

HS-SPME-GC-MS QUANTITATIVE ANALYSIS OF LIPOXYGENASE PATHWAY VOLATILE COMPOUNDS IN MONOCULTIVAR EXTRA VIRGIN OLIVE OILS FROM TUSCAN GERmplASM

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More than 500 olive tree cultivars have been registered so far in Italy [1] and each region is characterized by local varieties. In "Santa Paolina" (Follonica, Italy) centre for plant biodiversity conservation, about 1000 accessions of olive trees, 82 of them collected from Tuscany, are maintained. Most of the accessions are well characterised for morphological aspects [2] and in some cases for genetic diversity [3] but oils that can be produced from them have been only partially characterised. In order to acquire more information on the quality of the oils from these accessions, 130 mono-cultivar extra virgin olive oils (EVOOs) were produced from 67 different genotypes belonging to Tuscany region over 2 years.

Since C5 and C6 volatile compounds derived from lipoxygenase pathway are considered the most important for the aroma of high-quality olive oils [4], a quantitative method based on HS-SPME-GC-MS has been developed to screen the aroma potentiality of the produced EVOOs. The analysed EVOOs expressed great variability for the total amount of volatile compounds, ranging from 5 mg·kg⁻¹ to 159 mg·kg⁻¹. Differences were also observed for the different ratios between the three groups of compounds derived from lipoxygenase pathway, namely C5 and C6 volatile compounds from linolenic acid and C6 volatile compounds from linoleic acid. Excluding the season effect, most of the observed differences can be attributed to the genetic diversity since all the trees shared the same harvesting and agronomic conditions, the ripening of the olives was similar and the oils were produced under the same controlled conditions.

The acquired data shows the large variation in terms of volatile compounds generated from lipoxygenase pathway, and thus in expected aroma diversity, present in a restricted olive germplasm collection offering a wide choice for breeding programs aiming at the development of new cultivars with desired aroma characteristics.