

Changes in the cell wall components produced by exogenous abscisic acid treatment in strawberry fruit

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Abstract

Abstract: Fruit development and ripening are controlled by multiple plant hormones; for strawberries, recent evidence supports the role of abscisic acid (ABA) as a promoter of fruit ripening. Fruit softening during ripening is mainly a consequence of the solubilization and depolymerization of cell wall components mediated by the action of a complex set of enzymes and proteins. In the present work, we performed a comparative study (ABA-treatment vs. control) of the changes in the physiological properties of the cell wall-associated polysaccharide contents of strawberry fruit (*Fragaria x ananassa* 'Camarosa') via analysis of thermogravimetry (TG) combined with analysis of mRNA abundance, enzymatic activity and physiological characteristics. 'Camarosa' did not show a decline in the fruit firmness at 48 h post-treatment; however, we observed changes in cell wall stability based on the TG and differential thermogravimetric (DTG) analysis curves, which demonstrated the degradation of the cell wall polymers after ABA hormone treatment for 48 h, principally for hemicellulose polymers. Additionally, DTG analysis showed that dried samples derived from the treatment of the fruit with the ABA biosynthesis inhibitor fluridone maintained the same thermal stability as the control samples. Finally, the existence of a relationship between thermal stability, transcriptional analysis and enzymatic activity after hormone treatment was demonstrated, which provides the basis for a model for understanding the changes in the cell wall polymers of *F. x ananassa* mediated by the ABA hormone during fruit ripening. Graphic abstract: [Figure not available: see fulltext.]

Author keywords

Abscisic acid treatment
Cell wall disassembly
Strawberry
Thermogravimetry analyses