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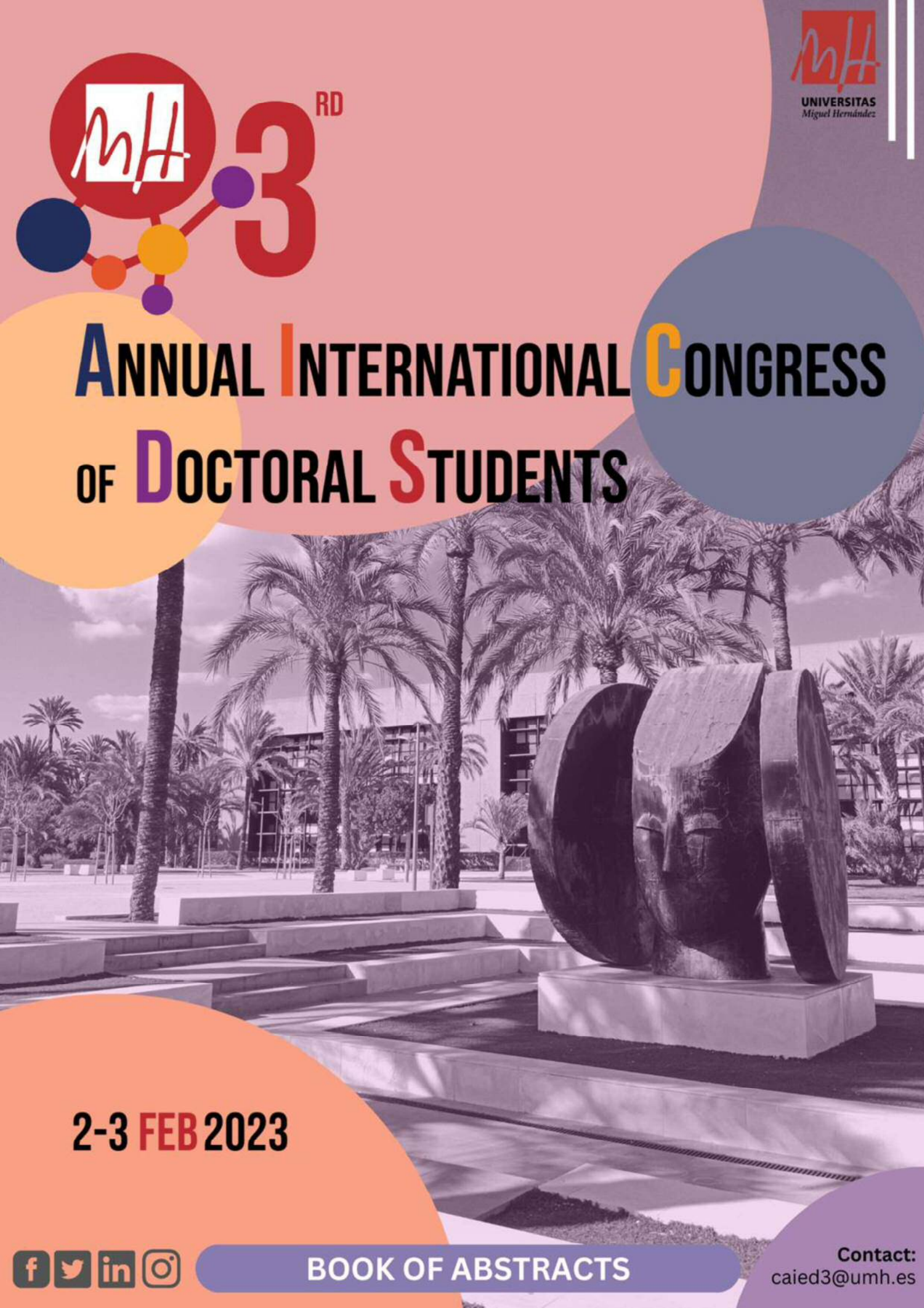

