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Chemometric comparison and classification of four essential oils originating from *Apiaceae* and *Lamiaceae* families based on their chemical composition and biological activities

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This study is focused on the comparison and classification of some plant essential oils (EOs) originating from *Apiaceae* and *Lamiaceae* families based on their chemical composition, total phenolic content, antioxidant and antibacterial activities, by using appropriate chemometric methods - principal component analysis (PCA) and hierarchical cluster analysis (HCA). The study was designed to determine: the chemical composition of essential oils extracted from dried leaves of parsley, lovage, basil, and thyme; their total phenolic content (TPC), their antioxidant capacity (TEAC), and their antibacterial efficacy against *Salmonella enteritidis* (ATCC 13076) and *Listeria monocytogenes* (ATCC 19114), two of the most common bacteria responsible for food poisoning. The results showed that parsley, lovage, and thyme EOs are rich in monoterpene hydrocarbons, but basil EO in oxygenated monoterpenes and phenylpropanoids, both PCA and HCA separated essential oils into two main groups of which one contains two sub-groups. β-Phellandrene was the major component identified in parsley and lovage EOs, estragole in basil EO, and o-cymene in thyme EO. Thyme EO showed the highest level of total phenolics, the highest antioxidant capacity, and exhibited the stronger antibacterial activity results emphasized by using both chemometric methods. Among tested essential oils, the one of parsley was distinguished by a low total phenolic content (TPC), weak antioxidant activity, and weak antibacterial activity against *S. enteritidis*; lovage EO by low TPC, weak antioxidant activity, but moderate antibacterial activity; and basil EO by low TPC, moderate antioxidant activity, and weak antibacterial activity against *L. monocytogenes*.

Biography

Cristina Anamaria Semeniuc has completed her PhD and Post-doctoral studies from University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca (UASVM). She has a 15-year teaching experience as Teaching Assistant, Lecturer, and Associate Professor at both BSc and MSc levels on food quality control, food preservation, and legislation topics at the UASVM Cluj-Napoca. She is responsible for technology of agro-food processing-long distance education program within the UASVM Cluj-Napoca from 2012 onwords. She has published more than 80 papers in reputed journals and has been serving as an Editorial Board Member of the *Bulletin UASVM Agriculture*.

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