



XV

MADEIRA

ENCONTRO DE QUÍMICA DOS ALIMENTOS

5-8 DE SETEMBRO DE 2021



ESTRATÉGIAS PARA A EXCELÊNCIA,
AUTENTICIDADE, SEGURANÇA
E SUSTENTABILIDADE ALIMENTAR



<http://xveqa.events.chemistry.pt/>

Ficha Técnica

Título

Livro de Resumos do XV Encontro de Química dos Alimentos: Estratégias para a Excelência, Autenticidade, Segurança e Sustentabilidade Alimentar

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Edição

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Editor

Universidade da Madeira, Centro de Química da Madeira

ISBN

978-989-8805-68-3

Data

Setembro de 2021

OC21: *Malpighia emarginata* DC. as a source of nutrients and bioactive compounds

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From the Industrial Revolution, humanity has been suffering the consequences of a system that only focus on economic growth, neglecting environment quality and, consequently, population's health. Horticulture is one of the industrial sectors where the greatest amount of organic waste is generated.¹ These biowastes are further discarded and devalued. However, these by-products are excellent sources of pigments, phenolic compounds, dietary fibres, sugar derivatives, organic acids, minerals and vitamins. All these compounds have health beneficial properties, so their reuse is an effective and promising alternative for industry and environment.² Many authors have studied different vegetable matrices and found molecules of high industrial interest in their composition.³ Due to its high vitamin C, carotenoids and anthocyanins content, *Malpighia emarginata* DC. (acerola) is known for its nutritional and functional properties. Its extracts are used as substitutes for phytoestrogen in medicines and show biofunctional effects, such as antioxidant activity in the prevention of age-related diseases, cancer, cardiovascular problems and hypertension.⁴ Considering that, this research work would make a nutritional and chemical characterization of acerola bioresidues, as well as a study of the bioactive potential of its extract. The nutritional profile (protein, ash, fat, carbohydrate and energy content) was determined using official methodologies for the analysis of food products (AOAC). The chemical profile was evaluated, determining free sugars by HPLC-RI, organic acids by UFLC-PDA, fatty acids by GC-FID, tocopherols by HPLC-fluorescence and phenolic compounds (anthocyanin and non-anthocyanin) by HPLC-DAD-ESI/MS. The bioactive potential was assessed through *in vitro* tests for antioxidant, anti-inflammatory and antimicrobial activity, as well as cytotoxicity and hepatotoxicity tests on human tumour cell lines and non-tumour primary cell culture, respectively, by applying the sulforhodamine B assay. Fructose, glucose and sucrose were identified, highlighting fructose as the main free sugar compound. Also, oxalic, malic, ascorbic and succinic acids were identified, being malic acid the most abundant organic acid. The fatty acids profile revealed the presence of fourteen compounds, being mostly represented by saturated fatty acids, with oleic acid as the majority. The phenolic composition evidenced the presence of six non-anthocyanin compounds and two anthocyanins, standing out isorhamnetin-*O*-pentosylhexoside and cyanidin-*O*-deoxyhexoside as the major compounds, respectively. Regarding the bioactive action, the presence of antioxidant and anti-inflammatory action was demonstrated, as well as, the antimicrobial activity revealed promising results, with good bacteriostatic and fungistatic effects. Concerning cytotoxic evaluation, the extract manifested anti-proliferative capacity against the half-tested tumour cell lines and exhibit non-toxicity in the non-tumour cell cultures. Overall, this study highlights the excellent composition in compounds of interest and bioactive potential of *Malpighia emarginata* DC. fruits, being a promising option for the development of functional products in the food and pharmaceutical industry.

Acknowledgements: The authors are grateful to the Foundation for Science and Technology (FCT, Portugal) for financial support by national funds FCT/MCTES to CIMO (UIDB/00690/2020); L. Barros, M.I. Dias and R. Calhella thank the national funds through the FCT, I.P., through the institutional scientific employment program-contract for their contracts. These authors are also grateful to financial support to Ministry of Education, Science and Technological Development of Republic of Serbia; and the projects Norte-01-0247-FEDER-024479 (Mobilizador ValorNatural) and TRANSCoLAB (0612_TRANS_CO_LAB_2_P).

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