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Characterization of Asiatic Lily Genotypes for Flowering and Quality Parameters under Protected Conditions

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A B S T R A C T

The present investigations were carried out in the experimental block of the department of Floriculture and Landscape Architecture, College of Horticulture, Mudigere, Chikmagalur, Karnataka to characterize the Asiatic lily genotypes for flowering and quality of cut flowers under naturally ventilated polyhouse. The days taken for flower bud emergence were significantly differed among all the genotypes of Asiatic lily. The genotype Telisker was the earliest to show colour by taking (35.00 days) whereas, Ercolania (48.67 days) was late for expressing colour in its flower. The genotype Pirandeu was the earliest to show colour by taking minimum number of days followed by Telisker. The genotype Merluza (19.51 cm) followed by Courier (19.34 cm) produced significantly bigger sized flowers than any other genotypes. The genotypes viz., Pirandeu, CEB Dazzle, Dazzle, Courier, Pavia and Tresor recorded maximum number of spikes per square meter(24.00) while, the genotype Batistero recorded the minimum number (16.67). The genotype Pirandeu extended its vase life maximum up to (12.37 days) and found significantly superior over other genotypes and it was found to be on par with Pavia (12.17 days) whereas, the minimum number of days was recorded in Navona (7.73 days).

Introduction

The Lilies belongs to genus *Lilium* of Liliaceae family, consist of about 80-100 species distributing in the northern hemisphere (Eurasia and North America continent). All *Lilium* species are diploid (2n=2x=24), except some triploid forms of *L. tigrinum and* L. *bulbiferum existing* in nature. The genome size of *Lilium* belongs to one of the largest in plant kingdom.

The two important distribution centers of lily are South-East Asia (China, Korean peninsula and Japan) and North America are with 61 and 21 species, respectively and the number of

native European and Eurasian species is approximately 10 (Van *et al.*, 2011).

Materials and Methods

The present investigations were carried out in the experimental block of the department of Floriculture and Landscape Architecture, College of Horticulture, Mudigere, Chikmagalur, Karnataka to characterize the Asiatic lily for cut flower yield and quality under naturally ventilated polyhouse. Fifteen Asiatic lily genotypes were procured from M/S Florence Flora, Bangalore and M/S Sheel Biotech, New Delhi. The name and colour of these fifteen genotypes are presented in the Table 1. The experiment was laid out in randomized complete block design (RCBD) with three replications. The size of the experimental plot was 2.5 m x1 m (2.5 m^2). The healthy, uniform sized (12-14 cm diameter) bulbs of fifteen Asiatic lily genotypes were planted at a depth of 10 cm in each plot with 30 X 15 cm spacing.

The recommended dose of FYM @ 4 kg per m^2 and N, P and K (10:15:20 g/m^2) fertilizers were applied in the form of urea (46.40% N), rock phosphate (28.00 % P_2O_5), muriate of potash (60.00% K_2O), respectively. The basal dose of 50 per cent of NPK was applied at the time of planting, while remaining 50 per cent of NPK was applied in 5 split doses at different crop growth stages. A secondary nutrient like Calcium was applied as basal dose in the form of Calcium Ammonium Nitrate to soil at the rate of 30 g/m^2.

Results and Discussion

The data pertaining to flowering characters like days taken to colour visibility and days taken to 50 per cent flowering are furnished in Table 2 and Figure 1. The days taken for visibility of colour in flower bud from planting varied significantly among different genotypes. The genotype Telisker was the earliest to show colour by taking (35.00 days) whereas, Ercolania (48.67 days) was late for expressing colour in its flower. The days taken for 50 per cent flowering varied significantly among different genotypes of Asiatic lily. The genotype Pirandeu was the earliest to put forth 50 per cent flowering (43.00 days) which was followed by genotype Courier (44.00 days), while the genotype Merluza (64.00 days) was late to put forth 50 per cent flowering. These variations for flower bud initiation may be attributed to genetic make-up and physiological differences among the genotypes as reported earlier by Dhiman (2003), Sindhu (2006) and Pandey *et al.*, (2010).

The genotype Pirandeu was found to be the earliest to put forth 50 per cent flowering which was followed by genotype Telisker. The variation in floral characters may be attributed to the genetic make-up of plants. Wide variation in floral parameters has also been reported by Dhiman (2003), Sindhu (2006), Chitra and Rajamani (2009) and Pandey *et al.*, (2010). The days taken to flowering was also affected by duration of cold storage of bulbs. As the cold storage was extended the variation in time to flowering decreased. The results are in agreement with the findings of Wilfret and Raulston (1971). The data pertaining to different flower quality parameters *viz.*, flower bud diameter (mm), flower diameter (cm), stalk length (cm) and vase life (days) are presented in Table 3 and Figure 2.

