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Performance of different tuberose cultivars for flowering parameters under Malwa Plateau of Madhya Pradesh

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Abstract

An experiment entitled “Performance of different tuberose cultivars for flowering parameters under Malwa Plateau of Madhya Pradesh” was carried out during 2019-20 at RVSKVV – College of Horticulture, Mandsaur (MP). Experiment were consist 10 cultivars and these treatments were replicated three times in Randomized Block Design and analyzed. Data raveled that V₇ show the best performance with respect of most of the parameters i.e. spike length, spike girth, rachis length, number of florets per spike, number of spike per plant, length of florets, number of open florets per spike, percentage of open florets per spike, fresh weight of spike and dry weight of spike, while the minimum days taken to spike emergence, days taken to opening of first floret and maximum diameter of florets was observed under the cultivar V₁ Arka Nirantra.

Keywords: Tuberose, cultivars, flowering parameters

Introduction

Tuberose (*Polianthes tuberosa* L.) is one of the most important cut flower and loose flower crop of India. It comes under genus *Polianthes* and having 14 species out of which *P. tuberosa* is commercially cultivated and it belongs to the family Amaryllidaceae. It is native to Mexico from where it's spread to different parts of the planet during 16th century. The tuberose is derived from Greek word ‘*Polios*’ that means Shiny or white and ‘*Anthos*’ meaning flower. Tuberose having haploid chromosome number 30. It is commonly known as Rajanigandha in Hindi and in Kannada it is known as Sugandharaja.

Tuberose is an important perennial bulbous crop. This is having shallow and adventitious root system. In tuberose the stem is modified into bulbs and bulblets which are used for the propagation purpose. The colour of the leaves is light green (Singh *et al.*, 2018)^[13]. The inflorescence of tuberose is called spike. This will be of 25±10 pairs of florets which usually open from bottom to top i.e. acropetal. Flowers are usually inverted cone shape and are highly fragrant, the flowers are white in colour and having waxy appearance. They have about 25 mm long stamens, which are 6 in numbers and ovary posses 3 locules which contains numerous ovules. The fruit of tuberose is called capsule (Naik *et al.*, 2018)^[7].

Tuberose crop is commercially grown for the ornamental, aesthetic and oil extraction purpose. It is having more demand in international market for its fragrance for making perfumes. In India it is having a major role in making flower arrangement, bouquets, indoor decoration, and garlands and also used as cut flower. Tuberose may be used in religious functions as well as auspicious occasions. It grows well in tropical and subtropical climatic condition. Well drained loamy and sandy loamy soils are best suitable for tuberose cultivation. The soil temperature around 20 °C suitable for maximum root growth (Singh and Sisodia, 2017)^[12]. Optimum soil pH for flower is 5.5-6.0 (Ganesh *et al.*, 2013)^[11]. Tuberose is propagated through bulbs. In our country mostly planted in the month of February–March in plain regions where as in hills it is planted in April-May. (Singh and Sisodia, 2017)^[12].

There are mainly two type's varieties in tuberose, which includes single and double type the single type varieties bear pure white flowers with just one row of corolla segment, whereas double type flowers are white in colour with red ting at bud stage, the corolla segment of more than 3 rows (Kamei & Singh, 2019)^[5]. Flower of the ‘Single’ cultivars are extra aromatic than ‘Double’ kind and incorporate 0.08 to 0.14% concrete that is utilized in high-grade perfumes. (Safeena & Thangam, 2019)^[14].

There is good demand for tuberose concrete and absolute in worldwide market and fetches a very good price. Its important oil is exported at France, Italy and different countries. Hence, tuberose is appreciably cultivated as supply of raw material for perfume industry. (Gogoi & Talukdar, 2019)^[2]. There are few cultivars of tuberose under cultivation viz., Arka Nirantra, Calcutta Single, Calcutta Double, GK TC-4, Hyderabad Single and Hyderabad Double, kahikuchi Single, Kahikuchi Double, Phule Rajani, Vaibhav, Prajwal and Sikkim Selection-6.

