

Serbian Plant Physiology Society

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

2nd International Conference on Plant Biology

21th Symposium of the Serbian Plant Physiology Society

COST ACTION FA1 106 QUALITYFRUIT Workshop



Petnica Science Center, June 17-20, 2015

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

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Publishers

Serbian Plant Physiology Society
Institute for Biological Research „Siniša Stanković“, University of Belgrade,
Bulevar despota Stefana 142, 11060 Belgrade, Serbia

Editor

Branka Uzelac

Technical editor

Branislav Šiler

Photograph in front page

Danijela Mišić

Graphic design & prepress

Lidija Mačej

Printed by

Makarije, Belgrade

Number of copies

250
Belgrade, 2015

CIP - Каталогизacija у публикацији
Народна библиотека Србије, Београд

581(048) I

INTERNATIONAL Conference on Plant Biology (2 ; 2015 ; Petnica)

[Book of Abstracts] / 2nd International Conference on Plant Biology [and] 21th Symposium of the Serbian Plant Physiology Society [and] COST Action FA1106 QualityFruit Workshop, Petnica, June 17-20, 2015 ; [organized by] Serbian Plant Physiology Society [and] Institute for Biological Research "Siniša Stanković", University of Belgrade ; [editor Branka Uzelac]. - Belgrade : Serbian Plant Physiology Society : Institute for Biological Research "Siniša Stanković", 2015 (Belgrade : "Makarije"). - 203 str. : ilustr. ; 24 cm

Tiraž 250. - Registar.

ISBN 978-86-912591-3-6 (SPPS)

1. Društvo za fiziologiju biljaka Srbije. Simpozijum (21 ; 2015 ; Petnica)

2. COST Action FA1106 QualityFruit. Workshop (2015 ; Petnica)

a) Ботаника - Апстракт

COBISS.SR-ID 215711500

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

PROGRAMME

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

Wednesday 17th June, 2015

09:00-14:00 *Registration*

14:00-15:00 *Lunch*

Section I: **Plant Biotechnology**

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 17th June, 2015

08:00-09:00 *Breakfast*

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

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

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

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

Section IV: Phytochemistry

17:30-18:00	(Invited talk) Roque Bru Martínez	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) Sokol Abazi	Chemical analysis of secondary metabolites isolated from endemic Albanian plants with subcritical CO ₂
18:20-18:40	(Invited talk) Vuk Maksimović	Composition and therapeutic values of berry wines - bitter truth about sweet product
18:40-19:00	(Invited talk) Maja Natić	Phenolic profiles of wild fruits grown in Serbia
19:00-19:15	(Selected talk) Dorisa Cela	NMR structure elucidation of a new alkaloid isolated from <i>Gymnospermium maloi</i>
19:15-19:30	(Selected talk) Đura Nakarada	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 19th June, 2015

08:00-09:00 *Breakfast*

Section V: Biodiversity and Conservation

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

Section VI: Evolutionary Plant Biology

11:30-12:00	(Invited talk) Petr Smýkal	Past legume crop domestication and agriculture of tomorrow
12:00-12:20	(Invited talk) Stevan Avramov	Comparative approach in evolutionary ecology of plants
12:20-12:40	(Invited talk) Yuval Sapir	Population divergence and speciation within a species: ecology and the Royal Irises
12:40-12:55	(Selected talk) Aleksej Tarasjev	Population scale multi-year monitoring of <i>Iris pumila</i> in Deliblato Sand: flowering phenology
12:55-13:10	(Selected talk) Vukica Vujić	Light induces variation in size and shape of <i>Iris pumila</i> flower parts in two natural habitats
13:10-13:25	(Selected talk) Sanja Manitašević Jovanović	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) Angelos Kanellis	Introduction to Session Genetic improvement of fruits and vegetables for health
15:40-16:10	(Invited talk) Mondher Bouzayen	Cross-talk between multiple hormone signaling pathways associated with the ripening of tomato fruit
16:10-16:40	(Invited talk) Julia T Vrebalov	The role of transcription factors in regulation of tomato fruit ripening and quality