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BOOK OF ABSTRACTS

Contact:
caied3@umh.es

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4.4 Ciencias de la naturaleza III

Moderador de la mesa: Marta Arumí Planas

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Centro de Investigação de Montanha (CIMO)
Instituto Politécnico de Bragança

CO-202.- Do wheat flag leaves and ears respond similarly to drought? A study of the effect of two different water deficit regimes on physiological and antioxidant responses under combined elevated CO_2 and high temperature

Ouardia Bendou, *Ismael Gutiérrez-Fernández, Nara Bueno-Ramos, Emilio L. Marcos-Barbero, Jon Miranda-Apodaca, Ana I. González-Hernández, Rosa Morcuende, Juan B. Arellano*

Instituto de Recursos Naturales y Agrobiología de Salamanca (IRNASA CSIC)

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Departamento de Tecnología Agroalimentaria
Universidad Miguel Hernández de Elche

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Imane Hadjadj, *María José Argente, María de la Luz García*

Centro de Investigación e Innovación Agroalimentaria y Agroambiental (CIAGRO-UMH).
Universidad Miguel Hernández de Elche

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CO-202.- Do wheat flag leaves and ears respond similarly to drought? A study of the effect of two different water deficit regimes on physiological and antioxidant responses under combined elevated CO2 and high temperature

Ouardia Bendou[1], Ismael Gutiérrez-Fernández[1], Nara Bueno-Ramos[1], Emilio L. Marcos-Barbero[1], Jon Miranda-Apodaca[2], Ana I. González-Hernández[1], Rosa Morcuende[1], Juan B. Arellano[1].

[1]Instituto de Recursos Naturales y Agrobiología de Salamanca (IRNASA), Consejo Superior de Investigaciones Científicas (CSIC). Salamanca, España.

[2]Departamento de Biología Vegetal y Ecología, Facultad de Ciencia y Tecnología, Universidad del País Vasco (UPV/EHU). Bilbao, España.

Contacto: ouardia.bendou@irnasa.csic.es

The projected continuous rise in atmospheric CO_2 accompanied by an increase in global mean temperatures will bring together more frequent and severe drought episodes, particularly in Mediterranean regions. Wheat is one of the most cultivated cereals in the world, and these future climate changes will negatively affect its growth and productivity, especially during the reproductive stage. In the present study, we aim to investigate the effect of different water regimes on flag leaves and ears of a bread wheat genotype Gazul. Potted wheat plants were grown in an environment-controlled chamber in which CO_2 was injected and kept constant at 900 µmol mol−1 and the temperature was 4 ºC above the current average temperatures typically experienced in the province of Salamanca (Spain) and was maintained at 26 ºC/16 ºC day/night. The plants were subjected to two different water deficits: a long water deficit (LWD) applied at the vegetative growth stage, and a terminal water deficit (TWD) applied at the ear emergence stage. Both organs were analysed for changes in biomass and morphology, the content of proline (Pro), ascorbate (AsA) and glutathione (GSH) as well as enzymatic antioxidant activities. The statistical analysis was performed using the R software. The obtained results showed a different behaviour of the organs toward the water deficit regimes. LWD significantly reduced the biomass, area, moisture content percentage (MC%) and AsA content but caused an increase in dry matter per area (DMA), Pro content, catalase and glutathione reductase activities of the flag leaf. However, TWD treatment produced no significant changes for this organ compared to control. In contrast, both treatments similarly affected the ears by reducing the biomass, DMA and GSH content, and enhancing MC%. Additionally, TWD caused an increase in Pro content and superoxide dismutase activity. In conclusion, the results showed that elevated CO_2 might mitigate the severity of both water deficits and thereby reduce ROS production in both organs. Furthermore, the multifactorial analysis showed better adaptation of ears to water deficit than flag leaves, underlining the importance of this finding for breeding programs to improve wheat productivity under future climatic changes scenarios.

Palabras clave: wheat, antioxidant activity, water deficit, flag leaf, ear, elevated CO_2

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