Abstracts

FOR

5th International Symposium on

Phytochemicals in Medicine and Food

(5-ISPMF)

AUGUST 25 – SEPTEMBER 01 2021, NANCHANG, CHINA

PP72: Chlorophyll-based coloring extracts obtained from biowaste

Leonardo Corrêa Gomes[1], Carla Pereira [1,]*, Maria Inês Dias[1], Adriana K. Molina[1,2], Isabel C.F.R. Ferreira[1], Lillian Barros[1]
Centro de Investigação de Montanha (CIMO), Instituto Politécnico de Bragança, Campus de Santa Apolónia, 5300-253 Bragança, Portugal

The growing consumers' concern about the possible long-term adverse effects of artificial molecules commonly used in the food industry has led to an increased interest in natural products. At the same time, there is a demand for a more eco-sustainable use of natural matrices, which justifies the search for by-products that have no other application to be explored in the development of new food products [1,2]. In this context, the present study aimed to explore natural pigments, more specifically chlorophylls, from carrot and tomato aerial part biowaste for the development of food dyes as they are the most abundant pigments in plants and have several bioactive properties. In this work, maceration extraction, ME, and ultrasound assisted extraction, USE, techniques were applied to lyophilized aerial parts of biowaste to maximize the yield of chlorophyll extraction. For the extraction processes, priority was given to green solvents, namely water, ethanol (90%), and hexane. The parameters that affect the recovery of pigments were varied for each technique, more specifically the time, ultrasonic power, and solvent for USE, and the time and solvent for ME. The extractions were performed protecting the samples from light and the results were monitored through the implementation of a new chromatographic method, HPLC coupled to a diode array detector (DAD) and mass spectrometry (MS), in order to determine the concentration of chlorophylls and the best procedure to be performed. Both aerial parts presented chlorophylls and derivatives in significant concentrations and extraction yields of up to 88% for the ethanol extracts. The chromatographic method applied proved to be adequate for the analysis of this class of pigments, allowing a good resolution and peak separation, but also a characteristic TIC spectrum for the tentative identification of compounds. Therefore, the results of the present study can be exploited for the development of chlorophyll-based dyes from these biowaste, but also from similar by-products.

Acknowledgments:
The authors are grateful to the Foundation for Science and Technology (FCT, Portugal) for financial support through national funds FCT/MCTES to CIMO (UIDB/00690/2020). National funding by FCT, P.I., through the institutional scientific employment program-contract for C. Pereira, M.I. Dias, and L. Barros contracts and A.K. Molina PhD grant (2020.06231.BD). To FEDER-Interreg España-Portugal programme for financial support through the project TRANSCoLAB 0612_TRANS_CO_LAB_2_P; to the European Regional Development Fund (ERDF) through the Regional Operational Program North 2020, within the scope of Project Mobilizador Norte-01-0247-FEDER-024479: ValorNatural®.

1. Tulipani S, Mezzetti B, Capocasa F, et al. Journal of Agricultural and Food Chemistry, 2008, 56, 3, 696-704.
2. Schulz M, Chim JF. Food Bioscience, 2019, 31, 100438.