S6-PO-02 ALTERATION IN THE EXPRESSION OF CHLOROPLAST IRON TRANSPORT RELATED PROTEINS PIC1 AND NICO UNDER DIFFERENT FE SUPPLY CONDITIONS

Hong Diep Pham*, Brigitta Müller, Sára Pólya, Ferenc Fodor, Ádám Solti

Department of Plant Physiology and Molecular Plant Biology, Institute of Biology, Faculty of Sciences, Eötvös Loránd University, Pázmány Péter sétány 1/C, Budapest, 1117, Hungary
* hong.diep@ttk.elte.hu

Iron is essential for all plants because it is used as cofactor in numerous enzymes involved in photosynthesis, respiration, DNA synthesis. In addition, Fe is of vital importance for chlorophyll biosynthesis and ferritin clusters in plastids which is indispensable for germination, plant development and against iron stress. Therefore, chloroplast iron homeostasis has a prime importance in maintaining the physiological function of plants. Complex regulatory pathways control changes in the expression of genes involved in Fe homeostasis. The activation or repression of chloroplast Fe uptake related genes may also depend on the Fe supply conditions but only a few pieces of information are available on the regulation of protein expression related to iron transport. PIC1 was the first protein found to be related to Fe acquisition which is targeted in the inner envelope of chloroplasts and mediates Fe accumulation within cells together with NiCo protein.
Oilseed rape (*Brassica napus* L. cv. DK Exquisite) plants were grown hydroponically on half strength Hoagland nutrient solution (iron source: 20 µM Fe(III)-EDTA). Seedlings were pre-cultivated up to four-leaf stage. To induce Fe deficiency, plants were transferred to an iron-free and $CaCO_3$ containing nutrient solution. To induce Fe excess, plants were also cultivated on nutrient solution containing 100 µM Fe(III)-EDTA. Iron content of chloroplasts increased in parallel to the development of the leaves but decreased by the aging. The highest amount of Fe was measured in 14-day-old leaves under all three conditions. Compared with Fe overload treatment, a decrease was found in the photosynthetic activity by ageing in both control and Fe deficient leaves but Fe surplus treatment retained the photosynthetic activity. To follow *BnPIC1* (*Bra036409*), identified as the ortholog of *At2g15290* and *BnNiCo* (*Bra037287*), ortholog of *At2g16800* expression, specific primers were designed according to the Brassica DataBase. The transcript content was confirmed by quantitative real time-PCR (qPCR) based on the amount 18sRNA as internal control. The highest transcript level of *BnPIC1* was found in 14-day-old leaves in all treatments, whereas the peak expression of *BnNiCo* was observed in 21-day-old leaves under control and Fe deficiency conditions. Nevertheless, the expression peak was found under Fe excess treatment in 14-day-old leaves. Screening the data revealed that *BnPIC1* and *BnNiCo* are expressed in leaves throughout all the developmental stages; leaf ageing might also be related to Fe re-translocation from the older to the younger leaves.

Keywords: iron, chloroplast, permease in chloroplast1, nickel/cobalt transporters, Brassica napus

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