

## Original Research Article

### Studies on Vase Life of Tuberose (*Polianthes tuberosa* L.) varieties by Use of Aluminium Sulphate

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#### ABSTRACT

The experiment was conducted at College of Horticulture, Dapoli, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Dist- Ratnagiri (M.S.) during 2019-20 to study the vase life of cut spikes of different varieties of tuberose (*Polianthes tuberosa* L.) by use of Aluminium Sulphate @30ppm. The varieties were studied for various vase life attributes. The experiment was conducted in a randomized block design with three replications. In this experiment 9 tuberose varieties were studied viz., Local Single, Prajwal, ArkaNirantara, Phule Rajani, Shringar, Local Double, Hyderabad Double, Suvasini, Phule Rajat. From the present investigation it was observed that there was a significant variation among the varieties for vase life attributes. Aluminium Sulphate application @30ppm resulted in maximum number of florets opened per spike in the variety Phule Rajani and Hyderabad Double (21.00). The variety Local Double recorded maximum percent florets opened per spike (84.32 %), uptake of solution (79.33 ml) and vase life (17 days).

#### Keywords

Tuberose,  
Varieties, Vase life

#### Introduction

Tuberose (*Polianthes tuberosa* Linn.) is one of the most popular cut flowers. Tuberose belongs to family Amaryllidaceae. Tuberose is a native of Mexico from where it spreads to other parts of the world. In the orient white goes for virtue and purity, tuberose is much adored for its colour, elegance and fragrance. Tuberose occupies a very selective and special position to flower loving people. It has a great economic potential for cut flower trade and essential oil industry (Sadhu and Bose, 1973). Tuberose is a half-hardy bulbous

perennial crop multiplying itself through bulb and bulblets. Roots are mainly adventitious and shallow, the leaves are long, narrow, linear grass like, green and arise in rosette, the flowers have a funnel shaped perianth, waxy white in colour and born in a spike. Tuberose spikes bear pairs of florets which open acropetally (i.e., from base to top of the spike). The long spikes of tuberose are used for vase decoration and bouquet preparation and the florets for making artistic garlands, ornaments and buttonhole use. The flowers emit a delightful fragrance and the source of tuberose oil. The natural flower oil of

tuberose is one of the most expensive perfumer's raw materials. There are 4 types of tuberose named on the basis of number of rows of petals they bear. They are Single, Semi-double, Double and Variegated.

In India the commercial cultivation of tuberose is confined mainly to West Bengal, Karnataka, Tamil Nadu, Maharashtra and Andhra Pradesh. Its cultivation in India is gaining popularity due to ease of cultivation, low input, wide adaptability, multipurpose use and higher return. This traditional flower crop of India blooms throughout the year. Prolonging vase life of cut flower is one of the most important aspect fields of floristry (Umebese *et al.*, 2010). Keeping quality is an important parameter for evaluation of cut flower quality, for both domestic and export markets. The use of preservative solution is considered a common practice for the storage of floral stems. These treatments allow controlling pathogen development and maintenance of respiration balance (Arboleda, 1993). Aluminium Sulphate, a germicide has been found to reduce petal pH to stabilize the anthocyanin of petals to acidify the holding solution, to reduce bacterial and fungal growth (Halevy and Mayak, 1981) and it is reported that Aluminium Sulphate extended the vase life and improved water relation of cut flowers by antimicrobial effect (Ichimura and Ueyama, 1998). The techniques of prolonging the vase life of flowers will be a great asset to the growers and end users.

### **Materials and Methods**

The experiment was conducted at College of Horticulture, Dapoli, Dr.Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Dist-Ratnagiri (M.S.) during 2019-20 to study the vase life of cut spikes of different varieties of tuberose (*Polianthes tuberosa* L.) by use of Aluminium Sulphate @30ppm. The

experiment was conducted in a randomized block design with three replications. In this experiment 9 tuberose varieties were studied *viz.*, Local Single, Prajwal, ArkaNirantara, Phule Rajani, Shringar, Local Double, Hyderabad Double, Suvasini, Phule Rajat. These varieties grown in the field, package of cultural practices were followed during field experiment. For vase life study of different varieties of tuberose the cut spikes were harvested early in the morning with the help of secateur when basal two florets started opening and placed in bucket containing water and were brought to the laboratory. Spikes of uniform size and length were selected and stem ends were cut about 1 cm and placed in conical flasks which contain 30ppm Aluminium Sulphate solution. Every day the solution changed and stem ends were recut about 1 cm with the help of knife to prevent vascular blockage. Various vase life attributes like number of florets opened per spike, percent florets opened, uptake of solution and vase life were recorded. When 50% florets wilted, it was considered to be end of the vase life. The data was statistically analyzed by standard method of analysis of variance as given by Panse and Sukhatme (1985) and the results are presented as under.

