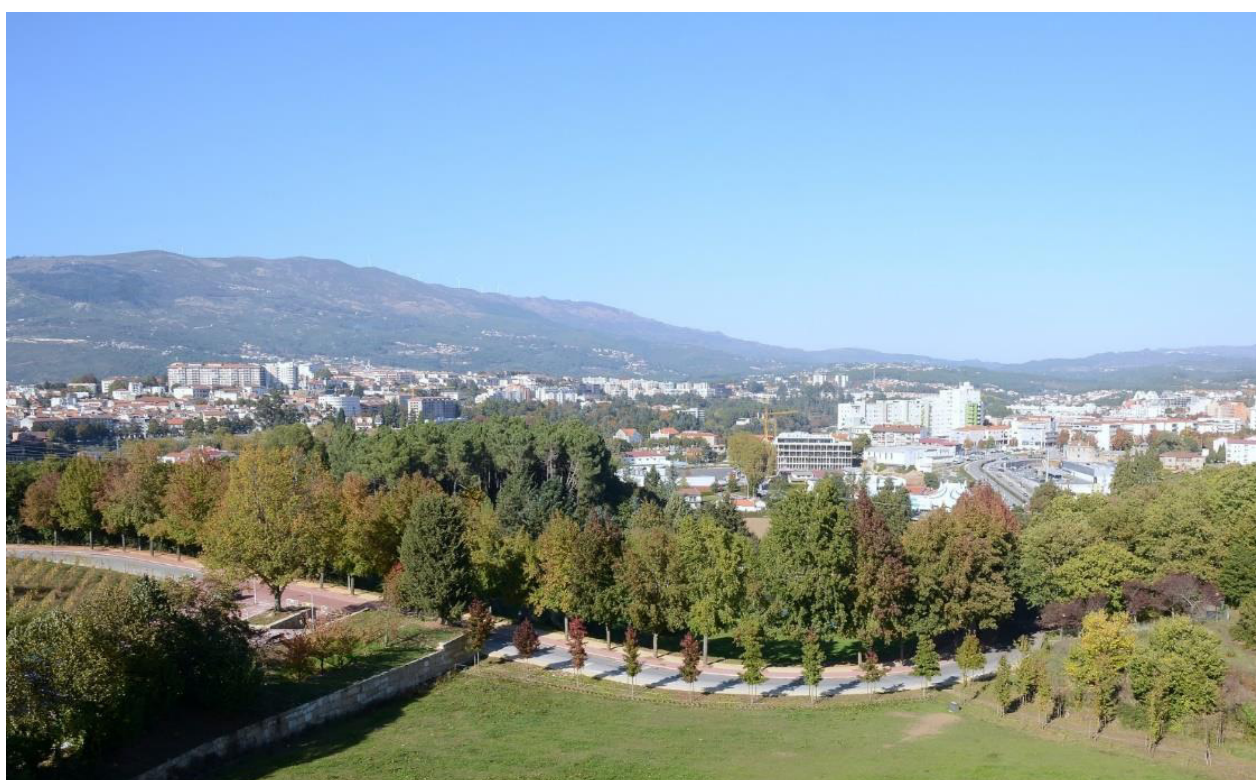




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EVALUATION OF THE PHENOLIC PROFILE AND BIOACTIVE POTENTIAL OF PORTUGUESE AND ALGERIAN PUMPKIN BY-PRODUCTS

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Pumpkin, a globally appreciated fruit, possesses a balanced nutritional profile and valuable biological and pharmacological properties. However, currently, the industrial processing of this fruit still focuses on the pulp, while large volumes of by-products are wasted. Considering the potential content of high value-added compounds in this fruit parts, like seeds and peel [1], the present study proposed the seeds, peel, and fibrous strands from three different genotypes that are economically significant in Portugal and Algeria to produce bioactive extracts. In order to support their usage as preservatives, their phenolic content and bioactivity were assessed. The hydroethanolic extracts (80:20 ethanol/water) were obtained by maceration, and their phenolic profile was analyzed by HPLC-DAD-ESI/MS, with a tentative identification followed by quantification. Also, the antioxidant properties were assessed through two cell-based assays (OxHLIA and TBARS) and the antimicrobial capacity was tested against eight bacterial and two fungal strains. In terms of phenolic profile, eight compounds were found, six of which belonging to the flavonoid family. The Portuguese ‘Common Pumpkin’ peel showed the most diversified profile and also the highest concentration of total phenolic compounds (9.4 ± 0.3 mg/g), with considerable concentrations of (-)-epicatechin (4.58 ± 0.08 mg/g). Despite the different phenolic composition, all samples presented relevant bioactive properties.

Regarding the antioxidant capacity, the seeds of ‘Butternut Squash’ from both countries stood out, while the fibrous strands of Portuguese ‘Butternut Squash’ and the seeds of Algerian ‘Gold Nugget Pumpkin’ revealed the strongest antimicrobial activity. In addition, the potential safety of the extracts was verified, where none of the samples showed toxicity against a primary culture of non-tumor porcine liver cells (PLP2) up to 400 g/mL. The identification of bioactive compounds in pumpkin byproducts highlights their significant potential as a source of bio-based preservatives, which can promote consumers’ health and contribute to a circular economy.

References

[1] M. G. Leichtweis, M. B. P. Oliveira, I.C.F.R. Ferreira, C. Pereira, L. Barros, *Antioxidants*, 10 (2021), 827.

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