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Performance of gladiolus varieties for flowering traits

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Abstract

A field experiment was conducted to study the “Evaluation of varieties and post-harvest studies in gladiolus” during 2016-2017 at Horticulture Research Farm, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, and Uttar Pradesh. In this experiment 25 varieties of gladiolus namely Anjali, Arti, Chandani, Darshan, Dhanvantari, Punjab Dawn, Pusa Kiran, Pusa Manmohak, Pusa Srijan, Shabnam, Shubhangini, Sunayna, Surya Kiran, Aldebaran, American Beauty, Flavour Souvenir, Green, Green Star, Invitatie, Mascagni, Nova Lux, Plum Tart, Princess Margaret Rose, Priscilla and Purple Flora were planted for evaluation of various flowering traits. Experiment was laid out in Randomized Block Design with five replications. Healthy corms of gladiolus varieties were planted at 30 × 20 cm distance. Uniform cultural practices were followed for all the varieties. There was significant difference among the varieties with respect to flowering characters. Early spike emergence was observed in cv. Priscilla, whereas, early colour show was observed in cv. Pusa Kiran (75.70 days). Maximum rachis length, maximum spike length at first and last floret open was observed in cv. Anjali. Earliest opening of first, third and fifth floret was found in cv. Purple Flora. Maximum diameter of first, third and fifth floret was observed with cultivar American Beauty. Cultivar Chandani registered maximum longevity of first floret, whereas, longevity of third and fifth floret was found maximum in cultivar Plum Tart. However, minimum longevity of first, third and fifth floret was found in cultivar Dhanvantari.

Keywords: gladiolus, evaluation, cultivars, flowering

Introduction

Flowers are used for various purposes in our day to day life like worshipping, religious and social functions, wedding, interior decoration and self-adornment. Flowers play a cardinal role in human behavior and culture, bringing tranquillity and peace of mind (Singh and Sisodia, 2017) [13]. Among the bulbous cut flowers, gladiolus occupied prominent position. Gladiolus belongs to family Iridaceae and sub family Ixioideae (Singh, 2014) [10]. Gladiolus is native of South Africa. It is grown commercially for its fascinating flowers in many parts of the world and is popularly called as “Queen of bulbous” flowers. Gladiolus is commonly known as ‘sword lily’ because of its sword shaped leaf. The inflorescence spike bears up to 25 florets arranged alternately on the axis of the flowers open from bottom to upwards. The flowers may be frilly, ruffled or plain, solid coloured or multi-colored and they come in every shade and color combination imaginable. There are many excellent varieties of gladiolus with outstanding inflorescence in exhaustive range of colours, different shades, varying number of florets and size and wide range of keeping quality. It is very much necessary to evaluate gladiolus cultivars for different purposes and different Agroclimatic reasons. Hence, the present experiment was conducted to study the relative performance of 25 genotypes of gladiolus for their different flowering traits.

Materials and Methods

The field trial was conducted at Horticulture Research Farm, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, UP, and India during 2016-17. Healthy, uniform size and disease free corms of 25 gladiolus cultivars (Anjali, Arti, Chandani, Darshan, Dhanvantari, Punjab Dawn, Pusa Kiran, Pusa Manmohak, Pusa Srijan, Shabnam, Shubhangini, Sunayna, Surya Kiran, Aldebaran, American Beauty, Flavour Souvenir, Green, Green Star, Invitatie, Mascagni, Nova Lux, Plum Tart, Princess Margaret Rose, Priscilla and Purple Flora) were planted at spacing of 30 cm between the rows and 20 cm between the plants during November, 2016. Experiment was laid out in a Randomized Block Design, with five replications. Uniform cultural practices were adopted for all the cultivars. Observations were recorded on various flowering attributes and data were analyzed statistically.

