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Effect of NTHK1 gene to transgenic alfalfa leaf enlargement

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Key words: NTHK1 gene alfalfa ,transgenic plant ,leaf enlargement ,effect analysis

Introduction Living cells respond rapidly to the surrounding stimuli to adapt to changes in their environment. One of the mechanisms of these stimuli is known as the two-component regulatory system. Ethylene receptors sense ethylene and regulate downstream signaling events. To bacco ethylene receptor NTHK1, has been found to function in plant growth and salt-stress response. The NTHK1 cDNA has a length of 2732 bp and encodes a protein of 762 amino acids with a molecular mass of 85 3 kDa and a pI of 6 7. NTHK1 contains transmembrane domains, a GAF domain, a kinase domain (KD) and a receiver domain (RD) (Figure 1). The transmembrane domains plus GAF domain may have a role in promoting leaf cell growth, and the kinase domain may strengthen this role (Zhou, et al., 2006).



Figure 1 Structure of NTHK1.

Material and methods The plasmids of the NTHK1 gene were introduced into alfalfa by A grobacterium mediated transformation and got the transgenic plants . Sixty four transferred plants were obtained , and checked 19 plants of them , and 2 positive plants were obtained by PCR and RT-PCR analyses .

Results and conclusion The results demonstrated that the NTHK1 gene has been integrated into alfalfa genome . And the leaves of transgenic alfalfa are much larger than for control . By measure and calculation , the leaves area of transgenic plant is two and half times of the control . This result shows the gene function of leaves enlargement (Figure 2 , 3) .



Figure 2 Leaf of transgenic alfalfa is larger than of control.

Note: the left is transgenic alfalfa; the right is CK

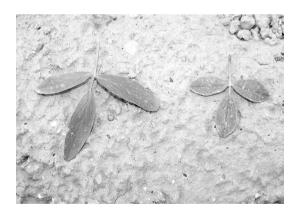


Figure 3 Leaf of transgenic alfalfa is larger than of the control.

Note: the left is transgenic alfalfa; the right is CK

Reference

H. L. Zhou, W. H. Cao, Y. R. Cao, J. Liu, Y. J. Hao, J. S. Zhang, S. Y. Chen, 2006. Roles of ethylene receptor NTHK1 domains in plant growth, stress response and protein phosphorylation. FEBS 580: 1239-1250