

Serbian Plant Physiology Society

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Institute for Biological Research „Siniša Stanković”, University of Belgrade

2<sup>nd</sup> International Conference  
on Plant Biology

21<sup>th</sup> Symposium of the  
Serbian Plant Physiology Society

COST ACTION FA1 106 QUALITYFRUIT  
Workshop



Petnica Science Center, June 17-20, 2015

**2<sup>st</sup> International Conference on Plant Biology • 21<sup>th</sup> Symposium of the Serbian Plant Physiology Society • COST ACTION FA1106 QUALITYFRUIT Workshop**  
**PETNICA SCIENCE CENTER 17-20 JUNE, 2015**

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## PROGRAMME

### 2<sup>st</sup> International Conference on Plant Biology • 21<sup>th</sup> Symposium of the Serbian Plant Physiology Society • COST ACTION FA1106 QUALITYFRUIT Workshop PETNICA SCIENCE CENTER 17-20 JUNE, 2015

#### Wednesday 17<sup>th</sup> June, 2015

09:00-14:00 *Registration*

14:00-15:00 *Lunch*

#### Section I: **Plant Biotechnology**

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15:00-15:30 *Opening Ceremony*

15:30-16:00 (Invited talk) **Alain Tissier** Systems biology of a plant cell factory, the tomato glandular trichomes

16:00-16:20 (Invited talk) **Jules Beekwilder** Biotechnological production of plant compounds

16:20-16:40 (Invited talk) **Milen Georgi** Metabolomics, lead, discovery and plant biotechnology: perfect holistic match?

16:40-17:00 (Invited talk) **Dragana Božić** Exploring the secondary metabolism in trichomes of *Salvia fruticosa* and *Rosmarinus officinalis*: the case of carnosic acid

17:00-17:30 *Coffee break*

17:30-17:45 (Selected talk) **Milica Bogdanović** Problems in detecting activity of fluorescent reporter genes – case of DsRED and GFP

17:45-18:00 (Selected talk) **Stevan Jeknić** Alteration of flower color in *Solanum lycopersicum* through ectopic expression of a gene for capsanthin-capsorubin synthase from *Lilium lancifolium*

18:00-18:15 (Selected talk) **Miloš Prokopijević** Characterization of soybean hull peroxidase immobilized on glycidyl methacrylate copolymers

18:30-19:30 *Poster session: Plant Biotechnology*

20:00-21:00 *Dinner*

21:00- *Wine tasting*

#### Wednesday 17<sup>th</sup> June, 2015

08:00-09:00 *Breakfast*

#### Section II: **Plant Growth, Development, Metabolism and Nutrition**

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09:00-09:30 (Invited talk) **James Giovannoni** Harnessing genetic diversity to better understand regulation of tomato fruit ripening and nutritional quality

09:30-09:50 (Invited talk) **Christian Fankhasuer** Photosensory receptor-mediated growth responses in Arabidopsis

09:50-10:10 (Invited talk) **David Honys** Male germline development: lesson from the -omics

10:10-10:30 (Invited talk) **Dragan Vinterhalter** Acid growth theory, auxin and potato phototropism

10:30-10:50 (Invited talk) **Bojana Banović** How to avoid self-fertilization in plants- a buckwheat story

