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
4th International Conference on Plant Biology

(23rd SPPS Meeting)

Belgrade, 2022

4th International Conference on Plant Biology
(23rd SPPS Meeting)
6-8 October, Belgrade

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

Suported by the Ministry of Education, Science, and Technological Development of the Republic of Serbia

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
Hormonome 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*

Alterations in specialized metabolism and antioxidant capacity of *Nepeta sibirica* L. as induced by two *Trichoderma* sp.

PP2-32

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

(dragana.bozic@ibiss.bg.ac.rs)

Institute for Biological Research "Siniša Stanković"- National Institute of Republic of Serbia, University of Belgrade, Bulevar Despota Stefana 142, 11060 Belgrade, Serbia

Trichoderma spp. have been extensively explored and used in agriculture due to their well-known biological control mechanisms. Fungi of the genus *Trichoderma* produce secondary metabolites which affect plant metabolism by stimulating the production of defense-related compounds and increasing the antioxidant capacity through enhanced polyphenol content and elevated activity of antioxidant enzymes, a result of the excess production of reactive oxygen species. In this work, *Nepeta sibirica* plants were grown in vitro on solid medium treated with two *Trichoderma* strains (*T. viride* and *T. harzianum*). After three and six days of treatment, leaves were metabolically profiled for major phenolic acids (chlorogenic, caffeic, and rosmarinic acid), and iridoids content (cis,trans-nepetalactone and 1,5,9-epideoxyloganic acid), in parallel with the expression analysis of nepetalactone biosynthetic genes and regulatory genetic elements-transcription factors (TFs). Both fungal strains induced changes in phenolic acids production, while only *T. harzianum* induced elevated levels of iridoids. Biosynthetic genes GPPS, and IS, as well as TF MYC2, were the only genes with expression levels not affected by the treatments with micro fungi. The response of antioxidant enzymes in *N. sibirica* leaves was also studied. The most active antioxidant enzyme following the infection with *T. viride* and *T. harzianum* was peroxidase (POX). Catalase (CAT) and superoxide dismutase (SOD) activity were also affected by the treatments. Results indicate a possibility of using *Trichoderma* infection in *N. sibirica* to elicit the production of biologically active defense compounds.

Keywords: *Trichoderma*, antioxidant activity, *Nepeta sibirica*, phenolic acid, nepetalactone biosynthetic pathway genes, iridoids

Acknowledgment: This work is financed by the Science Fund of the Republic of Serbia, Program IDEAS (project NEPETOME, No. 7749433), and is supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia (451-03-68/2022-14/200007).