Coloring extracts from chlorophyll-based biowaste

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INTRODUCTION and METHODOLOGY

The increasing worldwide consumption of cherry tomatoes (*Solanum lycopersicum* L. var. *cerasiforme*) is explained by the great acceptability by the consumer, along with the ease in its trade and distribution. Despite being a fruit that provides essential nutrients such as lycopene, vitamin C, and phenolic acids, its consumption is closely related to its sensory characteristics such as taste, color, and appearance. Nevertheless, along the production chain, some by-products are not used and are, therefore, discarded, generating large amounts of bio-residues. The use of such bio-residues, namely the aerial parts, as a source of valuable compounds that can find other applications in food industry as, for example, food colorants, is a growing tendency [1-3]. In this context, the following work aimed to explore the hydroethanolic extracts obtained from the aerial parts of cherry tomato in terms of chlorophylls. Two extraction methodologies were used, namely ultrasound assisted (USE) extraction for 15 minutes at 400 W and maceration assisted (EM) extraction for 120 minutes, both using 90% ethanol (v/v) as solvent shown by **Figure 2**. The chlorophyll pigments were identified and quantified through the implementation of a chromatographic method, HPLC coupled to a diode array detector (DAD) and mass spectrometry (MS).

EXTRACTION

Bioresidues processing

Extraction

Monitoring of concentration

HPLC coupled to a fluorescence detector and mass spectometry

Data processing and analysis

Figure1. Methodology for chlorophyll extraction.

RESULTS and CONCLUSION

Chlorophyll a, b, and their isomers (a' e b') were identified in both extracts, as well as direct derivatives of chlorophyll and phaeophytin a and a', compounds commonly found in fruits of cherry cultivars. Regarding ultrasound assisted extraction, the most expressive compounds found were chlorophyll b and its b' isomer. As for maceration assisted extraction, chlorophylls a and b were the most abundant compounds in the extract. The results were monitored through the implementation of a chromatographic method, HPLC coupled to a diode array detector (DAD) and mass spectrometry (MS), to obtain the individual profile of both samples and to determine the concentration of chlorophylls and carotenoids. Figure 2 demonstrates the process of extraction of chlorophylls from the samples. UAE proved to be more effective than MAE, with increased extraction yields in the extractions performed employing higher ultrasonic power.

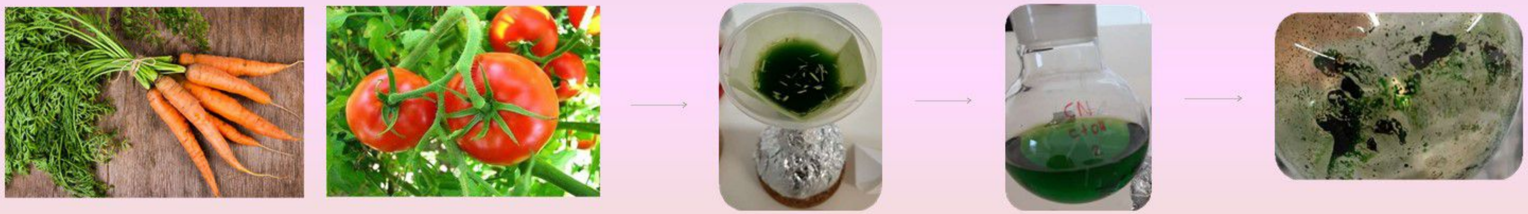

Figura 2. process of extraction of chlorophylls from the samples

RECOMMENDATIONS

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[3] S. S. Monteiro, S. S. Monteiro, E. A. da Silva, e L. P. Martins, "maturação fisiológica de tomate cereja", rebagro, vol. 8, nº 3 (2018) 05-09.

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