



Theme: Agro-Bio Sciences and Botanical Sciences Post Harvest Studies Of Gladiolus Varieties Under Vidharbha Conditions

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Abstract

A field experiment on 'Post harvest studies of gladiolus varieties under Vidharbha conditions' was conducted at Department of Horticulture, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola during *rabi* season of the years 2008-09 and 2009-10 to study the effect of vase solutions i.e. sucrose 2 per cent, sucrose 4 per cent and control (water) on post harvest parameters of three gladiolus varieties viz. Phule Neelrekha, Phule Tejas and Phule Ganesh. The results revealed that, during both the years total uptake of vase solution and vase life of gladiolus flowers were found maximum and pH of vase solution was found minimum with the variety Phule Ganesh. Maximum total uptake of the vase solution and vase life of flowers and minimum pH of the vase solution were recorded with the flowers treated with the vase solution i.e. 4 % sucrose. However, the treatment combination V₃S₂ i.e. variety Phule Ganesh + 4 % sucrose was found to be superior over all the treatment combinations in respect of total uptake of vase solution, vase life of flower and pH of vase solution during both the years of experimentation.

Keywords: Gladiolus, varieties, sucrose, uptake, vase life

Introduction

Gladiolus (*Gladiolus grandiflorus* L.) popularly known as "Queen of bulbous flowers", is one of the most important cut flowers grown almost all over the world. It is a herbaceous, perennial, flowering bulbous plant belonging to the family *Iridaceae*. Gladiolus has earned tremendous popularity due to its attractive shades, varying sizes of flowers, brilliance of colour tones and long lasting flower life. Suitable variety for the region is one of the important factors influencing the yield and quality of gladiolus spikes and corms. An ornamental plant, particularly cut flowers has a very short vase life. The development of flower and vase life after harvest depends to a greater extent upon the carbohydrates and other synthates in the plant tissues. The flower being a living entity, the loss of considerable carbohydrates due to continuous respiration causes depletion, resulting in decreased vase life. One of the major requirements for an increased vase life of cut flower is that, water uptake should take place unhindered. The two chemicals widely used in cut flower research are important in increasing the level of moisture retention in cut flowers. They are the 8-hydroxyquinoline salts and sucrose. Sucrose (C₁₂H₂₂O₁₁) is the most widely used sugar as a floral preservative. Sugar acts as an additional food source and also improves the water balance of cut flowers. The optimum concentration of sugar is the main source of nutrition for flowers and prolonging the vase life. The present study was undertaken to find out the suitable variety of gladiolus for the region and concentration of the sucrose as a preservative for increasing the vase life of gladiolus cut flowers.

Material and methods

An investigation was carried out at Main Garden, Department of Horticulture, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola (M.S.) during *rabi* season of the years 2008-09 and

2009-10. The three gladiolus varieties viz. Phule Neelrekha (V₁), Phule Tejas (V₂) and Phule Ganesh (V₃) were planted on the field. The flowers harvested from the varietal plots were kept in the various vase solution treatments viz., sucrose 2 per cent (S₁), sucrose 4 per cent (S₂) and control (water-S₃). The cut flowers were harvested as per the treatment in the morning hours at the stage of opening of first floret by cutting the gladiolus spikes, from the point of its emergence. The cut spikes were immediately kept in the bucket which was filled with the sufficient quantity of water to avoid the entry of air bubbles inside the stem. The flowers were then brought to the laboratory. Later on, the flowers were placed individually in the glass bottles of an appropriate size containing 200 ml vase solution as per the treatment. The observations on total uptake of vase solution, pH of vase solution and vase life of flower were daily and recorded accordingly during the course of investigation.

Result and Discussion

The data obtained in respect of the different parameters of vase life study of the gladiolus cut flowers viz., total uptake of vase solution, pH of vase solution and vase life of cut flower as influenced by the varieties and vase solution is presented in Table 1 and 2.

Influence of varieties

The data presented in Table 1 shows that, during both the year total uptake of vase solution (68.12 and 68.95 ml, respectively) and vase life of gladiolus flowers (9.75 and 9.84 days, respectively) were found maximum with the treatment V₃ i.e. Phule Ganesh, however, minimum total uptake of vase solution (59.13 and 60.01 ml, respectively) and vase life of cut flower (8.66 and 8.86 days, respectively) were recorded with the treatment V₂ i.e. Phule Tejas. An

uptake of the vase solution might have been increased due to the better quality spikes which might have maintained the stem turgidity even under the high rate of respiration and hence the total uptake of vase solution and ultimately the vase life of flower might have been increased. Minimum pH of the vase solution (7.16 and 7.19, respectively) was recorded with the varietal treatment V₃ (Phule Ganesh) and it was found to be maximum with the treatment V₂ i.e. PhuleTejas (7.30 and 7.31, respectively). This might have been due to maximum uptake of vase solution by the variety Phule Ganesh as compared to other varieties due to which pH of vase solution might have been reduced. Similar results are also reported by Saud *et al.* (2005) in gladiolus.

