

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

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The oxidative stress in *Ambrosia artemisiifolia* L. shoots grown *in vitro* induced by *Nepeta rtanjensis* and *N. cataria* essential oils

PP8-7

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The possibility of using essential oil (EO) of *Nepeta rtanjensis* and *N. cataria* as bioherbicides against *Ambrosia artemisiifolia* L., an important weed and allergen species, was explored. *In vitro* culture experimental system of *A. artemisiifolia* has been established and ragweed shoots were exposed to the atmosphere enriched with volatile compounds (VOCs) emitted from EOs. *N. rtanjensis* EO was characterized by high amounts of 4α,7α,7β-nepetalactone (*trans,cis*-nepetalactone), while *N. cataria* EO possessed high amounts of 4α,7α,7α-nepetalactone (*cis,trans*-nepetalactone). Reduction in *A. artemisiifolia* shoots growth and their discoloration, in the presence of *N. rtanjensis* and *N. cataria* EOs (2% and 4%, final nepetalactone concentrations) was observed after 2 weeks of exposure. An antioxidative defense system of *A. artemisiifolia* was activated by increasing peroxidases activity or by inactivating catalases and superoxide dismutases activity. Overall, stronger inhibitory effect on shoot growth, CAT activity, and stimulating POX activity was observed for *N. cataria* EO. *N. rtanjensis* EO was more efficient in inhibiting rooting and root growth, and in suppressing SOD activity. Therefore, EOs of *N. rtanjensis* and *N. cataria* might be recommended as potential bioherbicides against highly allergenic and weed species *A. artemisiifolia*. Further exploration of EOs' mode of action, confirmation of phytotoxicity in field conditions, and feasibility assessment for the commercial production and application in agricultural practice, is the course of our further work.

Keywords: *Ambrosia artemisiifolia*, nepetalactone, antioxidative enzymes, *Nepeta rtanjensis*, *Nepeta cataria*

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Physiological responses to drought conditions in transformed *AtCKX1* and *AtCKX2* potato (*Solanum tuberosum* L.) plants

PP8-8

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Cytokinins (CKs) have an important role in plant responses to abiotic stresses, such as drought. It is known that during the stress, an alteration of CK transport from the roots occurs and influences gene expression in the shoots and, thus, elicits appropriate responses to the stress. Moreover, possible enhancement of CKX ac-