



BOOK OF ABSTRACTS

XXI EUROFOODCHEM

22-24 November 2021

On-line conference



TITLE

Book of Abstracts of the XXI EuroFoodChem Congress

EDITORS

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EDITION

Sociedade Portuguesa de Química
Av. Da República, 45 – 3º Esq
1050-187 Lisboa – Portugal

DATE

November 2021

ISBN

ISBN 978-989-8124-34-0



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Extraction of phenolic compounds with antioxidant activity from cherry seeds: preliminary study

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The food processing industry is responsible for the generation of a significant amount of wastes and by-products, resulting from the transformation processes applied to food. These residues are highly rich in bioactive compounds with antioxidant activity, like for example the phenolic compounds [1]. To recover these compounds from the residues, extraction operations usually apply, but their optimization is important to maximize yield, minimize costs and reduce the environmental impacts. One of the main issues is related with the use of organic solvents derived from petroleum [2].

The objective of this study was to test different extraction conditions to obtain phenolic compounds from cherry seeds. For this the seeds used were pre-dried in the sun and grounded, and the powder was then dried in a stove for 24 hours at a temperature of 40 °C. The extraction was performed using different solutions: water, methanol, ethanol:water (in variable percentages from 50% to 100% water) and ultrasounds. Also, the temperature was varied from 35 to 80 °C. The total phenolic compounds (TPC), anthocyanins, flavonoids and antioxidant activity (DPPH and ABTS methods) were measured using spectroscopic methods.

The results showed that the extraction of total phenolic compounds was higher for extraction with water or mixtures of water and ethanol, rather than with methanol or water plus ultrasounds (Fig.1). Additionally, testing different temperatures and percentages of water, it was verified that maximum extraction of phenolic compounds was obtained for 70 °C, and using an extraction solution of ethanol:water (40:60, % v:v), which was 2.65 mg/g (galic acid equivalent). Under these conditions, the anthocyanins were 0.65 mg/g, and flavonoids were 1.05 mg/g (malvidin-3-glucoside equivalent). The antioxidant activity was 2.26 mg/g measured by ABTS method and 0.65 mg/g measured by DPPH method, in both cases expressed as Trolox equivalents.

In this way it was possible to obtain extracts rich in phenolic compounds with antioxidant activity, using an aqueous solution with 40% ethanol, and by performing the extraction at 70 °C and using magnetic stirrer.

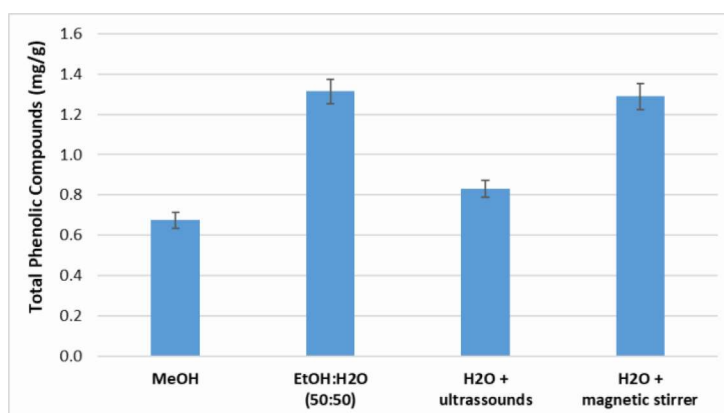


Fig.1. Extraction of Phenolic compounds with different conditions.

Acknowledgments: This work is funded by National Funds through the FCT - Foundation for Science and Technology, I.P., within the scope of the project Ref^o UIDB/00681/2020. Furthermore, we would like to thank the CERNAS Research Centre and the Polytechnic Institute of Viseu for their support. This work was developed in the ambit of project VALCER ref. PROJ/IPV/ID&I/021.

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