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ABSTRACT BOOK

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CHARACTERIZATION OF SAFFRON AROMA PROFILE: COMPARISON AMONG PTR-TOF-MS, HS-SPME-GC-MS AND HS-SPME-2DGC-MS/TOF

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The dried, red stigmas of *Crocus sativus* L. (saffron) are a very expensive spice known as saffron, which is used as a food flavoring, coloring agent or traditional herbal medicine. The postharvest dehydration process is necessary to convert *C. sativus* stigmas into the saffron spice. Saffron quality is determined by its color, taste, and aroma, which depend on many factors such as soil, climate, rainfall, harvest time, and finally postharvest treatments. Saffron samples from Tuscany, Italy were analyzed for their content in aroma and bioactive compounds with different analytical techniques. HPLC was used for the identification and quantification of crocins, picrocrocin, safranal and flavonoids content. The proton transfer reaction time-of-flight mass spectrometer (PTR-TOF-MS), HS-SPME-GC-MS and HS-SPME-2DGC-MS/TOF were employed for the aroma compounds analysis. The aim of this research is to study both aroma and bioactive compounds in order to improve saffron characterization with the use of different techniques. PTR-TOF-MS is a non-destructive technique which allows the achievement of the whole spectra of analyte masses with a time of resolution inferior to 1 s and the detection of high molecular weight molecules with a high resolution power. HS-SPME-GC-MS and HS-SPME-GC×GC-MS fingerprint analysis are ideal tools to analyze complex volatile matrices, and provide a sensitive method for the direct comparison and chemical visualization of food volatile components. GC×GC-MS is currently adopted as separation technique not only because of its high separation power and sensitivity but also for its ability to produce more widely distributed and rationalized peak patterns for chemically correlated group of analytes. The advantages and drawbacks of each techniques are compared and discussed. This work is supported by VOLATOSCA project.