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Wine authentication using GC-IRMS approach

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Since ancient times, wine has been considered one of the most sophisticated matrices. In the last decades, the continuous rise in volumes and in prices of wine has encouraged adulteration in the oenological field. One of the most commonly used techniques is the sugar addition in the form of cane, beet sugar, or syrup coming from vegetal fonts like cereals or fruits. Since 1990, the International Organisation of Vine and Wine (OIV) have issued two specific official isotopic methods to fight against this practice, but they are not always effective. With the aim to develop a new method to identify the sugar addition, we compared the 13C of sugar extracted from grape must following the official method UNI ENV 12140:1997 to the 13C of the amino acid proline through GC-IRMS, after extraction and derivatization of the samples. In addition, following the same approach, the carbon isotopic composition of two characteristic grape must sugars (myo and scyllo – inositol) was measured to identify the illegal correction of their concentration. We concluded that stable isotope ratio analysis using GC-IRMS approach represents a novel analytical tool to support and improve certification and control procedures.