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Evaluation of different gladiolus varieties (*Gladiolus hybridus* Hort.) under Konkan conditions of Maharashtra

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Abstract

Gladiolus (*Gladiolus hybridus* Hort.) is an important cut flower crop. It is ideal for both garden display as well as floral arrangements. It is also commonly used for table and interior decoration by making high quality bouquet. Long and number of spikes, number of florets per spike and good corm multiplication ability are the main characters to be considered for gladiolus improvement. The experiment was conducted to evaluate ten different varieties of gladiolus at College of Horticulture, Mulde under Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli during the rabbi season of the year 2015. The results revealed that early sprouting of corms (4.00 days), maximum diameter of corms (23.39 cm), maximum length of spike (88.61 cm), maximum number of florets per spike (13.47) and maximum vase life (11.47 days) were recorded in variety Phule Ganesh, while maximum number of sprouted corms (19.78) and sprouting percentage (98.89 %) were noticed in variety Phule Tejas. The maximum number of leaves per plant (12.97), maximum number of spike per plant (2.33) and maximum yield in terms of number of spikes ha⁻¹ (3.45 lakhs) were noticed in variety G-11. The variety Rose Supreme recorded minimum days for first spike emergence (45.40 days) while variety Phule Prerana produced maximum number of corms (138.87).

Thus study revealed that gladiolus variety Phule Ganesh recorded early sprouting, bigger size corms, longer spike, more florets per spike and longer vase life.

Keywords: Gladiolus, varieties, corm, growth, colour, vase life

Introduction

Gladiolus (*Gladiolus hybridus* Hort.) is an important commercial flower and is very popular as cut flower both in domestic and international market (Singh *et al.*, 2017)^[17]. It belongs to family Iridaceae having 260 species and more than 30,000 varieties. It is the most important herbaceous bulbous flowering crop and popularly known as Queen of the bulbous flower. Gladiolus is one of the most valuable cut flower crop recognized in the global commercial floriculture. Spikes are attractive having huge form florets with dazzling colour and longer keeping quality. It produces magnificent inflorescence with variety of colours which makes it attractive for use as herbaceous border, beddings, rockeries, pots and cut flowers. Popularity of this crop as cut flower is increasing day by day due to its long keeping quality and wide range of floret colour. Gladiolus has a great potential for export market especially during winter for European countries which fetch better market prices.

Gladiolus can be grown successfully in tropical, subtropical and temperate climates. In India, it is commercially cultivated in West Bengal, Himachal Pradesh, New Delhi, Karnataka, Uttar Pradesh, Jammu and Kashmir, Tamil Nadu and Maharashtra. Gladiolus is richest in its varietal wealth with an addition of new varieties every year. Hence varietal evaluation plays important role in finding out suitable variety for a particular region. Agro climatic conditions of Konkan region of Maharashtra State are suitable for cultivation of gladiolus and have great potential for cultivation. However, lack of scientific knowledge of cultivation and scarcity of suitable cultivars are the main constraints for its successful cultivation and spread in the region. Hence, the present investigation was undertaken to screen different gladiolus cultivars under Konkan conditions for growth, flower yield and vase life.

Materials and methods

A field experiment was carried at the College of Horticulture, Mulde, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli (M.S.) during *rabi* season of 2015 to evaluate the different

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gladiolus cultivars for growth, flower yield and vase life. The experiment comprised ten varieties of gladiolus viz., Rose Supreme, Phule Tejas, Phule Ganesh, Phule Neelrekha, G-12, Friendship, Phule Prerana, G-11, Good White and Red Beauty. The experiment was laid out in Randomized Block Design (RBD) with four replications. Healthy and uniform size corms of different varieties were selected for planting. The selected corms were dipped in Carbendazim (50 % WP) solution @ 2 g/Lit. for 5 minutes before planting. Experiment was planted in open field in a plot size of 4.5 m X 3 m with a spacing of 45 X 15 cm. All standard cultural practices and plant protection measures were followed throughout the crop stand. Observations were recorded on ten randomly selected plants from each plot. The observations emergence, growth, flowering and corm production were recorded. Data recorded were statistically analyzed as per the procedure given by Panse and Sukhatme (1995)^[11].