### **Results and Discussion**

#### **Vase life parameters**

##### **Number of florets opened per spike**

The observations regarding number of florets opened per spike of nine tuberose varieties are presented in Table 1. Number of florets opened per spike were obtained maximum (21.00) in V<sub>4</sub> Phule Rajani and V<sub>7</sub> Hyderabad Double which was at par with V<sub>2</sub> Prajwal, V<sub>6</sub> Local Double (20.00) and V<sub>5</sub> Shringar (19.00) whereas minimum number of florets opened per spike (13.00) were obtained in V<sub>1</sub> Local Single which was at par with V<sub>3</sub>

ArkaNirantara, V<sub>8</sub> Suvasini (16.00) and V<sub>9</sub> Phule Rajat (17.00). The results obtained are in accordance with those reported by the Fernandes (2003).

### Percent florets opened

The observations regarding percent florets opened per spike of nine tuberose varieties are given in Table 1. The percent florets opened per spike were maximum (84.32 %) in V<sub>6</sub> Local Double which was at par with V<sub>5</sub> Shringar (82.02 %), V<sub>9</sub> Phule Rajat (80.61 %), V<sub>4</sub> Phule Rajani (77.51 %) and V<sub>2</sub> Prajwal (77.02 %) whereas minimum percent florets opened per spike (69.44 %) were recorded in V<sub>1</sub> Local Single which was at par with V<sub>8</sub> Suvasini (72.58 %), V<sub>3</sub> ArkaNirantara (75.83 %) and V<sub>7</sub> Hyderabad Double (75.84 %). Similar results were reported by Fernandes (2003).

### Uptake of holding solution

The observations regarding uptake of holding solution of nine tuberose varieties are given

in Table 1. The maximum uptake of solution (79.33 ml) was observed in V<sub>6</sub> Local Double variety which was at par with V<sub>2</sub> Prajwal (75.33 ml) and followed by V<sub>7</sub> (68.67 ml), V<sub>4</sub> (66.00 ml), V<sub>9</sub> (64.00 ml) and V<sub>8</sub> (57.33ml) while minimum uptake of solution (46.33 ml) was observed in V<sub>5</sub> Shringar which was at par with V<sub>1</sub> Local Single (51.00 ml) and V<sub>3</sub> ArkaNirantara (51.67 ml). The results obtained are in accordance with those reported by the Fernandes (2003).

### Vase life (days)

The observations regarding uptake of holding solution of nine tuberose varieties are given in Table 1. The maximum vase life (17.00) days was recorded in V<sub>6</sub> Local Double which was at par with V<sub>2</sub> Prajwal (16.00) and followed by V<sub>7</sub> (14.00) whereas minimum vase life (11.00) days was recorded in V<sub>5</sub> Shringar which was at par with V<sub>1</sub> Local Single, V<sub>3</sub> ArkaNirantara, V<sub>8</sub> Suvasini (12.00), V<sub>4</sub> Phule Rajani and V<sub>9</sub> Phule Rajat (13.00). Similar results were reported by Fernandes (2003).

**Table.1** Performance of tuberose varieties with respect to vase life parameters

Treatments	Number of florets opened per spike (no.)	Percent florets opened (%)	Uptake of holding solution (ml)	Vase life (days)
V <sub>1</sub> -Local Single	13.00	69.44	7.77	12.00
V <sub>2</sub> -Prajwal	20.00	77.02	2.59	16.00
V <sub>3</sub> -Arka Nirantara	16.00	75.83	7.77	12.00
V <sub>4</sub> -Phule Rajani	21.00	77.51	2.59	13.00
V <sub>5</sub> -Shringar	19.00	82.02	7.77	11.00
V <sub>6</sub> -Local Double	20.00	84.32	2.59	17.00
V <sub>7</sub> -Hyderabad Double	21.00	75.84	7.77	14.00
V <sub>8</sub> -Suvasini	16.00	72.58	2.59	12.00
V <sub>9</sub> -Phule Rajat	17.00	80.61	7.77	13.00
S.E m±	1.37	2.59	2.83	0.93
C.D @ 5%	4.10	7.77	8.47	2.78

From the above findings the data revealed that Aluminium Sulphate @ 30 ppm has significantly influence the vase life of Local Double variety among the nine varieties of tuberose under study.

These results may be attributed to uptake of solution which was maximum in Local Double variety as compared to other varieties during the course of investigation.

The uptake of solution may have improved the source and sink relationship which ultimately influences vase life of tuberose parameters like number of florets opened per spike, per cent florets opened, uptake of holding solution and vase life.

Further the use of chemical namely *viz.*, Aluminium Sulphate which acidifies the solution and prevents the clogging due to bacterial growth where the injury or cut was given with the help of secateur during harvesting. All above evidences may be related to improve the vase life of tuberose in cv. Local Double.

Vase life studies on cut spikes of tuberose cultivars revealed that variety 'Local Double' performed well among the various varieties related to vase life parameters like number of florets opened per spike, percent florets opened, uptake of holding solution and vase life was found maximum by use of chemical *viz.*, Aluminium Sulphate @ 30 ppm.

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