Abstract

The exposure of plants to high salt concentrations causes accumulation of sodium ions. This leads to the inability of the plants to uptake water, a disturbance of ion homeostasis, a decrease in photosynthesis and oxidative stress. As a result of the salt stress, the availability of NADPH decreases. The adaptation to the concentrations of salt depends on plant's ability to compensate for the decreased availability of NADPH, which can be further used in antioxidative cycles and the synthesis of antioxidative compounds and osmoprotectants.

In this work, the reduction of relative water content, a decrease in the Rubisco enzyme activity, an increase of Hsp70 in the leaves and an increase in the accumulation of sodium ions was shown in cucumber plants (*Cucumis sativa* L. *convar*. *Jogger F1*) exposed to salt stress (100 mM NaCl). As a consequence of salt stress, an increase in the activity of NADPH providing enzymes was found. Particularly on the second and third day of salt stress, an increase in the activity (up to 270 %) of: NADP-isocitrate dehydrogenase, glucose-6-phosphate dehydrogenase, NADP-malic enzyme, non-phosphorylating glyceraldehyde-3-phosphate dehydrogenase in leaves was detected. The activity of less abundant NADP-dehydrogenases (glucose 1-dehydrogenase, gluconate 2-dehydrogenase, galactose 1-dehydrogenase, ribose 1-dehydrogenase and glycerol 2-dehydrogenase) was also increased (up to 200 %) as a part of an early response to salt stress in the roots and leaves of the stressed plants. In addition, there was an increase in the activity of shikimate dehydrogenase, a key enzyme of the shikimate pathway, leading for example to the synthesis of phenolic compounds and flavonoids, whose amount was also increased.