OPEN ACCESS Freely available online

Journal of Chemical Engineering & Process Technology

A metabolic study of calabrian bergamot essential oil using nuclear magnetic resonance spectroscopy

R A Salvino[1, 2], G De Luca[1] and C Aroulanda[2]

[1]University of Calabria, Italy
[2]Paris-Sud University, France

Abstract

Citrus Bergamia, also known as bergamot, it is a fruit belonging to the Rutaceae family which grows almost exclusively in the Calabrian strip coast between Villa San Giovanni and Gioiosa Jonica (Italy). It is mainly cultivated for the bergamot essential oil (BEO) extracted from the fruit peel, a high commercial raw substance which is widely employed in the international perfumery and cosmetics industries but also in pharmaceutical production thanks to its antiseptic and antibacterial properties. All the characteristics of BEO have been largely studied and related to the metabolite composition of the mixture. The characterization of BEO is essential to ensure its effectiveness in the various fields of application and, in particular, for the release of the "Protected Designation of Origin (PDO)" of "Bergamotto di Reggio Calabria – Olio essenziale ". Nowadays, the accepted instrumental methods used to asses the BEO quality and origin are the chromatographic techniques, but the scientific research is moving in the direction of new fast methodologies to better characterize this high values extract often subjected to fraud and sophistication. In this contribution, for the first time NMR spectroscopy was used on samples provided by the "Consorzio del Bergamotto di Reggio Calabria" in order to analyze (fingerprinting) the oil directly, without any treatment. 1D and 2D NMR experiments were recorded dissolving BEO in a common solvent for the metabolic characterization. Moreover, proton NMR spectra were recorded using benzoic acid as internal standard to perform a quantitative analysis of the main metabolites. Combining 1H-NMR spectra with statistical tools (PCA - Principal Component Analysis) and 2D NMR diffusion techniques, preliminary results on BEO samples adulterated with less expensive essential oils have been obtained.

Biography

R A Salvino took her master degree in chemistry at the age of 25 years in the University of Calabria (110/110 cum laude). She is now a PhD student within a joint PhD between the University of Calabria (IT) and Université Paris Saclay (FR).

Citation: R A Salvino, A metabolic study of calabrian bergamot essential oil using nuclear magnetic resonance spectroscopy, Physical Chemistry 2021, 4th International Conference on Physical and Theoretical Chemistry, March 25, 2021, Pages 04

J Chem Eng Process Technol 2021, an open access journal
ISSN: 2157-7048 Volume 12 | Issue 6 | 04