Results and discussion

Growth and corm characteristics

The data presented in Table 1 and Table 2 revealed that gladiolus varieties were statistically significant for all characters under study.

The data on corm sprouting, number of leaves spike emergence and corm characters presented in Table 1 revealed that variety Phule Ganesh showed early germination (4.00 days) whereas late germination (5.87 days) was noticed in the variety Red Beauty. This could be due to the permeability of corm tissues for water imbibition as per Nazir and Dwivedi, (2006)^[8] which could have resulted into activation of the meristematic tissues and ultimately significance in the sprouting of corms. Similar variation in days required to sprouting as influenced by different varieties of gladiolus has been reported by Dalal *et al.*, (2006)^[3].

The maximum number of sprouted corms (19.78) was recorded in variety Phule Tejas followed by the variety Phule Prerana (19.33) and G-11 (19.33). The minimum number of sprouted corms was recorded in variety Good White (14.33). This variation might be attributed due to the genetic potential of the varieties under study. Similar findings in gladiolus were observed by Chopade, (2011)^[1]. Highest sprouting percentage of corms (98.89 %) was noticed in the variety Phule Tejas which was at par with rest of the varieties except variety Good White. Variety Good White recorded the lowest sprouting percentage (71.67 %). The results are in accordance with the findings of Kumar *et al.*, (2007)^[6].

The significantly maximum number of leaves per plant was recorded with variety G-11 (12.97) as compared to other varieties. Minimum number of leaves per plant was observed with cv. Good White (7.61) followed by Phule Neelrekha (11.38) and Friendship (11.00). Variation in number of leaves per plant in gladiolus was also reported by Padma and Kumar (2004)^[10] and Kumar *et al.*, (2007)^[6]. Early first spike emergence (45.40 days) was reported in the variety Rose Supreme while variety G-11 recorded maximum days (57.27 days) for emergence of first spike. Variation in duration for first spike emergence was also reported by Chopade (2011)^[1] in gladiolus.

Variety Phule Ganesh showed bigger size corms and recorded 23.39 cm diameter of followed by Rose Supreme (21.87 cm). The minimum diameter was recorded in variety Friendship (15.09 cm) which was statically at par with G-12 (17.89 cm).

Similar findings were also reported by Talukdar, (2005)^[18] and Kumar, (2009)^[7] who reported significant varietal difference in corm diameter. The number of corms per plant was the highest in Phule Prerana (138.87) and at par with Phule Tejas (114.53). Minimum number of corms per plant was observed in Phule Neelrekha (15.67). Patil *et al.*, (1994)^[12], Shiramagond and Hanamashetti, (1991), Kamble *et al.*, (2004)^[5] noticed the different in number of corms per plant in gladiolus. Sharma and Gupta (2003)^[15] suggested that the availability of stored food material in bigger sized mother corms might have helped in better plant growth which was resulted in more corms production.

Flower characteristics, flower yield and vase life

The data presented in Table 2 revealed that the variety Phule Ganesh recorded significantly maximum length of spike (88.61 cm) and at par with the variety Phule Neelrekha (77.39 cm) while, minimum length of spike was observed with the variety Good White (57.04 cm). The variation in spike length may be due to the corm vigour attributed due to the genetic potential of the varieties (Rani *et al.*, 2007)^[13]. Significantly the maximum florets per spike (13.47) were noted in variety Phule Ganesh which was found to be at par with the variety Phule Neelrekha and Phule Tejas whereas, the varieties G-12 and Red Beauty had produced minimum florets per spike (10.47 and 10.13, respectively). The difference might be due to the variation in genetic makeup of cultivar. Similar variation in length of spike and florets per spike were recorded in earlier studies by Rani *et al.*, (2007)^[13], Negi *et al.*, (2014)^[9], Kadam *et al.*, (2014)^[4], Rao and Sushma, (2015)^[14].

