

Book of Abstracts

1st PhotosynthOS Conference



PhotosynthOS

April 24-25, 2023 Osijek, Croatia

Book of Abstracts

1st PhotosynthOS Conference

Published by:

Croatian Society of Plant Biologist, Rooseveltov trg 6, 10 000 Zagreb, Croatia

Edited by:

Zorana Katanić, Selma Mlinarić and Lidija Begović, Department of Biology, Josip Juraj Strossmayer University of Osijek, Osijek

Logo design by: Vlatko Galić

Cover design by: Selma Mlinarić

ISSN 2991-342X (Online)

Recommended citations:

Katanić, Z., Mlinarić, S. & Begović, L. (eds.) (2023) 1st PhotosynthOS Conference - Book of Abstracts, Croatian Society of Plant Biologists, Zagreb

Mlinarić, S (2023): Loving the curves: discovering the shapes of the OJIP transient. In: Katanić, Z., Mlinarić, S. & Begović, L. (eds.) (2023) 1st PhotosynthOS Conference - Book of Abstracts, Croatian Society of Plant Biologists, Zagreb; 4

Osijek & Zagreb, 2023



PhotosynthOS

1st PhotosynthOS Conference

April 24-25, 2023 Osijek, Croatia

Organizers:

Agricultural Institute Osijek, Osijek

Faculty of Humanities and Social Sciences, Josip Juraj Strossmayer University of Osijek

Department of Biology, Josip Juraj Strossmayer University of Osijek

Croatian Society of Plant Biologists, Zagreb



Sponsor:

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1st PhotosynthOS Conference program

Monday, April 24, 2023

8:30-9:30 Registration

9:30-10:00 Conference opening

Plenary lecture

10:00-11:00 **Kalaji, H. M., Dąbrowski, P., Sierka E., Piano D., Golonko, P., Mojski, J., Jaszczuk, Z., & Adamski, A.**: An advanced biological feedback system enables plants to regulate their supplemental lighting in greenhouse conditions

11:00-11:15 Coffee break

Oral presentations

11:15-11:30 **Lepeduš, H.**: A brief historical overview and scientific impact of chlorophyll a fluorescence measurements in Croatia during first 20 years

11:30-11:45 **Mlinarić, S.**: Loving the curves: discovering the shapes of the OJIP transient

11:45-12:00 **Šimić, D. & Mlinarić, S.**: Chlorophyll a fluorescence and beyond: Recent advancements and future prospects

12:00-13:00 *Poster section*

Mlynarikova Vysoka, D., Kovar, M., Živčák, M., Jasenovská, L., Barboričová, M., Filaček, A. & Brestič, M.: Effect of UV-B radiation on primary photosynthetic processes of lettuce plants

Jasenovská, L., Brestič, M., Barboričová, M., Filaček, A. & Živčák, M.: Screening of the effects of monochromatic light in microgreens using analysis of chlorophyll fluorescence kinetics

Tkalec, M., Vitko, S., Talanga Vasari, A., Goreta Ban, S. & Salopek-Sondi, B.: Photosynthetic adaptation of kale to abiotic stresses

Vitko, S., Vuk, T., Bauer, N. & Vidaković-Cifrek, Ž.: Salt and osmotic stress influence photosynthetic performance of *Arabidopsis thaliana* with modified DMS3 expression

Barboričová, M., Filaček, A. & Brestič, M.: Evaluation of the sensitivity of photosynthetic parameters in conditions of drought and high temperature

13:00-14:00 Lunch break

Oral presentations

14:00-14:15 **Galić, V., Ledenčan, T., Jambrović, A., Zdunić, Z., Podnar Žarko, I. & Šimić, D.**: Photosynthetic activity shows different breakpoints in response to increasing temperatures between maize maturity groups

14:15-14:30 Viljevac Vuletić, M., & Mihaljević, I.: Application of chlorophyll fluorescence in fruit science

14:30-14:45 Mahawar, L. & Brestič, M.: Impact of the foliar application of zinc oxide nanoparticles on photosynthesis and physiology of *Raphanus sativus* L. under salinity stress

14:45-15:00 Antunović Dunić, J., Peršić, V., Zellnig, G. & Cesar, V.: The effect of cadmium on photosynthesis and chloroplast ultrastructure in *Spirodela polyrhiza*: age-related susceptibility

15:00-15:15 Mazur, M., Vukadinović, L., Jambrović, A. & Galić, V., Šimić, D.: Unveiling the potential of chlorophyll a fluorescence as a highthroughput phenotyping method in maize breeding and research

15:15-15:45 Coffee break

15:45-17:00 *Poster section*

Filaček, A., Živčák, M. & Barboričová, M.: Non-invasive methods reveals the significance of alternate electron fluxes in photoprotection of different wheat genotypes under nitrogen deficit conditions

