BOOK OF ABSTRACTS

3rd International Conference on Plant Biology

(22nd SPPS Meeting)

9-12 JUNE 2018
BELGRADE

Serbian Plant Physiology Society

Institute for Biological Research "Siniša Stanković", University of Belgrade

Faculty of Biology, University of Belgrade

3rd International Conference on Plant Biology

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9-12 June 2018, Belgrade

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PROGRAMME

Saturday 9th June

09:00-14:00	*Registration*	
14:00-14:30	*Opening Ceremony*	

Section 2 • Plant Stress Physiology

Chairs: Sonja Veljović-Jovanović & Ivana Maksimović

14:30-15:00	(Plenary lecture) **Hrvoje Fulgosi**	Sifting the elements of FNR-TROL bifurcation
15:00-15:30	(Plenary lecture) **Autar Mattoo**	Tomato (*Solanum lycopersicum*) lipoxygenase (LOX) gene family: Delineating gene members associated with growth, development and abiotic stresses
15:30-15:50	(Invited talk) **Tamara Rakić**	Two-year study of ecophysiological parameters of *Miscanthus* × *giganteus* grown on tailing pond at the mine "Rudnik" (Serbia)
15:50-16:10	(Invited talk) **Vladimir Crnojević**	Data science in biosystems
16:10- 16:40	*Coffee break*	
16:40-17:00	(Invited talk) **Ingeborg Lang**	Tolerance to heavy metals – some examples in bryophyte species
17:00-17:15	(Selected talk) **Predrag Bosnić**	Silicon mediates sodium (Na+) transport in maize under moderate NaCl stress
17:15-17:30	(Selected talk) **Milan Borišev**	Dynamics of Cd accumulation and metabolic adaptation of *Salix alba* grown hydroponically
17:30- 17:45	(Selected talk) **Slavica Dmitrović**	Nepetalactone-rich essential oil mitigates BASTA-induced ammonium toxicity in *Arabidopsis thaliana* L. by maintaining glutamine synthetase activity
17:45-18:00	*Group Photo*	
18:00-19:00	*Poster session: Plant Stress Physiology (Section 2)*	
19:00-21:00	*Welcoming cocktail (Rectorate of the University of Belgrade)*	

Sunday 10th June

09:00-14:00 *Registration*

Section 1 • Plant Growth, Development, Metabolism and Nutrition

Chairs: Snežana Zdravković-Korać & Miroslav Nikolić

09:30-10:00	(Plenary lecture) **Guido Grossmann**	Cellular growth regulation in roots - how to adapt in a complex environment
10:00-10:20	(Invited talk) **Ondrej Novák**	Tissue- and cell-specific analysis of phytohormones
10:20-10:40	(Invited talk) **Ksenija Radotić**	Plant cell walls – mechanical and chemical modifications underpin growth and stress response
10:40-11:00	(Invited talk) **Herman Heilmeier**	Bioavailability of elements for effective phytoremediation and phytomining: the role of rhizosphere processes
11:00- 11:30	*Coffee break*	
11:30-11:50	(Invited talk) **Václav Motyka**	Comprehensive phytohormone profiling during Norway spruce (*Picea abies*) somatic embryogenesis
11:50-12:05	(Selected talk) **Danijela Paunović**	Are receptor tyrosine kinases chimeric AGP's?
12:05-12:20	(Selected talk) **Jelena Pavlović**	Silicon increases iron use efficiency in cucumber- a strategy 1 model plant
12:20-12:35	(Selected talk) **Katarina Ćuković**	Characterization of *Arabidopsis GLN1;5* knockout mutant
12:35- 14:00	*Lunch break*	

