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Abstract

Novel Incorporation of Red-Stage *Haematococcus pluvialis* Wet Paste as a Colourant and Enhancer of the Organoleptic and Functional Properties of *Filloas* †

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† 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: *Haematococcus pluvialis* Flotow is a microalga used as a nutraceutical, due to its high content in bioactive compounds, mainly carotenoids, in which astaxanthin stands out [1]. Furthermore, *H. pluvialis* has shown a high antioxidant potential, and combined with its intense red colour, this microalga could have dual functionality: as a colourant and a bioactive ingredient [2]. The process to obtain this ingredient involves several transformation steps—namely, lyophilisation and saponification—raising the costs to develop and obtain free astaxanthin, which paradoxically presents greater instability and solubility than its esterified counterpart [3]. Thus, this study provides an alternative approach for the application of red, astaxanthin-rich, *H. pluvialis* wet paste as a partial substitute for wheat flour (7% and 13% *w*/*w*) in the preparation of *filloas* (Galician pancakes), a typical dessert from the northwestern region of the Iberian Peninsula. To evaluate its power as a natural pigment, the stability of colour over time (3, 6, and 9 days) was measured, and the results were compared with those of a commercial colourant. At the same time, its physicochemical properties such as the microbiological profile were measured to determine its functionality as a food preservative. As a result, redness stability (a*) of 8% higher than that of the commercial colourant was obtained for the maximum concentration of *H. pluvialis* analysed. The texture showed a significant response ($p < 0.02$), improving its properties as the concentration of the microalga increased, which showed a tenacity of 3.23 N and extensibility of 15.10 mm during the first 6 days, i.e., a 52% and 19% improvement, respectively, in relation to the control group. In turn, an enrichment of carotenoids, fatty acids, and phenolic compounds, in combination with a potential moderator of microbiological degradation by this unicellular organism, gives added value to this food matrix.

Keywords: *Haematococcus pluvialis*; *filloas*; microalgae; colourant; bioactive compounds; functional food

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Citation: Castillo, A.; Finimundy, T.C.; Heleno, S.A.; Rodrigues, P.; Fernandes, F.A.; Pereira, S.; Garcia-Jares, C.; Barros, L.; Lores, M. Novel Incorporation of Red-Stage *Haematococcus pluvialis* Wet Paste as a Colourant and Enhancer of the Organoleptic and Functional Properties of *Filloas*. *Biol. Life Sci. Forum* **2021**, *6*, 72. https://doi.org/10.3390/Foods2021-11072

Academic Editor: Antonio Cilla

Published: 14 October 2021

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/Foods2021-11072/s1, Video S1: Novel Incorporation of Red-Stage *Haematococcus Pluvialis* Wet Paste as a Colourant and Enhancer of the Organoleptic and Functional Properties of *Filloas*.

Author Contributions: Conceptualisation, L.B., M.L. and C.G.-J.; methodology, T.C.F., S.A.H., P.R. and F.A.F.; software, A.C.; formal analysis, A.C.; investigation, A.C. and T.C.F.; resources, S.P., M.L., C.G.-J. and L.B.; writing—original draft preparation, A.C.; writing—review and editing, A.C., T.C.F., M.L., C.G.-J. and L.B.; supervision, T.C.F., F.A.F., P.R. and S.A.H.; project administration, S.A.H., P.R., T.C.F. and L.B.; funding acquisition, L.B., C.G.-J. and M.L. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by project ED431 2020/06 (Galician Competitive Research Groups Xunta de Galicia). This study was supported by project EQC2018-005011-P (Ministry of Science, Innovation and Universities, Spain). All these programmes are co-funded by FEDER (EU). The authors are also grateful to Foundation for Science and Technology (FCT, Portugal) for financial support through national funds FCT/MCTES to CIMO (UIDB/00690/2020); to FCT for S. Heleno (CEECIND/03040/2017) and L. Barros contracts through the individual and institutional scientific employment programme contract, respectively. This article is based upon work from the Sample Preparation Study Group and Network, supported by the Division of Analytical Chemistry of the European Chemical Society.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

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

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