Trace and ultratrace elements in grapes: Possible applications for geographical traceability

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In the last decades the demand of information and criteria, suitable for connecting products to their production regions, is becoming more urgent in order to protect the qualitative high level productions by forgery. Wine is one of the products that could benefit of a scientific system of analysis able to define its production area. Features of the association between wine and territory is not only related to pedological but also to geographical aspects. Currently several studies to define markers, such as isotopic ratios of O, C, and N, able to identify types of wine has been carried out, but they are not suitable to univocally define a specific type of wine in particular due to the high variability of some factors (temperature, age of vineyard, period of such us isotopic…).

The aim of this work is to identify grape's characteristic parameters in the Euganei Hills area (NE of Italy) considering that they have to be directly related to in soils and than in vines. Euganei Hills are an ideal test site because in this zone there is a high quantity of vines farms in soils with an high geochemical heterogeneity.

Concentration of major (Si, Ti, Al, Fe, Mn, Mg, Ca, Na, K, P) and trace elements (Ba, Ce, Co, Cr, La, Nb, Ni, Pb, Rb, Sr, Th, V, Y, Zn, Zr, Cu, Ga, Nd, S, Sc) on 20 samples of soils (collected in a range of 30-40 cm of depth) and corresponding 20 samples of grapes has been analyzed by XRF. Moreover ICP-MS analysis has been carried out on wine grapes samples, with more attention on rare earth elements.

In the investigated areas the grapes have shown typical concentration ratios of some trace and ultratrace elements suitable to identify the production areas.

Apollo 16 impact melt vs basalt: Textural and chemical analyses

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This study builds upon previous work to distinguish between lunar impact melts and texturally similar pristine mare basalts. In the past, some lunar samples were initially incorrectly classified such as sample 14310, which was classified as a basalt [1-3], but later reclassified as an impact melt [4, 5]. Similarly, sample 14321, 1486 was identified as a basalt [6], but recently proven to be an olivine vitrophyre impact melt [7]. We use Crystal Size Distribution (CSD) textural analyses in conjunction with major and trace element mineral analyses to correctly categorize Apollo basalt and impact melt samples based on previous plagioclase work by [8]. Preliminary results suggest Apollo 16 basalts may have gentler plagioclase CSD slopes (Figure 1) than Apollo 14 impact melts and the three basalt groups [9] suggesting different crystallization conditions that could be correlated with the bulk composition (i.e. correlation between Al_2O_3 content and the CSD slope).

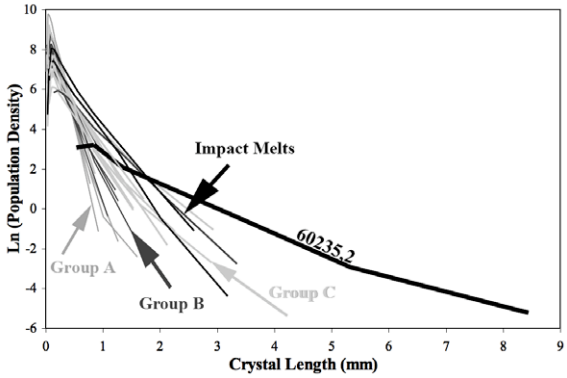

Figure 1: Plagioclase CSD of 60235, 2 (thick black) in contrast to Apollo 14 impact melts (thin black) and basalt groups (shades of grey).

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