

EFFECT OF CHEMICAL FLORAL PRESERVATIVES ON VASE LIFE OF CUT FLOWERS OF GERBERA CV. SUNCITY

R. Amith¹, Ravishankar M. Patil^{2*} and V. Chikkasubbanna²

¹Department of Horticulture, Karnataka State

²University of Horticultural Sciences, Bagalkot, Karnataka, India.

*E-mail: revishankar.horti@gmail.com

ABSTRACT : Gerbera cv. Suncity was subjected to twelve different treatment combinations against control to evaluate vase life and quality. Treatment with 200ppm Aluminium sulphate + 4% sucrose + 200 ppm 8-HQS + 100ppm Silver thiosulphate showed significant beneficial effect in extending the vase life of the cut flower to 10 (9.5) days, as against 7 (7.47) days of vase life in control. Presence of microbes (*Bacillus spp.* and *Pseudomonas spp.*) was also recorded less on treated cut flower stems over control.

Keywords : Gerbera, cut flower, STS, HQS, aluminium sulphate, AgNO₃.

Gerbera is an elegant garden flower of immense value. They are a real attraction in the garden with their star like flowers of varying colour shades. Flowers borne terminally on slender long stems, and form effective, colourful flower borders or beds. The first scientific description of a Gerbera was made by J.D. Hooker in Curtis's Botanical Magazine in 1889, when he described *Gerbera jamesonii*, a South African species also known as Barberton Daisy. Addition of chemical floral preservatives to the holding solution has been recommended (Vaidya and Collis, 6) to prolong the vase life of cut flowers. Keeping the view in mind, present study was conducted to determine the effects of different chemicals in extending vase life of gerbera flowers.

MATERIALS AND METHODS

The present investigation was carried out at Division of Horticulture, UAS Bengaluru during 2009-10. Flowers selected for the experiment were harvested when their outer ray florets were completely elongated or when outer two rows of disc florets were perpendicular to the flower stalk. Flowers were carefully brought to the laboratory without causing any damage and they were kept in clean water. Then they were imposed with treatments.

Flowers were sorted out for uniform head size so as to maintain uniformity within the replication. About an inch (2.5 cm) of basal portion of stem was cut to evaluate for the presence of bacteria. Then stems were cut to a uniform length of 50cm and each flower stalk was placed in 500ml bottle containing 250 ml of aqueous solutions of different chemical preservatives used individually or in combination as detailed (Table 1)

in each experiment or 250 ml of distilled water. Distilled water was used to increase experimental variability. Observations on water uptake, water lost due to transpiration, water balance, fresh weight of the flower and vase life were recorded.

Plate count technique was adopted to estimate the presence of bacteria. Stem pieces of 2.5 cm were taken in 100 ml sterile water and placed in a shaker for 10 minutes. Afterwards serial dilution was made up to 10⁻⁷. The dilutions of 10⁻⁵, 10⁻⁶ and 10⁻⁷ were plated on nutrient agar for presence or absence of bacteria. Bengal agar was used to find out the presence of different bacteria. Under each dilution, three plates were used by making with plus symbol and presence of microorganisms was recorded with plus. More plus indicates higher density of microorganisms.

The experiment was laid out in a single factorial design with three replications. The mean data on various parameters recorded during the period of study were subjected to statistical analysis as per the procedure of Sundarraj *et al.* (5).

RESULTS AND DISCUSSION

Gerbera cv. Suncity cutflowers recorded maximum cumulative water uptake of 46.33 g/fl with treatment combination of 200 ppm sodium benzoate + 4% sucrose + 200 ppm 8- HQS followed by 44.0 g/fl with treatment combination of 100ppm silver nitrate + 6% sucrose + 400 ppm 8-HQS against other treatments and control (22.33g/fl). A significant influence was noticed on water uptake of gerbera by sodium benzoate treatments in combination with sucrose and germicide as compared to control (Table

1). This might be due to inhibiting bacterial blockage by improving water uptake (Vaidya and Collis, 7) minimizing loss in fresh weight.

confirming to the reports of Chand *et al.* (1) in rose and Shigeru *et al.* (4) in carnation.

Table 1 : Effect of chemical floral preservatives on vase life of cut flowers of gerbera cv. Suncity.

