Sub-tropical peaches are grown commercially in the plains of North India. The harvesting period of peach fruit coincides with the hot summer months and due to high temperature and low relative humidity during this period fruit cannot be stored for longer period at ambient conditions. Keeping it in view an experiment was planned to maintain the postharvest quality of peach fruits cv. Shan-i-Punjab with the post harvest treatments of chemicals under low temperature storage conditions. Healthy and uniform fruits of peach cv. Shan-i-Punjab were treated with sodium bicarbonate (0.5, 1.0, 2.0 & 3.0) sodium carbonate (0.5, 1.0, 2.0 & 3.0), sodium benzoate (0.5, 1.0, 2.0 & 3.0) and control (water dip) for five minutes. Treated fruits were dried under shade before packaging. After drying fruits were packed in CFB boxes before storage at 0-1°C and 90-95% RH. Results revealed that lower doses (0.5% & 1.0%) of chemicals maintained the better fruit quality as compared to higher doses in all the chemical treatments. Fruits treated with sodium bicarbonate (0.5%) retained the maximum fruit firmness, total sugar content, total phenolics and minimum spoilage during entire storage period, it was followed by sodium benzoate (0.5%) and sodium bicarbonate (1.0%) treatment.

The experiment was conducted during the year 2013 in the Department of Fruit Science, Punjab Agricultural University Ludhiana. For the storage studies physiological mature, uniform and healthy fruits of cv. Shan-i-Punjab were harvested in the first week of May. Only selected fruits were washed with chlorinated water and subjected to the post-harvest dip treatments viz; T1-sodium bicarbonate @ 0.5%, T2-sodium bicarbonate @ 1.0%, T3-sodium bicarbonate @ 2.0%, T4-sodium bicarbonate @ 3.0%, T5-sodium carbonate @ 0.5%, T6-sodium carbonate @ 1.0%, T7-sodium carbonate @ 2.0%, T8-sodium carbonate @ 3.0%, T9-sodium benzoate @ 0.5%, T10-sodium benzoate @ 1.0%, T11-sodium benzoate @ 2.0%, T12-sodium benzoate @ 3.0% and T13-control (water dip) for five minutes. Treated fruits were dried under shade before packaging. After drying fruits were packed in CFB boxes before storage at 0-1°C and 90-95% RH. Stored fruits were analyzed.
Influence of Chemicals on Quality of Low Temperature

**Fig. 1** Effect of chemical treatments on firmness (lbs) of cold stored peach fruits

**Fig. 2** Effect of chemical treatments on spoilage (%) of cold stored peach fruits

**Fig. 3** Effect of chemical treatments on total sugars (%) of cold stored peach fruits

**Fig. 4** Effect of chemical treatments on total phenolics (%) of cold stored peach fruits

for fruit firmness, spoilage, total sugars and total phenolics after 2, 4, 5 & 6 weeks of storage. Firmness of randomly selected fruits was measured with the help of fruit pressure tester. About 1 square centimeter of the skin in each fruit from the shoulder end on both sides was removed with the help of peeler and firmness of pulp was recorded and expressed in terms of lb force. Per cent fruit rot was calculated by counting the total number of fruits that had spoiled at each storage interval. The total sugar and phenolic contents of the fruit were estimated according the method described by\(^3\). The experiment was laid out in a Completely Randomised Block Design (Factorial) and analysis of data was done using computer programme\(^4\).

**RESULTS AND DISCUSSION**

Results obtained from the experiment are presented in Fig. 1, 2, 3 and 4. Figure 1 depicts the effect of chemical treatments on firmness of peach fruit under cold storage conditions. A significant difference in fruit firmness was observed with advancement of storage period. Similarly, a reduction in fruit firmness with extension in storage period has been observed\(^5\). Maximum fruit firmness was observed in fruits treated with 0.5% sodium bicarbonate, followed by 0.5% sodium benzoate during the entire storage period. It may be due the better maintenance of fruit health during storage by sodium bicarbonate (0.5%) treatment as compared to other
Influence of Chemicals on Quality of Low Temperature treatments. Higher doses (2 & 3%) of all the chemicals showed the less fruit firmness as compared to lower doses (0.5 &1%). Softening of fruit is caused by the breakdown of insoluble protopctins into soluble pectin's or by the cellular disintegration leading increased membrane permeability6.

Spoilage of fruits increased with the advancement of storage period (Fig.2), this increase may be due the disintegration of cell wall and softening of fruits during ripening in the storage. Fruit softening weaken the barrier for entry of several pathogens which ultimately lead to fruit rotting. Among the various post harvest treatments minimum spoilage was recorded in sodium bicarbonate (0.5%) treatment. Similarly, the blood orange fruits are strongly influenced by sodium bicarbonate applications and stored in a good quality for 42 days7. Sodium bicarbonate was a substitute or alternative to fungicides or chemical materials used in controlling injuries and fruit deteriorations during storage of citrus fruit for export. A reduction in the incidence of both green and blue molds up to 90% after treating artificially inoculated fruit with different concentrations of Sodium bicarbonate8.

In all the chemicals lower doses were found more effective to check the spoilage as compared to higher doses.

Total sugars of the peach fruits showed an inconsistence in trend with the increase in storage period (Fig.3). An increase in total sugars was observed up to four weeks in sodium bicarbonate (0.5 & 1.0%), sodium carbonate (0.5 %) and sodium benzoate (0.5 & 1.0%) treated fruits, but after five and six weeks of storage decline in sugar content was recorded in all the treatments. At the end of storage maximum total sugars were retained by sodium bicarbonate (0.5%) treated fruits. The increase in sugars during storage may possibly be due to breakdown of complex organic metabolites into simple molecules or due to hydrolysis of starch into sugars. The decline in the sugar content at the later stages of storage may be attributed to the fact that after the completion of hydrolysis of starch, no further increase in sugars occurs and subsequently a decline in sugars is predictable as they along with other organic acids are primary substrate for respiration9.

The data revealed that the total phenolics reduced with the prolongation of storage period (Fig.-4). However, the decline of total phenolics was less pronounced in sodium bicarbonate (0.5%) and sodium benzoate (0.5%) treated fruits. Similar results have also been reported in earlier studies10 in peach fruit during storage studies. The decline in total phenolics may be due to higher activity of polyphenol oxidase enzyme during cold storage.

ACKNOWLEDGEMENTS

Financial assistance provided by the University Grant Commission, New Delhi to conduct the research is gratefully acknowledged.

REFERENCES