Abstract

We evaluated the effect of cold quarantine treatments on the development of CI and temperature conditioning on the induction of low temperature tolerance in "Rouge La Toma" grapefruit (*Citrus paradisi* Macf.), and their effects on acetaldehyde, ethanol and D-limonene contents and sensory characteristics. Various treatments, non-conditioned + quarantine at 2 °C and 85% RH for 18 days + storage at 13 °C and 85% RH for 4 days or 17 days + marketing period at 20 ° C and 85% RH for 7 days; conditioned at 15 °C and 85% RH for 7 days + quarantine at 2 °C and 85% RH for 18 days + storage at 13 °C and 85% RH for 4 days or 17 days + marketing period at 20 °C and 85% RH for 7 days; storage at 13 °C and 85% HR for 22 days or 35 days + marketing period at 20 °C and 85% RH for 7 days (control treatments), were assayed. By the end of the simulated marketing period, the conditions did not promote chilling injury development in "Rouge La Toma" grapefruit. After the simulated marketing period, acetaldehyde, ethanol and D-limonene contents were not affected in fruit stored under treatments that included cold quarantine. In some cases, treatments that included temperature conditioning significantly increased acetaldehyde and ethanol levels, however, the amounts detected were comparable with fresh grapefruit juice. In general, the storage times involved in the treatments assayed, did not promote increases in the acetaldehyde and ethanol levels. Conversely, fruit stored at non-chilling temperatures (control treatments) had higher levels of D-limonene compared to those which underwent treatments that included cold quarantine. In addition, a significant increase in D-limonene levels between the initial time of the treatments and the end of the marketing period was observed, for all treatments, with the highest and most variables levels observed in fruit stored under control treatments. Sensory characteristics, such as sweet, acid and bitter taste and typical flavor intensity, in general, were not affected by the postharvest handling practices applied. Therefore, it can be concluded that the cold quarantine treatment and temperature conditioning may have important commercial applications for "Rouge La Toma" grapefruit *(Citrus paradisi* Macf.) without adversely affecting its quality.