Title Modulation of fruit softening by antisense suppression of endo-β-1,4-glucanase in strawberry

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Abstract

To test the effect of endo-β-1,4-glucanase (EGase) in strawberry, we produced transgenic strawberry plants that contained sense and antisense cDNA encoding strawberry EGase under the *CaMV 35S* promoter (*CaMV35S-P*) and the strawberry fruit dominant ascorbate peroxidase (*APX*) promoter. Independent transgenic lines were generated and the firmness of the fruit was characterized after harvest. Interestingly, transgenic lines that harbored the cDNA antisense under the *CaMV 35S* promoter were not generated, but transgenic lines that contained sense *EGase* cDNA (*FraCel1*) under the *CaMV 35S* promoter and sense and antisense *EGase* cDNA under the *APX* promoter were successfully obtained using a tissue culture system. Reverse transcriptase polymerase chain reaction (RT-PCR) analysis revealed that the steady-state transcript levels of *CaMV35S-P:FraCel1* sense transgenic lines were dramatically increased in fruit evaluated at all stages, as well as in the leaves. Moreover, real-time PCR analysis demonstrated that the steady-state transcript level of *FraCel1* in independent transgenic lines that contained antisense *FraCel1* under the *APX* promoter was reduced in fruit during the turning and red stages when compared with wild-type strawberries. These results were consistent with the firmness of strawberries that contained the antisense *FraCel1* under the *APX* promoter, which was 19–36% greater in the turning stage and 22–25% greater in the red stage when compared to wild-type strawberries. Taken together, these findings indicate that fruit-specific down-regulation of the *EGase* gene using the *APX* promoter is an effective technique for increasing fruit firmness in strawberries.

http://www.springerlink.com/content/uj737177w5326626/fulltext.pdf