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Changes of resistance for *Erwinia carotovora* on transgenic potatoes expressing cu/zn superoxide dismutase genes of Lily

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Objectives

This study was focused on the change of the resistance for *E. carotovora* from transgenic potato plants, expressing Cu/Zn gene with sense and antisense orientation.

Materials and Methods

1. Material

Plant *Solanum tuberosum*. L. cv. Desiree (Transgenic potatoes : Cu/Zn SOD with sense and antisense orientation)

Pathogen Strains *Erwinia carotovora* subsp *carotovara* strain SCC1

2. Methods:

The plants were infected by cultured *E. carotovora* subsp *carotovara* SCC1 culture ($\sim 10^4$ to 10^6 cfu/plant) with a toothpick. The plants were infected at 200-250 $\mu\text{mol m}^{-2}\text{s}^{-1}$ photon flux density with 48hrs light period. O_2 was measured by staining of Nitro blue tetrazolium(NBT).

Accumulation of H_2O_2 was detected by staining potato leaves with DAB (Sigma-Aldrich) and Luminol test.

Results and Discussion

The leaves of SS, SA and wild-type plants were stained with 3,3'-diaminobenzidine (DAB) to detect H_2O_2 accumulation. SS plants showed strong accumulation of H_2O_2 4h after treatment. However, accumulation of O_2 in SS plants showed very low.

SS, SA and wild-type plants were treated with *E. carotovara*, MeJA and SA. Local samples were collected 0, 0.5, 1.5, and 3h after treatments. The samples were analyzed in northern hybridization with gene-specific RNA probes of PR2, PR3, and GST. The genes were strongly induced in response to treatment with SA short of PR2 gene.

The leaves of SS4, SA1 and Wild-type plants were inoculated by infiltration with *E. carotovora*(10^6 cfu/plant). SS4 plants are resistant to *E. carotovora* infection in normal light. We studied the effect of various scavengers and inhibitors known to eliminate O_2 and H_2O_2 . The results indicated that the plants treated with CuCl_2 100 μM are resistant for *E. carotovora*.

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