

**Title** Polygalacturonase activity and expression of related genes during ripening of strawberry cultivars with contrasting fruit firmness

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#### **Abstract**

Fleshy fruits soften during ripening mainly as a consequence of the catabolism of cell wall components. In strawberry (*Fragaria* × *ananassa* Duch), the depolymerization and solubilization of pectins increase during ripening and contribute to fruit softening. In the present paper, we report the cloning and expression analysis of two polygalacturonase (PG) putative cDNAs: *FaPG1* and *T-PG*. The former seems to be the same sequence of previously reported PG in strawberry, while *T-PG* cDNA has a deletion of 85 bp that cause a frame shift and would produce an inactive protein. Measurement of total PG activity and expression of *FaPG1* and *T-PG* were performed in strawberry cultivars with contrasting softening rates. The softest cultivar (Toyonaka) showed the higher total PG activity in all ripening stages analyzed. The analysis by RT-PCR revealed that both genes express in the three cultivars, though the expression pattern was different. In the firmer cultivars (Selva and Camarosa) the expression of *T-PG* was considerably higher than the expression of *FaPG1*, while the opposite occurred in the softest cultivar (Toyonaka). Therefore, the higher PG activity detected in Toyonaka correlates with the enhanced expression of *FaPG1* gene, while the low PG activity found in the firm cultivars correlates with a higher expression of *T-PG*, a gene that could encode a truncated protein without PG activity. The influence of auxins on both the expression of *PG* genes and the total PG activity during strawberry fruit ripening was also analyzed.