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LATEST APPLICATIONS OF THE LC-CO-IRMS FOR FOOD AND DIETARY SUPPLEMENTS AUTHENTICATION

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The LC-co-IRMS represents an innovative technique based on the oxidation in acid conditions of all the carbon-based compounds of a sample mixture, previously separated from each other through an appropriate analytical column. Since its introduction in the market in 2004, the LC- co-IRMS has been used to analyse various matrices [1].
Nevertheless, the potential of this techniques is still far from being fully exploited. In this work, we presented some of the latest LC-co-IRMS applications that our group developed for traceability purposes.

In a recent study, the LC-co-IRMS was applied to check for the fraudulent addition of exogenous sugars to Italian authentic wine must. A database of about 100 samples from 16 different Italian regions was considered to set reference values for the carbon isotopic ratio ($\delta^{13}C$) of glucose and fructose in this matrix [2].

Besides sugars, organic acids have also been considered. The addition of biosynthetic citric acid obtained though the fermentation of cheap starting materials like cane sugar by the fungus *Aspergillus Niger* was detected in matrices such as tomato sauce, lemon and orange juice.
Finally, dietary supplements and drugs have also been studied. Levodopa is an amino acid prescribed for Parkinson disease. Natural levodopa can be extracted from plants like the *Mucuna pruriens*, but cheaper analogues can be chemically synthesised or biochemically obtained from the fermentation of sugars by various fungi [3]. The LC-co-IRMS led to the characterisation of the different levodopa sources, pointing out the possibility to detect fraudulent additions of the biochemical active principle to products declared as natural.

References

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