Materials and Methods

The present experiment was conducted during May 2019 to March 2020 at the Department of Floriculture and Landscape Architecture, K.N.K. College of Horticulture, Mandasaur (M.P.). The 10 cultivars namely Arka Nirantra, Calcutta Single, GK TC-4, Hyderabad Single, Mexican Single, Phule Rajani, Prajwal, Pune Local Single, Shringar, Sikkim Selection-6 were taken for the experiment. These treatments were evaluated under Randomized Block Design with three replications. All the cultural package of practices was adapted to grow a healthy crop. In each replication five plants were marked for observation. Data was recorded for various flowering parameters and statistically analyzed using the method of analysis of variance as described by Panse and Sukhatme (1985)^[8].

Results and Discussion

Spike length (cm)

It was found that the maximum length of spike (93.27 cm) was recorded in cv. Prajwal. However, the minimum length of spike (65.73 cm) was found in cv. Mexican Single. The variation in spike length might be due to genotypic differences and variation in different genotype as well as environmental interaction effects. The similar findings have also been reported by Ramachandrudu *et al.* (2009)^[10], Krishnamoorthy *et al.* (2014)^[4] and Prakash *et al.* (2015)^[9].

Spike girth (cm)

It was found that the maximum spike girth (1.04 cm) was recorded with cv. Prajwal, whereas the minimum spike girth (0.73 cm) was obtained with cv. Mexican Single and Hyderabad Single. Variation in spike girth in these varieties may be attributed to the inherent genetic character of individual cultivars and environmental factors. Similar research finding have been observed by Madhumathi *et al.* (2018)^[6].

Rachis length (cm)

The maximum rachis length (31.00 cm) was recorded with cv. Prajwal while, the minimum rachis length (18.33 cm) was recorded with cv. Sikkim Selection-6. The increase in rachis length may be attributed to the inherent genetic character of the particular cultivars and environmental factor. Mudhumathi *et al.* (2018) and Prakash *et al.* (2015)^[9] also found the similar results for rachis length.

Number of florets per spike

The maximum number of florets (48.87) was recorded in cv. Prajwal. While, the minimum number of florets per spike (30.20) was recorded by cv. GK TC-4. The variation in number of floret per spike might be due to genetic make-up of variety and environmental reciprocal action. Similar results were also reported by Prakash *et al.* (2018).

Number of spike per plant

The highest number of spike per plant (6.53) was found in cv. Prajwal. While, the lowest number of spike per plant was show in cv. Sikkim Selection-6 (3.07). The variation in number of spike per plant might be due to inherent capability of particular genotype as well as prevailing climatic conditions during growing period. Similar results were reported by Gogoi *et al.* (2020)^[3] and Singh *et al.* (2018)^[13].

Length of florets (cm)

The maximum florets length (6.27 cm) was found in cv. Prajwal. However, minimum length of florets (3.53 cm) was found in cv. Sikkim Selection-6. The variation in length of floret might be attributed to inherent genetic characters of the varieties and environmental conditions and the similar results have been observed by Prakash *et al.* (2015)^[9]. These results are confirmed by Ranchana *et al.* (2013)^[11].

Number of open florets per spike

The highest number of open florets per spike (39.87) was found with cv. Prajwal. While, lowest number of open florets (23.73) was founded in cv. GK TC-4. Variation in number of open florets / spike is governed by genetic make-up and due to the environmental condition during growth period. These results are confirmed by Singh *et al.* (2018)^[13].

Percent of open florets per spike (%)

The highest percent of open florets (89.33%) was observed in cv. Prajwal. However, lowest percent of open florets (66.44) was observed with cv. Sikkim Selection-6. The variation in percent of open florets per spike might be due to the genetic make-up and environmental condition. Similar variation in percent of open florets was also recorded by Singh *et al.* (2018)^[13].

