Effect of preservative chemicals on post-harvest behaviour of cut rose Etoile De France

Maitra, M.K. Mondal and N. Roychowdhury

Horticultural Society, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, West Bengal - 741252

Abstract: Blooms of "Etoile De France" a cultivar of rose were treated with vase-solutions containing several known preservative chemicals at various concentrations. Highest water uptake (9.50g) was recorded with distilled water. The total water loss was recorded maximum (9.79g) when placed in distilled water, however it was minimum (2.96g) with the vase solution containing Sucrose (4%) + Silver nitrate (100ppm). The enhancement in the fresh weight was recorded highest (0.70g) in Sucrose (4%) + Silver nitrate (100 ppm) treated vase solution. Holding solution containing sucrose (4%) + 8-HQC (300 ppm) was proved beneficial for the earliest opening of the flowers (1.00 day) and also prolonged duration of prime beauty (3.55 days). The "bent neck" was recorded minimum with Sucrose (4%) + Aluminium sulphate (0.5%). However the vase-solution treated with Sucrose (4%) + 8-HQC (300 ppm) showed the longest post-harvest life (4.50 days) of cut rose flowers. (Key words: Rose, Post-harvest behaviour, Vase-life)

Materials and Methods

Aqueous solutions of the following chemicals were compared: 8-HQS, Silver nitrate, Aluminium nitrate, 8-HQC, Nickel chloride at various concentrations along with sucrose 4%. Distilled water was used as control. The various treatments were tested with some notations.

Sucrose (4%) + 8-HQS (200 ppm)
Sucrose (4%) + Silver nitrate (100 ppm)
Sucrose (4%) + Aluminium sulphate (0.5%)
Sucrose (4%) + 8-HQC (300 ppm)
Sucrose (4%) + Nickel chloride (200 ppm) T6 - control with distilled water

Conical flask with 100 ml capacity were used. Each vase contained 2 blooms and the treatments were replicated four times. The design of the experiment was RBD. The experiment was carried out at room temperature (30°C). The cultivar used was 'Etoile De France'. A thin slice was cut at the base before the blooms were placed in different solutions.

Observations were taken on total water uptake, total water loss, water uptake and water loss ratio, changes in fresh weight, days required for opening of flower, flower opening to wilting period, vase-life and "Bent Neck" percentage.

Results and Discussion

Total water uptake

Distilled water showed better water uptake (9.50g) followed by sucrose (4%) + 8-HQS (200 ppm) and sucrose (4%) + 8-HQC (300 ppm). Sucrose (4%) along with nickel chloride (200 ppm) recorded the lowest amount of water uptake (2.38g) (Table 1).

Total water loss

Significant difference was observed between various preservative chemical solutions in respect of total water loss. Distilled water (control) recorded the highest water loss (9.79g) which was statistically at par with sucrose (4%) + 8-HQS (200 ppm) and sucrose (4%) + 8-HQC (300 ppm). However, the lowest amount of water loss (2.96g) was recorded with sucrose (4%) + silver nitrate (100 ppm).

Water uptake and water loss ratio
Fig. 1: Changes in fresh weight of cut-rose cv. Etoile De France as influenced by the flower preservative chemicals

Water uptake and water loss ratio is an indication of water balance within the cut bloom. It was highest (1.08) in the case of sucrose (4%) + silver nitrate (100 ppm) which showed highly positive water balance indicating better water status within the cut rose. On the other hand sucrose (4%) + nickel chloride (200 ppm) showed most negative water balance (0.71).

