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# Assessing the traceability and authenticity of fruit juices in terms of isotopic fingerprinting

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The authenticity and traceability of food are the main factors that predetermine the general perception of the quality and price, thus becoming an issue of great interest for both consumers and producers. Stable isotopes remain one of the most promising existing solutions to determine the provenance. In this work a set of 89 fruit juices samples, prepared from fruits collected during 2013 and 2014, from 12 representative areas in Romania, were discriminated in terms of their geographical origin using the O-H-C isotope ratio. Multivariate analysis based on stable isotope content was used to determine the parameters with the best ability in determining the geographical origin. A 91.48% discrimination rate was obtained for fruit juices sourced from different producing regions, concluding that the fruit growing regions maintained their unique fingerprint over the two harvest years. All isotope ratio were identified as providing the maximum discrimination between the fruit juices samples across different botanical origin. Discriminant analysis provided an overall classification rate of 97.24% highlighting that stable isotopes are influenced by the metabolic pathway specific to each type of fruit. The excellent prediction rate achieved through linear discriminant analysis in order to classify fruit juices according to their botanical/geographical origin and harvest year, reveals the ability of multivariate statistical analysis based on stable isotopes to confirm provenance. This work provides relevant data to generate a reliable isotopic (δ13C, δ18O, δ2H and D/H) map for fruit juices from different geographical regions which could be incorporated in the authenticity and traceability systems.

## Biography

Botoran Oana-Romina is a PhD student in chemistry (CSIII) with the thesis: „Identification of stable isotopes as origin markers by spectrometric methods" (Politehnica University of Bucharest, Faculty of Applied Chemistry and Material Science), has experience in applying stable isotope techniques for food and beverage authentication, specialized in fingerprinting methods application by NMR and IRMS. She has published more than 20 papers and she was involved in several national and international projects with the aim to develop analytical methods for quality control and origin authentication of food.

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