Sunday 10th June

Section 4 • Phytochemistry

Chairs: Vuk Maksimović & Vladimir Mihailović

14:00-14:30	(Plenary lecture) **Alain Tissier**	Engineering plant diterpenoid pathways in yeast: increasing yield and expanding product diversity
14:30-14:50	(Invited talk) **Roque Bru Martinez**	Metabolic engineering and elicitation strategies to produce stilbenoids in plant cell cultures
14:50-16:10	(Invited talk) **Sokol Abazi**	New fatty acids discovered for the first time in *Vitex agnus-castus*
16:10-16:30	(Invited talk) **Peđa Janaćković**	Do plant volatiles reflect taxonomy?
16:30- 17:00	*Coffee break*	
17:00-17:20	(Invited talk) **Angelos Kanellis**	The *Cistus creticus* terpene synthase gene family
17:20-17:40	(Invited talk) **Marina Soković**	Terpenes and terpenoids: linking bioactivity, opportunities and challenges
17:40-18:00	(Invited talk) **Jules Beekwilder**	Plant terpenes and bioplastics
18:00-18:15	(Selected talk) **Jelena Dragišić Maksimović**	Enzymatic behavior of edible berries – "Beroxidases"
18:15-18:30	(Selected talk) **Elma Vuko**	Inhibition of satellite RNA associated cucumber mosaic virus infection by essential oil of *Micromeria croatica* (Pers.) Schott
18:30-18:45	(Selected talk) **Dorisa Çela**	Structure elucidation of a new alkaloid and other 11 known compounds isolated from *Gymnospermium* species
18:45-19:45	***Poster sessions: Plant Growth, Development, Metabolism and Nutrition; Phytochemistry (Sections 1 and 4)***	

Monday 11th June

Section 5 • Applications in Agriculture, Pharmacy and Food Industry

Chairs: Jasmina Glamočlija & Slavica Ninković

09:00-9:30	(Plenary lecture) **Mondger Bouzayen**	New factors controlling fruit development: epigenetic modifications associated with the fruit set transition in tomato
09:30-10:00	(Plenary Lecture) **Andrew Allan**	New breeding technologies for fruit trees
10:00-10:20	(Invited talk) **Slađana Žilić**	Food and pharmacy application of anthocyanins originating from colored grains
10:20-10:40	(Invited talk) **Eligio Malusa**	Microbial-based inputs: opportunities and challenges for sustainable and resilient agricultural productions
10:40-11:10	*Coffee break*	
11:10-11:30	(Invited talk) **Dragana Miladinović**	Old problems, new tools - Integrated approach to oil crop breeding
11:30-11:45	(Selected talk) **Brankica Tanović**	Prospects of cabbage leaf debris use in the control of *Fusarium* wilt of pepper
11:45-12:00	(Selected talk) **Nina Devrnja**	Effects of tansy essential oil on fitness and digestion process of gypsy moth larvae
12:00-12:15	(Selected talk) **Zora Dajić-Stevanović**	Advantages and limitations of phytogenic feed additives
12:15-14:00	*Lunch break*	

Monday 11th June

Section 3 • Biodiversity, Conservation and Evolution of Plants

Chairs: Jelena Aleksić & Aleksej Tarasjev

14:00-14:30	(Plenary lecture) **Hendrik Poorter**	Meta-Phenomics: Converting data into knowledge
14:30-15:00	(Plenary lecture) **Antonio Granell Richart**	The biodiversity present in European tomato, phenotypes galore and a first insight in the underlying genetics
15:00-15:20	(Invited talk) **Zlatko Šatović**	Origin and genetic diversity of Croatian common bean landraces
15:20-15:50	*Coffee break*	
15:50-16:10	(Invited talk) **Aneta Sabovljević**	Conservation physiology of bryophytes
16:10-16:30	(Invited talk) **Nataša Barišić Klisarić**	Biomonitoring: Plants' (in) perspective
16:30-16:50	(Selected talk) **Sanja Budečević**	Morphological diversity of functionally distinctive floral organs in *Iris pumila*: Does the flower color matter?
16:50-17:05	(Selected talk) **Žaklina Marjanović**	First data on arbuscular mycorrhizal communities from selected climatic borderline forest ecosystems of the Balkan Peninsula
17:05-17:20	(Selected talk) **Tijana Banjanac**	Verification of interspecies hybridization within the genus *Centaurium* Hill using *EST-SSR* molecular markers
17:20-18:20	*Poster sessions: Applications in Agriculture, Pharmacy and Food Industry; Biodiversity and Conservation, Evolutionary Plant Biology (Sections 5 and 3)*	
18:20-18:30	*Closing Ceremony*	
18:30-19:00	*SPPS General Assembly Meeting*	
21:00-01:00	*Gala dinner: Restaurant "Vizantija"*	