10:50-11:20 *Coffee break*

|             |   |   |
|-------------|---|---|
| 11:20-11:50 | (Invited talk) <b>Hrvoje Fulgosi</b>    | Revisiting alternative electron partitioning pathways in photosynthesis                                   |
| 11:50-12:10 | (Invited talk) <b>Miroslav Nikolić</b>  | The rhizosphere: perspective and challenges for plant nutrition   |
| 12:10-12:30 | (Invited talk) <b>Jelena Samardžić</b>  | Silicon alleviates oxidative stress in cucumber plants grown under copper excess                          |
| 12:30-12:45 | (Selected talk) <b>Lidija Begović</b>   | Lignin deposition and synthesis in the internodes during barley ( <i>Hordeum vulgare L.</i> ) development |
| 12:45-13:00 | (Selected talk) <b>Milan Dragičević</b> | DUF1070 is a conserved signature domain of some arabinogalactan peptides                                  |
| 13:00-13:15 | (Selected talk) <b>Jan Fíla</b>         | Phosphoproteomics profiling of tobacco mature pollen and pollen activated <i>in vitro</i>                 |
| 13:15-13:30 | (Selected talk) <b>Václav Motyka</b>    | New findings about the role of <i>cis</i> -zeatin-type cytokinins in plant physiology and evolution       |
| 14:00-15:00 | <i>Lunch</i>                            |   |

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**Section III: Plant and Fungal Natural Products in Human Nutrition and Medicine**

|             |                                       |  |
|-------------|---------------------------------------|--|
| 15:00-15:30 | (Invited talk) <b>Autar Mattoo</b>    | Functional Foods & Nutrition: Facts, Fiction, and Needs  |
| 15:30-15:50 | (Invited talk) <b>Nataša Simin</b>    | Wild-growing <i>Allium</i> species (sect. <i>Codonoprasum</i> ) as promising sources of novel herbal drugs   |
| 15:50-16:10 | (Invited talk) <b>Marina Soković</b>  | Alternative sources of natural products: mystery of mushrooms and beyond   |
| 16:10-16:25 | (Selected talk) <b>Miloš Đorđević</b> | <i>Centaurium erythraea</i> extract improves redox-status and antioxidant enzyme activity of STZ-treated pancreatic $\beta$ -cells and diabetic rat liver and kidney |
| 16:25-16:40 | (Selected talk) <b>Bojan Jevtić</b>   | Effects of cucumber extracts on cytokine production in encephalitogenic cells  |
| 16:40-16:55 | (Selected talk) <b>Filis Morina</b>   | Quercetin 7-O-glucoside inhibits the formation of dinitrosocatechins and their quinones in catechin/nitrite systems under stomach simulating conditions              |
| 16:55-17:10 | (Selected talk) <b>Milica Pešić</b>   | Development of natural product drugs in a sustainable manner   |
| 17:10-17:30 | <i>Coffee break</i>                   |  |

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**Section IV: Phytochemistry**

|             |  |   |
|-------------|--|---|
| 17:30-18:00 | (Invited talk) <b>Roque Bru Martínez</b>   | Early and late molecular mechanisms involved in the biosynthesis and accumulation of stilbenoids in elicited grapevine cell cultures established from berries |
| 18:00-18:20 | (Invited talk) <b>Sokol Abazi</b>  | Chemical analysis of secondary metabolites isolated from endemic Albanian plants with subcritical CO <sub>2</sub>   |
| 18:20-18:40 | (Invited talk) <b>Vuk Maksimović</b>   | Composition and therapeutic values of berry wines - bitter truth about sweet product  |
| 18:40-19:00 | (Invited talk) <b>Maja Natić</b>   | Phenolic profiles of wild fruits grown in Serbia  |
| 19:00-19:15 | (Selected talk) <b>Dorisa Cela</b>   | NMR structure elucidation of a new alkaloid isolated from <i>Gymnospermium maloi</i>  |
| 19:15-19:30 | (Selected talk) <b>Đura Nakarada</b>   | Thapsic acid, a rarely found natural product among bryophyte species  |
| 19:30-20:30 | Poster sessions: <i>Plant Growth, Development, Metabolism and Nutrition; Plant and Fungal Natural Products in Human Nutrition and Medicine; Phytochemistry</i> |   |

|             |   |
|-------------|---|
| 20:30-21:00 | <i>Dinner</i>                                 |
| 21:00-21:30 | <i>Presentation of Petnica Science Center</i> |
| 21:30-22:30 | <i>Tour around Petnica Science Center</i>     |

