



***Salicornia europaea* L. Na⁺/H⁺ antiporter gene improves salt tolerance in transgenic alfalfa (*Medicago sativa* L.)**

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ABSTRACT. In order to obtain a salt-tolerant perennial alfalfa (*Medicago sativa* L.), we transferred the halophyte *Salicornia europaea* L. Na⁺/H⁺ antiporter gene, *SeNHX1*, to alfalfa by using the *Agrobacterium*-mediated transformation method. The transformants were confirmed by both PCR and RT-PCR analyses. Of 197 plants that were obtained after transformation, 36 were positive by PCR analysis using 2 primer pairs for the *CaMV35S-SeNHX1* and *SeNHX1-Nos* fragments; 6 plants survived in a greenhouse. RT-PCR analysis revealed that *SeNHX1* was expressed in 5 plants. The resultant transgenic alfalfa had better salt tolerance. After stress treatment for 21 days with 0.6% NaCl, the chlorophyll and MDA contents in transgenic plants were lower, but proline content and SOD, POD, and CAT activities were higher than those in wild-type plants. These results suggest that the salt tolerance of transgenic alfalfa was improved by the overexpression of the *SeNHX1* gene.

Key words: *Medicago sativa*; *Salicornia europaea*; Transgenic alfalfa; Na⁺/H⁺ antiporter gene; Salt tolerance