

Title Characterization of a beta-1,3-glucanase from citrus fruit as related to chilling-induced injury and ethylene production

Author M. Teresa Sanchez-Ballesta, M. José Gosalbes, M. Jesus Rodrigo, Antonio Granell, Lorenzo Zacarias and M. Teresa Lafuente

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Abstract

We report the identification of a full-length cDNA encoding an acidic class III β -1,3-glucanase (*CrGlcQ*) from the flavedo of the chilling-sensitive 'Fortune' mandarin. By using heterologous expression of the *CrGlcQ* cDNA in *Escherichia coli*, we showed that it encoded a protein with glucanase but not antifreeze activity. Accumulation of the *CrGlcQ* mRNA appears to be linked to chilling-induced damage occurring during holding of fruit at a chilling temperature (2 °C). The *CrGlcQ* transcript was also up-regulated by mechanical wounding and by exogenous ethylene at low temperature, which reduced chilling injury (CI). This result suggests that the *CrGlcQ* gene may play a role in reducing chilling-induced peel damage in citrus fruit. Furthermore, the induction of this gene in wounded fruit appears to be dependent on ethylene but also on an ethylene-independent signal associated with mechanical damage.