Serbian Plant Physiology Society

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

2nd International Conference on Plant Biology

21st Symposium of the Serbian Plant Physiology Society

COST ACTION FA1106 QUALITYFRUIT Workshop

Book of Abstracts

Petnica, 17-20 June 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

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 Maćej
Printed by	Makarije, Belgrade
Number of copies	250
	Belgrade, 2015

CIP - Каталогизација у публикацији
Народна библиотека Србије, Београд

581(048) I
TERNATIONAL 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)
[illegible] Simpozijum (21 ; 2015 ; Petnica)

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 Georgiev**	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	

Thursday 18th 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

Anti-cancer activities of jatrophane diterpenoids from *Euphorbia dendroides* in human multi-drug resistant cancer cell lines

PP3-25

Ana Podolski-Renić[1], Jasna Banković[1], Tijana Stanković[1], Jelena Dinić[1], Zorica Milošević[1], Sonja Stojković[1], Miodrag Dragoj[1], Milka Jadranin[2], Ivana S. Aljančić[2], Milica Pešić[1]
(ana.podolski@ibiss.bg.ac.rs)

[1] Institute for Biological Research, Department of Neurobiology, University of Belgrade, Bulevar despota Stefana 142, 11060 Belgrade, Serbia
[2] Institute of Chemistry, Technology and Metallurgy, Center for Chemistry, University of Belgrade, Njegoševa 12, 11001 Belgrade, Serbia

Widely distributed spurge – *Euphorbia dendroides* is a valuable source of new bioactive compounds. Among them, macrocyclic jatrophane diterpenoids, were recognized as new inhibitors of P-glycoprotein (P-gp) leading to modulation of multi-drug resistance (MDR) in cancer cells. In this study, we evaluated the anti-cancer activities of four jatrophane molecules isolated from *Euphorbia dendroides*. The effects of jatrophanes were studied in three different MDR human cancer cell lines developed in our laboratory (NCI-H460/R non-small cell lung carcinoma, DLD1-TxR colorectal carcinoma and U87-TxR glioblastoma cell lines). Tested jatrophanes showed moderate inhibitory effect on cancer cell growth. They significantly increased the accumulation of rhodamine 123 in MDR cancer cells. One of them completely blocked the P-gp pump in DLD1-TxR cells and demonstrated a stronger activity when compared to well-known P-gp inhibitors verapamil and tariquidar. Besides considerably high P-gp inhibiting activity, jatrophane diterpenoids showed significant potential to reverse the paclitaxel resistance in all MDR cancer cell lines. The combinations of jatrophane diterpenoids with low paclitaxel concentrations induced the cell cycle disturbance, which additionally contributed to their chemo-sensitizing activity. Jatrophane diterpenoids isolated from *Euphorbia dendroides* are promising compounds for a potential cancer treatment due to their strong anti-P-gp activity and can be considered as a valuable tool for drug development and the improvement of chemotherapy in MDR cancers.

Keywords: jatrophane diterpenoids, multi-drug resistance, P-glycoprotein, paclitaxel

Drinking of flavonoid-rich juice of *Aronia melanocarpa* may affect fatty acid phospholipid compositions in rat liver

PP3-26

Slavica Ranković[1], Tamara Popović[1], Slavica Debeljak Martačić[1], Marija Glibetić[1], Đurđica Ignjatović[2], Gordana Tovilović[2], Mirko Tomić[2]
(djurdjica@ibiss.bg.ac.rs)

[1] Institute for Medical Research, University of Belgrade, Tadeuša Košćuška 1, 11000 Belgrade
[2] Institute for Biological Research „S. Stanković", University of Belgrade, Bul. despota Stefana 142, 11000 Belgrade

Aronia melanocarpa fruits are among the richest plant sources of phenolic substances, mainly anthocyanins. Aronia fruit juice and derived flavonoids were evaluated in a number of studies for high antioxidative activity, whose sequels were many beneficial physiological and metabolic effects, like hepato-protective, anti-inflammatory and antitumor. This study was designed to explore the effects of one month intensive consumption of aronia juice on phospholipid compositions in rat liver. Three experimental groups of young male rats were being supplied for 34 days with different drinking solutions *ad libitum*: 1. (ARO group) 20% (m/m) master aronia juice in tap water; 2. (MIX) 5% master aronia juice + 15% juice reconstruct (without flavonoids);

3. (PLC) 20% juice reconstruct. The animals were sacrificed on day 35 and their livers were weighed and used for analysis. The average mass of liver in ARO group was somewhat higher (13-14%) than in other two groups. In comparison with PLC, both experimental groups exhibited significantly lower proportions of stearic acid (18:0) and arachidonic acid (20:4), whilst the level of MUFA was increased only in MIX group on account of vaccenic acid elevation (18:1(7)). Also, there was a certain increase of omega-3 PUFA with a decline of omega-6/omega-3 PUFA ratio in both groups that consumed aronia juice. All these changes in the liver phospholipid compositions, which were induced by everyday drinking of flavonoid-rich aronia juice, appeared to be favorable regarding the healthy ratios of the liver fatty acid contents.

Keywords: *Aronia melanocarpa*, fatty acids, phospholipid compositions, rat liver

The influence of edible mushroom *Laetiporus sulphureus* (Bull.:Fr) Murr. extract on certain quorum-sensing regulated functions

PP3-27

Marija Smiljković, Jovana Petrović, Jasmina Glamočlija, Ana Ćirić, Miloš Nikolić, Dejan Stojković, Marina Soković
(marija.smiljkovic@ibiss.bg.ac.rs)
Institute for Biological Research "Siniša Stanković", University of Belgrade, Belgrade, Serbia

Quorum sensing (QS) is described as a set of behaviour which related with resistance of pathogenic bacteria. So far, biofilm formation, certain types of bacterial motility and production of pigments are most frequently associated with bacterial pathogenicity and ability to withstand the effect of antibiotics. Having in mind the growing trend of microorganisms resistance to known antimicrobial agents, efforts have been made to develop techniques which would indicate potential anti-QS of natural sources. In the last decade, numerous sources have been subjected to these protocols, including plants, algae, and other, marking them as promising agents. In this study, an edible mushroom, *Laetiporus sulphureus*, was tested for its potential as a QS regulator. This white-rot basidiomycete was previously described regarding its biological activity (including antimicrobial). Its methanolic extract showed dose-dependent antiqourum effect toward *Pseudomonas aeruginosa* PAO1 strain. Effects of the sub-MIC values of *Laetiporus sulphureus* methanol extract regulated production of virulence factor pyocyanin, reducing it by 80.88%, which is in the range of activity of commercial antimicrobial agents (Streptomycin 75.9% and Ampicillin 83.12%). Also, the extract had a significant inhibitory effect on flagella and twitching motility. Results indicate that *L. sulphureus* methanolic extract may be a promising agent for the eradication of pathogenic bacteria.

The authors are grateful to the Ministry of Education, Science and Technological Development of the Republic of Serbia for the financial support (OI173032).