



Interreg
España - Portugal

Fondo Europeo de Desarrollo Regional
Fundos Europeus de Desenvolvemento Regional



UNIÓN EUROPEA
UNIÃO EUROPEIA



**INVESTIGACIÓN
E INNOVACIÓN**

CHALLENGES AND OPPORTUNITIES FOR THE INNOVATION WITH PHENOLIC COMPOUNDS

IBERPHENOL. IBERIAN CONGRESS ON
PHENOLIC COMPOUNDS

BOOK OF ABSTRACTS

Ourense, 2nd October 2019

<http://iberphenol.webs.uvigo.es/>

Fotografía: Suzy Hazelwood (Pexels)

UniversidadeVigo

AAI: Grupo de Investigaciones Agro-ambientais e Agroalimentarias

CITACA: Clúster de Investigación e Transferencia Agroalimentaria do Campus da Auga

Facultade de Ciencias

Vicerreitoría do Campus de Ourense Campus da Auga

Vicerreitoría de Comunicación e Relacións Institucionais

Entidad financiadora



Entidades colaboradoras



Entidades patrocinadoras





Interreg
España - Portugal

Fondo Europeo de Desarrollo Regional
Fundo Europeu de Desenvolvimento Regional



UNIÓN EUROPEA
UNIÃO EUROPEIA



**INVESTIGACIÓN
E INNOVACIÓN**

CHALLENGES AND OPPORTUNITIES FOR THE INNOVATION WITH PHENOLIC COMPOUNDS

IBERPHENOL. IBERIAN CONGRESS ON
PHENOLIC COMPOUNDS

BOOK OF ABSTRACTS

Ourense, 2nd October 2019

<http://iberphenol.webs.uvigo.es/>

BOOK OF ABSTRACTS
IBERPHENOL. IBERIAN CONGRESS ON PHENOLIC COMPOUNDS
Ourense, 2nd October 2019

Editors:

Jesús Simal Gándara
Beatriz Cancho Grande
Elena Martínez Carballo
Raquel Rial Otero
Carmen González Barreiro
Patricia Reboredo Rodríguez
María Figueiredo González

ISBN: 978-84-8158-820-0

All rights reserved.

No portion of this book may be reproduced in any form, including photocopy, microfilm, information storage and retrieval system, computer database or software, or by any means, including electronic or mechanical, without written permission from the publisher.

Proposed section: Phenolic agro-industries
Proposed format: oral

Influence of the growth cycle on the bioactive properties and phenolic composition of *Cynara cardunculus* L. var *atilis*

Mandim F^{a,b}, Petropoulos S^c, Dias M I^a, Fernandes A^a, Pinela J^a, Kostic M^d, Soković M^d, Barros L^a, Santos-Buelga C^b, Ferreira I C F R^a

filipamandim@ipb.pt

(a) Centro de Investigação de Montanha, Instituto Politécnico de Bragança, Bragança, Portugal

(b) GIP-USAL, Facultad de Farmacia, Universidad de Salamanca, Salamanca, Espanha

Cynara cardunculus L. (syn. Cardoon), is an erect perennial herbaceous plant, native to the Mediterranean basin. It is characterized by a high variety and richness in compounds with health benefits. Also, its cultivation and economic impact are highly important due to the diverse industrial applications (i.e. vegetable rennet, biomass, bioenergy, etc.) [1, 2]. Due to its increasing consumption and commercial interest, this study purposes the analysis of phenolic compounds and bioactive properties of different cardoon parts (heads, bracts, and seeds) collected in Greece during different maturation stages. The phenolic composition was determined by HPLC-DAD-ESI/MS. The antibacterial and antifungal activities were evaluated by applying the microdilution method. The cytotoxic effects were evaluated in four human tumor cell lines using the sulforhodamine B assay, while the anti-inflammatory activity was evaluated through the inhibition of NO production in macrophage cells. Finally, the antioxidant activity was measured through the TBARS and OxHLIA assays. The content in phenolic compounds decreased with the maturation process, except in the seed extract. All the tested samples exhibited antibacterial and antifungal activity, where lower MICs were observed when the plant reached maturity. Regarding the cytotoxic and anti-inflammatory activities, the earliest harvest stages revealed the highest activity, except for seeds. Moreover, with the maturation process, extracts presented higher capacity to OxHLIA and TBARS inhibition. The heterogeneity of the biological results reveals that other compounds than phenolic ones may be correlated with these bioactivities. This study proved the high biological potential of cardoon parts as also its possible use as a source of important bioactive compounds. Nevertheless, further studies are needed to understand which compounds are responsible for the observed bioactivities, as well as to find the stage of maturity that provides the best bioactive properties.

Keywords: Cardoon; Polyphenolic profile; Antioxidant activity; Cytotoxic activity; Antibacterial activity.

References:

- [1] B. de Falco, G. Incerti, M. Amato, V. Lanzotti. (2015). *Phytochem Rev*, 993-1018.
- [2] E. Christaki, E. Bonos, P. Florou-Paneri. (2012). *IJAST*, 64-70.