

LIPID AND METABOLIC PROFILES OF OYSTER (PLEUROTUS) MUSHROOMS CULTIVATED ON GRAPE MARC OR OLIVE MILL WASTES

Dimitra Tagkouli ^A, Sofia Ntouranidi ^A, Archontoula Drouka ^A, Dimitra Z. Lantzouraki ^{B,C},
Vassilia J. Sinanoglou ^B, Panagiotis Zoumpoulakis ^C, Georgios Koutrotsios ^D, Georgios I.
Zervakis ^D, Nick Kalogeropoulos ^A

^A Harokopio University, Department of Nutrition and Dietetics, Athens, Greece

^B National Hellenic Research Foundation, Institute of Biology,
Medicinal Chemistry, and Biotechnology, Athens, Greece

^C University of West Attica, Department of Food Science & Technology, Athens, Greece

^D Agricultural University of Athens, Laboratory of General and Agricultural Microbiology,
Athens, Greece

*E-mail: dtagkoul@hua.gr

Wine making and olive oil production are among the most important agricultural activities in the Mediterranean region, generating big volumes of wastes and by products (Romero et al., 2018). Within the concept of recycling and sustainability, several attempts have been made to exploit these agro industrial wastes for the production of value added products, like mushrooms (Koutrotsios et al., 2018). During the last decades mushroom consumption is constantly increasing as a result of their health benefits and unique organoleptic characteristics (Rathore et al., 2017). *Pleurotus* spp are among the most common and widely commercialized species worldwide. Hence, the present work aimed to study the effect of alternative cultivation substrates on the lipid and metabolic profiles of three *Pleurotus* species, namely *P. eryngii*, *P. nebrodensis* and *P. ostreatus*, grown on wheat straw, grape marc, olive leaves and 2-phase olive mill wastes, in mixtures or separate. Substrates and harvested mushrooms were freeze dried, homogenized and analysed for their lipid and metabolic profiles. Fatty acids were determined by GC-MS, after direct hot saponification and transmethylation with BF₃/MeOH. The mushrooms lipid profiles were examined in total lipid (Folch) extracts by means of Iatroscan TLC – FID analysis, while their metabolic fingerprint was recorded on aqueous ethanolic extracts by quantitative NMR spectroscopy. Among the species studied *P. nebrodensis* exhibited the higher total lipid content, its fatty acid profile being more likely affected by substrate, while *P. ostreatus* presented a more homeostatic behaviour. Monounsaturated fatty acids predominated in the phylogenetically relative species *P. eryngii* and *P. nebrodensis*, and polyunsaturated fatty acids were more abundant in *P. ostreatus* lipids. Among lipid classes, examined in total lipid (Folch) extracts using Iatroscan TLC – FID analysis, triacylglycerols and sterols predominated. Finally, quantitative NMR spectroscopy indicated differences in free amino acids, sugar entities and low MW organic acids. Overall, *Pleurotus* species responded in a different manner by selectively absorbing organic compounds.

KEYWORDS: *Pleurotus* spp, Lipid profile, GC-MS, Iatroscan, NMR

REFERENCES:

1. Koutrotsios, G., Kalogeropoulos, N., Kaliora, A.C., & Zervakis, G.I. (2018). *Journal of Agricultural and Food Chemistry*, 66, 5971–5983.
2. Rathore, H., Prasad, S., & Sharma, S. (2017). *PharmaNutrition*, 5, 35–46.
3. Romero, C., Medina, E., Mateo, M. A., & Brenes, M. (2018). *Journal of the Science of Food and Agriculture*, 98, 225-230.