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Results and Discussion

Significant difference due to varieties was observed on various flowering parameters (Table 1). Early spike emergence was observed in cv. Priscilla (68.40 days), which was statistically at par with cvs. Purple Flora (68.60 days), American Beauty (69.20 days) and Shubhangini (69.20 days) and significant to all other varieties, whereas, cv. Invitatie was late in spike emergence (78.40 days). Early colour show was exhibited in cv. Pusa Kiran (75.70 days) which was statistically at par with cvs. Purple Flora (76.20 days) and Plum Tart (76.60 days). It is clearly indicated from the data that there is variation in days to spike emergence and colour show trait which is probably due to genetic nature of the varieties. Similar finding have been reported by earlier worker Poon *et al.* (2009) [6] and Neha *et al.* (2012) [5]. Maximum rachis length, spike length at colour show, was found in cv. Anjali followed by cvs. Subhangini and American Beauty, although, cv. Anjali was statistically significant to all the varieties. Maximum spike length at first and last floret open was observed in cv. Anjali and American Beauty, which was significant to all other the varieties, while, minimum spike length at first and last floret open was observed in cv. Chandani. In a trial Singh *et al.* (2017) [11] observed maximum spike length of gladiolus cv. Jyotsana. Similar results were also observed by previous workers Susila (2013), Sarkar and Chakroborty (2014) [8], Chourasia *et al.* (2015) [2] and Singh *et al.* (2017) [11].

Various varieties showed significant difference on duration of floret open, open floret at a time, number of florets/spike, duration of flowering and withering (Table 2) and diameter and longevity of first, third and fifth floret (Fig. 1 and 2). Earliest opening of first floret was found in cv. Purple Flora which was statistically at par with cvs. Plum Tart and Pusa Kiran, while, late opening of first floret was observed in cv. Invitatie followed by cvs. Arti and Anjali. Early opening of third and fifth floret was found in cv. Purple Flora which was statistically at par with cvs. Pusa Kiran and Plum Tart, however, late opening of third and fifth floret was found in cv. Invitatie followed by cvs. Arti and Anjali. Open florets at

a time were found maximum in cv. Nova Lux, while, minimum in cvs. Pusa Manmohak and Shabnam. Maximum number of florets/spike was found in cultivar Subhangini (16.40), whereas, minimum number of florets/spike was observed in cultivar Chandani (8.40). Variation on flowering traits like durability of floret and opening of floret also observed by Singh *et al.* (2015) [12], Singh and Sisodia (2015) [12] and Singh *et al.* (2017) [11] in gladiolus. Similar result was obtained by Kamble *et al.* (2004), and Shaukat *et al.* (2013). Maximum duration of flowering was exhibited with cv. Dhanvantri which was significant to all other the varieties, however, minimum duration of flowering was observed in cv. Aldebaran. Maximum duration of withering was found with cv. Invitatie (105.0 days) followed by Anjali (100.70 days) and Arti (99.0 days). Minimum duration of withering was observed in the cultivar Chandani (89.60 days) and Purple Flora (89.60 days). The results confirm the earlier findings of Nagaraju and Parthasarathy (2001) and Neha *et al.* (2012) [5]. For good appearance of a spike, florets in a spike should be attractive, big and to be arranged in a compact manner. Maximum diameter of first, third and fifth floret was observed in cultivar American Beauty. Minimum diameter if first floret was found in cv. Darshan, whereas, minimum diameter of third and fifth floret was exhibited with cv. Chandani (Fig. 1). Longevity of florets on plant is very important character and it has significant role on attractiveness of spike and garden display purpose. The variations might be due to the thickness of petals of different cultivars. Maximum longevity of first floret was found in cultivar Chandani, which was statistically significant with cvs. Punjab Dawn and Plum Tart. Longevity of third and fifth floret was found maximum in cultivar Plum Tart, whereas, minimum longevity of first, third and fifth floret was found in cultivar Dhanvantri (Fig. 2). Variation on different flowering traits was also observed by Singh *et al.* (2013) [14] in tuberose, Singh *et al.* (2017) [11] in gladiolus. These findings were also enclosing confirmative with the observation made by Ahmed *et al.* (2002), Sheikh *et al.* (2006) and Read and Jones (2008) [7].

