

Abstract

The loss of quality in peach (*Prunus persica*) after harvest is associated with metabolic changes, mechanical damage, loss of pulp firmness, physiological disorders and decay. In the 'Chiripá' cultivar, woolliness is a major physiological process that affects the postharvest quality. For a better understanding of the development of woolliness in 'Chiripá' peach and to identify conditions that can prevent it, we devised several postharvest treatments consisting of cold storage (CS) either alone or in combination with the application of ethylene or 1-methylcyclopropene (1-MCP), intermittent warming or controlled atmosphere (CA) storage. We evaluated the effects of these treatments on postharvest preservation, the occurrence of woolliness and the activities of endo-polygalacturonase (endo-PG), exo-polygalacturonase (exo-PG) and pectin methylesterase (PME). Our results indicated that these treatments could modify the activities of the three enzymes, and that the induction of endo-PG and exo-PG activity and/or the repression of PME activity reduced the occurrence of woolliness. CS alone had a major effect on endo-PG and exo-PG activity but less impact on PME activity. The application of 1-MCP exacerbated this difference. Either ethylene application or intermittent warming increased endo-PG and exo-PG activities without reducing PME activity, resulting in the loss of pulp firmness and decay. Under CA storage, PME activity was effectively reduced and the activities of endo-PG and exo-PG, which were low during the treatment, dramatically increased 5 days after the end of the treatment. The overall quality of the peaches was better preserved under CA storage alone. With this treatment, the difference between PG and PME activity narrowed and the activity of both enzymatic groups decreased. As a result, the firmness of the pulp was better preserved and the incidence of decay and woolliness decreased.