In the North-Western Indian plains many low chilling and early ripening peach (Prunus persica L.) cultivars like Partap, Floradasun, Flordaprince, Parbhat, Shan-i-Punjab, Earli Grande and indigenous varieties like Khurmani and Sharbati have been recommended for commercial cultivation. Under Punjab conditions, the fruits of these cultivars mature towards the third week of April to end of June, hence ensure good economic returns to the growers. Peaches, if harvested too early are small, very firm in texture, with low sugars, reduced flavour and colour while the later picked fruits are very soft, high in sugar and water content and all the physiological processes which complicate storage are underway. Once the fruit ripens, senescence begins; physical and chemical changes continue after optimum ripeness is reached including further softening, loss of desirable flavor and complete breakdown. Peach fruits of different sizes are available on the trees at the time of harvesting. These fruits of different sizes can be used for different purposes viz; as fresh fruits or processed products, but it is must to know about its quality before its use for a particular purpose. Keeping it in view, a study was planned to analyze the quality attributes of different sizes of peach fruits. Growers have to select and grade these fruits for further marketing.

MATERIAL AND METHODS

Studies were conducted on 10 year old peach plants during 2012-13 and 2013-14 at Punjab Agricultural University, Regional Research Station, Bathinda. The average rainfall at the experimental site was 400 mm, the annual maximum temperature was 31.5°C and annual minimum temperature was 16.9 °C during fruiting season. The soil was sandy loam and characterized with pH (8.31), organic carbon (0.32%), electrical conductivity (0.24 dS/m), available N (212 kg/ha), available P (21.5 kg/ha) and available K (357.0 kg/ha). The fruits of peach cv. Shan-i-Punjab were harvested from the orchard in the first week of May. The fruits were divided into different five groups on the basis of their weight. These fruit were analysed for various physico-chemical characteristics viz; fruit weight, fruit length, fruit width, stone weight, stone length, stone width, firmness, total soluble solids, total acidity, TSS:acid ratio, total phenols and anthocyanins. Five fruits of each group were taken for determination of weight and size of fruit and stone. TSS was recorded with the help of hand refractometer (Model : Erma, Japan) at room temperature in terms of degree brix (%) and the readings were corrected to 20°C with the help of temperature correction chart. The total acidity was determined in terms of maleic acid by titrating a known volume of juice with 0.1 N NaOH solution using phenolphthalein as an indicator. The ratio was calculated by dividing the values of TSS with that of the corresponding titratable juice acidity. The firmness of 5 fruits were measured with the help of a ‘Pressure tester’ hand penetrometer and results were expressed as kg/cm². Total phenols were estimated as total tannins by extracting the fruit samples in...
80 per cent ethanol. The colour was developed with Folin-Denis reagent\(^2\). The anthocyanins were estimated by the method of Pirie and Mullins\(^3\). Analysis of variance (ANOVA) and the test of mean comparison according to critical difference (CD) were applied. Significance level was accepted at \(p \leq 0.05\). The data of 3 replications was analyzed statistically by randomized block design using CPCS1 software as a statistical analysis tool\(^4\).

**RESULTS AND DISCUSSION**

The fruit weight of different groups varied from 90.15g to 21.40 g (Table-1). The fruit length was \((p \leq 0.05)\) higher in group I. There was linear decrease in fruit length from group I to group V i.e., from 6.40 cm to 4.02 cm. Similar trend was observed in case of fruit width. Likewise, stone weight was \((p \leq 0.05)\) higher under group I followed by group II and minimum under group V. Similar was observed in case of stone length and width. This may be due to larger the size of fruit, more will be stone weight resulting in high stone length and width. The fruits under different groups also showed a variation in bio-chemical characteristics ie: TSS and acidity. The TSS content was \((p \leq 0.05)\) higher in the fruits under group II (12.08) followed by group I (11.60) and group III (11.40). The TSS Content was recorded \((p \leq 0.05)\) lower under group V (Fig.-1). The acid content was \((p \leq 0.05)\) low in fruits kept under group I and showed negative correlation with the size of the fruit (Fig.-2). The loss in acidity with increase in size of the fruit might be due to mobilization of organic acid and loss of carboxylic groups in the form of CO\(_2\) in the process of respiration 5,6. The TSS/ acid ratio was \((p \leq 0.05)\) higher in fruits under group II which was closely followed by group I (Fig.-3). The TSS/ acid ratio \((p \leq 0.05)\) lower in the fruits under group V (13.25). This might be attributed to the increase in total soluble solids and reduction in acidity of fruits with the increase in size of the fruit\(^7\). A negative correlation was observed between fruit firmness and size of fruits (Fig.-4) ranging from 8.25 to 6.38 kg/cm\(^2\). The decrease in fruit firmness with increase in size may be attributed to the less retention of Ca\(^{++}\) ions in later stage of harvest maturity as compared to pre-optimum and optimum stage of maturity. More mature fruits tended to lose their firmness more rapidly\(^8\). The

<table>
<thead>
<tr>
<th>Group</th>
<th>Fruit weight (g)</th>
<th>Fruit length (cm)</th>
<th>Fruit width (cm)</th>
<th>Stone weight (g)</th>
<th>Stone length (cm)</th>
<th>Stone width (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>90.15</td>
<td>6.40</td>
<td>5.50</td>
<td>9.80</td>
<td>3.65</td>
<td>2.29</td>
</tr>
<tr>
<td>II</td>
<td>79.36</td>
<td>5.60</td>
<td>5.36</td>
<td>9.00</td>
<td>3.42</td>
<td>2.26</td>
</tr>
<tr>
<td>III</td>
<td>57.20</td>
<td>5.05</td>
<td>4.75</td>
<td>7.60</td>
<td>2.85</td>
<td>1.95</td>
</tr>
<tr>
<td>IV</td>
<td>38.60</td>
<td>4.35</td>
<td>4.25</td>
<td>5.00</td>
<td>2.72</td>
<td>1.88</td>
</tr>
<tr>
<td>V</td>
<td>21.40</td>
<td>4.02</td>
<td>3.85</td>
<td>5.40</td>
<td>2.30</td>
<td>1.70</td>
</tr>
<tr>
<td>CD at 5% level</td>
<td>8.0</td>
<td>0.173</td>
<td>0.193</td>
<td>0.587</td>
<td>0.067</td>
<td>0.065</td>
</tr>
</tbody>
</table>

**Fig.-1:** TSS content in relation to wt. of peach fruits

**Fig.-2:** Acidity in relation to wt. of peach fruits
total anthocyanins were observed (p ≤ 0.05) higher (0.145 absorbance units) in fruits under group I followed by the fruits under group II (Fig.-5). The onset of softening coincide with an increase in red colour of peaches. A negative correlation was observed between the total phenol content and size of the fruit (Fig.-6). The total phenol content was (p ≤ 0.05) lower in the fruits under group I followed by group II. This loss of astringency which occurs on ripening is probably connected with increased polymerization of tannins. The phenolic substances served as the substrate for polyphenol oxidase and declined with maturity.

REFERENCES