Influence of vase solutions

Maximum total uptake of the vase solution (74.74 and 75.22 ml, respectively) and vase life of flowers (10.31 and 10.41 days, respectively) and minimum pH of the vase solution (6.84 and 6.87, respectively) were recorded with the flowers treated with the treatment S₂ i.e. 4 % sucrose, whereas, the total uptake (50.49 and 52.29 ml, respectively) and vase life of flower (7.92 and 8.07 days, respectively) were registered to be minimum, while pH of vase solution was recorded maximum (7.87 and 7.89, respectively) under the control treatment S₃ during both the years of study. The sugar in the vase solution might have replaced the depleted endogenous carbohydrates utilized during the post harvest life of the flowers. Sucrose also acts as a respiratory substrate and it accumulates in the flower tissues. This accumulated sugar might have increased its osmotic concentration and it would have helped to improve the flowers ability to absorb more water and maintain the turgidity and thereby increase vase life of flower. Similar result has also been recorded by Somavanshi (2007) in chrysanthemum.

Interaction effect of varieties and vase solutions

The treatment combination V₃S₂ i.e. variety Phule Ganesh + 4 % sucrose was found to be superior over all the treatment combinations in respect of total uptake of the vase solution (79.10 and 78.73 ml, respectively), vase life of flower (10.87 and 10.85 days, respectively) and pH of vase solution (6.72 and 6.78, respectively) during both the years of experimentation, whereas, minimum total uptake (46.34 and 47.55 ml, respectively) of the vase solution and vase life of flower (7.45 and 7.57 days, respectively) with maximum pH of vase solution (7.90 and 7.92, respectively) were recorded with the treatment combination V₂S₃ i.e. PhuleTejas + control (water). The inferior results in

respect of total uptake of the vase solution and vase life of gladiolus flower due to the treatment combination V₂S₃ might have been recorded due to the combined effect of the gladiolus variety coupled with water as the vase solution. This might be due to the production of inferior quality flowers by the variety 'PhuleTejas' as compared to the other varieties, due to which an uptake of vase solution might have been decreased and ultimately reduced the turgidity of the flower spikes and thereby vase life of flower. Similarly, there was an appreciable decrease in the vase life with absence of sucrose in the vase solution which might have reduced the supply of carbohydrates when, the natural carbohydrates are depleted. Similar results are obtained by Bhattacharjee (1998) and Singh *et al.* (2003) in rose cut flowers.

Conclusion

Thus, it can be concluded from the present experiment that, to increase the post harvest life of gladiolus cut flowers it will be beneficial to keep the cut flowers of variety Phule Ganesh in the vase solution of sucrose at 4 % concentration immediately after harvesting.

References

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Table 1. Influence of varieties and vase solutions on vase life parameters of gladiolus

Treatments	Total uptake of solution (ml)		pH of vase solution		Vase life (days)	
	I Year	II Year	I Year	II Year	I Year	II Year
Main factor – Varieties (V)						
V₁ – PhuleNeelrekha	64.39	66.71	7.22	7.22	9.26	9.45
V₂ – PhuleTejas	59.13	60.01	7.30	7.31	8.66	8.86
V₃ – Phule Ganesh	68.12	68.95	7.16	7.19	9.75	9.84
Sub- factor – Vase solution (S)						
S₁ – 2% sucrose	66.42	68.16	6.96	6.95	9.44	9.67
S₂ – 4% sucrose	74.74	75.22	6.84	6.87	10.31	10.41
S₃ – control (water)	50.49	52.29	7.87	7.89	7.92	8.07

Table 2. Interaction effect of varieties and vase solutions on vase life parameters of gladiolus

Treatment combinations	Total uptake of vase solution (ml)		pH of vase solution		Vase life (days)	
	I Year	II Year	I Year	II Year	I Year	II Year
V₁S₁	67.20	69.53	6.97	6.94	9.50	9.77
V₁S₂	75.49	77.60	6.81	6.85	10.25	10.38
V₁S₃	50.50	53.01	7.87	7.89	8.02	8.20
V₂S₁	61.43	63.14	7.01	7.01	8.73	9.00
V₂S₂	69.62	69.34	6.98	7.00	9.80	10.00
V₂S₃	46.34	47.55	7.90	7.92	7.45	7.57
V₃S₁	70.64	71.81	6.91	6.90	10.08	10.23
V₃S₂	79.10	78.73	6.72	6.78	10.87	10.85
V₃S₃	54.62	56.32	7.84	7.87	8.30	8.43