Changes in fresh weight

Results revealed that sucrose (4%) + silver nitrate (100 ppm) showed the highest increase (0.70 g) and lowest decrease (-0.83 g) of fresh weight of the cut rose flowers. Changes in fresh weight of rose was found to be non-significant except in case of 4th day. However, in the second day both sucrose (4%) + silver nitrate (100 ppm) and sucrose (4%) + nickel chloride (200 ppm) showed the highest increase in the fresh weight (0.40 g) and sucrose (4%) + 8-HQC (300 ppm) showed the lowest (0.20 g). In the third day sucrose (4%) + aluminium sulphate (0.5%) showed the highest increase in the fresh weight (0.26 g) followed by sucrose (4%) + 8-HQC (300 ppm) and sucrose (4%) + nickel chloride (200 ppm) (0.25 g), but sucrose (4%) + 8-HQS (200 ppm) showed decrease in fresh weight (-0.06 g). In the 4th day only sucrose (4%) + 8-HQC (300 ppm) showed increase in the fresh weight (0.40 g). On the 5th day all the treatments showed decrease in the fresh weight. Only sucrose (4%) + 8-HQC (300 ppm) showed a steady increase in fresh weight up to 4th day (Fig 1 and Table 2).

Days required for opening of flower

Sucrose (4%) + 8-HQC (300 ppm) recorded the lowest days (1) required for opening of the flowers.

Flower opening to wilting period

It has been found from the observation that sucrose (4%) + 8-HQC (300 ppm) took longer time from flower opening to wilting (3.50 days) and distilled water took the lowest (1.25 days).

Vase-life

The highest days of vase life (4.50) was obtained with sucrose (4%) + 8-HQC (300 ppm) treated holding solution and the lowest with distilled water (3.00 days) (Fig 2).

‘Bent Neck’ percentage

This problem is less with the application of sucrose (4%) + Aluminium Sulphate (0.5%).

Flowers treated with distilled water absorbed and also lost the highest amount of water might be due to enhanced respiration rate because there was no antirespiratory substance in the vase-solution.

Most stable water balance and highest increase
Fig. 2: Influence of different flower preservative chemicals on the vase-life of cut-rose cv. Etoile De France.

Table 1. Effect of different flower preservative chemicals on the post-harvest life of cut roses cv. Etoile De France.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Total water uptake (g)</th>
<th>Total water loss (g)</th>
<th>Water uptake &amp; water loss ratio</th>
<th>Increase in fresh weight (g)</th>
<th>Decrease in fresh weight (g)</th>
<th>Days required for opening of flower</th>
<th>Opening to wilting (days)</th>
<th>Vase-life (Days)</th>
<th>Bent Neck (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>7.00</td>
<td>8.13</td>
<td>0.86</td>
<td>0.36</td>
<td>1.31</td>
<td>1.25</td>
<td>2.25</td>
<td>3.50</td>
<td>100</td>
</tr>
<tr>
<td>T2</td>
<td>2.83</td>
<td>2.96</td>
<td>1.08</td>
<td>0.70</td>
<td>0.83</td>
<td>1.50</td>
<td>2.00</td>
<td>3.50</td>
<td>50</td>
</tr>
<tr>
<td>T3</td>
<td>4.25</td>
<td>5.03</td>
<td>0.83</td>
<td>0.68</td>
<td>1.45</td>
<td>1.75</td>
<td>2.00</td>
<td>3.75</td>
<td>0</td>
</tr>
<tr>
<td>T4</td>
<td>7.00</td>
<td>8.14</td>
<td>0.84</td>
<td>0.64</td>
<td>1.54</td>
<td>1.00</td>
<td>3.50</td>
<td>4.50</td>
<td>100</td>
</tr>
<tr>
<td>T5</td>
<td>2.38</td>
<td>3.48</td>
<td>0.71</td>
<td>0.65</td>
<td>1.09</td>
<td>1.25</td>
<td>2.25</td>
<td>3.50</td>
<td>50</td>
</tr>
<tr>
<td>T6</td>
<td>9.50</td>
<td>9.97</td>
<td>0.95</td>
<td>0.46</td>
<td>0.93</td>
<td>1.75</td>
<td>1.25</td>
<td>3.00</td>
<td>100</td>
</tr>
<tr>
<td>Sem ±</td>
<td>0.39</td>
<td>0.92</td>
<td>0.07</td>
<td>0.17</td>
<td>0.22</td>
<td>0.21</td>
<td>0.35</td>
<td>0.27</td>
<td>-</td>
</tr>
<tr>
<td>CD at 5%</td>
<td>2.69</td>
<td>2.76</td>
<td>0.21</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>1.04</td>
<td>0.81</td>
<td>NS</td>
</tr>
</tbody>
</table>

