EFFECT OF POSTHARVEST FUNGICIDAL APPLICATION ON DEVELOPMENT OF CAROTENOID PIGMENTS IN KESAR MANGO FRUITS

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ABSTRACT

An experiment was conducted to study the effect of postharvest fungicidal application on carotenoid development of Kesar mango fruits during storage period. For this purpose, fully matured Kesar mango fruits were subjected to the various treatments of waxol (6%), waxol (6%) coupled with carbendazim (0.1%) and captan (0.2%). These treated and untreated fruits lot (as control) were kept for storage at room temperature (24.18-30.57°C temp. with 47.50-74.00 % RH), cool chamber (21.36-23.15°C temperature with 87.00-91.50 % RH) and in cool storage (10°C temperature with 90.0-95.0 % RH). It was observed that the fruits treated with waxol (6%) and either carbendazim (0.1 %) or captan (0.2 %) successfully controlled the postharvest diseases of mango fruits. However, besides this, these fungicides were found to be beneficial in delaying the ripening process of mango fruits by slow development of carotenoid pigments.

Mango (Mangifera indica L.) belonging to family anacardiaceae is the national fruit of India and popularly known as the 'King of fruits' owing to its attractive saffron colour of flesh, excellent taste, exotic flavour, exemplary nutritive value and its delicacy for the table of rich as well as food for million of poor people during summer. Owing to lack of information on appropriate postharvest treatments and cool storage, the fruits not only lose their quality but also encounter a substantial postharvest loss. The research efforts have been helped to increase the production of mango fruit but the purpose of obtaining maximum profit will not be served unless the increased production is supplemented with similar efforts to minimize their post-harvest losses which range between 30-40 per cent (Salunkhe and Desai, 1984). There is very little information available on Kesar mango fruit with reference to physico-chemical change such as carotenoid development. Therefore, a detailed study on this aspect was undertaken to preserve the fruits in good condition during storage and ripening.

The fruits were harvested early in the morning at 5 A.M. at proper stage of maturity. The ambient temperature at harvest was 25°C and the fruits were harvested by using Dapoli harvester and as such the stalk length was kept upto 2.5 cm. Then the fruits were brought to the Postharvest Technology Laboratory, Mahatma Phule Krishi Vidyapeeth, Rahuri. The fruits were graded, washed thoroughly in running cold water, drained and then they were subjected to the following six postharvest treatments viz., T₁ = Control, T₂ = Waxol (6%), T₃ = Waxol (6%) + Carbendazim (0.1%), T₄ = Waxol (6%) + Captan (0.2 %), T₅ = Control + Carbendazim (0.1 %) and T₆ = Control + Captan (0.2 %).

Treated and untreated (control) fruits of uniform size were packed in export quality corrugated fibreboard (CFB) boxes and four lots of such packed materials were prepared and kept in perforated plastic crates. One lot of these was stored at (i) room temperature (24.18-30.57°C temp. with 47.50-74.00 % RH), second lot was kept for storage in cool chamber (21.36-23.15°C temperature with 87.00-91.50 % RH), third lot was precooled at 10°C for 12 hrs and fourth lot was unprecooled and both the lots were stored in cool storage (10°C temperature with 90.00-95.00 % RH). The above treatments were
Table 1. Effect of various postharvest treatments on carotenoid development of Kesar mango fruits during storage under various environments

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Storage No. environments</th>
<th>Shelf life (days)</th>
<th>Treatments</th>
<th>T_1</th>
<th>T_2</th>
<th>T_3</th>
<th>T_4</th>
<th>T_5</th>
<th>T_6</th>
<th>CD at 5 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>RT</td>
<td>Initial = 0</td>
<td>Final = 20</td>
<td>15135.51</td>
<td>12885.60</td>
<td>11441.36</td>
<td>12175.27</td>
<td>13703.00</td>
<td>14614.82</td>
<td>412.52</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>269.98</td>
<td>269.98</td>
<td>269.98</td>
<td>269.98</td>
<td>269.98</td>
<td>269.98</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>CC</td>
<td>Initial = 0</td>
<td>Final = 26</td>
<td>13390.21</td>
<td>11982.42</td>
<td>10381.76</td>
<td>10979.59</td>
<td>12342.40</td>
<td>13088.09</td>
<td>1095.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>269.98</td>
<td>269.98</td>
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<td>269.98</td>
<td>269.98</td>
<td>269.98</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>CS</td>
<td>Initial = 0</td>
<td>Precooled final = 50</td>
<td>10462.90</td>
<td>9080.81</td>
<td>8151.92</td>
<td>8695.11</td>
<td>9479.37</td>
<td>10141.49</td>
<td>440.69</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Unprecooled final = 46</td>
<td>11485.01</td>
<td>9890.28</td>
<td>8695.11</td>
<td>9273.71</td>
<td>10585.04</td>
<td>10951.46</td>
<td>396.99</td>
</tr>
</tbody>
</table>

RT - Room temperature  
CC - Cool chamber  
CS - Cool store.

replicated thrice and the periodical observations on carotenoid development in kesar mango fruit was determined with the method described by Roy (1973).

It was observed from the Table 1 that the total carotenoid content of mango fruit increased significantly throughout the storage period irrespective of postharvest treatments and storage conditions. It was also noted that with the advancement of storage period, the total carotenoid content of control fruit increased significantly at a faster rate as compared to other fruits treated with waxol and fungicides. At the beginning of the storage period, the total carotenoid content of mango fruit was found to be 269.98 μg/100 g.

It was observed that the kesar mango fruits treated with waxol (6 %) coupled with carbendazim (0.1 %) and precooled at 10°C temp. for 12 hrs and then stored in cool storage for 50 days recorded the minimum total carotenoid content of 8151.92 μg/100 g as compared to unprecooled ones which recorded the total carotenoid content of 8695.11 μg/100 g at the end of 46 days whereas cool chamber and room temperature stored fruits after 26 and 20 days of storage period recorded the total carotenoid content of 10381.76 and 11441.36 μg/100 g, respectively.

The rate of increase in total carotenoid content of mango fruit was found to be at a faster rate at RT storage as compared to CC and CS ones. This might be due to the fact that high temperature and low humidity at RT storage resulted in accelerated biosynthesis with chlorophyll degradation and an increase in carotene content was accompanied by a decrease in acid and increase in sugar content. Prolonged storage of mango fruits at low temperature and high humidity in CC and CS impeded the ripening process and resulted in lower values of total carotenoids in all the treatments. The observations are in line with the findings reported by Joshi (1983) at RT storage, Badar (1990) in CC storage and Joshi (1983), Kapse et al. (1985) and Krishnamurthy and Joshi (1989) in CS condition of mango fruits.
REFERENCES


