



# **BOOK** of **ABSTRACTS**

## **4<sup>th</sup> INTERNATIONAL CONFERENCE ON PLANT BIOLOGY (23<sup>rd</sup> SPPS Meeting)**



**6-8 OCTOBER 2022  
BELGRADE**

**Serbian Plant Physiology Society**

**Institute for Biological Research "Siniša Stanković"  
National Institute of Republic of Serbia, University of Belgrade**

**Faculty of Biology, University of Belgrade**

**BOOK OF ABSTRACTS**  
**4<sup>th</sup> International Conference**  
**on Plant Biology**  
**(23<sup>rd</sup> SPPS Meeting)**



Belgrade, 2022

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**(23<sup>rd</sup> SPPS Meeting)**  
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# PROGRAMME

**THURSDAY 6<sup>TH</sup> OCTOBER**

- 12:00-18:00      **Registration**
- 12:00-14:00      *NEPETOME project workshop (Science Fund of the Republic of Serbia, #Grant No 7749433): "Methodologies for the iridoid diversity investigation within the genus Nepeta" (Botanical Garden "Jevremovac")*
- 18:00-22:00      *Welcoming cocktail and Celebration of SPPS jubilee (Botanical Garden "Jevremovac")*

**FRIDAY 7<sup>TH</sup> OCTOBER**

- 09:00-09:15      **Opening Ceremony**

**SECTION 2 · PLANT STRESS PHYSIOLOGY**

**Chairs:** Jelena Dragišić Maksimović & Tamara Rakić

- 09:15-10:00      **Keynote: Mondher Bouzayen**  
*Uncoupling fruit softening from fruit ripening: a paradigm shift of thinking*
- 10:00-10:30      **Plenary lecture: Miroslav Lisjak**  
*Growth conditions may affect the nutritional quality of wheatgrass (*Triticum aestivum* L.)*
- 10:30-11:00      **Plenary lecture: Hermann Heilmeier**  
*The functional role of non-essential elements in the root zone: how interactions between essential and non-essential elements shape the chemical rhizosphere environment*
- 11:00-11:30      **Coffee break**
- 11:30-11:50      **Invited talk: Zsófia Bánfalvi**  
*Regulation and function of GIGANTEA genes in *Solanum tuberosum* cultivar 'Désirée'*
- 11:50-12:10      **Invited talk: Ingeborg Lang**  
*Drought or heavy metals – investigating the abiotic stress tolerance in bryophytes*
- 12:10-12:30      **Invited talk: Biljana Kukavica**  
*Flooding and antioxidative response in plants*
- 12:30-12:50      **Invited talk: Sonja Milić Komić**  
*Distinctive regulation of different phenolics biosynthesis by high light and UV-B in three basil varieties*
- 12:50-13:05      **Selected talk: Mariana Stanišić**  
*What happens with phloretin in plants? – Phloretin real-time effects and post-treatment metabolism in treated *Arabidopsis* seedlings*
- 13:05-13:20      **Selected talk: Danijela Arsenov**  
*Fullerenol (C<sub>60</sub>(OH)<sub>24</sub>) as a potent stress alleviator against drought and trace-element toxicity in *Alliaria petiolata* (M.Bieb.) Cavara et Grande*
- 13:20-14:00      **Poster session**
- 14:00-15:30      **Lunch break**

## SECTION 1 · PLANT GROWTH, DEVELOPMENT, METABOLISM AND NUTRITION

**Chairs:** Ivana Maksimović & Slavica Ninković

- 15:30-16:00      **Plenary lecture:** Panagiotis Kalaitzis  
*A prolyl-4-hydroxylase and Arabinogalactan proteins are involved in relocation of tomato abscission zone*
- 16:00-16:30      **Plenary lecture:** Marjorie Guichard  
*State-dependent protein interaction networks of a central regulator of plant growth and metabolism*
- 16:30-16:50      **Invited talk:** Václav Motyka  
*Hormone and role of desiccation in somatic embryogenesis of conifers*
- 16:50-17:20      **Coffee break**
- 17:20-17:40      **Invited talk:** Julien Pirrello  
*Transition to ripening in tomato fruit needs genetic reprogramming initiated in gel tissue*
- 17:40-18:00      **Invited talk:** Guido Grossmann  
*Robust yet adaptive - morphogenesis and growth regulation in roots*
- 18:00-18:20      **Invited talk:** Jan Fíla  
*The beta-subunit of nascent polypeptide associated complex plays a role in flowers and siliques development of Arabidopsis thaliana*
- 18:20-18:35      **Selected talk:** Kiril Mishev  
*The interaction network of the plant NudC family protein NMig1*
- 18:35-19:15      **Poster session**

