

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 FA1106 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

Organization Committee

Marijana Skorić, Jelena Savić, Danijela Mišić, Branislav Šiler, Ana Ćirić, Milana Trifunović, Bojana Banović, Nemanja Stanisavljević, Živko Jovanović, Jelena Dragišić Maksimović, Stevan Avramov, Aleksandra Dimitrijević, Dunja Karanović

Scientific Committee

Sokol Abazi (Tirana, Albania)
Jules Beekwilder (Wageningen, The Netherlands)
Harro Bouwmeester (Wageningen, The Netherlands)
Mondher Bouzayen (Castanet-Tolosan, France)
Christian Fankhauser (Lausanne, Switzerland)
Hrvoje Fulgosi (Zagreb, Croatia)
Milen Georgiev (Plovdiv, Bulgaria)
James Giovannoni (Ithaca, USA)
Giovanni Giuliano (Roma, Italy)
David Honys (Prague, Czech Republic)
Angelos Kanellis (Thessaloniki, Greece)
Miroslav Lisjak (Osijek, Croatia)
Autar Mattoo (Beltsville, USA)
Cathie Martin (Norwich, UK)
Roque Bru Martínez (Alicante, Spain)
Václav Motyka (Prague, Czech Republic)
Petr Smýkal (Olomouc, Czech Republic)
Mario Pezzotti (Verona, Italy)
Alain Tissier (Halle, Germany)
Julia Vrebalov (Ithaca, USA)
Jelena Aleksić (Belgrade, Serbia)
Goran Anačkov (Novi Sad, Serbia)
Milan Borišev (Novi Sad, Serbia)
Tijana Cvetić Antić (Belgrade, Serbia)
Bojan Duduk (Belgrade, Serbia)
Dragana Ignjatović-Mičić (Belgrade, Serbia)
Zorica Jovanović (Belgrade, Serbia)

Ivana Maksimović (Novi Sad, Serbia)
Vuk Maksimović (Belgrade, Serbia)
Vladimir Mihajlović (Kragujevac, Serbia)
Dragana Miladinović (Novi Sad, Serbia)
Jovanka Miljuš-Đukić (Belgrade, Serbia)
Danijela Miljković (Belgrade, Serbia)
Neda Mimica-Đukić (Novi Sad, Serbia)
Danijela Mišić (Belgrade, Serbia)
Miroslava Mitrović (Belgrade, Serbia)
Nevena Nagl (Novi Sad, Serbia)
Maja Natić (Belgrade, Serbia)
Miroslav Nikolić (Belgrade, Serbia)
Slavica Ninković (Belgrade, Serbia)
Dejan Orčić (Novi Sad, Serbia)
Pavle Pavlović (Belgrade, Serbia)
Ljiljana Prokić (Belgrade, Serbia)
Marina Putnik Delić (Novi Sad, Serbia)
Svetlana Radović (Belgrade, Serbia)
Tamara Rakić (Belgrade, Serbia)
Aneta Sabovljević (Belgrade, Serbia)
Marko Sabovljević (Belgrade, Serbia)
Jelena Samardžić (Belgrade, Serbia)
Ana Simonović (Belgrade, Serbia)
Marina Soković (Belgrade, Serbia)
Angelina Subotić (Belgrade, Serbia)
Sonja Veljović-Jovanović (Belgrade, Serbia)
Tanja Vujović (Čačak, Serbia)
Snežana Zdravković- Korać (Belgrade, Serbia)
Bojan Zlatković (Niš, Serbia)

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 - Апстрактни

COBISS.SR-ID 215711500

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

The effect of long-term salt stress on different genotypes of the moss *Atrichum undulatum*

PP8-33

Vesna Nerić, Marija Rajčić, Milorad Vujičić, Marko Sabovljević, Aneta Sabovljević
(vesna.neric@gmail.com)

Institute of Botany and Botanical Garden, Faculty of Biology, University of Belgrade, Takovska 43,
11000 Belgrade, Serbia

The ancestor of bryophytes belongs to the first terrestrial plants. Thus, many of them exhibit a high degree of abiotic stress tolerance, which enables them to survive in the harsh environment. Different genotypes of the moss *Atrichum undulatum* were chosen and axenically grown in controlled *in vitro* conditions. The five genotypes were chosen from ecologically various sites across Europe. Clear genetic incongruence and dissimilarities were confirmed among accessions. The shoots were exposed to long-term (28 d) salt stress by addition of NaCl (0-500 mM) to the basal medium. Survival, indices of multiplication, secondary protonemal diameters, and biochemical parameters such as chlorophyll and carotenoid contents or chlorophyll a/b ratio clearly showed the differences among genotypes exposed to long term salt stress. These parameters proved Italian (highmountain) genotype to be the most resistant to long-term salt stress. Although the multiplication and emergence of new shoots decreased strongly with the increase of salt concentration in all genotypes, Hungarian and Italian genotypes at lower concentration of added salt developed the best (according to the numbers of new shoots appearing). Lower concentrations of salt in the media were also long-standing conditions for German and Italian genotypes. Biochemical parameters were not congruent with developmental ones. German genotype did not express significant variation in total, a, b and ratio of chlorophylls and carotenoid contents. The results obtained clearly showed that stress caused reaction is not equal and the same in all the representatives of species, and thus can be highlighted as genotype specific.

