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## Evaluation of tuberose cultivars for post-harvest characters

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**Abstract**

An experiment was carried out growing 14 tuberose varieties at Horticulture Research Farm, Department of Horticulture, Banaras Hindu University, Varanasi. All the post-harvest observations were recorded in Post-harvest Laboratory, Department of Horticulture, Institute of Agricultural Sciences, Banaras Hindu University. The experiment was laid out in Randomized Block Design with three replications. The results of the experiment were revealed that cv. Vaibhav resulted maximum weight of spike at first, third and sixth day, maximum days taken to withering of first floret and maximum days to 50% flower opening. Whereas, Germplasm ACC NO-7 exhibited minimum weight of spike at first, third, sixth and ninth day, minimum weight of spike after withering, minimum water uptake, minimum number of florets open on first day and minimum vase life. Maximum water uptake was found in cv. Phule Rajani while maximum vase life was recorded in cvs. Calcutta Single and Phule Rajani. Earliest withering of first floret was observed in cv. Hyderabad Single and highest percentage of opened florets was observed in cv. GKTC-4.

**Keywords:** tuberose, cultivars, post-harvest, vase life

**Introduction**

Tuberose (*Polianthes tuberosa* L.) belongs to family Amaryllidaceae and the genus contains about 14 species. It is originated from Mexico, spread to different parts of the world. It is a prominent bulbous ornamental flowering plant of tropical and subtropical areas (Tiwari and Singh, 2002). During 16<sup>th</sup> century tuberose spread to different part of world from the place of origin (Singh and Sisodia, 2017) [4, 7]. Tuberose saturates the surrounding with its sweet fragrance. Numerous lanceolate leaves is found in tuberose which is green, narrow, long and arise in rosette. The tuberose flowers are funnel shaped, waxy white and borne in spike. Valuable aromatic oil is obtained from the florets of tuberose which is an expensive raw materials for the perfume industry. The essential oil of tuberose is one of the most sought after and expensive perfumery raw material, exported to the other countries at higher price (Rao and Sushma, 2015; Singh, 2006) [2, 3]. The loose flowers of tuberose are used for making artistic garlands, buttonholes and gajras and for extraction of essential oil. It is also popular as a cut flower, used in floral arrangements, table decoration and in bouquets. The single florets of tuberose can provide fragrance to bouquets and boutonnières. The spikes of tuberose has long vase life and can be transported for long distance. Present experiment was conducted to evaluate the performance of various cultivars for post-harvest parameters with the objective to find out the cultivars which can remain fresh for long duration, long vase life and for long distance transportation.

**Materials and Methods**

Present investigation was conducted to evaluate the post-harvest performance of 14 tuberose varieties which were grown at Horticulture Research Farm, Department of Horticulture, Banaras Hindu University, Varanasi, U.P. All the post-harvest observations were recorded in Post-harvest Laboratory, Department of Horticulture during the year 2017-2018. The experiment consisted of 14 varieties of tuberose viz., Shringar, Calcutta Double, Vaibhav, GKTC-4, Sikkim Selection, Prajwal, Hyderabad Single, Phule Rajani, ACC NO-9, Pune Local Single, Arka Nirantara, ACC NO-7, Calcutta Single and Mexican Single. The experiment was laid out in Randomized Block Design with three replications. For post-harvest studies the spikes were harvested when two or three florets were opened. After cutting spikes were kept in bucket containing water to avoid wilting of florets. A slant cut was given to the spikes and kept in conical flask containing 250 ml distilled water. The observations were recorded on different post-harvest parameters (viz., weight of spike at first day, weight of spike at third, sixth and ninth day, weight of spike after withering, total water uptake, florets open on first day, days to withering of first floret, days to 50% flower opening, percentage of opened florets and vase life).