### Friday 19<sup>th</sup> June, 2015

08:00-09:00 *Breakfast*

#### Section V: Biodiversity and Conservation

|             |   |   |
|-------------|---|---|
| 09:00-09:30 | (Invited talk) <b>Goran Anačkov</b>             | Phenotypic plasticity or new taxa?  |
| 09:30-09:50 | (Invited talk) <b>Jelena Aleksić</b>            | What does Balkan Peninsula has to offer to conservation biologists?   |
| 09:50-10:10 | (Invited talk) <b>Maja Lazarević</b>            | Plant diversity drivers in the Balkans: ploidy, hybridization and cryptic speciation                                    |
| 10:10-10:25 | (Selected talk)<br><b>Zora Dajić Stevanović</b> | Conservation of floristic and vegetation diversity in Southeast Europe: sustainable use and ecosystem services approach |
| 10:25-10:40 | (Selected talk) <b>Mihailo Jelić</b>            | Assessment of genetic integrity and diversity of <i>Populus nigra</i> in protected areas along the Danube River         |
| 10:40-10:55 | (Selected talk) <b>Marko Sabovljević</b>        | Conservation biology of European bryophytes   |
| 11:10-11:30 | <i>Coffee break</i>                             |   |

#### Section VI: Evolutionary Plant Biology

|             |   |  |
|-------------|---|--|
| 11:30-12:00 | (Invited talk) <b>Petr Smýkal</b>                     | Past legume crop domestication and agriculture of tomorrow   |
| 12:00-12:20 | (Invited talk) <b>Stevan Avramov</b>                  | Comparative approach in evolutionary ecology of plants   |
| 12:20-12:40 | (Invited talk) <b>Yuval Sapir</b>                     | Population divergence and speciation within a species: ecology and the Royal Irises                                      |
| 12:40-12:55 | (Selected talk) <b>Aleksej Tarasjev</b>               | Population scale multi-year monitoring of <i>Iris pumila</i> in Deliblato Sand: flowering phenology                      |
| 12:55-13:10 | (Selected talk) <b>Vukica Vujić</b>                   | Light induces variation in size and shape of <i>Iris pumila</i> flower parts in two natural habitats                     |
| 13:10-13:25 | (Selected talk)<br><b>Sanja Manitašević Jovanović</b> | How do <i>Iris pumila</i> plants respond to photo-oxidative stress in the wild: the variation of leaf functional traits? |
| 13:30-13:45 | <i>Group photo</i>                                    |  |
| 14:00-15:00 | <i>Lunch</i>  |  |

#### Section VII: Molecular mechanisms underlying health compounds biosynthesis in fruits (COST ACTION FA1106)

|             |  |   |
|-------------|--|---|
| 11:50-15:40 | (Invited talk) <b>Angelos Kanellis</b> | Introduction to Session<br>Genetic improvement of fruits and vegetables for health                  |
| 15:40-16:10 | (Invited talk) <b>Mondher Bouzayen</b> | Cross-talk between multiple hormone signaling pathways associated with the ripening of tomato fruit |
| 16:10-16:40 | (Invited talk) <b>Julia T Vrebalov</b> | The role of transcription factors in regulation of tomato fruit ripening and quality                |

|             |   |   |
|-------------|---|---|
| 16:40-17:10 | (Invited talk) <b>Cathie Martin</b>   | Engineering the production of health-promoting metabolites in tomato for studies of comparative nutrition                         |
| 17:10-17:40 | (Invited talk) <b>Giovanni Giuliano</b>   | Tomato fruit carotenoid biosynthesis: regulation and evolutionary aspects   |
| 17:40-18:10 | (Invited talk) <b>Panagiotis Kalaitzis</b>  | Suppression of a tomato prolyl 4 hydroxylase results in multiple alterations on fruit development, ripening and health components |
| 18:10-18:30 | <i>Coffee break</i>   |   |
| 18:30-19:30 | Poster sessions: <i>Biodiversity and Conservation; Evolutionary Plant Biology</i> |   |
| 21:00-      | <i>Gala dinner</i>  |   |