Treatment	Water uptake	Water Loss	uptake :loss ratio	Water balance	Fresh weight	Vase life
T ₁ : 200ppm Aluminum sulphate +4% sucrose + 200 ppm 8-HQS	37.00	44.00	0.84	-7.0	21.67	8.03
T ₂ : 400ppm Aluminum sulphate +6% sucrose + 400 ppm 8-HQS	36.33	41.33	0.88	-5.0	23.33	8.20
T ₃ :T ₁ + 100ppm Silver thiosulphate	34.67	39.67	0.87	-5.0	26.00	8.30
T ₄ :T ₂ + 150ppm Silver thiosulphate	30.33	36.00	0.84	-5.7	23.67	8.40
T ₅ :200ppm Sodium benzoate +4% sucrose + 200 ppm 8-HQS	46.33	54.33	0.85	-8.0	38.33	9.50
T ₆ :300ppm Sodium benzoate + 6% sucrose + 400 ppm 8-HQS	40.67	46.67	0.87	-6.0	27.67	8.63
T ₇ :T ₅ + 100ppm Silver thiosulphate	39.33	45.33	0.87	-6.0	30.33	9.10
T ₈ :T ₆ + 150ppm Silver thiosulphate	38.00	44.00	0.86	-6.0	33.00	8.30
T ₉ :50ppm Silver nitrate + 4% sucrose + 200 ppm 8-HQS	36.67	42.67	0.86	-6.0	36.00	8.40
T ₁₀ :100ppm Silver nitrate + 6% sucrose + 400 ppm 8-HQS	44.00	52.00	0.85	-8.0	36.33	9.03
T ₁₁ : T ₉ + 100ppm Silver thiosulphate	37.67	43.67	0.86	-6.0	37.00	9.20
T ₁₂ :T ₁₀ +150ppm Silver thiosulphate	34.33	40.33	0.85	-6.0	36.33	8.70
T ₁₃ : Control (Distill water)	22.33	28.33	0.79	-6.0	21.33	7.47
CD (P=0.05)	1.34	1.23	0.09	0.3	1.08	0.054

The maximum cumulative water loss of 54.33 g/fl was recorded in flowers treated with 200 ppm sodium benzoate + 4% sucrose + 200 ppm 8- HQS followed by 52.00 g/fl with treatment combination of 100ppm silver nitrate + 6% sucrose + 400 ppm 8-HQS against other treatments and control (32.00 g/fl). Flowers treated with sodium benzoate in combination with 8-HQS showed water loss but still recorded a long vase life compared to control. Dasgupta (2) and Yoo and Kim (8) had also documented similar findings which confirms present results.

All the treatments including control showed minimum water uptake to water loss ratio. However, among the treatments 400ppm Aluminum sulphate + 6% sucrose + 400 ppm 8-HQS recorded maximum water uptake to water loss (0.88) and it can be observed from the table that the cut flowers recorded a negative water balance in all the treatments including control. Results are in line of Chand *et al.* (1) and Yoo and Kim (8).

Maximum fresh weight of 38.33 g/fl was recorded in flowers treated with 200 ppm sodium benzoate + 4% sucrose + 200 ppm 8- HQS followed by 37.00 g/fl in 100ppm silver nitrate + 6% sucrose + 400 ppm 8-HQS and control recorded least fresh weight of 21.33g/fl

The significant increase in fresh weight was due to STS in vase solution containing aluminum sulphate. This is attributed to the inhibition of ethylene production during vase life and minimizing loss in fresh weight. Similar findings were also reported by Nair *et al.* (3) and Vaidya and Collis (6) in gerbera and Dendrobium, respectively.

Maximum vase life of 9.50 days was recorded in flowers treated with 200 ppm sodium benzoate + 4% sucrose + 200 ppm 8- HQS and vase life of 9.20 days was observed in treatment 100ppm silver nitrate + 6% sucrose + 400 ppm 8-HQS and control recorded lowest vase life of 7.47 days.

Presence of bacteria in the basal stem portion of cut gerbera

Data with respect to the presence of bacterial presence in the basal stem segment of cut gerbera cultivars is presented in Table 2. The basal cut stems of size 2.5 cm were taken and subjected to microbial examination in all the cultivars. From the table, it is evident that the basal stem portion recorded the presence of *Pseudomonas* and *Bacillus*. They were found more in control as compared to the other treatments.

Table 2 : Bacterial presence in the basal stem segment of cut flowers of gerbera cv. Suncity.

Treatment	<i>Bacillus spp.</i>	<i>Pseudomonas spp.</i>
200 ppm Sodium benzoate + 4% sucrose + 200 ppm 8-HQS	++	++
Control	++++	++++

Conclusion

The best flower longevity was recorded in the treatment 200 ppm sodium benzoate + 4% sucrose + 200 ppm 8- HQS preservative solution and the lowest vase life was recorded from cut flowers treated with water. Generally, it can be concluded that use of Sodium benzoate+ sucrose + 8-HQS preservative solution for flower longevity and maintaining post-harvest characteristics of Gerbera cv. Suncity cut flowers.

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