Keywords: bryophyte, abiotic stress, tolerance

This work was supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia (O1173024 and O1173030).

The effect of salt stress on yellow wort (*Blackstonia perfoliata*) seed germination

PP8-34

Marija Nešić¹, Stevan Avramov², Tijana Banjanac², Branislav Šiler², Danijela Mišić², Slađana Todorović², Suzana Živković²
(nesicmarija5@gmail.com)

¹ Faculty of Science and Mathematics, University of Niš, Višegradska 33, 18000 Niš, Serbia

² Institute for Biological Research "Siniša Stanković", University of Belgrade, Bulevar despota Stefana 142,
11060 Belgrade, Serbia

Blackstonia perfoliata (L.) Huds. belongs to the family Gentianaceae. Due to a high content of biologically active secondary metabolites (gentiopicrin, swertiamarin and sweroside) this species has been described as a possible substitute for *Centaurei Herba* – a bitter remedy for treatment of digestive system disorders. Yellow wort is widespread in European and African regions of the Mediterranean and in Western Europe, mainly on calcareous grasslands habitats and fixed sand dunes. Therefore, the environmental conditions such as salinity and osmotic stress are very important for the growth and development of this species. The germination re-

covery from salt stress conditions of three populations of *B. perfoliata* collected from different natural habitats was examined. Germination rate, germination velocity and rate of germination recovery were tested. Results showed that germination characteristics depended on NaCl pre-treatment and were population-specific. Increase in salt concentration inhibited seed germination and germination recovery rate. Additionally, seeds of *B. perfoliata* population collected from sandy locality of Vojvodina showed different germination pattern in comparison with seeds collected from saline habitat; salt treatment improved their germination rate, but also attenuated germination velocity response.

Keywords: salinity, stress, *Blackstonia perfoliata*, germination

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

.....

Volatile compounds of three *Nepeta* species inhibit seed germination, reduce seedling growth and induce oxidative stress in garden cress (*Lepidium sativum* L.)

PP8-35

Jasmina Nestorović Živković¹, Mirjana Perišić², Andreja Stojić², Suzana Živković¹, Slavica Dmitrović¹, Branislav Šiler¹, Danijela Mišić¹
(jasmina.nestorovic@ibiss.bg.ac.rs)

¹ Institute for Biological Research „Siniša Stanković“, University of Belgrade, Bulevar despota Stefana 142, 11060 Belgrade, Serbia

² Institute of Physics, University of Belgrade, Pregrevica 118, 11000 Belgrade, Serbia

Phytotoxic effects of volatile organic compounds (VOCs) from *Nepeta* species on agricultural and weed species have been previously demonstrated, and are usually attributed to iridoid monoterpenes nepetalactones. Here we studied the effect of VOCs of three endemic *Nepeta* species, differing in their qualitative nepetalactone content, on seed germination and seedling growth of garden cress (*Lepidium sativum* L.). Garden cress was exposed to the atmosphere enriched with VOCs released from the leaf surface of three *Nepeta* species. Identification of VOCs was performed by headspace GC-MS, while the concentrations of nepetalactone in the atmosphere of culture vessels were detected by PTR-MS. Volatiles released from *N. rtanjensis* and *N. sibirica* shoots reduced seed germination and inhibited seedling growth of garden cress. Phytotoxic effect of *N. rtanjensis* and *N. sibirica* originates from the dominant bioactive compound of these species – nepetalactone. Stereochemistry of nepetalactone considerably determines its phytotoxic potential, *trans,cis*- isomer is more active than the *cis,trans* nepetalactone. Phytotoxic effect of nepetalactone is reflected through its effect on biochemical processes that are the consequence of plants disturbed antioxidative system: the inhibition of activities and changed profiles of peroxidases, catalase, Fe- and Cu/Zn-superoxide dismutase isoforms were observed.

Keywords: phytotoxicity, peroxidase, catalase, Fe-superoxide dismutase, CuZn-superoxide dismutase

This work was financially supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia (OI173024).