

CHANGES IN GENE EXPRESSION IN TOBACCO WITH INCREASED CYTOKININ LEVEL

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ABSTRACT

Cytokinins are plant hormones that regulate a number of growth, developmental and physiological processes in plants. Further, we suppose that cytokinins are implicated in oxidative stress. We employed *ipt* activable system to increase endogenous cytokinin level in tobacco. The activation and subsequent elevation of cytokinin level lead to occurrence of necrotic lesions and the other marks of oxidative stress. Two independent lines with different degree of severity in the phenotype were compared. Using real-time RT-PCR we investigated *ipt* transcript level, transcript level of some genes implicated in photosynthesis (*CAB*, *FNR*), photosynthetic apparatus protection (*VDE*) and pathogen response (*PR-1b*, *CHITINASE*). Further, we examined some prospective transcriptional markers for the cytokinins. Real-time RT-PCR analysis showed strong down-regulation of *CAB*, *FNR* and *VDE* and up-regulation of the genes included in pathogen response in activated plants. Comparing the both lines, the degree of up/down-regulation of monitored genes was in accordance with the degree of the phenotype severity. No potential transcriptional marker of cytokinins showed useful properties. Taken together, the damage emerging after the activation of cytokinin biosynthesis gene *ipt* in tobacco is accompanied by dramatic changes in gene expression. The impact of these changes will be discussed in context of previously published data.

Key words: cytokinins, tobacco, gene expression, photosynthesis, pathogen-related genes

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