

iberPhenol

International Conference

Advances in the role of phenols
in health effects and other uses

5-6 November 2020

Faculty of Pharmacy
UNIVERSITY OF COIMBRA

Coimbra, Portugal



BOOK OF ABSTRACTS

- 09.45 - 10.00 Daniela Correia **OCI2:** Polyphenolic modulators of endoplasmic reticulum stress as anticancer agents
- 10.00 - 10.15 Daniela Ribeiro **OCI3:** 2-styrylchromones versus flavonoids: which have the best anti-inflammatory activity?
- 10.15 - 10.30 José Pedro Baptista **OCI4:** Biological Activity of *Brassica* By-products in Cell Models of Lipid Toxicity
- 10.30 - 11.15 Coffee Break and Poster session 2 (P27 to P52)

Session 3 | Chairperson: Nuno Mateus

Health effects of phenolics

- 11.15 - 11.45 Artur Figuerinha **PL02:** FFUC, phenolic compounds and health
- 11.45 - 12.00 Rosa Direito **OCI5:** Reduction of inflammation and colon injury by a *Satureja hortensis* L. (Savory) phenolic extract in experimental inflammatory bowel disease in mice
- 12.00 - 12.15 Patrícia Correia **OCI6:** Skin health and wellness promoting effects of anthocyanin derivatives
- 12.15 - 12.30 Paula Oliveira **OCI7:** Therapeutic properties of *Tilia platyphyllos* Scop. in K14HPV16 mice
- 12.30 - 12.45 Romeu Videira **OCI8:** Pursuing a proficient polyphenol-based nanoformulation to address the challenge of the degenerative brain diseases
- 12.45 - 13.00 Sónia Pedreiro **OCI9:** *Crepis vesicaria* L. subsp. *taraxacifolia* (Thuill.) Thell: Phenolic profile and biological activities
- 13.00 - 14.30 Lunch

Session 4 | Chairperson: Lígia Couto

Circular economy and phenolic compounds

- 14.30 - 15.00 Jesús Simal **PL03:** Circular economy and phenolic compounds
- 15.00 - 15.15 Catarina L.-Lopes **OC20:** Optimization of microwave-assisted extraction conditions for antioxidant compounds from *Undaria pinnatifida* using response surface methodology
- 15.15 - 15.30 Filipa Mandim **OC21:** Study of the bioactive properties and phenolic composition in different plant parts of *Cynara cardunculus* L. var. *altilis*
- 15.30 - 15.45 Ignacio G.-Estévez **OC22:** Effect of yeast mannoproteins on the interaction between flavanols and salivary proteins
- 15.45 - 16.00 Licínio G.-Ferreira **OC23:** Phenolic compounds recovery from wastewaters through micellar enhanced ultrafiltration
- 16.00 - 16.15 Tânia Martins **OC24:** Phytochemical composition of broccoli inflorescences, stalks and leaves: comparative study as a resource of bioactive compounds for human diet
- 16.15 - 17.00 Coffee Break and Poster session 3 (P53 to P76)

Session 5 | Chairperson: Fernando Ramos

- 17.00 - 17.30 Patrícia Valentão **PL04:** Approaching phlorotannins bioavailability: challenges and opportunities
- 17.30 - 17.45 Awards for best poster and oral presentations and final words

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Study of the bioactive properties and phenolic composition in different plant parts of *Cynara cardunculus* L. var. *atilis*

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The planet's resources are increasingly scarce, a reason why their most efficient use is gaining more attention. Several studies have shown the influence of genetic background, environmental conditions, and different plant tissues on the polyphenolic composition and consequently on its bioactive potential, leading to different industrial applications.¹ *Cynara cardunculus* L. (*Asteraceae*), commonly known as cardoon, is a Mediterranean herbaceous plant with important economic value as a result of its diversified industrial applications (i.e. production of biomass, bioenergy, paper pulp, pharmaceuticals and cosmetics).^{1,2} The present work aims to valorize underused parts of cardoon by evaluating the phenolic profile and bioactive properties of different plant tissues. Petioles, blades, heads, bracts, and seeds from a Greek cardoon genotype were collected at different growth stages throughout the growing season depending on the plant part, e.g. petioles and blades were collected throughout the growing season, heads and bracts during the flowering stage and seeds after seed formation and until the seed ripening stage. The phenolic profile was determined by HPLC-DAD-ESI/MS and the antioxidant activity were measured through cell-based assays, namely TBARS and OxHLIA. Cytotoxic effects were screened in four human tumor cell lines and hepatotoxicity in a non-tumor cell line (PLP2) by the sulforhodamine B assay. Anti-inflammatory potential was tested through the inhibition of NO production. Finally, the antibacterial and antifungal activities were evaluated by the broth microdilution method. The blades of cardoon presented the highest bioactive activity and variety in phenolic compounds. Considering the maturation stage, the bracts stand out at the intermediate stage, showing a higher antioxidant potential for TBARS assay, and the petioles a higher anti-inflammatory activity. In turn, at the most advanced stage of maturity, the seeds presented lower EC₅₀ values in the OxHLIA assay. More immature plant tissues presented a higher content in phenolic compounds, and as expected, higher antioxidant activity in the OxHLIA assay. The most advanced states of maturation also presented highest cytotoxic and anti-inflammatory activity. For the antibacterial and antifungal activities, the results obtained were not affected by different plant parts or by the maturation stages studied. The results obtained in the present work, allows us to choose the best harvesting time of cardoon, allowing achieving a greater variety of phenolic compounds, and consequently, a highest bioactive potential, and ultimately the most appropriate use of their constituents. Nevertheless, further studies are needed to better understand the compounds responsible for the observed activities.

References:

[1] B. de Falco, G. Incerti, M. Amato, V. Lanzotti, *Phytochemistry Reviews*, (2015) 993.

[2] S. Petropoulos, Â. Fernandes, C. Pereira, et al., *Food Chemistry*, 289 (2019), 257.

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