



SELECTION OF UNTARGETED SPME-GC-MS MARKERS FOR POTENTIAL FRAUD DETECTION IN ROASTED AND GROUND COFFEE

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Over the years, food products have been increasingly adulterated, leading to potential allergenic disorders and economic losses for consumers. Coffee, one of the most consumed beverages worldwide after water, is a crucial commodity, which is frequently subject to fraud. As a result, a plethora of scientific research has been devoted to finding analytical techniques that can accurately and quickly detect and quantify adulteration in roasted and ground coffee. The objective of this study was to identify chemical markers to discriminate pure roasted and ground coffee from its most common adulterants (corn, barley, soybean, rice, coffee husks, and Robusta coffee). SPME-GC-MS coupled with chemometrics was a tool to identify volatile compounds (VOCs). Principal Component Analysis (PCA) indicated the discrimination among roasted ground coffee and adulterants. A tendency of separation among adulterants can be showed in the Hierarchical

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Clustering of Principal Components (HCPC) and heat map. The PCA results was corroborated by Partial Least-Squares Discriminant Analysis (PLS-DA) approach. From 24 VOCs evaluated 11 VOCs were selected as possible candidate markers to detect coffee fraud. These last VOCs were present in only one type of adulterant: coffee husks, soybean, and rice. The SPME-GC-MS technique coupled with chemometrics showed to be a suitable tool to coffee fraud control and prevention.

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