

Development of Cobrançosa "functional olive oils" by co-processing techniques

Madalena Marques¹, Suzana Ferreira-Dias¹, Cecília Gouveia², Conceição Vitorino², Miguel Mourato¹, Luisa L. Martins¹, Fátima Peres^{1,2}

¹ Universidade de Lisboa, Instituto Superior de Agronomia, LEAF —Linking Landscape, Environment, Agriculture and Food— Research Center, Tapada da Ajuda, 1349-017 Lisboa, Portugal.

² Instituto Politécnico de Castelo Branco, Escola Superior Agrária, 6001-909 Castelo Branco, Portugal.
fperes@ipcb.pt

Virgin olive oil is a food product that is part of the Mediterranean diet, representing one of the most important products included in this diet, since it is in the center of the pyramid, and should be the main source of fat.

"Flavored olive oils" appear on the market as a new food product, whose main objective is to improve the nutritional characteristics, sensorial and shelf life of olive oil, and to avoid or even disguise problems of oxidative degradation reactions and sensorial defects. In addition, the use of olive oil among non-traditional consumers increases, consequently adding value to this important Mediterranean agricultural product.

The aim of this work was to develop "functional olive oils" by co-processing techniques of 'Cobrançosa' olives with the addition of *Thymus citriodorus* (TL, lemon thyme) and *T. mastichina* L. (TM) from organic agriculture. The "functional olive oils" were prepared by: (i) thyme addition to the olives during the unit operations of crushing or malaxation, and (ii) implementation of ultrasound before the malaxation of the olive paste.

The trials were performed using the ripest fruits that remained on the trees, which contain a low aromatic potential. Several parameters were evaluated in the "functional olive oil" and in the virgin olive oil obtained without co-processing, namely: quality criteria parameters, total phenols, fatty acid composition, chlorophyllin pigments, and phenolic profile. Subsequently, the effect of storage (temperature 22-23 °C) on the chemical and sensory characteristics of the oils was studied.

The results obtained showed an important sensorial improvement of all the "functional olive oils" obtained by co-processing. In what concerns the phenol content, all the co-processed oils with TM showed a significant ($p < 0.05$) improvement of phenol compounds, while with TL no significant differences from the control were observed. In turn, in the trials with TL, the extraction of chlorophyllin pigments were higher, particularly in crushing co-processing. The main fatty acids were within the following intervals (%): oleic acid (71.1-72), palmitic acid (12.1-12.9), linoleic acid (8.8-9.8) and stearic acid (3.1-3.5). After the first four months, all the oils showed significant increase of oxidation, measured by peroxide value and UV absorbances, which was not observed in previous studies¹; this could be explained by the fatty acid composition of 'Cobrançosa' cultivar, more prone to oxidation due to its higher polyunsaturated fatty acids content.

Acknowledgements: We would like to thank Biotech Plant Lab of Beira Interior, Castelo Branco, Portugal.

Funding: This work was funded by national funds through FCT – Fundação para a Ciência e a Tecnologia, I.P., under the project UIDB/04129/2020 of LEAF-Linking Landscape, Environment, Agriculture and Food, Research Unit. (OLIVETHY exploratory project)

References:

1. Peres, F., Roldão, M., Mourato, M., Martins, L. L., & Ferreira-Dias, S. (2021). Co-Processed Olive Oils with *Thymus mastichina* L.— New Product Optimization. *Life*, *11*, 1048.