Study of Lignans as potential Varietal Markers of Virgin Olive Oils

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The biological, nutritional, and health-promoting effects of olive oil have been attributed to its high oleic acid content and to its content of natural antioxidants, particularly phenols and polyphenols. Some of the most representative phenolic compounds in olive oils are, among others, the oleosidic forms of hydroxytyrosol and tyrosol, the lignans (1-acetoxypinoresinol and pinoresinol) and the flavonoids (luteolin and apigenin). The phenolic component profile of virgin olive oils depends, among other variables, on the olive variety; although it is true that the phenolic profile of each variety may not be sufficient enough to distinguish between samples obtained from different varieties. There are a lot of studies published with the aim of characterizing virgin olive oils produced from different varieties; the authors in all these cases wanted to find potential markers for the geographical origin or the olive fruit variety.

In this research work, our attention was focused on lignans which are derived from the combination of two phenylpropanoid (C6-C3) units, and are broadly considered as representatives of phytoestrogens, a group of compounds which have been shown to act as modulators of the mammalian hormonal system.

To carry out the analyses of the oil samples (46 samples of 14 varieties and 3 different years), we used the extraction protocol described by Bendini et al [1] and an HPLC method [2] with UV and MS (with two ionization systems) detection.

We report in this work the evidence that the lignans ratio (between 1-acetoxypinoresinol and pinoresinol) could represent an effective tool to distinguish olive oil varieties.

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[1] Bendini, A.; Bonoli, M.; Cerretani, L.; Biguzzi, B.; Lercker, G.; Gallina-Toschi, T. *J. Chromatogr. A* **2003**, *985*, 425-433.

[2] Carrasco-Pancorbo, A.; Cerretani, L.; Bendini, A.; Segura-Carretero, A.; Del Carlo, M.; Gallina-Toschi, T.; Lercker, G.; Compagnone, D.; Fernández-Gutiérrez, A. *J. Agric. Food Chem*. **2005,** 53, 8918-8925.