

# BOOK OF ABSTRACTS

## 3rd International Conference on Plant Biology (22nd SPSS 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**

**3<sup>rd</sup> International Conference  
on Plant Biology  
(22<sup>nd</sup> SPPS Meeting)**



9-12 June 2018, Belgrade

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**3<sup>rd</sup> International Conference on Plant Biology**  
**(22<sup>nd</sup> SPPS Meeting)**  
**9-12 June, Belgrade**

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# PROGRAMME





**Saturday 9<sup>th</sup> 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<sup>+</sup>) 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 10<sup>th</sup> June09:00-14:00 *Registration*

## Section 1 • Plant Growth, Development, Metabolism and Nutrition

*Chairs: Snežana Zdravković-Korać & Miroslav Nikolić*

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

Sunday 10<sup>th</sup> June

Section 4 • Phytochemistry

**Chairs: Vuk Maksimović & Vladimir Mihailović**

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



Monday 11<sup>th</sup> June

## Section 5 • Applications in Agriculture, Pharmacy and Food Industry

**Chairs: Jasmina Glamočlija & Slavica Ninković**

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

Monday 11<sup>th</sup> 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 *Centaureum* 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 12<sup>th</sup> June

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

## Anatomical and micromorphological investigations of *Artemisia absinthium* L. (Asteraceae) from Serbia

PP3-10

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In this work anatomical and micromorphological investigations of vegetative organs of *Artemisia absinthium* L. (Asteraceae), wild-growing in Serbia, were conducted. The aim of this study was to examine the general anatomy and micromorphology, as well as to find possible valid taxonomic characters. Microscopic slides were prepared following the standard histological procedures. Tri-arch type of the vascular bundle is present in primary root structure, whereas typical secondary growth occurs in older roots. Also, large secretory ducts, with a brownish content, are present in the cortex. The stem is polygonal in shape and characterized by collateral vascular bundles. Clearly visible endodermis layer is noticed. The largest parenchyma cells occur in the pith. Also, small secretory ducts occur in the cortex and in the pith of the stem. Petiole has ellipsoidal shape, with similar anatomy to the stem. Concerning leaf anatomy, the isolateral palisade structure is observed. On the surface of all aerial vegetative organs, numerous morphologically variable T-shaped nonglandular, as well as very prominent, large glandular trichomes, with brownish content, were found. All of the data may be considered as possible taxonomic characters which could help in species identification and infrageneric taxonomy of the genus *Artemisia*. Thus, these findings are of importance for future anatomical, micromorphological and phytochemical investigations of this and related species.

**Keywords:** *Artemisia absinthium*, Asteraceae, anatomy, micromorphology

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## Cryopreservation of *Viola cornuta* shoot tips using vitrification procedure

PP3-11

Milena Trajković, Dragana Antoni<sup>ć</sup>, Maja Trajilović, Milana Trifunović Momčilov, Angelina Subotić, Slađana Jevremović  
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Cryopreservation represents a suitable method for long term storage of different plant genetic resources. The aim of this study was to develop protocol for cryopreservation of *Viola cornuta* shoot tips using one step freezing method with chemical dehydration of tissue with modified Plant Vitrification Solutions (PVS2 or PVS3). Shoot tips (1-2 mm) of two-week cold acclimated shoots were cultured on ½MS medium with 0.3 M sucrose for one day before treatment with loading solution (2 M glycerol, 0.4 M sucrose) for 30 min. Osmotic dehydration with PVS2 solution (30%

glycerol, 15% ethylene glycol and 15% DMSO in liquid ½MS medium with 0.4 M sucrose) were tested at 0 °C or 24 °C. Osmotic dehydration with PVS3 (50% sucrose, 50% glycerol in liquid ½MS medium) were tested at 24 °C for 45 min. After the treatment the explants were directly immersed in liquid nitrogen (LN) for at least one day. Re-warming was performed at 42 °C in water bath for 2 min. After re-warming, the PVS solutions were replaced with unloading solution containing 1.2 M sucrose for 20 min. Re-warmed shoot tips were cultured on ½MS medium with 0.1 mg L<sup>-1</sup> BAP. We observed that PVS2 solution is cytotoxic for *V. cornuta* shoot tips and cannot be used for cryopreservation. However, cryopreservation with PVS3 solution was successful, where 71.9-100% shoot tips survived treatment before immersion to LN and 31-40% survived after re-warming from LN. Regrowth of cryopreserved shoot tips with new well-formed leaves was obtained after four weeks of culture.

**Keywords:** horned pancy, Plant Vitrification Solution, PVS2, PVS3

*This study was supported by the Grant No. TR31019 from the Ministry of Education, Science and Technological Development of the Republic of Serbia.*

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## **Towards *ex situ* conservation of rare and endangered moss *Tayloria splachnoides*: biotechnical approach**

PP3-12

Aneta Sabovljević, Jelena Ostojić, Milorad Vujičić, Jovana Pantović,  
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*Tayloria splachnoides* is an uncommon moss species rarely found in high mountains of central Europe and in Scandinavia. It is red-listed in many European countries: Finland, Norway, Sweden, Austria, Czech Republic, Poland, Slovakia, Switzerland, Bulgaria, Romania and Slovenia. *In vitro* culture of an accession from Slovakian High Tatra Mountains was established with the aim to study massive micropropagation of this widely threatened species. The effect of plant growth regulators, different media types, and sugar content were tested to obtain well developed gametophores. Index of multiplication and secondary protonema diameter were measured. According to the results achieved, it can be emphasized that the best media type for *T. splachnoides* micropropagation was sugar- and plant regulators-free Murashige and Skoog medium, at 18 °C, and 16/8 light/dark condition. Considering protonema diameter, KNOP medium enriched with sucrose (7.5-15 mg L<sup>-1</sup>) was the most appropriate. In contrast, BCD enriched with sucrose had the opposite effect, i.e. decreasing the secondary protonema diameter. KNOP medium enriched with cytokinin BAP (0.1 µM) combined with auxin IBA (0.1 µM) clearly induced the largest secondary protonema diameter. Gametophore appeared only on KNOP medium supplemented with plant growth regulators, but no clear pattern can be inferred, which implicates no clear agents in bud induction on secondary protonema. Further investigations are urgently needed and in progress.

**Keywords:** conservation, rare, moss, development, propagation

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