



# **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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CIP - Каталогизacija у публикацији - Народна библиотека Србије, Београд

581(048)

INTERNATIONAL Conference on Plant Biology (4 ; 2022 ; Belgrade)

Book of Abstracts / 4th International Conference on Plant Biology [and] 23rd SPPS Meeting, 6-8 October 2022, Belgrade ; [organized by] Serbian Plant Physiology Society [and] Institute for Biological Research "Siniša Stanković", University of Belgrade [and ] Faculty of Biology, University of Belgrade ; [editor Milica Milutinović]. - Belgrade : Serbian Plant Physiology Society : University, Institute for Biological Research "Siniša Stanković" : University, Faculty of Biology, 2022 (Zemun : Alta Nova). - 169 str. : ilustr. ; 24 cm

Tiraž 30. - Registar.

ISBN 978-86-912591-6-7 (SPPS)

1. Društvo za fiziologiju biljaka Srbije. Sastanak (23 ; 2022 ; Beograd)

a) Ботаника - Апстракти

COBISS.SR-ID 74996233

**4<sup>th</sup> International Conference on Plant Biology**  
**(23<sup>rd</sup> SPPS Meeting)**  
**6-8 October, Belgrade**

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**Publishers**

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

**Editor**

Milica Milutinović

**Graphic design**

Dejan Matekalo

**Prepress**

Marija G. Gray

**Printed by**

Alta Nova, Zemun

**Print run**

30 pcs

Belgrade, 2022



# 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**



## Liquid chromatography with multistage mass spectrometry as a method for chemical differentiation of ten *Nepeta* species (fam. Lamiaceae)

PP4-13

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

(tbanjanac@ibiss.bg.ac.rs)

Department of Plant Physiology, Institute for Biological Research "Siniša Stanković" - National Institute of Republic of Serbia, University of Belgrade, Bulevar despota Stefana 142, 11060, Belgrade, Serbia

*Nepeta* species (fam. Lamiace, subfam. Nepetoideae, tribe Nepetae) are well known for their pharmacological properties, biopesticide potential and behavioral effects on cats. Different biological activities of *Nepeta* species are closely related to their secondary metabolites, among which iridoids predominate. Research objective of this study was to determine profiles of methanol-soluble iridoids in leaves of greenhouse-grown plants of 10 phylo diverse *Nepeta* species: *N. grandiflora* M. Bieb., *N. laevigata* (D. Don) Hand.-Mazz., *N. nervosa* Royle ex Benth., *N. stewartiana* Diels, *N. nuda* L., *N. parnassica* Heldr. & Sart., *N. rtanjensis* Diklić & Milojević, *N. ernesti-mayeri* Diklić & V. Nikolić, *N. cataria* L., and *N. sibirica* L. Untargeted metabolomics approach adopting UHPLC/LTQ Orbitrap MS<sup>n</sup> analysis in a negative ionization mode revealed the presence of totally 15 iridoids in samples, of which 13 were glucosides and two were aglycons of iridoids. Iridoid compounds were identified based on their monoisotopic masses, MS<sup>n</sup> fragmentation, and previously reported MS data. The results indicated that the iridoid profiles of the investigated species are very diverse both in terms of qualitative content of the compounds and their relative abundance in extracts. Among analysed *Nepeta* species, Balkan Peninsula endemics (*N. rtanjensis*, *N. parnassica*, and *N. ernesti-mayeri*) and *N. cataria*, are especially rich in isomers of 1,5,9-epideoxyloganic acid. 5-Deoxylamiol, nepetariaside, nepetanudoside B, and ajugol were detected in majority of analyzed species. The UHPLC-LTQ OrbiTrap MS analysis, in combination with chemometric data processing, has proven to be an efficient tool for chemical differentiation between *Nepeta* taxa, and could aid the efforts to unravel the chemical evolution within the genus.

**Keywords:** *Nepeta* sp., iridoids, chemotaxonomic classification, chemical differentiation

*Acknowledgment:* This research was supported by the Science Fund of the Republic of Serbia, GRANT No. 7749433, "Omics-guided disentangling of the iridoid diversity in the genus *Nepeta* L. for in planta metabolic engineering towards sustainable exploitation- NEPETOME" (2022-2025), and is supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia (Contract No. 451-03-68/2022-14/200007).