



Abstract

# Effective Production of Bioactive Phenolic Compounds from Olive Stones <sup>†</sup>

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<sup>†</sup> Presented at the 2nd International Electronic Conference on Foods—Future Foods and Food Technologies for a Sustainable World, 15–30 October 2021; Available online: <https://foods2021.sciforum.net/>.

**Abstract:** Olive stones (OS) are a by-product generated in the olive oil production process. This residue is obtained in industries after the oil extraction process, and it is recognized as an interesting feedstock for the production of bioenergy and value-added products. Nevertheless, currently, it is only used as a low-cost solid biofuel for combustion. An alternative valorization approach has been developed based on an acid-catalyzed process for the solubilization of hemicelluloses [1] and the production of furfural [2]. This process yields a solid cellulose and lignin-rich material, which can be further upgraded. In this work, an organosolv process for the delignification of the material and improvement of the enzymatic digestibility was applied and optimized. The organosolv stage was carried out with an ethanol:water ratio (50:50, *w/w*) in a Parr reactor, varying the temperature (140–190 °C) and the addition of the catalyst (0–100 mM H<sub>2</sub>SO<sub>4</sub>). The liquid fraction obtained was analyzed to evaluate the presence of value-added products, such as phenolic compounds with antioxidant activity. The total phenolic content was determined by the Folin–Ciocalteu method, obtaining a phenol concentration between 5 and 13 g GAE/L, corresponding to a phenol yield of 8 g GAE/100 g of processed material, which ranks in the range of those obtained from other plant sources, in other olive by-products such as exhausted olive pomace, up to 9 g GAE/100 g of extract have been reported [3]. The phenolic profile was obtained by capillary electrophoresis analysis, allowing the identification, among others, of vanillin and syringaldehyde as naturally occurring flavor components exhibiting antioxidant and antimicrobial properties. Therefore, with the present study, we were able to determine that the liquor obtained after the organosolv pretreatment of olive stones can also be valued as a bio-source of non-synthetic preservatives and additives for the food industry.

**Keywords:** olive stones; phenolic compounds; organosolv; capillary zone electrophoresis; agro-industrial residue valorization



**Citation:** Padilla-Rascón, C.; Ruiz, E.; Castro, E.; Roseiro, L.B.; Duarte, L.C.; Carvalheiro, F. Effective Production of Bioactive Phenolic Compounds from Olive Stones. *Biol. Life Sci. Forum* **2021**, *6*, 70. <https://doi.org/10.3390/Foods2021-10940>

Academic Editor: Antonio Cilla

Published: 13 October 2021

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**Supplementary Materials:** The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/Foods2021-10940/s1>, Poster: Effective Production of Bioactive Phenolic Compounds from Olive Stones.

**Author Contributions:** C.P.-R. conducted the research, and performed the analysis. C.P.-R., F.C., L.C.D., L.B.R. and E.R. designed the research, performed the data interpretation and discussion

and wrote the manuscript. F.C., L.C.D., L.B.R., E.R. and E.C. supervised the work and revised the manuscript. All authors have read and agreed to the published version of the manuscript.

**Funding:** The authors want to acknowledge the financial support from Agencia Estatal de Investigación (MICINN, Spain) and Fondo Europeo de Desarrollo Regional, reference project ENE2017-85819-C2-1-R. The present work has received funding from Horizon 2020's Research and Innovation Programme under grant agreement number 731101 (BRISK2 project: Biofuels Research Infrastructure for Sharing Knowledge). This work was partially carried out at the Biomass and Bioenergy Research Infrastructure (BBRI-LISBOA-01-0145-FEDER-022059), which is supported by the Operational Programme for Competitiveness and Internationalization (PORTUGAL2020), by the Lisbon Portugal Regional Operational Programme (Lisboa 2020) and by the North Portugal Regional Operational Programme (Norte2020) under the Portugal 2020 Partnership Agreement, through the European Regional Development Fund (ERDF).

**Institutional Review Board Statement:** Not applicable.

**Informed Consent Statement:** Not applicable.

**Data Availability Statement:** Not applicable.

**Acknowledgments:** C.P.-R. gratefully acknowledges the PhD Fellow grant by Universidad de Jaén (research grant R5/04/2017) and pre-doctoral stay fellowship (Acción 6 para estancias breves de Personal Investigador en Formación encaminadas a la obtención del título de Doctor con mención internacional). The authors thank Belina Ribeiro and Céu Penedo for their laboratory support.

**Conflicts of Interest:** The authors declare no conflict of interest.

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