Fresh weight of spike (g)

The maximum fresh weight of spike (94.33 g) was recorded in cv. Prajwal. While, the minimum fresh weight of spike (39.80 g) was recorded in cv. Shringar. The variation in fresh weight of spike might be due to genetic variation of genotype and also be due to environmental condition. Prakash *et al.* (2015)^[9] found the similar results for fresh weight of spike in tuberose.

Dry weight of spike (g)

The maximum dry weight of spike (6.20 g) was found in cv. Prajwal. However the minimum dry weight of spike (3.47 g) was found in cv. Mexican Single. The variation in dry weight of spike might be due to genetic make-up of the genotypes and environmental factors. The similar variation in weight of spike was also noticed by Prakash *et al.* (2015)^[9].

Days taken to spike emergence (days)

The early spike emergence was recorded (107.80 days) with cv. Arka Nirantra. While, the most delayed spike emergence was recorded with cv. Prajwal. The variation in days taken to spike emergence may be due to the genetic make-up of varieties and environmental reciprocal action. These results were advocated by Ramachandrudu *et al.* (2009)^[10] and Singh *et al.* (2018)^[13].

Days taken to opening of first florets

The earliest opening of first florets was recorded (128.30 days) with cv. Arka Nirantra While, the most delayed opening

of first florets (180.80 days) was observed in cv. Shringar. The variation in days taken to opening of first florets is might be due to the genetic make-up of genotypes and in addition to prevailing environmental conditions. Similar results have also been investigated by Prakash *et al.* (2015) [9] and Ramachandradu *et al.* (2009).

Diameter of florets (cm)

The highest floret diameter (4.63 cm) was found in cv. Arka Nirantra. While, the minimum diameter of floret (3.57 cm) was recorded in cv. Sikkim Selection-6. Variation in diameter of florets in these varieties might be attributed to the inherent genetic characters and environmental factors. Similar results were reported by Ranchana *et al.* (2013) [11].

Table 1: Performance of different tuberose cultivars for different flowering parameters

Treatments	Spike length (cm)	Spike girth (cm)	Rachis length (cm)	Number of florets per spike	Number of Spike per plant	Length of florets (cm)	Number of open florets per spike
V ₁ Arka Nirantra	80.60	0.95	25.67	34.80	3.53	5.73	30.00
V ₂ Calcutta Single	71.40	0.85	27.20	32.47	3.40	5.97	26.80
V ₃ GK TC-4	71.27	0.85	26.57	30.20	5.07	5.67	23.73
V ₄ Hyderabad Single	79.20	0.73	25.07	33.47	3.30	5.13	28.20
V ₅ Mexican Single	65.73	0.73	25.93	43.47	3.47	5.53	33.60
V ₆ Phule Rajani	89.60	0.82	26.47	40.20	5.83	5.50	35.33
V ₇ Prajwal	93.27	1.04	31.00	48.87	6.53	6.27	39.87
V ₈ Pune Local Single	75.93	0.89	23.47	39.47	4.13	6.17	34.33
V ₉ Shringar	77.60	0.78	27.60	41.27	4.93	4.97	36.87
V ₁₀ Sikkim Selection-6	92.93	0.79	18.33	45.53	3.07	3.53	32.47
S.Em. ±	3.91	0.04	1.48	3.56	0.44	0.15	2.37
C.D. at 5%	11.64	0.11	4.40	10.58	1.33	0.47	7.05

Table 2: Performance of different tuberose cultivars for different flowering parameters

