Evaluation of single type tuberose (*Polianthes tuberosa* L) genotypes for vegetative and bulb attributes in pot culture

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ABSTRACT

Tuberose (*Polianthes tuberosa* L) is a species with a high demand as cut as well as loose flower. Present study was conducted to evaluate the vegetative and bulb parameters of potted plant. There were seven genotypes as treatments replicated thrice in a completely randomized design under All India Co-ordinated Research Project at the floriculture farm, ZARS, Ganeshkhind, Pune, Maharashtra during the year 2020-2021. These genotypes were studied for vegetative and bulb characters for ascertaining suitability as potted plant. The results indicated a significant variation among tuberose genotypes for almost all the attributes studied. For vegetative characters, the better performing genotypes were GK-T-E-2, GK-T-S-2 and Arka Sugandhi. GK-T-E-2 performed better for bulbs and bulblets production.

Keywords: Tuberose; single type; pot culture; bulb; bulblet

INTRODUCTION

Today, due to rapid urbanization and industrialization the land under agriculture and forestry is fast depleting. Thus with an urge to bring nature to the drawing room, the urban population is more inclined to purchase and grow plants in the houses which has opened the avenue for the large scale production of potted plants and their marketing. Pot culture is more appropriate method of production of ornamental plants in this area. Tuberose, *Polianthes tuberose* L is a night-blooming plant that is inherent to Mexico. It is a perennial bulbous plant and an extrusive plant in Indian mythology and culture. It is known as Rajnigandha or Raat ki Rani in Hindi and Nishigandha in Marathi. Indoor plants are used to beautify the areas inside the house.

It is less costly to decorate the interior of a room with live plants compared to fresh flowers which need to be replaced frequently. On the other hand, with little care, a well-chosen house plant will continue to decorate a room for a longer period. The initial investment may be comparatively high but it proves economical in the long run. It is necessary to upgrade the technical knowledge in crop management, reduction in cost of production and developing and adopting new improved cultivars as per the market needs to fulfil the demand for potted ornamentals. Hence it was important to study the performance of single type tuberose genotypes under pot culture.

MATERIAL and METHODS

Geographically, Pune is situated at 18°32' North latitude and 73°51' East longitude at 569 m amsl on Deccan plateau. The average maximum and minimum temperature was 40.0 and 11.6°C respectively during the period of experiment while average maximum and minimum relative humidity recorded was 96 and 18 per cent respectively. The study was carried out from 15 March 2020 to April 2021 with seven genotypes of single type tuberose. The plastic pots of size 10" x 10" were used for growing genotypes. Each pot was filled with a media mixture of soil and FYM in 1:1 proportion. The experimental design was completely randomized with three replications having 10 pots under each replication and vegetative, flowering and bulb characters were recorded.

RESULTS and DISSCUSSION

Vegetative growth characters: Vegetative characters of potted plants are important in the sense of the attractiveness of plant foliage and the photosynthetic abilities of a plant. The careful perusal of data regarding vegetative growth characters such as days required for sprouting, plant height, number of leaves and horizontal spread of plants were recorded and analysed (Table 1).

Days required for sprouting ranged from 5 to 7. However there were no significant differences among the genotypes for the number of days for sprouting. Minimum plant height was observed in Arka Sugandhi (57.33 cm) followed by GK-T-E-2 (62.33 cm) which was at par with Arka Sugandhi. Maximum plant height was observed in Bidhan Snigdha (80.70 cm) and Pratap Rajani (78.35 cm) both at par. Number of leaves was recorded maximum in GK-T-S-2 (14.33) which was found at par with GK-T-S-4 (12.93) and Pratap Rajani (12.07). The minimum number of leaves per plant (8.67) was recorded in the genotype Arka Sugandhi which was at par with GK-T-E-2 (9.37). The significantly maximum horizontal spread was recorded in Bidhan Ujjwal (79.50 cm). It was least coverage in GK-T-S-4 (40.30 cm) which was at par with Bidhan Snigdha (43.99 cm) and GK-T-S-2 (48.00 cm). The variations in the sprouting period might be due to change in growing conditions, moisture maintenance in the root zone and the differences among genotypes for their morphological characters due to their genetic makeup. These results are in accordance with the findings of Madhumathi et al (2018) and Mahawer et al (2013) in tuberose.

