



iberian
**PLANT
BIOLOGY**
2023

Braga Portugal
9-12 July

XVIII Portuguese
Spanish Congress
of Plant Biology

XXV Meeting of the
Spanish Society of
Plant Biology

**BOOK OF
ABSTRACTS**

Portuguese Society
of Plant Biology

Spanish Society
of Plant Biology

Organizing Committee: Teresa Lino Neto; Adela Sánchez Moreiras; Alberto Dias; Ana Cunha; Anabela Bernardes da Silva; Hernâni Gerós; Manuela Costa; Vicent Arbona; Juliana Melo

Scientific Committee: Jorge Marques da Silva; Teresa Altabella Artigas; Teresa Lino Neto; Adela Sánchez Moreiras; Alberto Dias; Anabela Bernardes da Silva; Anabela Romano; Ana Cunha; Conceição Caldeira; Conceição Santos; Cristina Branquinho; Elena Monte; Herlânder Azevedo; Hernâni Gerós; Jaume Flexas; José Manuel Palma; Luis Valledor; Manuel Becana; Manuela Costa; Margarida Oliveira; Margarida Vaz; Miguel Pinheiro Carvalho; Paula Baptista; Paula Duque; Paula Scotti; Rosa Rivero; Teresa Capell; Vicent Arbona

ISBN 978-989-33-4917-5

Copyright by Universidade do Minho. All rights reserved

Published: July 2023

Encapsulated salicylic acid induces stress tolerance on *Arabidopsis thaliana*

Jimmy Sampedro-Guerrero¹, Vanessa Almache-Avendaño¹, Vicente Vives-Peris¹, Andrea Dalmau-Balaguer¹, Aurelio Gomez-Cadenas¹, **Carolina Clausell Terol**²

¹Departamento de Biología, Bioquímica y Ciencias Naturales. Universitat Jaume I, Castellón de la Plana, Spain,

²Departamento de Ingeniería Química. Instituto Universitario de Tecnología Cerámica. Universitat Jaume I, Castellón de la Plana, Spain

Abiotic stresses are the main constrain caused by climate change, conditioning the quantity and quality of crop production. Stressed plants trigger several responses that alter their gene expression, metabolism, endogenous hormone levels and growth rate. The stress response involves a regulatory complex where signalling molecules such as receptors, regulatory factors and phytohormones interact. Salicylic acid (SA) induces plant responses and their acclimation to unfavorable conditions. In addition, its exogenous application in plants can revert the negative effects of stress, and these benefits can be enhanced by its encapsulation in different coating materials. To study the practical applications of SA encapsulation, *Arabidopsis* plants were treated with encapsulated or free SA (1 µM) and subjected to different abiotic stress conditions (saline and osmotic stress individually applied or combined with high temperatures). Plants were cultivated in vitro, either by sowing seeds directly into plates with the media treatments or by transferring the plants after 4 days of growth. Plants were treated with salt or mannitol at 10 mM and subjected or not to high temperature (30°C). Phytohormone endogenous content and phytohormone-related gene expression were analyzed, both in rosettes and in roots, together with plant morphological characteristics. Plants treated with the encapsulated hormone showed greater tolerance to abiotic stress, improving root length, rosette size and density of secondary roots compared to untreated and free SA-treated plants. Data also showed that SA interacts with auxins (IAA) to regulate plant tolerance. In this work, we highlight the powerful promoting effect of SA encapsulation to alleviate the negative effects of harsh environmental conditions. Furthermore, this study could be the basis for future stress experiments under real field cultivation conditions.

Acknowledgments

This work was supported by MCIN/AEI/10.13039/501100011033 and by the European Union Next Generation (TED2021-129795B-I00) and AGROALNEXT program, funded by MCIN, European Union Next Generation EU-PRTR-C17.I1- and Generalitat Valenciana (AGROALNEXT/2022/010). Funding was also obtained from Generalitat Valenciana through the programs CIAICO/2021/063 and GRISOLIAP/2020/043.

References

Sampedro-Guerrero, J.; Vives-Peris, V.; Gomez-Cadenas, A.; Clausell-Terol, C. Improvement of Salicylic Acid Biological Effect through Its Encapsulation with Silica or Chitosan. *Int. J. Biol. Macromol.* 2022, 199, 108–120.



iberian PLANT BIOLOGY 2023

Braga Portugal
9-12 July

XVIII Portuguese
Spanish Congress
of Plant Biology

XXV Meeting of the
Spanish Society of
Plant Biology

Portuguese Society
of Plant Biology

Spanish Society
of Plant Biology