## Results and Discussion

Various varieties of tuberose were shown significant variation for different post-harvest parameters (Table 1 and 2 and Fig. 1). Maximum initial weight of spike was found in variety Vaibhav (83.30 g) which found statistically at par with cv. Calcutta Double while minimum initial weight of spike was recorded in germplasm ACCNO-7 (23.66 g). The maximum weight of spike at third and sixth day was found in variety Vaibhav (78.02 g and 70.13 g, respectively) which was statistically at par with cv. Calcutta Double while minimum weight of spike at third and sixth day was recorded in cv. ACC NO-7 (24.89 g and 16.22 g, respectively). Cultivar Calcutta Double (58.85 g) was exhibited maximum weight of spike at ninth day which was found statistically at par with cultivar Vaibhav, while minimum weight of spike at ninth day was recorded in cv. ACC NO-7 (12.99 g). After withering maximum weight of spike was found in germplasm Calcutta Double (37.41 g) followed by cvs. Phule Rajani, Prajwal and ACC NO-9 which was found statistically significant to all varieties. However, minimum weight of spike after withering was recorded in germplasm ACC NO-7 (10.06 g). Similar result was earlier investigated by Singh *et al.* (2013a)<sup>[6]</sup> and Singh *et al.* (2013b)<sup>[5]</sup> in tuberose and gladiolus cultivars, respectively. Maximum water uptake by spikes was found in cv. Phule Rajani (33.33 ml) which was found statistically at par with cvs. Sikkim Selection, Prajwal, Calcutta Single and Shringar. Genotype ACC NO-7 was recorded minimum water uptake (9.33 ml). The difference in water uptake was reported by Kumar *et al.* (2014)<sup>[1]</sup> and Singh *et al.* (2017)<sup>[4, 7]</sup>, in different tuberose varieties. The maximum number of opened florets on first day was observed in cv. Shringar (4.33) which was statistically at par with cvs. Pune Local Single, Mexican Single, Calcutta Double, GKTC-4 and Arka Nirantara while,

minimum number of opened florets on first day was found in cvs. ACC NO-7 (1.33) and Hyderabad Single (1.33). The variation in number of florets opened at first day was noticed by Kumar *et al.* (2014)<sup>[1]</sup> and Singh *et al.* (2017)<sup>[4, 7]</sup>. Cultivar Vaibhav (3.67 days) was observed maximum days taken to withering of first floret which was statistically at par with cv. Prajwal whereas, earliest withering of first floret was observed in cv. Hyderabad Single (1.33 days). The variation in days to withering of first florets was noticed by Kumar *et al.* (2014)<sup>[1]</sup> and Singh *et al.* (2017)<sup>[4, 7]</sup>, in different tuberose varieties. The maximum days taken to 50% flower opening was observed in variety Vaibhav (12.00 days) followed by cvs. Calcutta Double (10.00 days), Phule Rajani (8.67 days) and Calcutta Single (7.67 days) which was found statistically significant to other tuberose varieties. While, minimum days taken to 50% flower opening was found in variety GKTC-4 (5.33 days). The variation in 50% flower opening was noticed by Singh *et al.* (2013a)<sup>[6]</sup> and Singh *et al.* (2017)<sup>[4, 7]</sup>, in different cultivars of tuberose. Maximum percentage of opened florets was observed in variety GKTC-4 (82.72%) which was statistically at par with cvs. Phule Rajani, Calcutta Single, Pune Local Single and Shringar. However, minimum percentage of opened florets was found in genotype Sikkim Selection (59.18%). Similar results are also in line with the findings of Singh *et al.* (2013a)<sup>[6]</sup> and Singh *et al.* (2017)<sup>[4, 7]</sup>. Maximum vase life of spikes was recorded cvs. Calcutta Single (19.67 days) and Phule Rajani (19.67 days) which were statistically at par with cvs. Calcutta Double, Vaibhav and Prajwal. The minimum vase life was recorded in variety ACC NO-7 (12.67 days). Similar result of varietal difference was experimentally confirmed by Singh *et al.* (2013b)<sup>[5]</sup> in gladiolus and by Singh *et al.* (2017)<sup>[4, 7]</sup>, in tuberose cultivars.

