

Suppression of stress induced necrotization by improving antioxidant capacity of plants

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Our earlier results and data in the literature indicated that senescing plant tissues are more sensitive to necrotic diseases and various abiotic stresses as compared to younger tissues. The reasons for the higher tolerance of young tissues to necrotrophic pathogens are the higher tolerance to toxins, to cell-wall degrading enzymes and the decreased autolysis of membrane lipids. It is also known, that young plant tissues have higher antioxidant capacity and during senescence enzymatic and non-enzymatic antioxidant capacity decrease in plants. In addition, one of the earliest reactions of plants upon recognition of invading pathogens or to abiotic stresses, is the rapid formation of reactive oxygen species, which are harmful to the plants. Our aim was to improve stress tolerance of plants by inhibiting senescence, or elevating their antioxidant capacity.

In vitro selected paraquat tolerant (PT) tobacco and transformed (CtKm) tobacco plants containing the bacterial *ipt* gene responsible for the enhanced cytokinin production were used in the experiments. In order to further study the influence of leaf senescence (decreased antioxidant activity) on resistance to necrotization caused by biotic and abiotic stresses, lower (older) and upper (younger) tobacco leaves were tested as well.

Indeed, younger leaves and plants with inhibited senescence or with high antioxidant capacity proved to be more tolerant to several necrotic infections with virus, bacteria or fungi, and also to various abiotic stresses.

The possible mechanism of elevated tolerance will be discussed.

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