Bulbs and bulblets production: Formation and development of bulbs and bulblets are directly related to nutrient availability and also depend upon the promotion of cell proliferation and storage of starch in resulting cells. The characters were recorded on number of bulbs per clump, average weight of bulb, number of bulblets per clump and average weight of bulblets.

The number of bulbs produced per clump was significantly higher in genotype GK-T-S-2 (11.33) over the rest of the genotypes studied. The minimum number of bulbs per clump (5.23) was recorded in Bidhan Ujjwal which was at par with Bidhan Snigdha (5.33) and Pratap Rajani (6.00). The number of bulblets per

Table 1. Mean performance of tuberose genotypes for flowering and vegetative characters

Treatment	Days required for sprouting of bulbs	Plant height (cm)	Number of leaves/plant	Horizontal spread of plant (cm)	Number of bulbs/clump	Number of bulblets/clum	Average weight of bulb (g)	Average weight of bulblet (g)
GK-T-E-2	5.00	62.33^{ab}	09.37^{a}	56.07^{c}	7.35^{b}	47.00^{a}	23.47^{b}	2.71^{a}
GK-T-S-2	6.00	65.30^{b}	14.33^{c}	48.00^{abc}	11.33^{c}	67.67^{c}	16.01^{a}	3.87^{b}
GK-T-S-4	5.67	67.33^{b}	12.93^{bc}	40.30^{a}	9.17^{c}	99.67^{d}	22.65^{b}	2.67^{a}
Pratap Rajani	6.33	78.35^{c}	12.07^{bc}	49.30^{bc}	6.00^{a}	67.00^{c}	31.66^{d}	2.30^{a}
Arka Sugandhi	5.33	57.33^{a}	08.67^{a}	50.00^{bc}	6.20^{ab}	68.67^{c}	29.85^{cd}	2.27^{a}
Bidhan Snigdha	7.00	80.70^{c}	08.83^{a}	43.99^{ab}	5.33^{a}	67.00^{c}	24.70^{bc}	2.77^{a}
Bidhan Ujjwal	7.00	67.33^{b}	10.33^{ab}	79.50^{d}	5.23^{a}	55.00^{b}	31.77^{d}	2.75^{a}
SEm±	0.76	1.76	0.87	2.66	0.38	2.60	1.74	0.23
$CD_{0.05}$	NS	5.38	2.68	8.16	1.17	7.96	5.33	0.71

Figures carrying common alphabets in a column are statistically non-significant

clump was significantly maximum in GK-T-S-4 (99.67) and minimum number of bulblets per clump (47.00) was recorded in GK-T-E-2. The weight of the bulb was significantly maximum in Bidhan Ujjwal (31.77 g) which was at par with Pratap Rajani (31.66 g) and Arka Sugandhi (29.85 g). However the minimum weight of the bulb (16.01 g) was recorded in GK-T-S-2. The weight of bulblet was significantly higher in GK-T-S-2 (3.87 g) over all other genotypes. However all other genotypes were at par with one another for the weight of bulblets. Genotype with more number of leaves might have improved photosynthetic activity, source and sink relationship and accumulated more carbohydrates which improved the number and weight of bulbs and bulblets per clump. A similar variation in the number of bulbs was also reported previously by Safeena et al (2019), Nair and Bharathi (2019) and Naik et al (2018) in tuberose.

CONCLUSION

The seven genotypes were evaluated for vegetative and bulb characters in order to choose the genotypes which were suitable for pot culture. From overall findings it was found that the genotypes GK-T-E-2, GK-T-S-2 and Arka Sugandhi were identified as best performing single type tuberose genotypes and could be recommended for pot culture.

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