

Title Effect of intermittent warming, hot water and chemical treatments on reducing chilling injury and quality improvement in Shishe-Kab pomegranate fruits stored at chilling temperature

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Abstract

The present research was carried out to examine the effects of different treatments on fruit quality and storage life of Iranian Shishe-kab pomegranate cultivar stored at chilling temperature. The effect of postharvest treatments including (1) intermittent warming (24 hrs at 18 ± 1 °C every six days), (2) hot water dip (3 min, 50°C), (3) salicylic acid dip (4 mM/L for 3 min) and (4) calcium chloride dip (2% w/v for 3 min) was investigated. Treatments used in the study were hot water alone, hot water + salicylic acid and hot water + salicylic acid + calcium chloride. Distilled water dip (3 min, 20°C) was used as control. To study the combination effect of these treatments with intermittent warming, fruits were divided into two lots. Both lots were placed in low density polyethylene bags slightly open and placed at 2 ± 0.5 °C for 10 weeks. The first lot was held in cold room for 10 weeks and the second lot was removed from cold storage at six days intervals, held at 18 ± 1 °C for 24 hrs. Quality parameters and fruit decay were assessed after 8 weeks. In all treatments, fruit, that were subjected to intermittent warm periods had greater TSS values as compared with held fruit at cold storage. Combination treatments (hot water + salicylic acid) or (hot water + salicylic acid + calcium chloride) had lower fruit weight loss and higher firmness compared to the control fruits. Treated fruit with hot water alone or in combination with chemical treatments had better appearance compared to untreated fruit. Interestingly, in week 8, there was no decay in all treated fruits that were exposed to intermittent warming or held at cold temperature regardless of the treatment type, while peel chilling injury and decay (browning) occurred in untreated fruits (40%) that were subjected to warm periods. Overall, hot water dip alone combined with chemical treatments improved fruit quality and reduced chilling injury in fruit stored at cold temperature for 10 weeks compared with the control, whereas intermittent warming did not inhibit fruit chilling injury and decay.