Title Expression of five expansin genes during softening of *Fragaria chiloensis* fruit: Effect of auxin treatment

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Abstract

The Chilean strawberry fruit (*Fragaria chiloensis*) has potential as a new exotic berry. The rate of softening differs between *F. chiloensis* and its related species *Fragaria* × *ananassa*. The expression profiles of five expansin genes isolated from *F.* × *ananassa* were analyzed during softening of *F. chiloensis* fruit and the regulatory effect of auxins on them observed. The rapid decrease in fruit firmness observed between the large green and the turning stages of *F. chiloensis* correlated with the large increase in transcript accumulation of *FaEXP2* and *FaEXP5*. *FaEXP4* and *FaEXP6* had lower expression levels in *F. chiloensis* than in *F.* × *ananassa*, and expression profiles were not related to fruit softening. Auxins strongly repressed the expression of *FaEXP1* and *FaEXP2*, and had a minor repressive effect on *FaEXP4* and *FaEXP5*. In addition, tissue-specific expression was probed in different *F. chiloensis* tissues: *FaEXP2* and *FaEXP5* transcripts were found only in fruit tissues, while *FaEXP4* and *FaEXP6* transcripts were also found in runners, roots, leaves and flowers. In conclusion, most of the strawberry-expansin genes are expressed in *F. chiloensis* and some family members are closely related to fruit softening, especially *FaEXP2* and *FaEXP5*. This study reveals the repressive effect of auxins on the expression of those expansin genes related to softening in *F. chiloensis* fruit.