
INCREASED LEVELS OF CYTOKININS INDUCE HR-LIKE CELL DEATH

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ABSTRACT

Cytokinins (CKs) can, among others, positively regulate shoot development and delay onset of senescence. However, recently opposite effects of CK action, namely promotion of programmed cell death, and cytotoxic effects of over-expression of the CK-biosynthetic gene *ipt* in tobacco, were recognized. Here we investigated effects of *ipt* expression in tobacco in detail. We show that hypersensitive response like cell death in expanded tobacco leaves proceeds shortly after *ipt* induction – the first lesions accompanied with huge wilting being observed in app. 60 hours after induction of *ipt* expression, and lesions can spread over the entire leaf area within 4 days after induction. Formation of visible lesions was preceded by increase in reactive oxygen species and membrane damage. Further, we demonstrate that lesion formation is a light-dependent process as it is prevented by shading. The level of key redox regulator glutathione was also diminished after *ipt* expression. Furthermore we show that expression of *ipt* is followed by stomata closure but resulting decrease in pore conductivity couldn't fully explain extent of damage to leaves as revealed by application of lanolin on surface of the leaves.

Key words: cytokinins, *ipt*, cell death, oxidative stress

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