### Saturday 20<sup>th</sup> June

08:00-09:00 *Breakfast*

#### Section VIII: Abiotic and Biotic Stress and Ecophysiology

|             |   |   |
|-------------|---|---|
| 09:00-09:30 | (Invited talk) <b>Harro Bouwmeester</b>                                   | Strigolactones. Key players in the adaptation of plants to the abiotic environment  |
| 09:30-09:50 | (Invited talk) <b>Miroslav Lisjak</b>                                     | H <sub>2</sub> S and NO signalling in plants  |
| 09:50-10:10 | (Invited talk) <b>Jelena Savić</b>  | Essential oils elicit defense genes in potato: Can volatiles released from damaged plants prime defense in their undamaged neighbours?  |
| 10:10-10:30 | (Invited talk) <b>Živko Jovanović</b>                                     | <i>Alyssum markgrafii</i> as a model organism to study metal hyperaccumulation  |
| 10:30-10:45 | <i>Coffee break</i>   |   |
| 10:45-11:00 | (Selected talk) <b>Dejana Panković</b>                                    | The influence of <i>Trichoderma</i> spp. treatment on water regime, ABA content and gene expression in leaves and roots of tomato in drought conditions                             |
| 11:00-11:15 | (Selected talk) <b>Zorana Katanić</b>                                     | Effect of dynamic changes of vegetative compatibility types in <i>Cryphonectria parasitica</i> populations on biological control of chestnut blight in Croatia                      |
| 11:15-11:30 | (Selected talk) <b>Nevena Nagl</b>  | Effect of <i>in vitro</i> induced water deficit on lipid peroxidation intensity and antioxidant capacity of sugar beet  |
| 11:30-11:45 | (Selected talk) <b>Marija Vidović</b>                                     | High PAR and UV-B radiation-induced differential responses in green and white leaf sectors of <i>Pelargonium zonale</i> in relation to sugar, antioxidative and phenolic metabolism |
| 12:00-13:00 | Poster session: <i>Abiotic and Biotic Stress and Ecophysiology</i>        |   |
| 13:00-13:30 | <i>Closing Ceremony</i>   |   |
| 13:30-14:30 | <i>Meeting of the Serbian Plant Physiology Society/Cost Action FA1106</i> |   |
| 14:30-15:30 | <i>Lunch</i>  |   |
| 16:00-19:30 | <i>Excursion (Gradac Canyon and "Ćelije" Monastery)</i>                   |   |
| 19:30       | <i>Departure</i>  |   |
| 21:00       | <i>Arrival in Belgrade</i>  |   |

important for cultivation, as well as nutrition. Obtained results will assist in breeding programs aiming to obtain new genotypes with enhanced agronomical, nutritive and health beneficial properties.

**Keywords:** *Cucurbita* spp., molecular tools, breeding

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## Nursery production of purple beech (*Fagus sylvatica* 'Purpurea') by grafting

PP1-14

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*Fagus sylvatica* 'Purpurea' is a purple leaf cultivar of European beech, planted as an ornamental tree in many parks and gardens, but very rare in Serbia. This cultivar changes leaf color during the vegetation period: from red to very dark blackish-purple, that becomes bronze-green and, during the summer, dark green. Five adult purple beech trees were selected from 2 different locations in Belgrade, as sources of scion woods for grafting. Grafting was done in the nursery of Faculty of Forestry in Belgrade. The analysis of survival and vitality was performed, including variability of grafts height and root collar diameter. The data were processed by the software package „Statistica“, and the following results are presented: descriptive statistics (min and max values, average value, standard deviation), LSD-test, analysis of variance and cluster analysis. Results of this research can be used to determine the tree that could be appropriate as scion's source for the future mass production of purple beech in Belgrade.

