



th

PYCHEM

Portuguese Young Chemists Meeting



Book of Abstracts



SOCIEDADE PORTUGUESA DE QUÍMICA

SPQ – Sociedade Portuguesa de Química

Avenida da República, 45 - 3º Esq.

1050-187 Lisboa, Portugal

☎ (+351) 217932349

eventos@spq.pt

6PYCheM – 6th Portuguese Young Chemists Meeting

15th to 18th May 2018,

Avenida Luísa Todi 61-67

2900-459 Setúbal, Portugal

6pychem@chemistry.pt

Book of Abstracts of the 6th Portuguese Young Chemists Meeting



Thursday, May 17th 2018

Session 5 | Chairman: Nathan McClenaghan (Institut des Sciences Moléculaires, France) | Auditorium

- 09:00 | **PL2** | Luisa de Cola (University of Strasbourg, France)
Stimulus responsive and self-assembled materials
- 09:50 | **IL5** | Zita Martins (IST – University of Lisbon, Portugal)
Abiotic formation of the building blocks of life – implications to the origin of life on Earth and elsewhere
- 10:15 | **OC12** | Ana Rita Neves (Faculty of Pharmacy, Portugal)
From the Sea to... the Sea! Antifouling Marine-Inspired Synthetic Steroid Derivatives

10:30-11:25 Coffee break and Poster Session II (Galeria Municipal do 11)

Session 6 | Chairman: Nuno Basílio (LAQV@REQUIMTE – Univ. NOVA de Lisboa - FCT) | Auditorium

- 11:25 | **IL6** | Nuno Mateus (ICETA/REQUIMTE – University of Porto, Portugal)
ANTHO4SKIN – Recycling anthocyanins from food wastes for cosmetic applications
- 11:50 | **OC13** | Carla Pereira (CIMO - Instituto Politécnico de Bragança, Portugal)
Recovery of Anthocyanins from Sweet Cherry Wastes: Process Modeling and Optimization Using Response Surface Methodology
- 12:05 | **OC14** | Joana Oliveira (ICETA/REQUIMTE – University of Porto, Portugal)
Colour modulation of blue anthocyanin-derivatives. Lignosulfonates as a tool to improve the water solubility of natural blue dyes
- 12:20 | **OC15** | José Pinela (CIMO - Instituto Politécnico de Bragança, Portugal)
Ultra-high Pressure-assisted Extraction of Phenolic Compounds from Watercress: Characterization and Process Optimization
- 12:35 | **OC16** | Joana Azevedo (ICETA/REQUIMTE - University of Porto, Portugal)
Reactivity of cork extracts with (+)-catechin in wine model solutions: Identification of a new family of ellagitannin-derived compounds (corklins)
- 12:50 | **OC17** | Catarina Pinto (CQC - University of Coimbra, Portugal)
The molecules of color in Portuguese postage stamps

13:05-14:20 Lunch

Recovery of Anthocyanins from Sweet Cherry Wastes: Process Modeling and Optimization Using Response Surface Methodology

Carla Pereira¹, Lillian Barros¹, Miguel A. Prieto^{1,2}, Isabel C.F.R. Ferreira¹

Corresponding Author: carlap@ipb.pt

¹ Centro de Investigação de Montanha (CIMO), Instituto Politécnico de Bragança, Campus de Santa Apolónia, 5300-253 Bragança, Portugal; ² Nutrition and Bromatology Group, Faculty of Food Science and Technology, University of Vigo, Ourense Campus, E32004 Ourense, Spain.

Sweet cherries (*P. avium* L.) are widely consumed fruits appreciated for their sweet taste and appealing appearance. Their colour vary with the maturation stage, being an excellent indicator of the optimal harvest time. When ripen, these fruits acquire a dark red coloration that is mainly influenced by the anthocyanin concentration in the fruit peel and pulp [1]. These compounds are present in several natural matrices and their colour can vary from blue to violet and red depending on the surrounding medium conditions (pH, temperature, humidity, salinity, stress and storage conditions, etc.) [2]. Beyond bioactive properties, these compounds also possess a great coloring capacity, which justify their increasing exploitation for food industry application, especially for cherry wastes recovery, given the fact that bird bitten and fallen fruits are not suitable for sale nor consumption and represent a significant part of the production.

Thus, the aim of the present work was to optimize the extraction of these compounds from sweet cherry wastes, by studying the conditions that maximize the maceration extraction yield. For that purpose, a response surface methodology was applied using five levels for each of the independent variables (time, temperature, and solvent concentration). The quantification of anthocyanins present in the extracts was performed by high performance liquid chromatography coupled to a diode array detector (HPLC-DAD). For the model application, the anthocyanin concentration and the extraction yield were used as responses.

Through this extraction method, it was possible to obtain a yield of 1.86 ± 0.41 mg/g of cherry dry weight, in the optimal conditions of: 63.0 ± 3.2 min; $61.7 \pm 1.3^\circ\text{C}$ and $53.1 \pm 1.4\%$ of ethanol. The obtained residue represented 87% of the total cherry dry weight and the anthocyanin content was of 3.05 ± 0.41 mg/g of dry residue. The results obtained in this study demonstrate the potential application of sweet cherries as sources of anthocyanins.

References

- [1] B. Gonçalves et al., Food Chemistry 2007, 103, 976-984.
[2] N. Martins et al., Trends in Food Science & Technology 2016, 52, 1-15.

Acknowledgments

The authors are grateful to the Foundation for Science and Technology (FCT, Portugal) and FEDER under Programme PT2020 for financial support to CIMO (UID/AGR/00690/2013), Carla Pereira grant (SFRH/BPD/122650/2016) and L. Barros contract. FEDER-Interreg España-Portugal programme for financial support through the project 0377_Iberphenol_6_E. European Structural and Investment Funds (FEEI) through the Regional Operational Program North 2020, within the scope of *Mobilizador ValorNatural*® and Project NORTE-01-0145-FEDER-023289: DeCodE. To Xunta de Galicia for financial support to M.A. Prieto grant.