Treatments	Percentage of open florets per spike (%)	Fresh weight of spike (g)	Dry weight of spike (g)	Days taken to spike emergence (days)	Days taken to opening of first florets	Diameter of florets (cm)
V ₁ Arka Nirantra	86.20	55.87	3.67	107.80	128.30	4.63
V ₂ Calcutta Single	82.59	65.27	4.03	119.00	138.30	3.73
V ₃ GK TC-4	78.57	49.20	4.33	129.27	147.67	4.40
V ₄ Hyderabad Single	83.43	60.53	5.67	136.40	159.33	3.90
V ₅ Mexican Single	77.29	56.47	3.47	136.80	164.33	3.60
V ₆ Phule Rajani	87.88	52.00	3.93	139.07	165.30	4.20
V ₇ Prajwal	87.56	94.33	6.20	156.10	178.90	4.13
V ₈ Pune Local Single	86.97	49.53	4.43	134.67	157.93	4.17
V ₉ Shringar	89.33	39.80	3.73	134.60	180.80	4.07
V ₁₀ Sikkim Selection-6	66.44	70.27	3.80	154.43	162.40	3.57
S.Em. ±	4.10	3.81	0.28	8.36	10.04	0.17
C.D. at 5%	12.19	11.32	0.84	24.85	29.85	0.50

Conclusion

On the basis of above finding it may be concluded that, under Malwa plateau of Madhya Pradesh conditions, cultivar Prajwal and Arka Nirantra were found the best with respect of different flowering parameters.

References

- Ganesh S, Soorianatha Sundaram K, Kannan M. Studies on effect of plant growth regulators and micronutrients on growth, floral characters and yield of tuberose (*Polianthes tuberosa* L.) cv. 'Prajwal'. The Asian Journal of Horticulture. 2013;8(2):696-700.
- Gogoi K, Talukdar MC. Assessment of Variation in Concrete Recovery and Chemical Constituents among the Tuberose Cultivars in Assam Condition. International Journal of Current Microbiology and Applied Sciences. 2019;8(2):1661-1667.
- Gogoi K, Talukdar MC. Field performance of dingle cultivars of tuberose for growth and floral characters under Assam condition. International Journal of Current Microbiology and Applied Sciences. 2020;9(4):1936-1941.
- Krishnamoorthy V. Assessment of tuberose (*Polianthes tuberosa*) Varieties for growth and yield characters. The Asian Journal of Horticulture. 2014;9(2):515-517.
- Kamei Zaikhuanlung, Singh Devi. Evaluation of different varieties of tuberose (*Polianthes tuberosa*) under Prayagraj (Allahabad) agro-climate conditions. International Journal of Chemical Studies. 2019;7(5):996-998.
- Madhumathi C, Bhargav V, Reddy DS, Sreedhar D, Lakshmi TN. Evaluation of tuberose genotype for vegetative, flowering and yield traits. International Journal of Chemical Studies. 2018;6(6):88-90.
- Naik BC, Kamble BS, Tirakannanavar S, Parit S. Evaluation of different genotype of tuberose (*Polianthes tuberosa* L.) for growth, flowering and yield characters. International Current Microbiology and Applied Science. 2018;7(7):4135-4141.
- Panse VG, Sukhatme PV. Statistical Methods for Agricultural Workers. Fourth edition. ICAR Publication, New Delhi, 1985.
- Prakash S, Arya JK, Singh RK, Singh KP. Varietal Performance of tuberose in Muzaffarnagar under western plain zone condition. The Asian Journal of Horticulture. 2015;10(1):149-152.
- Ramachandrudu K, Thangam M. Performance of tuberose (*Polianthus tuberosa* L.) cultivars in Goa. Journal of Horticulture Science. 2009;4(1):76-77.
- Ranchana P, Kannan M, Jawaharlal M. The assessment

- of genetic parameters, yield, quality traits and performance of single genotypes of tuberose (*Polianthes tuberosa* Lin.). *Advances in Crop Science and Technology*. 2013;1(3):1-4.
12. Singh AK, Sisodia A. *Textbook of Floriculture and Landscaping*. New India Publishing Agency, New Delhi, 2017,415.
 13. Singh A, Singh AK, Sisodia A, Padi M, Pal AK. Evaluation of tuberose cultivars for post-harvest characters. *Journal of Pharmacognosy and phytochemistry*. 2018;7(4):1310-1312.
 14. Safeena SA, Thangam M, Singh NP. Evaluation of Different Cultivars of Tuberose Under Humid agro Climatic conditions of Goa. *Journal Horticulture Science*. 2019;14(2):109-114.