Sociedade Portuguesa de Química

Chromatography helps in times of crisis

Webinar, December 17th, 2021

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The Covid-19 pandemic was a very difficult and challenging phase for all society, including the academic community. Many challenges were overcome, and this crisis also created countless opportunities. Chromatography, in its different configurations, is a tool that proved to be very useful in several fields. The webinar ***Chromatography helps in times of crisis*** is planned to bring together the academic community, companies, and various entities that throughout this pandemic managed to take advantage of their skills and the huge potential of chromatography to solve several problems and/or to unveil novel knowledge.

All of you are welcome to attend this webinar, to establish or re-establish bridges and, if appropriate, to share new achievements that show the usefulness of chromatography in times of crisis.

Sílvia M. Rocha

President of the Chromatography Group of the Portuguese Society of Chemistry

Key dates

- Abstract Submission: December 2nd
- Registration with discount: December 4th
- Abstract acceptance notification: until December 6th

Development of an anthocyanin-rich juice powder based on blueberry by-products

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The food industry is in search of natural matrices that provide the commercialization of new and/or improved products. For this reason, matrices such as blueberries are widely studied in the food industry due to their high content of phenolic compounds, providing a high coloring power, as well as therapeutic properties to the consumer[1,2]. This study analyzed the stability of a pectin-stabilized juice powder based on blueberries *Vaccinium corymbosum* L. var. 'Legacy', at refrigerated temperature over three months (T_0-T_3) of storage. The determination of the chemical composition at both times was achieved by chromatographic analysis of the sugar profile (HPLC-RI), organic acids (UFLC-PDA), and phenolic compounds (HPLC-DAD/ESI-MS). As well, their bioactive properties, were assessed through methods of evaluation of antioxidant (TBARS and OxHLIA) and antimicrobial (antibacterial and antifungal) capacity. It was observed that glucose and fructose were present in both storage times, and six organic acids were detected, the main ones being quinic, citric, and malic acids. The non-anthocyanin phenolic compounds found were caffeic acid hexoside and 5-*O*-caffeoylquinic acid. As for the anthocyanin compounds, malvidin-3-*O*-pentoside and malvidin-3-*O*-glucoside were identified, the latter being the major anthocyanin. The formulation showed excellent coloring, antioxidant, and antimicrobial capacity, with slight changes in the concentration of anthocyanins. It did not show cytotoxic properties, being considered safe for food application. For all these reasons, the juice is optimal for consumption, providing beneficial properties to the consumer and reducing the waste produced in the food industry.

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References

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2. Lourenço, S. C., Moldão-Martins, M. & Alves, V. D. Antioxidants of natural plant origins: From sources to food industry applications. *Molecules* **24**, (2019)14–16.

Justification

Currently, the world is going through a time of crisis, where industries have had to reinvent themselves to propose new alternatives, not only for personal benefit, but also for collective benefit. Thus, in the food area, chromatography is used to analyze matrices that help both the industrial economic impact and the health of the consumer; therefore, the identification of sugars, organic acids, and phenolic compounds, allows to have a perspective of the chemical composition of biowaste, for example the study of blueberry fruits that are not suitable for sale were studied in order to find them an application, reusing them and, in turn, helping to provide knowledge on healthy and balanced foods to be included in the human diet.