Serbian Plant Physiology Society

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

19th SYMPOSIUM

of the Serbian Plant Physiology Society

Programme and Abstracts

Banja Vrujci, 13-15 June 2011

Screening for glutamine synthetase knockout mutants in *Arabidopsis*

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Glutamine synthetase (GS, EC 6.3.1.2) is a key enzyme of ammonium assimilation and recycling in plants. In *Arabidopsis*, five *GLN1* genes encode cytosolic (GS1) isoforms which combine to form, at least nine multimeric GS holoenzymes with overlapping expression. To investigate the role of each isoform, we used respective T-DNA insertion (SALK and SAIL) lines, obtained from The European Arabidopsis Stock Centre. The lines were picked so that the insertion is located in the exons of *GLN* genes, hopefully preventing the functionality of the transcripts. The plants carrying the T-DNA insertion were selected on kanamycin (for SALK lines carrying the *neo* gene) or phosphinotricin (for SAIL lines carrying the *bar* gene). The surviving plants were screened with a three-primer PCR protocol which allows for differentiation of wild type, homozygous and heterozygous plants. For monitoring the transcription of wild type and mutant alleles, the fast, simple and cost-efficient Touch and Go technique was used. So far, homozygous knockout mutants of two high expressed GS isoforms (*GLN1;2* and *GLN1;3*) have been identified.

This research was funded by Ministry of Science and Technological Development (Project ON173024).

The effect of yttrium on mineral nutrition of young maize plants

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Lanthanides are called rare earth elements (REE). The REE include the scandium and yttrium (Y). The elements of this group are widespread in the biosphere. In numerous experiments so far it was shown that REE have impact on the physiological and biochemical processes and yield of plants. The tests were carried out in most cases with products that contained more or less all REE. However, little is known about effects of single REE on life processes in plants. For these reasons, we found it interesting to investigate the effect of Y on the physiological processes of plants, and in particular on the concentration and accumulation of essential macro- and micronutrients. Experiments were done with young maize and sunflower plants, under semi-controlled conditions, in water cultures. The trials examined the effect of 10^{-5}, 10^{-4} and 10^{-3} M Y on concentration and accumulation of 20 elements. Since the results obtained on maize and sunflower were very similar, here we will show the effect that Y had on concentration of four elements in maize, that were the most effected: yttrium (Y), potassium (K), magnesium (Mg) and phosphorus (P). With an increase in concentration of Y in the nutrient solution, Y concentration significantly increased in roots and aboveground parts of maize. Consequently, the dry weight of plants was reduced, of shoots to a greater extend than roots. With increase in concentration of Y, the concentration and accumulation of K and Mg in both aboveground parts and roots was significantly reduced, whereas P concentration was significantly reduced only in the aboveground parts. In the roots, concentration of P significantly increased, possibly as a consequence of the reaction of P with Y. Accumulation of Y in the aboveground parts of maize points to its intense ascending transportation.