



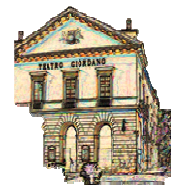
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## BOOK OF ABSTRACTS



## P1 - $\delta^{15}\text{N}$ OF PROLINE: THE DIRECT LINK BETWEEN SOIL AND WINE

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To date stable isotope ratio  $^{15}\text{N}/^{14}\text{N}$  (expressed as  $\delta^{15}\text{N}$ ) has not been investigated extensively in wine. We have studied  $\delta^{15}\text{N}$  throughout the wine production chain in order to measure its variability in the different matrices and understand the influence of physiological mechanisms and vinification processes.

Soil samples, leaves and grape berries were collected from seven different vineyards located in Trentino (Italy). To verify the isotopic effect of vinification process, grape samples were processed as for white and red wine and fermented with different selected dry yeasts, rehydrated according to the manufacturer's specifications.

Recently we have observed that there is a depletion of  $\delta^{15}\text{N}$  from soil to wine, with a total decrease by around -4‰, but that  $\delta^{15}\text{N}$  variability between locations is nevertheless conserved. Moreover, the  $\delta^{15}\text{N}$  of wine was found not to be affected by the yeast strain used or by the wine-making protocol applied.

Grapes contain various nitrogenous compounds, such as ammonium cations, amino acids, peptides and proteins. These compounds are used in biosynthesis, ammonium and amino acids being the preferred sources of nitrogen.

Proline is one of the main amino acids found in grapes and its utilization pathway requires the presence of oxygen. In anaerobic fermentation conditions, proline is not used by yeast as a nitrogen source and it is therefore maintained in wine.

This work presents compound-specific  $\delta^{15}\text{N}$  analysis of proline in grape juice and wine for the first time, in order to examine how it reflects the  $\delta^{15}\text{N}$  of soil and how it varies through the wine production. Measurement of proline  $\delta^{15}\text{N}$  values after N-acetylisopropyl derivatization was carried out using gas chromatography – combustion – isotope ratio mass spectrometry (GC-C-IRMS).

The data indicate that the  $\delta^{15}\text{N}$  value of proline in wine reflects the nitrogen isotopic value of proline in grapes, confirming that the fermentation process did not cause modification of its isotopic signature,

and both are really close to the  $\delta^{15}\text{N}$  value of soil, with average depletion of -0.4‰. Moreover, fermentation carried out with different yeast strains and different wine-making protocols did not have a significant impact on this parameter.