

3rd MS-Wine Day

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Mass Spectrometry & Grapes, Wines, Spirits

CONFERENCE PROCEEDINGS

$\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ Analyses of Amino Acids of grape

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$\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values of free amino acids in grape reflect the source of C and N of grapevine and the metabolic pathways involved in their biosynthesis. In this study, carbon and nitrogen isotope ratio analysis of whole amino acids extracted from several Italian musts and wine through ion-exchange chromatography and of proline after protein hydrolysis and derivatization were carried out by elemental-analysis- (EA) and by compound-specific gas chromatography-combustion- (GC-C) coupled with an isotope ratio mass spectrometry (IRMS). The sugar fraction isolated from must was also analysed. $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values of amino acids are not correlated. Our results showed a good correlation between the $\delta^{13}\text{C}$ of sugar and amino acid fractions. This could be effective in improving detection of the illegal addition of exogenous sugar to grape must. Both $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ of amino acids of must are related with those of wine. The $\delta^{15}\text{N}$ of amino acid seems to be related with the isotopic composition of soil, agricultural practices and with the climatic condition during ripening. We concluded that stable isotope ratio analysis of amino acids represents a novel analytical tool to support and improve certification and control procedures.

KEYWORDS: amino acids, must, wine, compound-specific, stable isotopes