Table 1: Performance of gladiolus varieties for days to spike emergence, days to colour show, rachis and spike length.

Treatment	Days to spike emergence	Days to colour show	Rachis length (cm)	Length of spike (cm)		
				Colour show stage	First floret open	Last floret open
Anjali	79.60	84.60	63.90	67.14	72.70	77.90
Arti	80.40	84.80	35.70	40.00	43.20	48.30
Chandani	70.00	76.70	32.14	38.54	40.74	46.40
Darshan	75.20	80.20	44.60	40.60	44.80	55.00
Dhanvantari	73.40	78.60	55.20	61.00	64.30	70.20
Punjab Dawn	70.80	79.20	40.00	49.18	54.00	59.80
Pusa Kiran	70.60	75.70	46.90	56.44	59.90	66.24
Pusa Manmohak	74.60	81.20	57.00	61.20	65.94	71.60
Pusa Srijan	72.80	78.50	38.80	43.50	45.72	50.80
Shabnam	72.20	78.40	53.80	59.60	62.80	74.00
Shubhangini	69.20	76.60	62.40	65.80	69.60	73.40
Sunayna	72.60	80.00	53.70	57.40	65.80	72.40
Surya Kiran	77.20	83.00	43.20	47.34	52.60	59.56
Aldebaran	72.60	79.80	37.80	43.80	47.50	50.20
American Beauty	69.20	79.20	60.80	65.30	71.70	77.80
Flavour Souvenir	70.20	77.40	34.40	40.40	43.90	47.80
Green	77.00	82.40	45.86	52.20	55.20	60.40
Green Star	71.20	79.50	45.80	50.04	54.70	58.00
Invitatie	78.40	87.00	47.50	49.90	59.70	64.80
Mascagni	71.40	79.00	49.30	53.54	56.60	61.80
Nova Lux	75.60	81.10	49.30	52.70	57.14	62.80
Plum Tart	69.40	76.60	52.80	58.04	64.20	69.20
Princess Margaret	70.40	78.40	36.00	38.20	41.24	47.80

Rose						
Priscilla	68.40	77.20	44.62	47.00	50.30	56.46
Purple Flora	68.60	76.20	41.30	46.00	48.80	53.80
C.D. at 5%	3.84	3.01	8.60	8.28	8.74	9.87

Table 2: Performance of gladiolus varieties for duration of floret opening, flowering and withering, open floret at a time and number of florets/spike.

Treatment	Duration of floret open (days)			Open florets at a time	Number of florets/spike	Duration of flowering (days)	Duration of withering (days)
	First floret	Third floret	Fifth floret				
Anjali	86.40	87.00	88.00	5.40	13.70	13.20	100.70
Arti	88.20	89.00	89.40	5.38	9.20	11.00	99.00
Chandani	80.80	81.80	82.80	6.00	8.40	9.50	89.60
Darshan	83.40	84.80	85.40	5.40	13.80	13.60	97.00
Dhanvantari	81.40	83.00	84.00	6.00	12.60	15.20	96.60
Punjab Dawn	83.80	85.20	85.40	5.80	14.40	13.16	95.00
Pusa Kiran	80.00	81.40	81.80	6.86	12.60	13.20	93.20
Pusa Manmohak	85.20	88.00	86.80	5.20	14.10	11.90	97.10
Pusa Srijan	81.00	82.20	83.00	5.40	8.70	9.60	90.50
Shabnam	82.00	83.40	84.20	5.20	14.00	12.80	94.80
Shubhangini	81.00	82.40	83.20	5.80	16.40	10.40	91.40
Sunayna	84.20	85.20	85.80	5.66	13.60	12.20	96.40
Surya Kiran	85.40	86.80	87.40	6.16	11.70	11.50	97.10
Aldebaran	83.60	83.80	84.40	5.40	9.80	9.00	92.60
American Beauty	82.80	83.80	84.40	7.20	16.00	11.20	94.00
Flavour Souvenir	80.40	82.00	82.80	5.80	10.20	11.20	91.60
Green	84.80	85.40	86.20	6.34	14.20	11.00	95.80
Green Star	84.00	84.80	85.80	7.20	13.10	12.00	96.60
Invitatie	91.40	92.60	93.80	5.40	14.20	13.50	105.00
Mascagni	81.60	82.60	83.00	5.80	11.40	11.00	92.60
Nova Lux	83.80	84.60	85.40	8.60	11.90	10.20	93.90
Plum Tart	79.80	81.60	82.20	6.20	11.90	12.60	92.20
Princess Margaret Rose	82.20	83.40	83.80	6.80	10.20	11.60	93.80
Priscilla	81.00	82.20	82.80	6.90	12.00	11.40	92.60
Purple Flora	79.20	79.80	80.80	6.40	10.80	10.40	89.60
C.D. at 5%	3.02	2.65	2.69	0.95	2.35	2.07	3.11

