



# BIO TEC 2019

CONGRESO NACIONAL DE BIOTECNOLOGÍA 10 - 13 JUNIO VIGO

---

## LIBRO DE ABSTRACTS

UniversidadeVigo



### **COMITÉ DE HONOR:**

Alberto Núñez Feijoo, Pedro Francisco Duque Duque, Carmen Pomar Tojo, Manuel Joaquín Reigosa Roger, Abel Caballero Álvarez, Patricia Argerey Vilar, José Alberto Díez de Castro.

### **COMITÉ ORGANIZADOR:**

#### **Comité organizador local**

M<sup>a</sup> Asunción Longo González, M<sup>a</sup> Angeles Sanromán Braga, M<sup>a</sup> Salomé Alvarez Alvarez, Francisco J. Deive Herva, Diego Moldes Moreira, Marta M<sup>a</sup> Pazos Currás, Emilio Rosales Villanueva.

#### **Comité ejecutivo SEBiot**

Fernando Peláez, M<sup>a</sup> José Hernáiz, Francisco Valero.

### **COMITÉ CIENTÍFICO:**

Francisco J. Plou, Pedro Lozano, Regina-Wittich, Pedro García Encina, María Molina, Víctor Mulero, Emilio Molina, Ramón González, Baltasar Mayo, Antonio Rodríguez, Alvaro Garcinuño, Juan Lema, José Mario Díaz Fernández, Esperanza Cerdán, Victoria Besada, David Posada, África González, Carlos Diéguez, José António Teixeira, Lorenzo Pastrana, María Raquel Aires-Barros, Mara G. Freire, Eduardo Santero, Jesús Aparicio, Emilio Montesinos, Federico Morán, M<sup>a</sup> Isabel Igeño, Isabel Ferreira, Pedro Pablo Gallego, Carmen Veiga, Isabel Medina, Tiago Henriques Silva, Isabel de la Mata, Toni Gabaldón, Juan Carlos Arbolea, Ion Arocena, María Pla.

### **MODERADORES:**

Pedro Pablo Gallego, Fernando Peláez, Ruth Gabriela Ulloa, Francisco J. Plou, Francisco Valero, Regina M. Wittich, Eva Martín del Valle, Jesús Aparicio, Alvaro González Garcinuño, María José Hernáiz.

### **EDITORES:**

M<sup>a</sup> Asunción Longo González, M<sup>a</sup> Angeles Sanromán Braga, M<sup>a</sup> Salomé Alvarez Alvarez, Francisco J. Deive Herva, Diego Moldes Moreira, Marta M<sup>a</sup> Pazos Currás, Emilio Rosales Villanueva, Fernando Peláez, M<sup>a</sup> José Hernáiz, Francisco Valero.

Abstracts Congreso Nacional de Biotecnología, Junio 2019

**ISBN:** *Solicitado*

Universidad de Vigo



Universidade de Vigo



Sociedad Española de Biotecnología

asebio



ZENDAL



VIVEIROS  
RIOTOLLO

ORBALLO

Magical<sup>®</sup>  
HYDRANGEA



# BIO TEC 2019

CONGRESO NACIONAL  
DE BIOTECNOLOGÍA

10 - 13 JUNIO  
VIGO

## PÓSTERS

UniversidadeVigo



Sociedad Española de Biotecnología

## Valorisation of a threatened plant species through *in vitro* culture elicitation of phenolic compounds

Manuel Ayuso<sup>1,2</sup>, Maria Inês Dias<sup>1</sup>, José Pinela<sup>1</sup>, Pedro Pablo Gallego<sup>2\*</sup>, M. Esther Barreal<sup>2</sup>, Lillian Barros<sup>1</sup>, Isabel C.F.R. Ferreira<sup>1\*</sup>.

<sup>1</sup> Centro de Investigação de Montanha (CIMO), Instituto Politécnico de Bragança, Campus de Santa Apolónia, 5300-253 Bragança, Portugal.

<sup>2</sup> Applied Plant and Soil Biology, Faculty of Biology, University of Vigo, Campus Universitario, s/n. 36310 Vigo, Pontevedra, Spain.

Corresponding author: \*pgallego@uvigo.es and iferreira@ipb.pt

**Thematic Areas:** Food biotechnology.

**Abstract:** *Ex situ* conservation strategies, such as *in vitro* culture, have been suggested for the recovery of threatened plants close to extinction. *In vitro* culture or micropropagation is a plant-multiplication technique that allows to obtain a large number of clones in a short period of time and limited space, which can be used in reintroduction programs and for research purposes (1). This biotechnological tool also allows increasing the production yield of secondary metabolites, such as phenolic compounds, thus emerging as an efficient system to obtain high added-value bioactive compounds (2). This approach allows valorising the culture of threatened plants for their commercial use in different industrial sectors interested in bioactive compounds, such as the food and pharmaceutical industries. Therefore, the aim of this research was to study the phenolic compounds elicitation by cytokinins in roots and aerial parts of the *in vitro* cultured endangered plant *Eryngium viviparum* J. Gay (Fam. Apiaceae).

*E. viviparum* explants were cultured *in vitro* in a solidified MS medium. A 3-level factorial design was implemented to study the effect of two cytokinins, 6-benzylaminopurin (BAP) and kinetin (KIN), at 0, 1 and 2 mg L<sup>-1</sup>, on the elicitation of phenolic compounds. The obtained plant material was lyophilized, reduced to powder, and submitted to a solid-liquid extraction with ethanol:water (80:20, v/v) to obtain combined extracts (3). Then, phenolic compounds were identified and quantified by HPLC-DAD-ESI/MS (3) and the main phenolic compounds with known bioactivities were correlated with both cytokinins. Seventeen phenolic compounds were identified in all *E. viviparum* hydroethanolic extracts, corresponding to 12 phenolic acids and 5 flavonoids. Rosmarinic and chlorogenic acids were the main bioactive phenolic acids. Regarding flavonoids, tectorigenin-*O*-glucuronide was identified and quantified only in the aerial parts. In the roots, the increase of phenolic acids was correlated with the presence of KIN in the culture media. Concerning the aerial parts, cytokinins did not correlate with phenolic acids, but KIN correlated with the increase of tectorigenin-*O*-glucuronide. In addition, the roots had a higher phenolic composition content than the aerial parts and the combination of both cytokinins promoted a doubling of the phenolic compounds concentration in some samples. Therefore, this study demonstrated the efficacy of *in vitro* culture in adding value to the threatened plant species *E. viviparum*, as the levels of valuable secondary metabolites were increased by elicitation, thus being a sustainable approach that can help save and valorise other endangered plants.

**Acknowledgements:** To FCT (Portugal) and FEDER under programme PT2020 for financial support to CIMO (UID/AGR/00690/2019) and the research contracts of J. Pinela (Project AINatt, POCI-01-0145-FEDER-030463), M.I. Dias and L. Barros. To FEDER-Interreg España-Portugal programme for financial support through the project 0377\_iberphenol\_6\_E. To IACOBUS research stay program for the financial support of M. Ayuso.



### References

1. M.E. Gonzalez-Benito, C. Martín, *In Vitro Cell. Dev. Biol.-Plant.* **2011**, 47, 46-54.
2. M.I. Dias, M.J. Sousa, R.C. Alves, I.C.F.R. Ferreira, *Ind. Crop. Prod.* **2016**, 82, 9-22.
3. M.I. Dias, L. Barros, J.C. Barreira, et al., *Food Chem.*, **2018**, 268, 196-202.