5th Portuguese Young Chemists Meeting

(5th PYCheM)

&

1st European Young Chemists Meeting

(1st EYCheM)

Centro Cultural Vila Flor

Guimarães, Portugal

26th – 29th of April

ICVS/3B's

Câmara Municipal de Guimarães

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General Programme

	26 April	27 April	28 April	29 April
9:00-13:20	Registration and Workshop of Open Science and European Open Access Policies in H2020	Organic Chemistry and Medicinal Chemistry	Inorganic, Physical, Analytical and Electrochemistry	Materials Chemistry and Nanomaterials and Surface Chemistry
13:30	Opening Ceremony	Lunch	Lunch	Lunch
14:00 - 18:00	Green Chemistry + Chemistry of Natural Products	Biochemistry and Medicinal Chemistry	CHEM2NATURE Symposium: Chemical strategies for modification of natural origin materials Assembleia GQJ (17h)	Materials Chemistry and Nanomaterials and Surface Chemistry
18:00		Walking Tour		Closing Ceremony
19:00	Welcome Cocktail		Gala Dinner	
21:30	Get-together night			

P71. Extraction of betacyanins from *Gomphrena globosa* L. flowers: Choosing an acid as adjuvant

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Betalains are plant derived natural pigments that are presently gaining popularity for use as natural colorants in food industry. Although being betalains from red beetroot already used as food colorant (E-162), these compounds are not as well studied as compared to other natural pigments such as anthocyanins, carotenoids or chlorophylls [1]. Since food additives are on the focus of public interest, it is becoming increasingly important to meet consumers' expectations for natural and healthy products. Hence, the search for new plant-derived colorants for the food industry is still necessary [2]. Betalains were originally called 'nitrogenous anthocyanins', which incorrectly implied structural similarities between the two pigment classes. There are two structurally different types of betalains: the yellow/orange betaxanthins which are the condensation products of betalamic acid and assorted amino compounds, and the red betacyanins which are formed by glycosylation and acylation of cyclo-DOPA [3]. Looking at the chemical structure of the pigment, the addition of an acid to the extraction solvent will increase the affinity of the pigment with the solvent. The aim of this study was to use *Gomphrena globosa* L. flowers, as an alternative plant source to obtain these pigments and to evaluate the best acid to be used within the extraction procedure. For that purpose three different acids (acetic, hydrochloric and phosphoric acids, all of them allowed by the food industry), adjusted at the same pH, were tested during a maceration extraction procedure. After the extraction a purification through C_{18} column was performed in order to obtain a more concentrate extract in betacyanins. The results were analysed by HPLC-PDA-MS/ESI. The betacyanin profile allowed the identification of gomphrenin II/III and isogomphrenin II/ III and the best results were achieved by performing the extraction procedure using hydrochloric acid (6.6 mg/g extract), while phosphoric acid only presented trace amounts of these compounds. When acetic acid was used, the pigment extracted was 6.8 times less (0.97 mg/g extract) when compared to HCl. In conclusion hydrochloric acid can be considered the most suitable acid to be applied in the extraction procedure of these pigments.

References

[1] Gengatharan, A., Dykes, G. A., & Choo, W. S. (2015). Betalains: Natural plant pigments with potential application in functional foods. LWT-Food Science and Technology, 64, 645-649.
[2] Otálora, M. C., Carriazo, J. G., Iturriaga, L., Nazareno, M. A., & Osorio, C. (2015). Microencapsulation of betalains obtained from cactus fruit (*Opuntia ficus-indica*) by spray drying using cactus cladode mucilage and maltodextrin as encapsulating agents. Food chemistry, 187, 174-181.
[3] Jain, G., & Gould, K. S. (2015). Are betalain pigments the functional homologues of anthocyanins in plants?. Environmental and Experimental Botany, 119, 48-53.

Acknowledgments
FCT for financial support to CIMO (PEst-OE/AGR/UI0690/2014) and L. Barros (SFRH/BPD/107855/2015) grant.