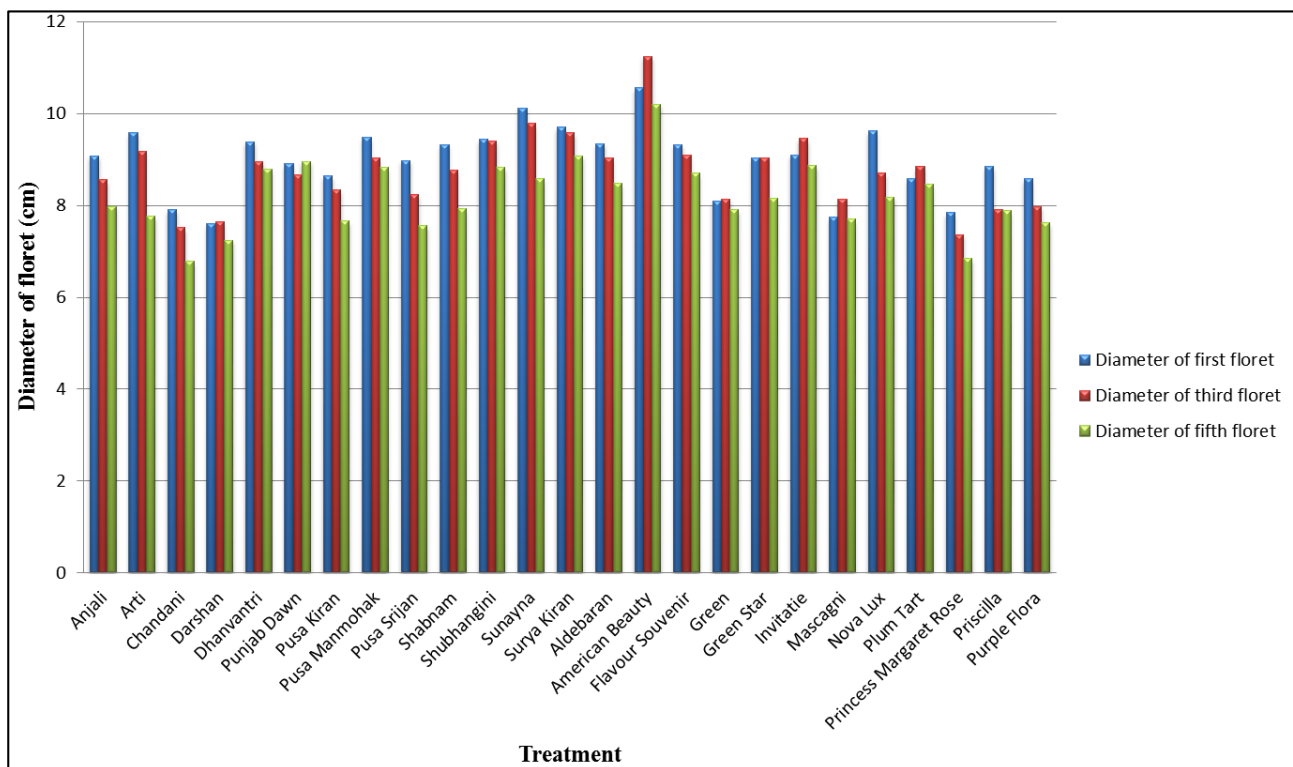


Fig 1: Performance of gladiolus varieties for diameter of first, third and fifth floret

