Serbian Plant Physiology Society

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

1st International Conference on Plant Biology

20th Symposium of the Serbian Plant Physiology Society

Programme and Abstracts

Hotel PATRIA, Subotica, June 4-7, 2013

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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	Dragan Vinterhalter
Technical editor	Slavica Klarić
Photograph in front page	Ljubinko Jovanović
Graphic design & tehnical editing	Lidija Maćej
Printed by	Makarije, Belgrade
Number of copies	250 Belgrade, 2013

CIP - Каталогизација у публикацији
Народна библиотека Србије, Београд

581 (048)

INTERNATIONAL Conference on Plant Biology (1; 2013; Subotica)

[Programme and Abstracts] / 1st International Conference on Plant Biology [and] 20th Simposium of the Serbian Plant Physiology Society, Subotica, June 4-7, 2013; [organized by] Serbian Plant Physiology Society [and] Institute for Biological Research „Siniša Stanković", University of Belgrade; [editor Dragan Vinterhalter]. - Beograd: Serbian Plant Physiology Society: Institute for Biological Research „Siniša Stanković", 2013 (Beogard: Makarije). - 174 str. ; 24 cm

Tiraž 250. - Registar.

ISBN 978-86-912591-2-9 (SPPS)
1. Vinterhalter, Dragan [уредник] 2,
Serbian Plant Physiology Society, Symposium (20; 2011; Subotica)
a) Ботаника - Апстракти
COBISS.SR-ID 198527484

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

Effect of water stress on root yield, stomata number and proline content in sugar beet

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Development and growing of high yielding sugar beet cultivars in Serbia can be severely hindered by unfavorable environmental conditions, especially summer drought. The objective of this study was to investigate reaction of selected sugar beet genotypes to conditions of reduced water supply, by analyzing some of the traits that may play an important role in reaction of sugar beet to water stress. The experiment was conducted in 2010/2011 in the greenhouse. As plant material were used eight F_1 hybrids, the offspring of four fertile monogerm inbred lines (3, 4, 7 and 12), previously selected for different ability to maintain turgor under water stress and two male-sterile monogerm testers (1 and 2). F_1 hybrids (3x1, 3x2, 4x1, 4x2, 7x1, 7x2, 12x1 and 12x2) were grown in the pots for eight weeks, until reaching the stage 10-12 leaves, when watering was reduced to 60% and 30% of their daily water need (DWN) for five weeks. The leaf samples were taken for determination of stomata number and proline content, and then the fresh root weight was measured. Water deficit of 60% DWN reduced root weight in all F_1 hybrids except 3x1. The treatment with 30% DWN reduced root weight in all genotypes. There were no differences in stomata number between fully watered control and 60% DWN treatment, while 30% DWN treatment increased their number in all hybrids except 3x1 and 4x1. Proline content was increased due to 60% DWN treatment only in hybrid 3x1, but 30% DWN treatment increased proline content in all tested hybrids.

Compression wood formation as a response of *Picea omorika* (Pančić) Purkyně to static bending stress

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Trees growth responses to movement include changes in development of leafs, branches, stem and below structural roots. Resistance of trees to mechanical perturbation depends on structural modifications for mechanical strength. Leaning stem develops abnormal wood (reaction wood). In gymnosperms (softwoods) reaction wood formation occurs on the lower side of the lean (compression wood), whereas in arboreal dicotyledons (hardwoods) it occurs on the upper side (tension wood). Compression wood contains higher amounts of lignin and galactan, and lower amounts of cellulose, mannan and xylan, compared to normal (opposite) wood. *Picea omorika* (Pančić) Purkyně is a Balkan endemic coniferous species and Tertiary relict of the European flora. Its natural habitat is reduced to the middle and upper courses of the Drina river. It is considered to be one of the most adaptable spruces.
To elucidate the adaptive strategy of *P. omorika* trees to survive in their natural habitats (cliffs, strong wind, snow or rockfall), we analyzed distribution of lignin and polysaccharides, as well as phenolic compounds that make transversal connection in the cell walls, in stems subjected to static bending stress.
Static bending by wiring was applied on 3 years old *P. omorika* plants at the end of the growing season. Bending angle was about 90 degrees. Stem samples were taken every 2-3 months during one year.