Tuesday 12th June

10:00-16:00	*Excursion: Special Nature Reserve "Carska bara"*

SECTION 4

Phytochemistry

H. perforatum var. *microphyllum* DC., *H. barbatum* var. *barbatum* Jacq., *H. barbatum* var. m*acedonicum* (Boiss. & Orph.) Boiss., *H. olympicum* var. *olympicum* L., *H. dimoniei* Vel., *H. cerastoides* (Spach) N.K.B.Robson, *H. annulatum* Moris, *H. montbretii* Spach, *H. richeri* subsp. *grisebachii* (Boiss.) Nyman, *H. rumeliacum* var. *rumeliacum* Boiss., *H. tetrapterum* Fries and *H. maculatum* subsp. *immaculatum* (Murb.) Fröhl. originating from the Republic of Macedonia. Flower and aerial part extracts from *H. perforatum* var. *perforatum*, *H. perforatum* var. *angustifolium*, *H. tetrapterum*, *H. richeri*, *H. barbatum* var. *macedonicum* and *H. maculatum* were shown to be the richest source of TP and TF compared to other tested species. The strongest DPPH scavenging activities were noticed in flower and aerial part extracts of *H. perforatum* var. *perforatum*, *H. perforatum* var. *angustifolium*, *H. tetrapterum*, *H. cerastoides*, *H. rumeliacum* and *H. maculatum*, as well as in leaf extracts from *H. barbatum* var. *macedonicum*, *H. olympicum*, *H. dimoniei* and *H. tetrapterum*. Present results revealed significant positive correlations between TP, TF and DPPH, indicating that phenolics and flavonoids are the major contributors to the antioxidant properties of tested *Hypericum* taxa. This study suggested that Macedonian *Hypericum* species represent promising source of phenolic compounds that could be used as natural antioxidants in food and pharmaceutical industry.

Keywords: antioxidant activity, flavonoids, *Hypericum* spp., phenolic compounds

Bioaccumulation abilities of different parts of *Iris pumila* L.

PP4-25

Stevan N. Avramov[1], Aleksandar Ž. Kostić[2], Biljana P. Dojčinović[3], Danijel Milinčić[2], Marina P. Mačukanović-Jocić[4]

(stevan@ibiss.bg.ac.rs)

[1] University of Belgrade, Institute for Biological Research "Siniša Stanković", Bulevar Despota Stefana 142, 11060, Belgrade, Serbia

[2] University of Belgrade, Faculty of Agriculture, Chair of Chemistry and Biochemistry, Nemanjina 6, 11080, Belgrade, Serbia

[3] University of Belgrade, Institute of Chemistry, Technology and Metallurgy, Njegoševa 12, 11000 Belgrade, Serbia

[4] University of Belgrade, Faculty of Agriculture, Chair of Agrobotany, Nemanjina 6, 11080, Belgrade, Serbia

The presence of certain elements in the soil controls their bioavailability to the plant. Uptake of elements depends on their concentration, solubility of occurring form and soil properties. Also, the propensity of the plant for the bioaccumulation process will condition the transfer of ions of elements from the soil to the various parts of the plant. Sometimes good bioaccumulation properties of plants can be used for their application for bioremediation of polluted areas.