**Keywords:** purple beech, cultivars, grafting, nursery production

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## Possibility of SSR and ISSR marker transfer in *Vicia* species

PP1-15

**Dragana Rajković<sup>1</sup>**, Ksenija Taški-Ajduković<sup>1</sup>, Nevena Nagl<sup>1</sup>, Milada Isakov<sup>1</sup>,  
Dragan Milić<sup>2</sup>, Đura Karagić<sup>2</sup>, Aleksandar Mikić<sup>2</sup>  
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The genus vetch (*Vicia* L.) includes over 200 herbaceous annual and perennial species, containing food and forage legumes among them, with a prevailing Euro-Asiatic distribution. There are only few studies published considering the assessment of genetic diversity in *Vicia* using DNA markers, except for faba bean, where these were used extensively. The development of novel markers requires high costs and is time consuming. Instead of developing new markers, their transfer within genus is an alternative in less studied species. Having that in mind, the goal of this research was to investigate the possibility of transfer of SSR and ISSR markers within *Vicia* genus. Cross-species amplifications of the 6 SSR and 4 ISSR primers were carried out, using genomic DNA isolated from three accessions of eight *Vicia* species. Average transferability for SSR markers was 56.25%. Primers VfG14 and GAI1 displayed the highest, while VfG24 had the lowest rate of transfer. Primers VfG14 and GATA5 indicated polymorphism among *V. narbonensis* and *V. ervilia* accessions. Average percentage of transferability of ISSR primers was very high (96.87%), with three out of four tested primers being 100% transferable. Amplification with primer ISSR8 resulted in different amplification profiles for each investigated *Vicia* spe-

cies, while polymorphism within species was observed in *V. narbonensis*, *V. sativa* ssp. *nigra* and *V. grandiflorum*. Our results suggest that tested SSR and ISSR markers can be transferred and employed within *Vicia* genus.

**Keywords:** *Vicia*, SSR, ISSR, transferability

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## Effect of osmotic stress conditions on *BvSTI*-expressing *Lotus corniculatus*

PP1-16

Jelena Savić<sup>1</sup>, Sofija Ninković<sup>1</sup>, Aleksandar Cingel<sup>1</sup>, Tatjana Ćosić<sup>1</sup>, Martin Raspor<sup>1</sup>,  
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Plant proteinase inhibitors (PIs) constitute a large and complex widely distributed group of small proteins involved in the regulation of the plant protein turn-over required in multiple physiological processes. Beside the roles regarding development and physiology, PIs are known to act in defense against herbivore insect pests. In recent years, the new intriguing role of plant PIs in abiotic stress tolerance has been implied. Inhibitor of serine type proteinases, *BvSTI* isolated from sugar beet pest resistant genotype was introduced into Bird's foot trefoil (*Lotus corniculatus* L.). To determine the effect of osmotic stress on *BvSTI*-expressing *L. corniculatus*, *in vitro*-grown shoots were exposed to elevated concentration of sucrose (5%, 7% and 9%). After 15 days of treatment, the growth response of sucrose-treated transformed lines 21, 73 and 109, as well as of nontransformed (NTC) line was determined by measuring the fresh weight and the length increment. Also shoots were scored for visible symptoms of osmotic stress-induced injuries by visual inspection. In order to avoid influence of observed phenotypic differences among lines on parameters analyzed under stress conditions, all values were presented relative to the controls (shoots grown under the same conditions on regular 3% sucrose) of each line. Additionally, the activities of antioxidant enzymes peroxidases (POD) and catalases (CAT) were determined spectrophotometrically.

**Keywords:** plant proteinase inhibitor, sugar, *Lotus corniculatus*

This work has been funded by the Ministry of Education, Science and Technological Development of the Republic of Serbia (O1173015)

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## The effect of antibiotics on the shoot regeneration in apple cultivar "Golden Delicious"

PP1-17

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The effect of antibiotics hygromycin, cefotaxime and meropenem on shoot regeneration in apple cultivar "Golden Delicious" was evaluated to optimize the protocol for *Agrobacterium tumefaciens*-mediated ge-