Abstract

Tomato fruit (*Solanum lycopersicon* L.) can develop mealiness and enhanced softening when exposed to chilling temperatures during storage, but the involvement of cell wall-associated enzymes in chilling injury development is not well understood. To study this aspect of injury development, we have exposed breaker stage tomato cv. Trust fruit to a chilling temperature of 3°C for 0, 7, 14 and 21 days followed by storage at 20°C for 12 days. Ethylene production was not affected by storage except after 21 days where production was greater at 20°C. Exposure of fruit to chilling temperatures delayed the ripening-related color change (chroma and hue) and initially increased compression values, but % extractable juice was not affected consistently. Increased polygalacturonase activity during ripening was reduced by approximately 50% after 7 days at 3°C and further inhibited with increasing storage periods. In contrast, the activities of pectin methylesterase and α-galactosidase were not significantly affected by the cold treatments. β-Galactosidase activity was greater in all chilled fruit compared with fruit ripened at harvest, whereas endo-β-1, 4-glucanase activity was lower after 21 days at 3°C. These results will be compared with equivalent changes in the activities of cell wall enzymes that are associated with wooliness development in chilling-injured peach fruit.