

DEVELOPMENT AND APPLICATION OF ANALYTICAL APPROACHES FOR EXTRA VIRGIN OLIVE OIL (EVOO) BIOPHENOLS DETERMINATION. MAPPING OF GREEK EVOOs

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Olive oil represents one of the most important components of the Mediterranean diet and Greece is a third world producing country after Spain and Italy. The beneficial effects of olive oil to the humans' health are attributed mainly to monounsaturated fatty acids (FA) but also to biophenols. Indeed, in 2011, the European Food Safety Authority (EFSA) published a scientific opinion suggesting the protective effect of certain EVOO polyphenols (hydroxytyrosol and its derivatives) against LDL oxidative damage. Despite the high number of published data on olive oil polyphenols, it doesn't exist so far an established analytical method for the complete separation and quantitation thereof in olive oil. Thus, the aim of the current work is to develop simple and reliable methods for the determination of EVOO biophenols and to map Greek EVOO based on the contained biophenols. Up to 300 different EVOOs have been collected from various regions, olive tree varieties and production procedures and analyzed using two approaches. The first one includes the quantitation of the 4 major biophenols i.e. tyrosol, hydroxytyrosol, oleacein and oleocanthal using both HPLC-DAD and UPLC-DAD-Fluorescence platforms. The second approach is based on the determination of total amount of hydroxytyrosol and tyrosol in olive oil after hydrolytic reaction in acidic conditions of their derivatives. The results obtained from the above analytical protocols led to significant conclusions about different biophenols levels in Greek EVOOs according to numerous parameters such as olive tree variety, environmental conditions, production procedure etc. Furthermore, the proposed methodologies could be generally utilized in order to prioritize EVOOs according to EFSA criteria.

Keywords: Biophenols, hydroxytyrosol, tyrosol, EVOO, mapping