THE ELEMENTAL PROFILE OF THE GREEK SAFFRON PDO "KROKOS KOZANIS" AS A TOOL IN AUTHENTICATION AND TRACEABILITY STUDIES

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Saffron, the dehydrated red stigmas of the plant *Crocus sativus* L., being the most expensive spice worldwide, is a potential target of fraud or mislabelling. So far, determination of the levels of the major water-soluble and volatile saffron compounds has been exploited for geographical differentiation or quality control purposes. The elemental profile of foods and especially REE one, which constitutes also a powerful tool for traceability, as well as for geographical origin demonstration, reflecting soil characteristics, area of production and environmental growing conditions, is not yet fully exploited [1,2]. The aim of the present work was to study the elemental profile of "Krokos Kozanis" which is the major European PDO product. Authentic saffron samples (*n* = 33), of the highest quality category [3], were subjected to ICP-MS analysis [4]. Trace and ultra-trace elements including REE (As, Cd, Co, Cr, Cu, Ni, Pb, Rb, Sb, Se, Sn, Sr, Ti, V, Zn, Zr, Ce, Er, Eu, Gd, La, Nd, Pr, Sc, Sm, Th, Y, Yb), were determined. Moreover, in order to study their accumulation from the soil to the aerial parts of the *Crocus sativus* L., whole plants and the soil portion corresponding to their rhizospheres were collected from a field (Krokos Kozani, Greece) and subjected to ICP-AES analysis. A first comparison between the derived compositional data and the respective ones for saffron produced in different regions of Italy (Abruzzo, Umbria, Tuscany) was found promising for the effectiveness of this approach in authenticity and traceability studies of the particular PDO product.

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Abbreviations: ICP-MS: Inductively Coupled Plasma – Mass Spectrometry, REE: Rare Earth Elements, ICP-AES: Inductively Coupled Plasma - Atomic Emission Spectroscopy

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