

PP4. Chemical analyses of truffle flavored (*Tuber* spp.) olive oils on the Greek market with HS-SPME

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Truffles are subterranean edible fungi of the genus *Tuber* (Ascomycota, Pezizales), with a high commercial interest and economic value due to their unique aroma [1]. There are a number of foods flavored with truffles, such as oils etc. The aroma profile of such flavored foods has been studied thoroughly during the last decades. In the framework of this study, 5 truffle olive oils from the Greek market were investigated, coming from white (*T. magnatum*) and black (*T. melanosporum*) truffles. All samples were analyzed by Headspace Solid-Phase Micro-Extraction (HS-SPME) coupled with Gas Chromatography-Mass Spectrometry (GC-MS) and a total of 31 metabolites were identified, including a variety of sulfur-containing volatiles. 2,4-Dithiapentane, well known as a volatile chemical marker of white truffles [2], was detected in high concentrations in both white and black truffle olive oils, however, probably as the main constituent of synthetic flavor additives. Furthermore, other artificial sulfur-containing compounds were identified in the oils available in the market, e.g. 1-propanethiol, diallyl sulfide, and allyl isothiocyanate, which have not been detected previously in other truffle olive oils but have been reported among the volatiles of *Allium* spp. [3,4] and *Brassica nigra* [5], respectively. In conclusion, this study confirmed that all studied truffle olive oils from the Greek market are produced by the addition of synthetic aroma compounds. These flavors are of low cost, highly effective olfactorily [6], and of low toxicity, used widely according to European regulations in order to imitate the aroma of truffles.

References:

- [1] Harki, E. et al., 2006. *Food Chem.* 99, 394–400.
- [2] Bellesia, F. et al., 1996. *Flavour Frag. J.* 11, 239–243.
- [3] Freeman, G.G., Mossadeghi, N., 1970. *J. Sci. Food Agr.* 21, 610–615.
- [4] Block, E., 2010. *Garlic and Other Alliums—The Lore and The Science*, RSC Publishing, Cambridge, UK, pp. 64.
- [5] Kask, K. et al., 2016. *Plant Cell Environ.* 39, 2027–2042.
- [6] Pacioni, G. et al., 2014. *Food Chem.* 146, 30–35.

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