Mirosavljević, M., Mikić, S., Kondić-Špika, A., Župunski, V., Ottosen, C-O. & Zhou, R.: The effect of heat stress on chlorophyll fluorescence in Pannonian wheat varieties

Komazec, B., Vidaković-Cifrek, Ž. & Peharec Štefanić, P.: Effect of silver nanoparticles and ions on photosynthetic performance and oxidative stress induction in *Chlorella vulgaris*

Komazec, B. & Peharec Štefanić, P.: Effect of copper oxide nanoparticles and ions on photosynthetic performance and oxidative stress induction in *Chlorella vulgaris*

Košpić, K., Biba, R., Peharec Štefanić, P., Balen, B. & Tkalec, M.: Coating-dependent effects of silver nanoparticles on photosynthetic performance of tobacco seedlings

Lazarević, B.: Chlorophyll fluorescence imaging in assessing crop abiotic stress

Katanić, Z., Mlinarić, S., Duvnjak, J., Šunić, K. & Španić, V.: Effect of drought on photosynthetic performance of wheat during stem elongation stage

19:00 Conference dinner

Tuesday, April 25, 2023

Plenary lecture

9:00-10:00 Živčák, M., Filaček, A. & Brestič, M.: Simultaneous measurements of chlorophyll fluorescence to study photosynthetic regulation in plants exposed to environmental stresses

10:00-10:15 Coffee break

Oral presentations

10:15-10:30 **Šunić, K., Katanić, Z. & Španić, V.:** Photosynthetic efficiency of winter wheat (*Triticum aestivum* L.) infected with *Fusarium* head blight in controlled conditions

10:30-10:45 **Peršić, V., Antunović Dunić, J., Drezner, G. & Cesar, V.:** Exploring winter wheat genotypes' response to physiological drought: insights into the photosynthetic performance

10:45-11:00 **Duvnjak, J., Katanić, Z. & Španić, V.:** Different responses of wheat varieties to drought stress assessed by chlorophyll a fluorescence

11:00 – 12:00 *Poster section*

Kovar, M., Živčák, M., Mlynarikova Vysoka, D., Jasenovská, L., Barboričová, M., Filaček, A. & Brestič, M.: Photosynthetic responses of a collection of sorghum genotypes to salinity

Melnjak, A., Limón Santana, J. A. & Peršić, V.: Hungry for sulfur: the interplay of photosynthesis, starch, and anthocyanins

Suman, L., Mlinarić, S., Krvavica, M., Krstin, Lj. & Žuna Pfeiffer, T.: Photosynthetic performance of sun and shade leaves in solitary *Sorbus domestica* L. trees

Begović, L., Mlinarić, S., Galić, V., Abičić, A., Lalić, A. & Cesar, V.: Impact of differing weather conditions on photosynthetic performance of three field- grown barley cultivars

Lunch break

PHOTOSYNTHOS

The effect of heat stress on chlorophyll fluorescence in Pannonian wheat varieties

Milan Mirosavljević^{1*}, Sanja Mikić¹, Ankica Kondić-Špika¹, Vesna Župunski¹, Carl-Otto Ottosen², Rong Zhou²

¹Institute of Field and Vegetable Crops, Novi Sad, Serbia

² Department of Food Science, Aarhus University, Aarhus, Denmark

*email of the presenter: milan.mirosavljevic@ifvcns.ns.ac.rs

Keywords: high temperature, photosynthesis, stress, wheat

Abstract:

Winter wheat is sensitive to heat stress, which highlights the need for adaptation to high-temperature events to ensure high and stable yields. This study aimed to investigate the chlorophyll fluorescence response of eight wheat varieties from southeastern Europe to heat stress. Heat stress was applied during anthesis and mid-grain filling at 35/25 °C and 38/28 °C day/night for seven days, respectively. The results showed no significant differences in F_v/F_m values between wheat plants grown under control and heat stress during anthesis on the first, second, fifth, and seventh stress days. This absence of high-temperature effect during anthesis indicates that temperatures of 35/25 °C for seven days are insufficient to differentiate wheat variety reactions based on F_v/F_m measurements. However, when temperatures were increased to 38/28 °C during mid-grain filling, a significant variation in F_v/F_m values among the studied wheat varieties was observed. NS 40S and NS Ilina showed a notably slower reduction in F_v/F_m over time under heat stress treatment at mid-grain filling, exhibiting the highest F_v/F_m values on the seventh day. These varieties can be valuable sources of heat stress tolerance and should be considered for further breeding activities under the conditions of southeastern Europe.

Acknowledgements: This research was supported by Transnational Access EPPN2020 – "Phenotyping of wheat (*Triticum aestivum* L.) response to heat stress at different developmental stages" ID: 170 and the APV long-term project "Winter wheat nitrogen use efficiency improvement in Vojvodina" grant number: 142-451-3152/2022-01/3.

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