

Studies on Keeping Quality of Cut Spikes of *Gladiolus cv. Arka Darshan*

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ABSTRACT

The present investigation entitled response of vase solution on keeping quality of cut spikes of *gladiolus cv. Arka Darshan* was carried out during the year 2015-16 at Citrus Research Station Tirupati. Treating of cut spikes of *gladiolus* with Sucrose 5 per cent + 8- HQC (600ppm) was found superior to other treatments for most of the floral traits.

Key words : *Gladiolus, Germicide, Spike, Sucrose, Vase life*

Gladiolus is the most popular ornamental bulbous plant, grown for its fascinating spikes, which open gradually from base to the top. Its elegant flower spikes, which have rich variation of colors, are the main reason for its ever-increasing demand. Though, the crop has a wide scope but still the contribution is meagre in the international market. This may be due to the lack of authentic information on post harvest management. The spikes last for only 6-7 days when they are placed in water (Murali and Reddy, 1993) which is too less a post harvest life for marketing of *gladiolus* for distinct market. Enhanced vase life of cut flowers depends on their water retention and retarding rate of senescence, which can be achieved by using certain chemicals. Therefore, the present study was conducted to test the effect of three floral preservative chemicals in combination with 5 per cent sucrose on vase life of cut spikes of *gladiolus cv. Arka Darshan*.

MATERIAL AND METHODS

The experiment was conducted at Citrus Research Station, Tirupati during 2015-16. The crop was raised under standard uniform cultural conditions planted in November 2015. The spikes were harvested early in the morning when lower most 1-2 florets started showing color and were brought to the laboratory immediately for placing them in bucket containing water. The maximum and minimum laboratory temperatures fluctuated between 28-30 °C, respectively and relative humidity was 65-75 per cent during the course of investigation. The basal 2 cm portion of the spike was re-cut in water to expose fresh tissue and the spikes were put in vase solutions containing sucrose (5%) in combination with different chemicals and compared with control (distilled water).

The experiment was laid in completely randomized design (CRD), consisted of eight treatments *viz.*, T₁- Sucrose 5 per cent, T₂- Sucrose 5

per cent + 8- HQC (300 ppm), T₃- Sucrose 5 per cent + 8- HQC (600 ppm), T₄- Sucrose 5 per cent + Al₂(SO₄)₃.16H₂O (100 ppm), T₅- Sucrose 5 per cent + Al₂(SO₄)₃.16H₂O (300 ppm), T₆- Sucrose 5 per cent + AgNO₃ (100 ppm), T₇- Sucrose 5 per cent + AgNO₃ (200 ppm), T₈- Control (with distilled water) and were replicated four times. Observations were recorded on initial weight of spike, days to open basal florets, floret diameter, spike weight at basal floret withering, days to wither 1st floret, number of open florets at 1st florets withering, solution absorption/spike and vase life. The mean values of the recorded data were statistically analyzed and presented in Table.

RESULTS AND DISCUSSION

Study reveals that the influence of various chemicals were found significantly superior in terms of extending vase life over control. The maximum vase life of 9.2 day was observed in treatment T₃ *i.e.*, Sucrose 5 per cent + 8- HQC (600 ppm) followed by vase life of 8.5 day in T₇- Sucrose 5 per cent + AgNO₃ (200 ppm). The chelating property of the 8- HQC which helps in chelating metal ions of enzyme creating vascular blockage and reduce physiological stem blockage in sterilized tissue (Halevy and Mayank, 1981). Similar to present studies, Pal *et al.* (2003) reported that the vase solution containing 4 per cent sucrose and 8- HQC (200 ppm) resulted in extended vase life. The minimum vase life (5.0 day) was observed in T₈- control (with distilled water).

The maximum (60.5 g) initial weight of spike was recorded in T₁, followed by T₇ [Sucrose 5% + AgNO₃ (200 ppm)] *i.e.* 59.7 g. The floret diameter was influenced by all floral preservative solutions but maximum floret diameter (8.6 cm) was found in treatment T₃ [Sucrose 5 per cent + 8- HQC (600 ppm)] which was significantly superior over rest of the treatments. However, the minimum flower diameter (6.6 cm) was found in treatment T₈. The increase in

