Changes in cell wall structural protein expression during tomato fruit ripening.

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Fruit softening during the ripening process is mainly due to cell wall disassembly. If alteration at the polysaccharide level have been extensively studied, currently no data on the contribution of cell wall proteins are available.

Performing cell wall extraction on 2 varieties of mature green and red ripe tomato fruit selected for their different textural characteristics, we studied the presence of cell wall protein by immunological approach. Two pools of extensins were detected showing differences in their extractibility properties. Changes in the epitope amount were also observed between the ripening stages and the fruit variety.

To go further into this study and identify genes coding for putative cell wall proteins, we conducted an exhaustive search on the TGI genebank. Ten candidate cDNAs coding for extensins (Ext), glycin rich proteins (GRP), proline rich proteins (PRP) and arabinogalactan proteins (AGP) were selected. Northern blots showed that 8 of them were expressed in tomato fruits. Six of these genes showed differential expression between the two tomato varieties, most of the corresponding RNAs being preferentially accumulated in the green stage of the firm variety. The two remaining genes, encoding a PRP and a GRP, were defined as ripening-associated genes since they were highly accumulated in mature green fruits and undetectable in red ripe ones in both varieties.

The changes in expression and content of cell wall proteins observed in this study indicate that modifications of the cell wall protein networks can represent another mechanism contributing to cell wall metabolism and tissue softening occurring during fruit ripening beside the polysaccharide network disassembly.