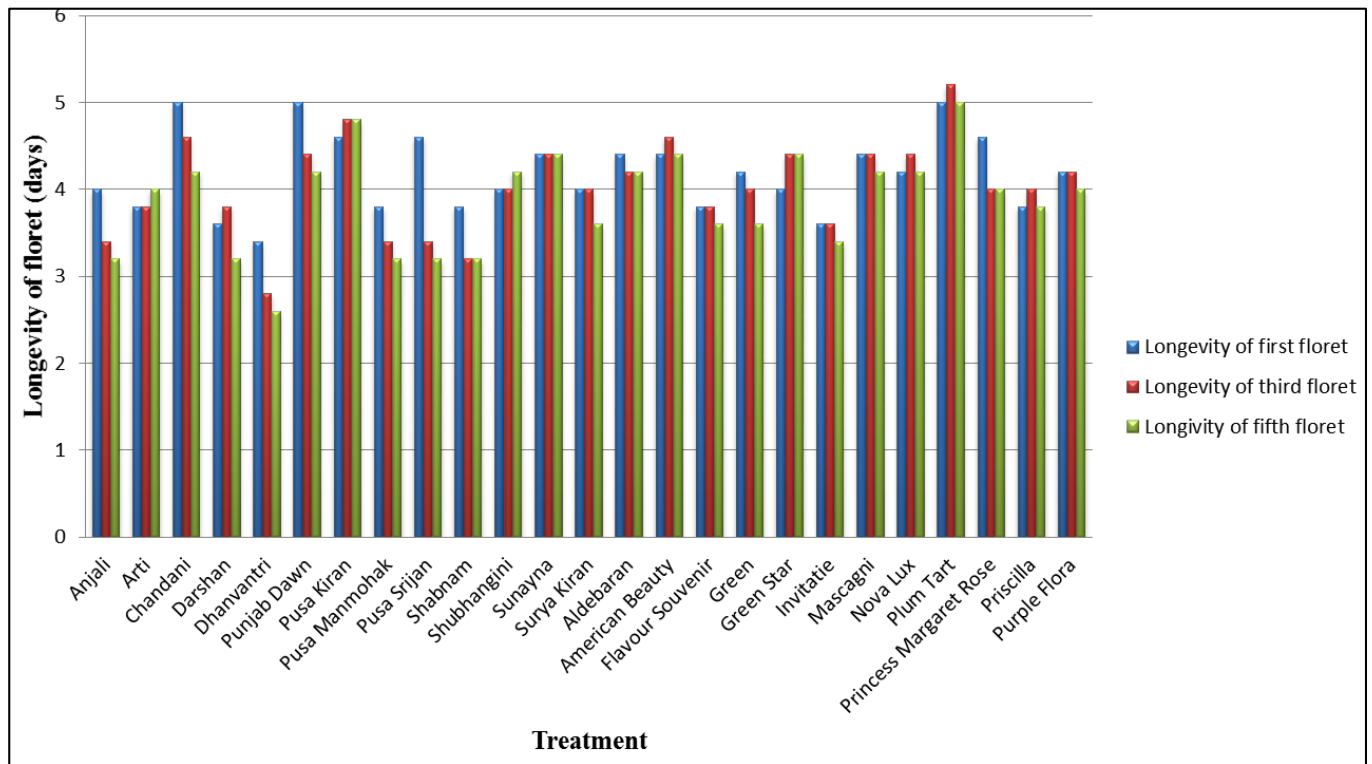


Fig 2: Performance of gladiolus varieties for longevity of first, third and fifth floret

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