

PEACH FRUIT SOFTENING IS STRICTLY ASSOCIATED WITH THE LOSS OF CELL ADHESION AND TURGOR AND WITH THE ENDOPOLYGALACTURONASE LOCALIZATION IN THE CELL WALL

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Peach fruit quality consists of many characteristics among which flesh firmness is of great concern. Firmness and texture of ripe fruit are considered to result, in large part, from the disassembly of the primary cell wall (Rose and Bennett, 1999, Brummel and Harpster, 2001). This process involves several biochemical and physiological factors, among which proteins able to plasticize (expansins) or degrade (endopolygalacturonases [endoPGs], pectin methyl esterases, cellulases) the cell wall components are of great importance. The involvement of endoPG proteins in peach softening, was investigated by our group which demonstrated that both protein transcription and protein modification, in particular glycosylation, are mechanisms used by plant to regulate endo-PG activity (Ardolino et al., 2005).

In this study, which is part of a project aimed to understand the molecular mechanisms regulating fruit softening, morphological analyses of peach mesocarp and esocarp have been carried out by producing semi-thin sections (0.5 µm). The following different cultivars have been analysed at different ripening stages: (i) “melting flesh” peaches (MF) showing a pronounced decrease in fruit firmness during the final stages of ripening; (ii) “non melting flesh” peaches (NMF) which remain relatively firm since the lack of the final melting phase of softening; (iii) “Stony Hard” peaches (SH) which maintain flesh firmness for several days after harvest even at room temperature; (iv) “Slow ripening” peach mutant characterized by the fruit development arrest in the pre-climateric phase with the absence of the typical maturation processes. Sections used for morphological analyses have been also probed with a rabbit polyclonal antibody specifically produced and tested for peach endopolygalacturonase (endoPG).

Image analysis results showed a progressive loss of cell adhesion and turgor in parallel with softening and with endoPG localization in cell wall. The analysis of the different peach cultivar showed that the loss of cell adhesion and turgor are characteristics strictly associated with the loss of flesh firmness and with the endo-PG accumulation in the cell wall.

Rose JKC and Bennett AB (1999) *Trends in Plant Science* **4**, 176-183.

Brummel DA and Harpster MH (2001) *Plant Molecular Biology* **47**, 311-340.

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