In fresh weight of cut blooms with silver nitrate might be due to antimicrobial and antirespiratory properties of the chemical. Ferreira and Sward (1981 a, b) reported that silver nitrate along with other preservative chemicals significantly increased the vase-life of cut 'Sonia' roses.

Quinoline salts reduce the vascular blockage property by its germicidal activity which may cause retardation of microbial growth at the cut end. Besides 8-HQC has the cytokinin-like property which may enhance the vase-life. Due to those reasons 8-HQC effectively reduced the time required for opening of flowers and increased the vase-life of the cut blooms. Marousky (1971) reported that 8-HQC (8-Hydroxy Quinoline Citrate) inhibited the growth of all bacteria, fungi and yeast commonly found in cut flower vase-
Table 2: Changes in fresh weight of cut roses under holding solutions.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>2nd day</th>
<th>3rd day</th>
<th>4th day</th>
</tr>
</thead>
<tbody>
<tr>
<td>$T_1$</td>
<td>0.21</td>
<td>-0.06</td>
<td>-0.84</td>
</tr>
<tr>
<td>$T_2$</td>
<td>0.40</td>
<td>0.22</td>
<td>-0.45</td>
</tr>
<tr>
<td>$T_3$</td>
<td>0.32</td>
<td>0.26</td>
<td>-0.26</td>
</tr>
<tr>
<td>$T_4$</td>
<td>0.20</td>
<td>0.25</td>
<td>0.40</td>
</tr>
<tr>
<td>$T_5$</td>
<td>0.40</td>
<td>0.25</td>
<td>-1.18</td>
</tr>
<tr>
<td>$T_6$</td>
<td>0.23</td>
<td>0.23</td>
<td>-0.93</td>
</tr>
<tr>
<td>Semi</td>
<td>0.10</td>
<td>0.11</td>
<td>0.24</td>
</tr>
<tr>
<td>CD at 5%</td>
<td>NS</td>
<td>NS</td>
<td>0.72</td>
</tr>
</tbody>
</table>

NS = Non significant

8-HQC along with Alar @ and Sucrose resulted in better keeping quality in roses (Metzger, 1972).

References


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Characteristics and the yield potential of different pepino accessions

L. MOHAN AND M. SUBASH CHANDRA ROSE

Horticultural Research Station, Ooty-643 001, The Nilgiris, Tamil Nadu.

Abstract: *Pepino Solanum muricatum* is a small herbaceous perennial minor fruit cum vegetable crop with multiple possibilities for consumption. Special features include its high yield potential, easy propagation by stem cuttings, perennial nature, fast growing and high response to intensive cultivation and fertilizer application and above all the habitat of flowering and fruit set round the year. As on date 9 promising accessions have been established based on plant and fruit morphology, yield performance and quality traits. These accessions also offered differing preference for different utilities such as dessert fruit, squash etc. (Key words: *Pepino, Solanum muricatum*, Fruit morphology, Solanaceae, Minor fruit)

*Pepino* (Solanum muricatum), often referred as Melon Pear, is a small herbaceous perennial belonging to Solanaceae. It is sub-tropical, medium to large sized minor fruit species native to Northern Andes, South America. For the first time in India it was introduced at Horticultural Research Station, Ooty during the later parts of 1994.

*Pepino* is a nutritious vegetable cum fruit crop with multiple possibilities for consumption like green and cooked vegetable, vegetable salads, patchadis, fresh fruit (dessert), fruit salad, delicious fruit juice, squash etc. *Pepino* fruits are highly juicy and moderately sweet and possesses characteristic pleasing aroma like that of melon fruit. These fruits are rich