

## Lipidomic profile of extra virgin olive oils from different Mediterranean countries by a rapid microbore RPLC-HRMS method

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Lipidomic analyses are commonly employed in food science research, with a focus on product quality and nutritional value. This work includes the development of an UPLC-Q-TOF method for the lipidomic analysis of extra virgin olive oil samples using a microbore UPLC C8 column (1.0 × 50 mm, with 1.7 μm diameter particles) and analysis times of 5 min per sample. In comparison to a 20-min conventional method, the novel proposed method saves 75% on mobile phase usage and reaches injection volumes of 0.2 μL. The approach was employed for the analysis of extra virgin olive oil samples from different Mediterranean countries (Greece, Israel, Palestine, Spain, and Cyprus), and statistically significant differences in triglycerides/markers of geographical origin were observed by multivariate statistical analysis. Additionally, statistically significant differentiations were observed in lipids between samples from different regions of Greece (Halkidiki, Kavala, Peloponnese, Crete). The new rapid method was evaluated for reproducibility and robustness using Quality Control (QC) samples, which were analysed every 8 samples throughout the analysis. The QC samples formed a tight cluster in the center of the PCA plot, indicating the stability of the system.

Cyclic ion mobility has the potential to be applied for the rapid separation of lipid isomers which is not always possible using conventional LC-MS instruments. In the present study, direct injection of QC samples from each country was performed and examples are presented regarding the separation of lipid isomers.

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