Title	Expression of a senescence-associated cysteine protease gene related to peel pitting of navel orange (*Citrus sinensis* L. Osbeck)
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Abstract

Previously, a suppression subtractive hybridization library was constructed to identify differentially expressed genes in peel pitting of navel orange fruit and a cDNA fragment sharing high similarities to cysteine protease genes was identified. In this study, we cloned its full-length cDNA sequence, designated *CsCP*, using the Rapid amplification of cDNA ends approach. It consists of 1,409 nucleotides and its ORF encodes 361 amino acids predicted to have an N-terminal signal peptide. Phylogenetic analysis revealed that CsCP belonged to the aleurain group in papain family of cysteine proteases. According to quantitative RT-PCR, the expression of *CsCP* was enhanced during the development of postharvest peel pitting concomitant with senescence, although it was detectable in all tested tissues including root, leaf, flower and peel of fruit. RNA gel blot analysis showed that the *CsCP* expression was induced by hypoxia (3% O_2), but repressed by anoxia (0% O_2), wounding, ethylene and high temperature (40°C). Conclusively, the *CsCP* is a senescence-associated gene and up-regulated during the development of citrus postharvest peel pitting, which provides a basis to understand its role in citrus peel pitting.

http://www.springerlink.com/content/p20547m477097hj1/fulltext.pdf