The objective of the present study was to determine the concentrations of selected elements in the rhizome and above-ground parts of *Iris pumila* grown in Deliblato Sands (Serbia) in relation to its surrounding soil. Potassium and selenium contents (mg $kg^{-1}$of dry matter) were determined by ICP-OES method after digestion of samples. The concentration, transfer and accumulation of some elements from the soil to rhizome and above-ground parts were evaluated in terms of Biological Absorption Coefficient (BAC): $c_{plant\ part}/c_{soil}$. The concentration of K+ ions in soil, rhizome, above-ground vegetative parts and flower were: 1,845.3 mg kg^{-1}, 1,307.0 mg kg^{-1}, 4,461.4 mg kg^{-1} and 2,875.1 mg kg^{-1}, respectively. The presence of selenium as a trace element was confirmed both in the soil (0.112 mg kg^{-1}) and in the plant parts (rhizome - 0.156 mg kg^{-1}; above-ground vegeta-

tive parts- 0.135 mg kg^{-1}; flower - 0.122 mg kg^{-1}). The obtained results confirmed that the above-ground parts accumulated potassium ($BAC_{vegetative}$= 2.42; $BAC_{flowers}$= 1.56). Also, all plant parts have shown the ability to bond selenium from soil in significant quantities ($BAC_{rhizomes}$= 1.38; $BAC_{vegetative}$= 1.20; $BAC_{flowers}$= 1.08). This suggests that this specie have potential in phytoremediation.

Keywords: bioaccumulation; *Iris pumila*; Deliblato sands; phytoremediation

This study is supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia, Grant No. 173025.

Organ-specificity and genotype-dependency of secoiridoid glucosides' constitutive biosynthesis in *Centaurium erythraea* Rafn

PP4-26

Nikolić Tijana[1,2], Matekalo Dragana[1], Skorić Marijana[1], Novaković Lazar[1,3,4], Božunović Jelena[1], Aničić Neda[1], Mišić Danijela[1]

(b3004_2016@stud.bio.bg.ac.rs)

[1] Institute for Biological Research "Siniša Stanković", University of Belgrade, Bulevar despota Stefana 142, 11060 Belgrade, Serbia

[2] Faculty of Biology, University of Belgrade, Takovska 43, 11060 Belgrade

[3] University of Melbourne, School of BioSciences, Building 122, Tin Alley, 3052 Parkville, Australia

[4] Max Planck Institute of Molecular Plant Physiology, Am Mühlenberg 1, Potsdam 14476, Germany

Plant species *Centaurium erythraea* Rafn (fam. *Gentianaceae*) is characterized by the presence of secoiridoid glucosides (SGs) as dominant secondary metabolites. The SG biosynthetic pathway has not yet been fully elucidated, despite the great pharmacological importance of this species. Here, an insight into the SG biosynthesis is achieved by comparing chemical profiles and secoiridoid-related gene expression patterns of different *C. erythraea* genotypes and plant organs. The results revealed that leaves are the main site of secoiridoid biosynthesis and accumulation in *C. erythraea*. The key function in the secoiridoid glucoside biosynthetic pathway has been assigned to genes encoding GES, G8O, 8HGO, 7DLGT and 7DLH2, while for *SLS* and *CPR* a potential biosynthetic-flux regulatory role has been determined. The correlation between the levels of these genes' expression and SG content is evident in different plant organs. Also, the analysis of SG high- and low-productive genotypes of *C. erythraea* points out that chemical variability existing at intra-species level is, at least partially, determined by the different patterns of expression of SG-related genes in different genotypes. Taking into consideration the biological activity of secoiridoid glucosides, not only is the information obtained in this study of importance for further SG biosynthesis elucidation, but it also shows a great potential for future biotechnology-based sustainable production of these valuable metabolites.

Keywords: *Centaurium erythraea* Rafn, secoiridoid glycosides, qPCR, UHPLC-MS/MS

This work was funded by the Ministry of Education, Science and Technological Development of the Republic of Serbia, Grant No. OI173024.