SATURDAY 8<sup>TH</sup> OCTOBER

- 09:00-10:00      **SPPS Assembly**

## SECTION 4 · ECOLOGY, GENETICS AND EVOLUTION OF PLANTS

**Chairs:** Branislav Šiler & Sanja Manitašević Jovanović

- 10:00-10:30      **Plenary lecture:** Velemir Ninković  
*Plant signaling and behavior mediated via volatiles*
- 10:30-11:00      **Plenary lecture:** Janez Kermavnar  
*Impacts of forest management on plant functional traits and ecological conditions in the Dinaric fir-beech forests (Slovenia)*
- 11:00-11:30      **Coffee break**
- 11:30-11:50      **Invited talk:** Ksenija Jakovljević  
*Ecophysiology of metal-hyperaccumulation in plants: what do we know so far?*
- 11:50-12:10      **Invited talk:** Jelena Milojević  
*Elucidation of the mechanism underlying somatic embryo induction in spinach*

- 12:10-12:30 **Invited talk: Miroslava Zhiponova**  
*Catmint (Nepeta nuda L.) Phylogenetics and Metabolic Responses in Variable Growth Conditions*
- 12:30-12:50 **Invited talk: Neda Aničić**  
*Progress in disentangling the diversity of iridoids within the genus Nepeta: surprising biosynthetic and evolutionary insights*
- 12:50-13:05 **Selected talk: Denitsa Teofanova**  
*Distribution, host range, and genetic variability of the holoparasitic genus Cuscuta in Bulgaria*
- 13:05-13:20 **Selected talk: Katarina Hočevar**  
*Variation in Hsp70 and Hsp101 levels in response to experimental warming in Iris pumila L.: an open-topped chamber experiment*
- 13:20-14:00 **Poster session**
- 14:00-15:30 **Lunch break**

**SECTION 3 · APPLICATION IN AGRICULTURE, PHARMACY AND FOOD INDUSTRY**

**Chairs: Ana Ćirić & Ana Marjanović Jeromela**

- 15:30-16:00 **Plenary lecture: Angelos K. Kanellis**  
*Aroma formation in Vitis vinifera grape berries*
- 16:00-16:30 **Plenary lecture: Ekaterina-Michaela Tomou**  
*Metabolomic strategy for detecting herbal products' differentiations and potential adulteration*
- 16:30-16:50 **Invited talk: Mila Grahovac**  
*Essential oils and hydrolates in control of plant pathogens*
- 16:50-17:20 **Coffee break**
- 17:20-17:40 **Invited talk: Carla Vogt**  
*Determination of elements, isotopes and organics in plants with high local resolution by mass spectrometric methods*
- 17:40-18:00 **Invited talk: Milan Mirosavljević**  
*Integrating physiological traits in local small grains breeding program*
- 18:00-18:20 **Invited talk: Nada Ćujić Nikolić**  
*Chokeberry, from natural polyphenol resource to promising functional foods and pharmaceuticals*
- 18:20-18:35 **Selected talk: Ana Pantelić**  
*Late embryogenesis abundant (LEA) proteins in Ramonda serbica Panc identification, classification and structural characterization*
- 18:35-18:50 **Selected talk: Dejan Stojković**  
*Supercritical fluid extraction of Chicory reveals its antimicrobial, antibiofilm and wound healing potentials*
- 18:50-19:15 **Poster session**
- 19:15-19:30 **Closing Ceremony**
- 20:00-00:00 **Gala Dinner**



## Physiological and antioxidant defense mechanisms of *Nepeta nervosa* plants against polyethylene glycol (PEG)-mediated drought stress

PP2-23

Slavica Dmitrović, Jasmina Nestorović Živković, Neda Aničić, Marijana Skorić, Uroš Gašić, Milica Milutinović, Dragana Matekalo, Luka Petrović, Jelena Božunović, Biljana Filipović, Tijana Banjanac, Branislav Šiler, Miloš Todorović, Tamara Lukić, Danijela Mišić

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Drought-stress conditions lead to excessive production of reactive oxygen species (ROS) and oxidative damage in plants. Plants display various defense mechanisms for survival, including the activation of antioxidant enzymes and the production of low molecular weight non-enzymatic antioxidants like phenolics. In this work, roots of four weeks old *Nepeta nervosa* plants were exposed to PEG solutions with osmotic pressure of  $-3$  MPa for one, three and six days. Fresh weight (FW) and relative water content (RWC) of *N. nervosa* plants were significantly reduced compared to the corresponding control - up to 68% (FW) and up to 35% (RWC). In leaves, the content of rosmarinic and chlorogenic acids, dominant phenolic compounds, as well as of less abundant ferulic and caffeic acids, was dependent on the duration of PEG-induced drought stress. The content of rosmarinic acid in control plants achieved an average value of 18.27  $\mu\text{g}/\text{mg}$  FW, while at PEG-treatments it increased by 355% (3 days of PEG-treatment). Among all examined antioxidative enzymes in leaves of PEG treated *N. nervosa* plants, superoxide dismutases (SOD) were the most active (an increase of 853% on day 6). PEG treatment also caused an increase in peroxidase (POX) activity in leaves of *N. nervosa* plants (108% increase on day 3). Since catalase (CAT) activity was significantly decreased on PEG treatment, except on day 1, it could be presumed that  $\text{H}_2\text{O}_2$  elimination is performed mostly by POX. This work is a useful contribution to the development of a strategy for overcoming oxidative stress in *Nepeta* species, especially in arid and semiarid regions.

**Keywords:** water stress, antioxidant enzymes, *Nepeta nervosa*, phenolic acid

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