP-MS and proved to be relevant for geographical discrimination purpose have been selected to replace this triple isotopic system.

A new method has been developed to measure simultaneously these 22 elements. It involves: (1) a quantification by isotopic dilution whenever possible to improve the precision of the measurements (one of the key factors achieve a good discrimination) and (2) the use of a triple quadrupole ICP-MS to eliminate the potential interferences and allow the analysis of the 22 elements all at once to save time.

The potential of this new method comes from the range of elements precisely measured that allow the selection of the relevant ones depending on the application aimed. The presentation will introduce the development of this new method, its analytical performances, and its application to discriminate the geographical origin of wines. In particular, the potential of the method will be illustrated at different scales: from the country level to almost the farm level.

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