(05-1-61)

Development of transgenic tall fescue (*Festuca arundinacea*) plants with enhanced tolerance to multiple abiotic stresses

Sang-Hoon Lee, Dong-Gi Lee, Sang-Soo Kwak[1], Suk-Yoon Kwon[1], Byung-Hyun Lee*

Division of Applied Life Science, Gyeongsang National University,
[1]Laboratory of Environmental Biotechnology, KRIBB

Objectives

Forage crops frequently encounter different kinds of abiotic stresses that adversely affect on growth, development or productivity. To develop enhanced abiotic stress tolerance forage crop, a multiple stress tolerance AtNDPK2 gene was introduced into the tall fescue plant genome through *Agrobacterium*-mediated genetic transformation method.

Materials and Methods

1. Plant cultivars: Tall fescue (*Festuca arundinacea*), cv. K-31
2. *Agrobacterium* strain: EHA105
3. Expression vectors:
   CaMV35S::*AtNDPK2* or SWPA2::*AtNDPK2* in pCAMBIA1300
4. Transformation: *Agrobacterium*-mediated transformation
5. Stress treatments: Leaf squares tissues of transgenic tall fescue plants were subjected for abiotic stress treatments such as methyl viologen (MV) or hydrogen peroxide (H_2O_2) and cellular damages are measured.

Results and Discussion

In this report, *AtNDPK2* overexpressing transgenic tall fescue plants were developed and examined their tolerance to different abiotic stresses. Molecular analysis such as PCR and Southern blot analysis reveled the successful integration of the transgene into the transgenic plants. RT-PCR analysis demonstrated the constitutive expression of the *AtNDPK2* gene in all transgenic plants. Leaf tissues of transgenic plants were subjected to examine the abiotic stress tolerance. Methyl viologen (MV), hydrogen peroxide (H_2O_2), cold and heat stress were used as abiotic stresses and cellular damage were measured. Transgenic plants performed significant reduction in cellular damage than of the control plants. Our results suggest that *AtNDPK2* overexpressing transgenic tall fescue plants exhibit enhanced tolerance to multiple abiotic stresses.

* *Corresponding author* : Byung-Hyun Lee, TEL: 055-751-5418, E-mail: hyun@gsnu.ac.kr