**Table 1:** Performance of tuberose varieties for post-harvest parameters

Treatment	Initial weight of spike (g)	Weight of spike after withering (g)	Florets open on 1 <sup>st</sup> day	Days to withering of first floret	Days to 50% flower opening
Shringar	48.10	21.92	4.33	2.33	6.67
Calcutta Double	79.12	37.41	3.00	3.00	10.00
Vaibhav	83.30	22.32	2.33	3.67	12.00
GKTC-4	36.00	20.83	3.00	1.67	5.33
Sikkim Selection	36.63	24.63	2.67	2.00	7.33
Prajwal	48.75	27.00	2.67	3.33	6.67
Hyderabad Single	25.86	14.61	1.33	1.33	7.33
Phule Rajani	41.28	29.74	1.67	2.67	8.67
ACC NO-9	43.11	26.51	2.67	2.33	5.67
Pune Local Single	34.25	14.52	4.00	2.67	7.33
Arka Nirantara	40.15	23.35	3.00	1.67	6.33
ACC NO-7	23.66	10.06	1.33	2.00	6.00
Calcutta Single	36.40	21.63	2.67	2.33	7.67
Mexican Single	36.84	18.41	3.33	2.67	7.00
C.D. at 5%	8.16	6.69	1.58	0.79	1.25

**Table 2:** Evaluation of tuberose varieties for post-harvest characters

Treatment	Weight of spike at 3 <sup>rd</sup> day (g)	Weight of spike at 6 <sup>th</sup> day (g)	Weight of spike at 9 <sup>th</sup> day (g)	Total water uptake (ml)	Vase life (days)
Shringar	38.61	32.81	27.51	29.33	13.67
Calcutta Double	75.64	68.47	58.85	20.00	18.33
Vaibhav	78.02	70.13	58.16	13.33	18.00
GKTC-4	35.03	31.01	28.14	15.33	16.33
Sikkim Selection	37.40	33.58	29.59	32.00	17.00
Prajwal	55.07	45.49	37.36	32.00	17.67
Hyderabad Single	28.25	24.53	21.61	16.67	16.33
Phule Rajani	50.47	45.06	38.57	33.33	19.67
ACC NO-9	44.55	39.18	32.97	26.00	15.00
Pune Local Single	29.59	25.23	20.19	21.33	14.00

Arka Nirantara	36.67	32.39	27.73	18.00	15.33
ACC No-7	24.89	16.22	12.99	9.33	12.67
Calcutta Single	38.74	35.28	29.93	32.00	19.67
Mexican Single	35.59	30.39	25.61	24.00	14.67
C.D. at 5%	11.39	10.89	10.41	3.99	2.64

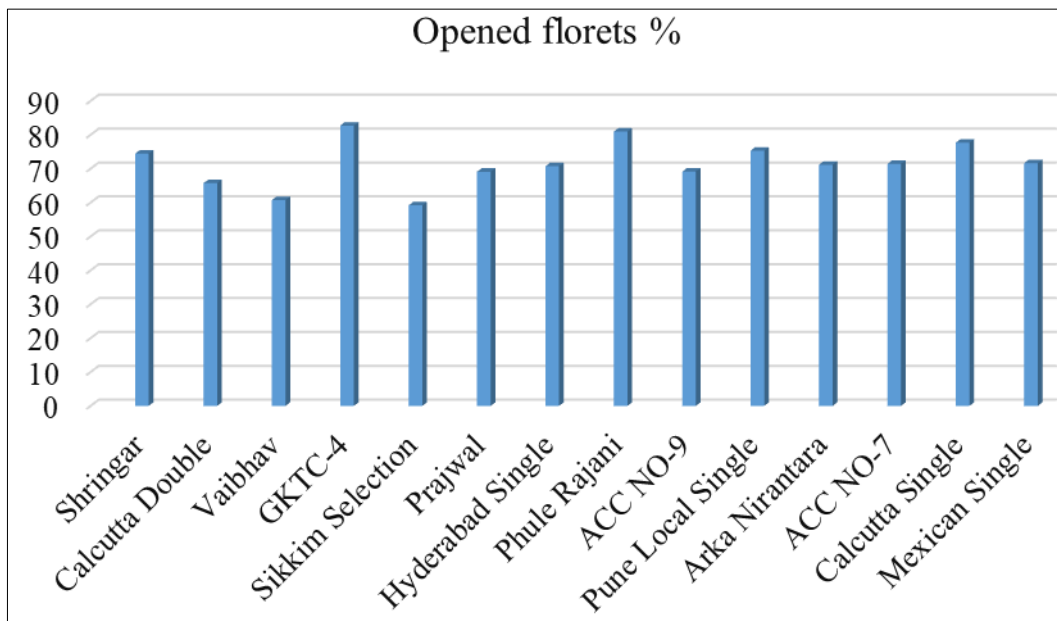


Fig 1: Evaluation of tuberose cultivars for percentage of opened florets

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