

BOOK OF ABSTRACTS

3rd International Conference on Plant Biology (22nd SPSS Meeting)



9-12 JUNE 2018
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Serbian Plant Physiology Society

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

Faculty of Biology, University of Belgrade

**3rd International Conference
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(22nd SPPS Meeting)**



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(APX E.C. 1.11.1.11) in leaves were measured. Ni increased S content only in NO₃-stems. Pigment and NPT concentrations were decreased by Ni only in NO₃-leaves, while in NO₃/NH₄-leaves pigment concentrations were higher under Ni stress. In Ni-treated seedlings, GR and APX activities were decreased only in NO₃-leaves. In NO₃/NH₄-leaves APX was unchanged, while GR was significantly increased. The results show that partial substitution of NO₃-N form by NH₄-N produces favorable effects under Ni stress, by protecting non-enzymatic part of antioxidative system and even stimulating GSH production.

Keywords: ammonium, kohlrabi, Ni, nitrate, stress parameters

The work was funded by the Ministry of Education, Science and Technological Development of the Republic of Serbia (Grant No. OI 173030).

Joint action of BASTA and *Nepeta rtanjensis* essential oil suppresses the effects of individual agents on *Arabidopsis thaliana* antioxidant system

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The present study describes the interactive effects of BASTA and *Nepeta rtanjensis* essential oil (NrEO), two agents showing differential mode of herbicidal action, on *Arabidopsis thaliana* antioxidant system. BASTA is known to act through inhibiting glutamine synthetase activity and inducing ammonium accumulation and toxicity, while NrEO and its major component nepetalactone induce oxidative stress in target plants. *A. thaliana* plants were exposed to BASTA through *in vitro* culture medium, while NrEO volatiles were supplied through the atmosphere of culture vessels. When applied independently for 10 days, BASTA (at 5 and 10 mg L⁻¹) and NrEO (2 and 4%), altered the activity and abundance of catalase (CAT) and peroxidase (POX) in 4 week old *A. thaliana* plants. The decrease in CAT activity in *A. thaliana* shoots and roots induced by NrEO treatment was followed by a decrease in CAT abundance. On the other hand, BASTA induced significant increase in both CAT activity and abundance in roots. Similar trend, which was more pronounced in roots, was observed for POX activity. Superoxide dismutase (SOD) activity in *Arabidopsis* shoots and roots were not significantly affected by BASTA or NrEO treatments, although decrease and increase in Mn-SOD abundance were recorded following BASTA and NrEO application, respectively. Simultaneous application of NrEO and BASTA mitigated the effects of the two agents applied independently. This was especially evident for CAT and POX activity. The results indicate the existence of complex control mechanisms underlying BASTA interaction with NrEO, which involve the activation or inactivation of antioxidant defense system enzymes, and their regulation at the transcriptional level.

Keywords: *Arabidopsis*, antioxidant enzymes, BASTA, essential oil, *Nepeta rtanjensis*

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