Maximum number of spikes per plant was recorded in variety G-11 (2.33) followed by Red Beauty (2.28) which statistically at par with each other and minimum number of spike per plant was found with Phule Ganesh (1.13) and Phule Neelrekha (1.13). In respect of spike yield, the variety G-11 had produced significantly maximum spike yield per hectare (3.45 lakh ha⁻¹) and was closely followed by the variety Red Beauty (3.38 lakh ha⁻¹) whereas, minimum yield of spike per hectare were recorded with the variety Phule Ganesh and Phule Neelrekha (1.68 and 1.68 lakh ha⁻¹ respectively). Variation in yield of spikes is mainly attributed due to the variation in sprouting percentage of corms and sprouts per plant which are the genetically controlled characters. Similarly variation in number of spike per plant and yield per hectare was recorded by Chopade, (2011)^[1].

The vase life of flower depends on its quality and uptake of vase solution. Vase life was found maximum in variety Phule Ganesh (11.47 days) which was statistically at par with the variety Phule Neelrekha and Phule Prerana (11.00 days each). The minimum vase life was recorded in the variety G-12 (9.27 days) which was at par with the varieties Good White (9.47 days). The increased vase life of flower might be due to increase in uptake of vase solution which might have maintained the stem turgidity even under the high rate of respiration. Similar variation in vase life of spike flower was found by Chopade, (2011)^[1], Chourasia *et al.*, (2015)^[2] and Singh *et al.*, (2017)^[17].

Thus study revealed that gladiolus variety Phule Ganesh recorded early sprouting, bigger size corms, longer spike, more florets per spike and longer vase life under Konkan agro conditions of Maharashtra.

Table 1: Response of gladiolus varieties for growth and corm production.

Name of variety	Days required for sprouting	Number of sprouted corms	Sprouting %	Average number of Leaves per plant at 60 DAP	Days required for first spike emergence	Average diameter of corms (cm)	Average number of corms
Rose Supreme	5.07	17.33	86.67	8.07	45.40	21.87	24.60
Phule Tejas	4.47	19.78	98.89	10.33	48.20	19.80	114.53
Phule Ganesh	4.00	17.33	86.67	8.27	55.67	23.39	25.67
Phule Neelrekha	4.33	18.00	90.00	11.38	56.73	21.18	15.67
G-12 (IIHR)	5.73	18.67	93.33	8.27	45.93	17.89	21.00
Friendship	5.53	18.67	93.33	11.00	54.07	15.09	27.20
Phule Prerana	5.33	19.33	96.67	9.73	53.60	19.97	138.87
G-11 (IIHR)	5.20	19.33	96.67	12.97	57.27	20.07	17.27
Good White	5.27	14.33	71.67	7.61	54.00	19.45	25.53
Red Beauty	5.87	17.33	86.67	9.07	52.73	18.44	26.60
SE (m) \pm	0.25	2.47	4.12	0.34	27.61	0.51	8.53
CD at 5%	0.74	7.35	12.25	1.01	82.0	1.51	25.33

Table 2: Performance of gladiolus varieties for flower characteristics, flower yield and vase life.

Name of variety	length of spike (cm)	Average number of florets per spike	Average number of spikes per plant	Yield (lakh spikes ha ⁻¹)	Vase life of flower (Days)
Rose Supreme	68.67	11.07	1.87	2.76	9.73
Phule Tejas	58.78	12.20	1.20	1.78	9.73
Phule Ganesh	88.61	13.47	1.13	1.68	11.47
Phule Neelrekha	77.39	12.67	1.13	1.68	11.00
G-12 (IIHR)	63.89	10.47	1.73	2.57	9.27
Friendship	68.83	11.33	1.47	2.17	10.73
Phule Prerana	67.33	12.13	1.33	1.97	11.00
G-11 (IIHR)	71.98	10.73	2.33	3.45	9.53
Good White	57.04	10.67	1.70	2.52	9.47
Red Beauty	69.25	10.13	2.28	3.38	9.60
SE (m) \pm	2.10	0.49	0.10	0.15	0.20
CD at 5%	6.23	1.46	0.30	0.45	0.59

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