

Title Molecular Cloning and Characterization of a NAC-like Gene in “Navel” Orange Fruit Response to Postharvest Stresses

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Abstract

A cDNA subtraction library had been constructed to identify differentially expressed genes in peel pitting of citrus fruit. Based on the sequence of a cDNA fragment homologous to *NAC* gene family, the full-length cDNA of 1,203 nucleotides was cloned from “navel” orange by rapid amplification of cDNA ends. It was designated as *CsNAC*, encoding a protein of 305 amino acids. The calculated molecular weight of the *CsNAC* protein was 35.2 kDa, and theoretical isoelectric point was 6.72. Sequence comparison showed that the *CsNAC* protein had a strikingly conserved region at the N terminus, which is considered as the characteristic of the NAC protein family. *CsNAC* protein was orthologous to *Arabidopsis thaliana* ATAF1. Phylogenetic analysis confirmed *CsNAC* belonged to the ATAF subfamily, which plays an important role in response to stress stimuli. RNA gel blot analysis showed that the expression of *CsNAC* gene was rapidly and strongly induced by stresses such as wounding and no oxygen. Low temperature (4°C) and exposure to ethylene also increased the expression level of *CsNAC* gene. However, its expression was suppressed by high temperature (40°C) but not affected by low oxygen (3%). Our results may provide the basis for future research of NAC-like gene's role in stress-induced citrus peel pitting.