

Analysis of virgin olive oil volatile fraction from two distinct geographical areas of eastern Morocco

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Increase in demand for virgin olive oils over the past few decades can be attributed to its potential health benefits in relation with the typical "Mediterranean diet". Virgin olive oil, as gourmet oil, is also highly prized for its delicious taste and fragrant flavour. Volatile compounds are responsible for virgin olive oil aroma and flavour. Thus, sensory quality plays an important role in the overall quality of olive oil, hence, in the preference of consumers. Various studies have shown that levels of volatile compounds decrease substantially during the ripening of the olives but also depend on climate, geographical area, olive tree varieties and olive processing manner. Many attempts have been made to assess the role of different volatile compounds in the flavour and aroma of olive oil produced in two geographical areas (Laayoun, Tafoughalte) of Eastern Morocco. There are as yet no data on the volatile fraction of virgin olive oils from these regions, which have particular pedoclimatic conditions of growth for *Olea europaea*, (Moroccan Picholine). Volatile compounds were extracted according to the "Likens-Nickerson procedure" or by using the Solid Phase Micro Extraction (SPME). Likens-Nickerson-Volatile fractions were analyzed by gas chromatography coupled with mass spectrometry (GC-MS). Major volatile compounds, typically associated with aromas of olive oils such as hexanal, cis-3-hexenol, 1-hexanol and (E, E)-2,4-decadienal, have been identified, but other minor compounds remain to be identified. Using the SPME technique coupled to GC-MS, 76 compounds belonging to different chemical classes (aldehydes, alcohols, esters, ketones and carboxylic acids) were identified. The main volatiles present in olive oil analyzed are C6 compounds such as (E)-hex-2-enal, Z-3-Hexen-1-ol and 1-Hexanol. These compounds were generally identified in all samples analyzed but at various concentrations. The flavour differences of olive oils could be attributed to concentration differences and/or to presence or absence of volatile components. Although in both cases (Laayoun and Tafoughalte), the olive oil is extracted from Moroccan Picholine variety, some minor volatile compounds are present in olive oil from Tafoughalte area but absent in olive oil from Laayoun. If their presence will be confirmed for several times and for consecutive olive harvest periods, they will serve as distinguishing marks for olive oils from this particular geographical area. The results suggest that besides the genetic factor, environmental conditions influence the olive oil volatile formation.

Keywords: Virgin olive oil; "Likens-Nickerson"-Extraction; SPME; aroma, volatile compounds.