

Abstract

FIA-ESI-MS Fingerprinting Method with Chemometrics for the Characterization of Adulterated Coffee Samples [†]

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[†] Presented at the 2nd International Electronic Conference on Foods—Future Foods and Food Technologies for a Sustainable World, 15–30 October 2021; Available online: <https://foods2021.sciforum.net/>.

Abstract: Food products are very complex matrices, which makes the quality of these products an issue of great interest in our society. Considering the complexity of the food chain, the adulteration of food is increasing, causing food fraud cases. In this field, drinks are food products that can be very easily adulterated. This work will focus on the theme of fraud detection in coffee, one of the most popular beverages in the world. Coffee contains an elevated number of bioactive substances (phenolic acids, polyphenols, and alkaloids, being especially abundant in ellagic, caffeic and chlorogenic acids) that give rise to its important antioxidant activity, known for its beneficial health effects. The aim of this work was to develop an efficient non-targeted FIA-ESI-MS fingerprinting method in combination with chemometrics to achieve the characterization, classification, and authentication of coffee samples, together with possible adulterants (barley, chicory, and flours) using partial least squares regression discriminant analysis (PLS-DA) chemometric method. In addition, Arabica and Robusta coffee samples were adulterated with barley, chicory and flour and the obtained FIA-ESI-MS data subjected to partial least squares (PLS) regression. Results demonstrated the feasibility of the proposed methodology to assess coffee authenticity and to quantify adulteration levels (down to 15%), showing good calibration and prediction errors. The poster of this work is provided in the supplementary materials.

Keywords: food fraud; FIA-ESI-MS; coffee; adulteration; fingerprinting



Citation: Núñez, N.; Pons, J.; Saurina, J.; Núñez, O. FIA-ESI-MS Fingerprinting Method with Chemometrics for the Characterization of Adulterated Coffee Samples. *Biol. Life Sci. Forum* **2021**, *6*, 102. <https://doi.org/10.3390/Foods2021-10919>

Academic Editor: Christopher J. Smith

Published: 13 October 2021

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Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/Foods2021-10919/s1>, Poster: FIA-ESI-MS Fingerprinting method with chemometrics for the characterization of adulterated coffee samples.

Author Contributions: Conceptualization, J.S. and O.N.; methodology, J.P. and N.N.; validation, J.P. and N.N.; investigation, J.P. and N.N.; resources, J.S. and O.N.; supervision, J.S. and O.N.; writing—original draft preparation, N.N. and O.N.; writing—review and editing, J.P., N.N., J.S. and O.N.; funding acquisition, J.S. and O.N. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the PID2020-114401RB-C22 of the Spanish Ministry of Science and Innovation, Spain.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Data is available upon request to the authors.

Conflicts of Interest: The authors declare no conflict of interest.