Recovery of Phenolic Compounds from Edible Algae Using High Hydrostatic Pressure: An Optimization Approach

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Abstract: Algae are not only of high ecological, but also of great economic importance. The industrial exploitation of algae has suffered a boom in the last two decades because they are a suitable source of interesting compounds for a number of sectors (agriculture, energy, food science, cosmeceutical, pharmacology, among other) [1]. Among these compounds, phenolics are gaining attention as their beneficial health properties that they are thought to confer as they are usually potent antioxidants, although some of them are also regarded as antimicrobial or anticarcenogenic. Taking into account this information, in this work, high hydrostatic pressure (HHP) was applied to optimize the extraction of phenolic compounds from eight edible algae species (*Laminaria spp., Saccharina latissimia, Himanthalia elongate, Undaria pinnatifida, Porphyra spp., Palmaria palmata, Codium spp.* and *Ulva spp*.). The process was optimized by response surface methodology using a five-level central composite design combining the independent variables of processing time (*t*, 5-90 min), pressure (*P*, 10-600 MPa) and solvent (*S*, 0-100 % of ethanol (v/v)) [2]. The individual and total phenolic compounds and the extraction yield were used as response variables. In general, the optimum extraction conditions for phenolic acids for all eight species analyzed were found at shorter values of *t,* high values of *P* and high values of *S*. The best results were obtained for Kombu real with a concentration of phenolic compounds of 78.7 mg / g and a yield of 22.0%. In conclusion, the present study contributes to the valorization of edible algae species, common in the North-West region of Spain, by the obtainment of rich extracts in phenolic compounds that potentially can be applied as ingredients in different industrial fields with a promising emerging technology.

Acknowledgment: The research leading to these results received financial support from Programa de Cooperación Interreg V-A España—Portugal (POCTEP) 2014–2020 (projects Ref. 0181_NANOEATERS_01_E and Ref. 0377_IBERPHENOL_6_E) that supports the pre-doctoral grant for C. Jimenez-Lopez; from MICINN supporting the Ramón&Cajal grant for M.A. Prieto (RYC-2017-22891) and A. Carreira Casais for his PhD grant (FPU 16/135); from Xunta de Galicia and University of Vigo supporting the post-doctoral grant for M. Fraga-Corral (ED481B-2019/096) and the pre-doctoral grants for A.G. Pereira (ED481A-2019/0228) and P. García-Oliveira (ED481A-2019/295); from MICINN supporting the Juan de la Cierva post-doctoral grant for Paz Otero (IJCI-2016-27774); from Axudas Conecta Peme (Xunta de Galicia) supporting the IN852A 2018/58 NeuroFood Project and AlgaMar (www.algamar.com) that supports the pre-doctoral grant for C. Lourenço-Lopes; from EcoChestnut Project (Erasmus+ KA202) that supports the work of M. Carpena; from Ibero-American Program on Science and Technology (CYTED - AQUA-CIBUS, P317RT0003); and from Bio Based Industries Joint Undertaking (JU) under grant agreement No 888003 UP4HEALTH Project (H2020-BBI-JTI-2019).

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