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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 . Tobacco 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 *Agrobacterium* 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