sociedadespañola de BIOLOGÍA de PLANTAS

Fitohormonas
2023, Segovia

Libro de Abstracts

XVI CONGRESO FITOHORMONAS

METABOLISMO Y MODO DE ACCIÓN

2023, Segovia

sociedadespañola de BIOLOGÍA de PLANTAS

CSIC
Consejo Superior de Investigaciones Científicas

CBGP Centro de Biotecnología y Genómica de Plantas
UPM-INIA/CSIC
Excelencia Severo Ochoa 2022 - 2025

Os damos la bienvenida al XVI Simposio de *Fitohormonas: Metabolismo y modo de acción*, de la Sociedad Española de Biología de Plantas

Después de un parón por la pandemia del Covid19, el Grupo de Fitohormonas de la SEBP celebrará este año, 2023, su reunión en el Convento de Mínimos de Segovia de los días 19 al 21 de abril.

En esta edición contaremos con la conferencia invitada impartida por el Dr Alain Goossens, quien nos dará una visión de cómo las plantas han desarrollado diferentes rutas para controlar el metabolismo en respuesta a cambios durante el desarrollo y en respuesta a diferentes estímulos ambientales. De forma particular, su seminario se centrará en el papel del ácido jasmónico para controlar finamente el balance entre crecimiento y respuesta de defensa frente a patógenos.

En este simposio se han seleccionado dos conferencias plenarias y 28 conferencias orales, donde se dará la posibilidad de exponer y discutir el papel de las fitohormonas durante el desarrollo de las plantas y en respuesta a factores abióticos y bióticos de la mayoría de los laboratorios participantes. Sin duda, en este congreso tendremos la oportunidad de asistir a los últimos avances científicos y tecnológicos de los diferentes grupos que trabajan en el campo de las hormonas vegetales de forma directa o, de manera indirecta, por la vinculación de las mismas en el proceso fisiológico de estudio.

En esta edición, cabe resaltar la gran participación de investigadores jóvenes y el haber incluido por primera vez la posibilidad de presentar pósters en formato digital con el fin de organizar un congreso más sostenible y dinámico. Agradecemos al Comité científico su trabajo a la hora de seleccionar las exposiciones orales teniendo en cuenta su calidad y para que estuviesen representadas las diferentes temáticas de estudio relacionadas con las fitohormonas. El Comité científico también seleccionará las presentaciones orales y los pósteres más destacados, que serán premiados al final del simposio.

Esperamos que este simposio sea del agrado de todos los asistentes y que tenga una repercusión positiva en vuestras investigaciones.

Un fuerte abrazo del comité de organización

Comité organizador

Juan Carlos del Pozo Benito (CBGP, INIA/CSIC), Andrea Chini (CNB, CSIC) y Luis Oñate (UPM)

Comité científico

Catarina Merchante (UMA), Pilar Cubas (CNB, CSIC), Concha Gómez-Mena (IBMCP, CSIC), Sara Izquierdo (Universidad Jaume I) y Francisco Pérez-Alfocea (CEBAS, CSIC)

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Kaolin application induces changes on citrus physiological and hormonal responses to an abiotic stress combination.

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Citrus is an important fruit crop worldwide which production has increased in the last decades. However, yield and fruit quality are negatively affected by adverse environmental situations, such as drought periods or heat waves. In addition, those hazardous situations are more severe and frequent in the last years as consequence of climate change. Some studies have reported that the application of reflective materials confers protection against environmental changes. Kaolin is a clay that has a mitigating effect on stress-induced damage in different crops. The aim of this study is to evaluate the effectiveness of kaolin applications in Carrizo citrange plants (*Poncirus trifoliata* L. Raf. X *Citrus sinensis* L. Osb.) subjected to high temperatures and high light intensity, occurring individually and simultaneously. The stress treatments were: high temperatures at 40ºC/ 24 hours, and high light intensity at 1000 µmol $m^{-2}s^{-1}$ for 8 hours per day during 5 days. The beneficial role of kaolin under heat and high light stress combination has been proved at different levels: i) improving plant performance (reduction of leaf damage and leaf abscission), ii) maintaining an active photosynthetic machinery, iii) increasing stomatal opening and transpiration and, iv) modulating hormonal levels and their precursors. Taken all these results together, it is concluded that foliar kaolin application can be a potential tool to protect citrus plant performance in a scenario of climate change.

This work was supported by MCIN/AEI/10.13039/501100011033 and by the European Union Next Generation (TED2021-129795B-I00 and PID2019-104062RB-100) and AGROALNEXT

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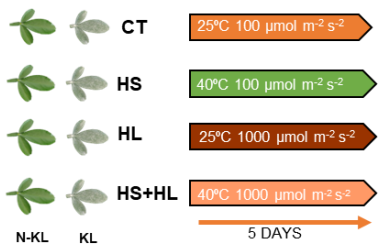
Introduction

Citrus is an important fruit crop which production has increased in the last decades. However, yield and fruit quality are negatively affected by adverse environmental situations as heat waves and high light intensity. Recently, several studies have reported the protective effect of reflective materials, such as kaolin (KL). It has been described that KL mitigates stress-induced damages in different crops.

