Title Cell wall metabolism in cold-stored tomato fruit

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Abstract

The effects of chilling on cell wall metabolism of tomato fruit (*Solanum lycopersicum* L. cv. Trust) have been investigated. Fruit were harvested at the breaker stage of maturity and ripened at 20 °C for 1–12 d, or stored at 3 °C for up to 3 weeks, and then ripened at 20 °C. The effects of cold storage on fruit ripening were small. Pericarp tissues from fruit stored for 2 weeks had only slightly reduced pectin solubilization and depolymerization. Polygalacturonase (PG) mRNA levels, PG protein accumulation and PG activity in the tissues were also reduced by chilling. A reduction of PG protein abundance and PG activity occurred to a greater extent than that of PG mRNA levels, suggesting that chilling affected post-transcriptional regulation. Expression of the expansin1 (*LeEXP1*) gene was also reduced by chilling, but LeExp1 protein accumulation levels were not affected by chilling. β-Galactosidase activity was highest in chilled fruit during cold storage and during early ripening, but expression of a β-galactosidase gene (*TBG4*) was unaffected. While chilling had no effect on pectin methylesterase (PME) activity, expression of *PME1* in tissues from cold-stored fruit was lower. Endo-β-1,4-glucanase (EGase) activity and the expression of endo-β-1,4-glucanase (*Cel1*) were not affected by chilling. The predominant effect of chilling on the activity, protein accumulation, and gene expression of *PG* did not correlate with pectin solubilization and depolymerization.