



BOOK of **ABSTRACTS**

4th INTERNATIONAL CONFERENCE ON PLANT BIOLOGY (23rd 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
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on Plant Biology
(23rd SPPS Meeting)



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(23rd SPPS Meeting)
6-8 October, Belgrade

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PROGRAMME

THURSDAY 6TH 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 7TH 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 (C₆₀(OH)₂₄) 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 8TH 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**

Metabolomic evaluation of three *Digitalis* species (fam. Plantaginaceae) using liquid chromatography with multistage mass spectrometry

PP4-11

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

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The aim of this research was to determine inter-species diversity in qualitative composition of methanol-soluble metabolites in leaves of three *Digitalis* species (*D. lanata*, *D. ferruginea*, and *D. ambigua*) from the central Balkans. Using the UHPLC-LTQ OrbiTrap MS technique, a total of 119 compounds were identified based on their monoisotopic masses, MSⁿ fragmentation, and previously reported MS data. All identified compounds were clustered into seven groups: steroidal glycosides (43 compounds), steroid aglycones (12 compounds), phenylethanoid glycosides (15 compounds), flavonoid glycosides (18 compounds), flavonoid aglycones (9 compounds), phenolic acid derivatives (14 compounds), and 8 compounds belonging to other classes. In addition to the expected cardiac glycosides, steroidal saponins and pregnane and furostanol glycosides were also abundant in the extracts of analysed *Digitalis* species. A detailed LC/MS qualitative analysis revealed very similar profiles of steroidal glycosides in extracts of *D. lanata* and *D. ferruginea* leaves, which were characterized by significant amounts of pharmaceutically important digoxin, deslanatoside, and lanatosides A, B, and C. On the other hand, these compounds were not detected in leaves of *D. ambigua*. The UHPLC-LTQ OrbiTrap MS method was proved to be simple, rapid, and accurate strategy for unambiguous taxonomic determination and chemical differentiation of *Digitalis* species. It also allowed the selection of high-resolution chemical markers for revealing inter- and intra-population variability of *Digitalis* species adopting targeted metabolomic approach, which is the course of our further work.

Keywords: UHPLC-LTQ OrbiTrap MS, cardiac glycosides, steroids, phenylethanoids, flavonoids

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