The aim of this work is to evaluate the effectiveness of kaolin application in Carrizo citrange (*Poncirus trifoliata* L. Raf. X *Citrus sinensis* L. Osb.) plants, a citrus genotype, subjected to high temperature and high light intensity, occurring individually or simultaneously.

Material and Methods



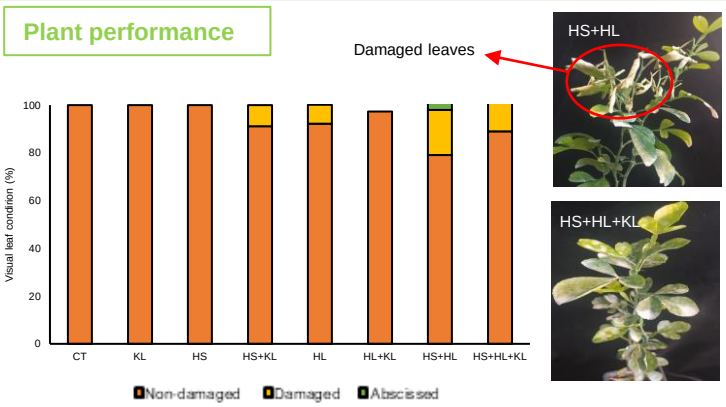
N-KL: Non Kaolin-treated plants
KL: Kaolin-treated plants (1%, w/v)

CT: Control conditions
HS: Heat stress **HL:** High light stress **HS+HL:** Heat and high light stress combination

Plant performance was determined by visual leaf damage. Physiological responses were measured with portable fluorometer and LCpro+ portable infrared gas analyzer. Hormonal responses were quatified with a triple quadrupole mass spectrometer through an ortogonal Z-spray electrosplray ion source.

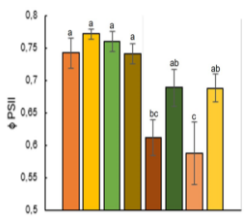
Results

Plant performance



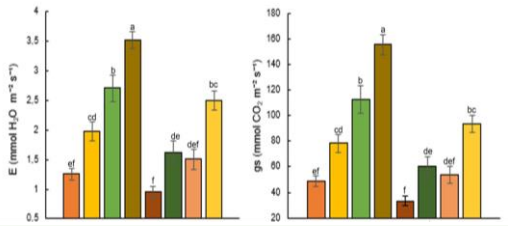
KL application improved plant performance under HL, individually and combined (HS+HL).

Physiological responses

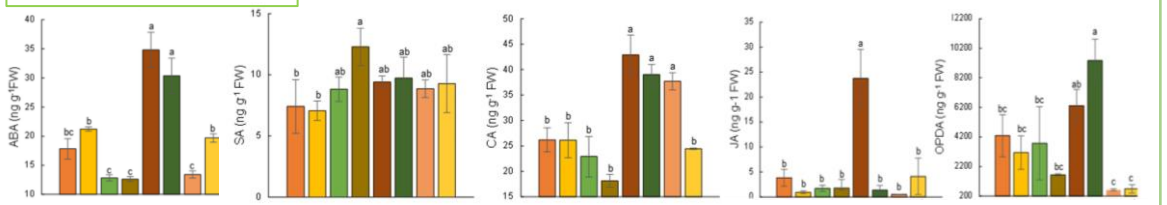


KL application protected the photosynthetic machinery under HL exposure occuring individually or combined with HS.

KL application increased transpiration rate (E) and stomatal conductance (gs) regardless the environmental conditions



Hormonal responses



KL application modulated hormones and their precursors' levels . KL application induced a significative increase in ABA content under HS+HL. Although, SA levels did not change under adverse conditions, CA content (SA precursor) significantly increased in plants under HL alone or combined with HS. KL application reduced CA content in HS+HL plants to control values. JA leaf concentration increased under HL, although KL reduced JA content to control levels in HL+KL. OPDA (a precursor of JA) content, increased under HL, kaolin application induced a significant increment under HL+KL compared to CT plants.

Conclusions

- High temperatures (HS) and high light intensity (HL) occurring simultaneously affect citrus plants differently in comparison to them taking place individually.
- Kaolin foliar application mitigates the negative effect of HS and HL in citrus plants at different levels (phenotypic, physiological and biochemical).
- Kaolin foliar application can be a potential tool to be used in citriculture in the scenario of climate change.

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