

# OXIDATIVE STRESS IN PLANTS WITH ELEVATED LEVEL OF CYTOKININS

## OXIDATIVNÍ STRES U ROSTLIN SE ZVÝŠENOU HLADINOU CYTOKININŮ

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### ABSTRACT

Cytokinins are plant hormones well known as positive regulators of shoot development and agents delaying senescence onset. Recently negative role of cytokinins like reduction in leaf expansion and promoting programmed cell death, started to be recognised. In accordance with this, endogenous increase in cytokinin level in our model plants - *Arabidopsis thaliana* and *Nicotiana tabacum*, cause phenotype resembling plant undergoing oxidative stress. To confirm this we have performed histochemical and fluorescent staining which reveal increase in the level of reactive oxygen species (= ROS). Normally ROS level is carefully controlled by antioxidants and antioxidant enzymes like ascorbate peroxidase and catalase. We have measured activity of these enzymes via spectrophotometric assays and found that activity of both of them was depressed. The level of transcript of *APX1* gene measured via quantitative RT-PCR method was also decreased. Contrary transcripts of the early light-inducible proteins ELIP1 and ELIP2, potential markers of the stress, were increased. In some cases increase in the level of antioxidants can prevented from oxidative stress. Therefore we have fed plants with reducing agent glutathione (=GSH) and observed predicted improvement of the plant phenotype. In summary we have revealed that higher levels of cytokinins cause oxidative stress, which can be explained by diminishing of the capability of the antioxidant enzymes. Feeding plants with reducing agent GSH can partly prevent severity of this damage.

**Key words:** Cytokinin, Oxidative stress, ROS, Ascorbate peroxidase, Catalase

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