16:40-17:10	(Invited talk) Cathie Martin	Engineering the production of health-promoting metabolites in tomato for studies of comparative nutrition
17:10-17:40	(Invited talk) Giovanni Giuliano	Tomato fruit carotenoid biosynthesis: regulation and evolutionary aspects
17:40-18:10	(Invited talk) Panagiotis Kalaitzis	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 20th June

08:00-09:00 *Breakfast*

Section VIII: Abiotic and Biotic Stress and Ecophysiology

09:00-09:30	(Invited talk) Harro Bouwmeester	Strigolactones. Key players in the adaptation of plants to the abiotic environment
09:30-09:50	(Invited talk) Miroslav Lisjak	H ₂ S and NO signalling in plants
09:50-10:10	(Invited talk) Jelena Savić	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) Živko Jovanović	<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) Dejana Panković	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) Zorana Katanić	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) Nevena Nagl	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) Marija Vidović	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>	

Variability source structure in tomato (*L. esculentum* Mill.) germplasm collection

PP5-4

Svetlana Glogovac¹, Adam Takač¹, Jelica Gvozdanović-Varga¹, Janko Červenski¹, Vukašin Popović¹, Slaven Prodanović², Tomislav Živanović²

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The purpose of the study was to investigate variability source structure and contribution of particular traits in total variability of tomato (*Lycopersicon esculentum* Mill.) germplasm collection. Plant material, belonging to the collection of the Institute of Field and Vegetable Crops in Novi Sad included: 5 landraces, 10 old varieties, 10 breeding lines and 4 commercial varieties. The trial was set at the experimental fields of the Rimski Šančevi site, during 2010-2012. Observations were recorded on the first truss and following traits were analyzed: fruit length (*FL*) and width (*FW*), locules number (*LN*), pericarp thickness (*PT*), dry matter content (*DM*), average fruit weight (*FWe*), fruit yield per plot (*FY/plot*), number of fruits per plot (*NF/plot*), average fruit number per plant (*FN/plant*), number of days from germination to the beginning of maturity (*ND*). Principal Component Analysis was performed in statistical software *STATISTICA 12*. The Warimax normalized method was used for the factor rotation. Three main components, chosen for further analysis, explained 81.5% of total variability with percentage part of: 49.4%, 19.5% and 12.6%, respectively. The first component was determined by: *FL*, *FW*, *Fwe*, *FY/plot*, *NF/plot* and *FN/plant*. The second component was defined by *LN* and *PT*, and the third by *DM* and *ND*. Projection of variables and genotypes on the surface covered by main components was used for visual presentation and data interpretation.

Keywords: Principal Component Analysis, tomato, variability

Pre-breeding for value-added traits in maize

PP5-5

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Pre-breeding represents a link between genetic resources and breeding programs, referring to identification of desirable characteristics and/or genes from unadapted materials, as well as adapted ones that have not been subjected to any kind of modern breeding. The narrow genetic base of maize commercial genotypes has limited variability for value-added traits and gene introgression from landraces could improve grain quality. Maize Research Institute Zemun Polje (MRI) gene bank has one of the largest maize collections in the world with approximately 5500 accessions, including 2217 landraces from the Western Balkans and 3258 populations and inbred lines from 40 countries. Sub-sets of the accessions were subjected to protein and oil content and composition analyses. High oil (up to 7.9%) and high protein (up to 14.29%) accessions were identified. Fatty acid analysis revealed that most of the high oil accessions were also rich in oleic acid content (up to 45.24%). Most of the high protein accessions were rich in tryptophan content (up to 0.089%). Moreover, accessions that concurrently had high contents of protein, oil and tryptophan were identified. Also, a set of 20 coloured popcorn varieties and coloured kernels of 53 populations of common maize were subjected to anthocyanin, total yellow pigment, total phenols and antioxidant activity analyses. Blue coloured popcorns and