

showed a strong tolerance to methyl viologen (MV)-mediated oxidative stresses and high temperature. In this study, NDPK2 gene was further introduced into SSA plants (SSAN plants) under the control of *SWPA2* promoter by an *Agrobacterium tumefaciens*-mediated transformation to expect the synergistic effect of SSA plants and SN plants. SSAN potato plants were generated from leaf explants on MS medium containing 500 mg/L cefotaxime and 100 mg/L kanamycin. The integration of foreign genes was confirmed by PCR and Southern blot analysis. When leaf discs of SSAN plants were subjected to 3 μ M MV, they showed approximately 20%, 30% and 50% less membrane damage than SSA, SN, or non-transgenic plants, respectively. Further characterization of SSAN plants is under study in terms of multiple stresses including oxidative stress, high temperature and salt at the level of whole plant. We anticipate that SSAN potato plants would be useful for commercial cultivation in unfavorable growth conditions.

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Enhanced Salt Tolerance by Overexpression of a *Arabidopsis* Na⁺/H⁺ Antiporter in Tobacco

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Salinity stress is one of the most serious factors limiting the productivity of agricultural crops throughout the world. One of the best possibilities the plants could survive salt stress is that they compartmentalize sodium ions away from the cytosol. Na⁺/H⁺ antiporters provide an efficient mechanism to prevent the toxic effects of sodium ion in the cytosol and play a major role to maintain osmotic balance by using sodium accumulated in the vacuole. In order to study the role of the Na⁺/H⁺ antiporter (NHX) in plants, we isolated a NHX cDNA from *Arabidopsis*. The full-length cDNA of the NHX gene consists of 1,633 nucleotides and 583 amino acid residues. The AtNHX shares from 99% identity of deduced amino acid sequence with *Arabidopsis* AtNHX1. A recombinant binary vector containing *Arabidopsis* NHX gene was introduced into tobacco plants by *Agrobacterium*-mediated gene transfer. Presence of the transgene in T₀ plants was confirmed by PCR and Southern analyses. Southern analysis showed that the AtNHX gene was stably integrated into the genome of the transgenic tobacco plants. The seeds of wild-type plants and T₀ transgenic plants overexpressing AtNHX were tested on MS medium supplemented with 200 mM NaCl, after 15 days the former showed a low germination and the inhibition of growth but the latter displayed an unaffected germination and a normal growth. Furthermore, the transgenic seeds were germinated and grown on MS medium containing 250 mM NaCl. These results demonstrate the possibility of engineering salt tolerance in crops.

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