Table. Pulsing studies on gladiolus spikes cv. A.Darshan

Treatments	Vase life (day)	Initial weight of spike (g)	Floret diameter (cm)	Days to opening of basal floret	No. of florets open at a time	Days to wither 1 st floret	Spike weight at 1 st floret withering	Solution absorption/spike (ml)
T ₁ - Sucrose 5%	6.4	60.5	7.0	3.0	7.0	6.0	66.0	56.9
T ₂ - Sucrose 5% + 8HQC (300 ppm)	6.8	58.2	7.6	2.9	6.5	6.3	64.1	62.5
T ₃ - Sucrose 5% + 8-HQC (600ppm)	9.2	57.5	8.6	2.0	7.6	6.8	71.1	63.9
T ₄ - Sucrose 5%+Al ₂ (SO ₄) ₃ .16H ₂ O (100ppm)	7.4	55.6	7.9	3.4	6.2	5.3	64.5	61.1
T ₅ - Sucrose 5% +Al ₂ (SO ₄) ₃ .16H ₂ O (300ppm)	8.4	57.7	8.0	2.7	7.5	6.4	70.1	62.5
T ₆ - Sucrose 5% +AgNO ₃ (100 ppm)	7.6	58.0	7.7	3.0	7.0	5.8	67.1	59.8
T ₇ - Sucrose 5% +AgNO ₃ (200 ppm)	8.5	59.7	8.0	1.8	7.5	7.0	70.5	61.4
T ₈ - Control	5	57.1	6.6	3.5	3.7	5.5	61.8	50.7
C.D. (P= 0.05)	0.9	1.6	0.5	0.7	0.5	0.5	3.7	2.1

floret diameter by chemical formulations might be due to the fact that sucrose provides energy for growth and helps in higher uptake of vase solution and simultaneously these formulations have profound effect to check the deleterious microbial activity. These results are also in conformity with results of Suneetha and Kumar (1998).

The minimum number of days taken for basal floret opening (1.8 day) were observed in treatment T₇ [Sucrose 5% + AgNO₃ (200 ppm)] which was at par (2.0 day) with treatment T₃ [Sucrose 5% + 8- HQC (600 ppm)], whereas the maximum (3.5 day) was observed in treatment T₈. The maximum spike weight (71.1 g) at 1st floret withering was observed in T₃ [Sucrose 5% + 8- HQC (600ppm)], whereas minimum (61.8 g) was recorded in T₈ - control. It might be due to that 8- HQC with sucrose facilitated the higher intake of water and total soluble sugars in the petal cells probably by enhancing the osmotic driving force for the solution uptake thereby making the cells water potential more negative. The increased solution uptake in the cut spikes further caused increase in spike weight.

The maximum (7.6) number of floret opened at a time was observed in treatment T₃ [Sucrose 5% + 8- HQC (600 ppm)], which was at par with T₅ [Sucrose

5% +Al₂(SO₄)₃. 16H₂O (300 ppm)] and T₇ [Sucrose 5% + AgNO₃ (200 ppm)], while the minimum (3.7) was recorded in T₈ (control). The maximum number of days (7.0 day) taken to 1st floret withering was observed in T₇ [Sucrose 5% + AgNO₃ (200 ppm)] followed by T₃ (6.8 day). These results are in close agreement with the findings of Kumar *et al.* (2007).

Since gladiolus spikes has a multi-floret system, the spikes might require considerable quantity of food reserve to ensure efficient opening of florets and sucrose is best energy source for cut flower to maintain pH by synergist effect, which improves the water balance and reduces moisture stress affecting stomatal closure. But sucrose is only effective when used with antimicrobial agent because stem xylem occluded by microbes (Singh *et al.*, 2000). The research findings of this experiment are in agreement with the findings of Suneetha and Kumar (1998) in gladiolus *cv.* Oscar and Singh *et al.* (2000) in gladiolus *cvs.* Suchitra and Jacksonville Gold.

Cut flowers held in preservative solutions absorbed more water than those held in distilled water. The spikes held in 5 per cent sucrose solutions containing 8- HQC (600 ppm) recorded maximum amount of water uptake (63.94 ml) as compared to those held in distilled water (50.7 ml). This could be

attributed to the strong antimicrobial activities of 8-HQC (Marousky, 1973) that restricted the growth of microorganism in the solution and eliminated the vascular occlusion in the xylem which ultimately resulted into resistance free solution flow (Burdett, 1970) and increased the uptake of sucrose solution. These results are also in conformity with results of Namita *et al.* (2006).

CONCLUSION

It can be concluded from the present study that the application of the vase solution of 8- HQC (600 ppm) with sucrose (5%) enhanced the keeping quality of gladiolus cut spikes *cv. A.Darshan*.

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Received on 20.03.2017 and revised on 24.06.2018