Olive oil is a directly consumable fatty juice of olive fruit (Olea europaea L.) and recognised as healthy and well-known food stuff due in part to its noticeable nutritional value and particular sensory characteristic. Olive oil differs from most of the other vegetable oils in terms of the production method not including any chemical application during process. Although just mechanical production requirements present, due to high consumers’ demand, price of the olive oil is considerably high compared to the other vegetable originated oils. As such, olive oil is often illegally adulterated with other less expensive vegetable and cheaper graded olive oils. For these reasons, a large number of articles have been published about marker chemical variables of olive oil to detect adulteration and several analytical techniques such as high-performance liquid chromatography (HPLC), gas chromatography (GC), near-infrared spectroscopy (NIR), fourier transform infrared (FT-IR), fourier transform Raman (FT-Raman) and nuclear magnetic resonance (NMR) have been developed.

In recent years, determination of the virgin olive oil authentication has been a major issue for the traceability and also become more important than adulteration for producers, consumers, and policy makers. Four books containing chapters focused specifically on olive oil authenticity (Nollet 2003, Singhal et al. 1997, Firestone and Reina 1996, Bianchi 2002) and reviews (ioannis and Antoniosi, 2007, Ben-Ayed et al. 2013, Dais and Hatzakis 2013) appeared in literature. Furthermore, a scientific workshop on “Olive Oil Authentication” was held in Madrid, 2013, to discuss current situation and problems.

To date, several approaches such as chemical compositions (1), stable isotopes (2) and DNA (3) have been proposed to control olive oil authentication. For the first method, the marker chemical compounds of olive oils for the classification and authenticity are triacylglycerides (TAGs) composition, phenolic fraction, and unsaponifiable components monitoring by statistical and mathematical analyses to evaluate the results. However, researchers reported that the chemical composition of virgin olive oil is influenced by processing conditions, genetic (variety) and environmental (climatological and edaphologic conditions) factors. As a result, the new approaches as DNA based and the stable isotopes technologies are gaining greater attention, since they are not influenced by environmental conditions.

This review (or speech) focused on major and minor chemical compounds and related official analytical methodologies to verify authenticity of olive oil. Additionally several fast and reliable new techniques for the detection of olive oil authentications and their potentials were discussed briefly

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