The results indicated that, significant differences were observed for bud diameter of different Asiatic lily genotypes. It was maximum in the genotype Merluza (25.96 mm) and was found on par with Courier (23.92 mm) followed by Mestre (23.60 mm) whereas, Tresor recorded minimum (17.46 mm) bud diameter.

Table.1 Colour characteristics of 15 Asiatic lily genotypes

Genotypes	Colour	Source
Advantage	Orange	M/S Florence Flora, Bangalore
Bright Diamond	White	M/S Florence Flora, Bangalore
CEB Dazzle	Yellow	M/S Sheel Biotech, New Delhi
Dazzle	Yellow	M/S Florence Flora, Bangalore
Courier	White	M/S Florence Flora, Bangalore
Mestre	Light pink	M/S Florence Flora, Bangalore
Telisker	Orange	M/S Sheel Biotech, New Delhi
Batistero	Red	M/S Sheel Biotech, New Delhi
Pirandeu	Dark pink	M/S Sheel Biotech, New Delhi
Merluza	White	M/S Sheel Biotech, New Delhi
Fangio	Red	M/S Sheel Biotech, New Delhi
Pavia	Yellow	M/S Sheel Biotech, New Delhi
Ercolania	White	M/S Florence Flora, Bangalore
Tresor	Orange	M/S Sheel Biotech, New Delhi
Navona	White	M/S Sheel Biotech, New Delhi

Table.2 Performance of different Asiatic lily genotypes for flowering parameters under protected condition

Treatment	Genotypes	Days to colour visibility	Days to 50 per cent flowering
T_1	Advantage	43.33	57.33
T_2	Bright Diamond	42.67	57.00
T_3	CEB Dazzle	46.67	62.67
T_4	Dazzle	44.67	61.33
T_5	Courier	37.67	44.00
T_6	Mestre	45.00	61.33
T_7	Telisker	27.00	45.33
T_8	Batistero	35.67	53.33
T_9	Pirandeu	35.00	43.00
T_{10}	Merluza	43.33	64.00
T_{11}	Fangio	44.67	62.67
T_{12}	Pavia	46.00	63.00
T_{13}	Ercolania	48.67	63.00
T_{14}	Tresor	45.67	60.67
T_{15}	Navona	45.33	58.67
	SEm±	0.95	1.29
	C.D. (P=0.05)	2.74	3.73

Table.3 Performance of different Asiatic lily genotypes for flower quality under protected condition

Treatment	Genotypes	Flower bud diameter (mm)	Flower diameter (cm)	Stalk length (cm)	Vase life (days)
T_1	Advantage	19.20	17.71	50.57	8.27
T_2	Bright Diamond	19.86	16.97	67.77	9.25
T_3	CEB Dazzle	18.85	17.69	65.63	10.33
T_4	Dazzle	17.75	17.15	61.63	10.37
T_5	Courier	23.92	19.34	54.47	9.37
T_6	Mestre	23.60	18.09	75.87	9.27
T_7	Telisker	18.73	18.28	67.43	11.27
T_8	Batistero	20.34	16.70	59.67	10.23
T_9	Pirandeu	19.19	18.27	49.77	12.37
T_{10}	Merluza	25.96	19.51	56.57	10.23
T_{11}	Fangio	19.54	16.41	57.87	8.23
T_{12}	Pavia	18.87	18.79	48.93	12.17
T_{13}	Ercolania	19.05	18.68	52.53	8.20
T_{14}	Tresor	17.46	17.27	45.00	8.23
T_{15}	Navona	18.58	16.41	34.77	7.73
	SEm±	1.53	0.58	2.01	0.59
	C.D. (P=0.05)	4.42	1.67	5.84	1.72

Table.4 Performance of different Asiatic lily genotypes for flower Yield under protected condition

Treatment	Genotypes	Number of florets/spike	Number of spikes/m^2
T_1	Advantage	2.80	23.33
T_2	Bright Diamond	3.20	23.33
T_3	CEB Dazzle	4.87	24.00
T_4	Dazzle	4.40	24.00
T_5	Courier	2.80	24.00
T_6	Mestre	3.93	23.33
T_7	Telisker	3.47	23.67
T_8	Batistero	2.93	16.67
T_9	Pirandeu	5.00	24.00
T_{10}	Merluza	2.93	22.00
T_{11}	Fangio	3.20	21.33
T_{12}	Pavia	4.53	24.00
T_{13}	Ercolania	3.93	23.67
T_{14}	Tresor	3.60	24.00
T_{15}	Navona	4.27	19.33
	SEm±	0.26	0.97
	CD@ 5%	0.75	2.80

Fig.1 Performance of different Asiatic lily genotypes for flowering Parameters under protected condition

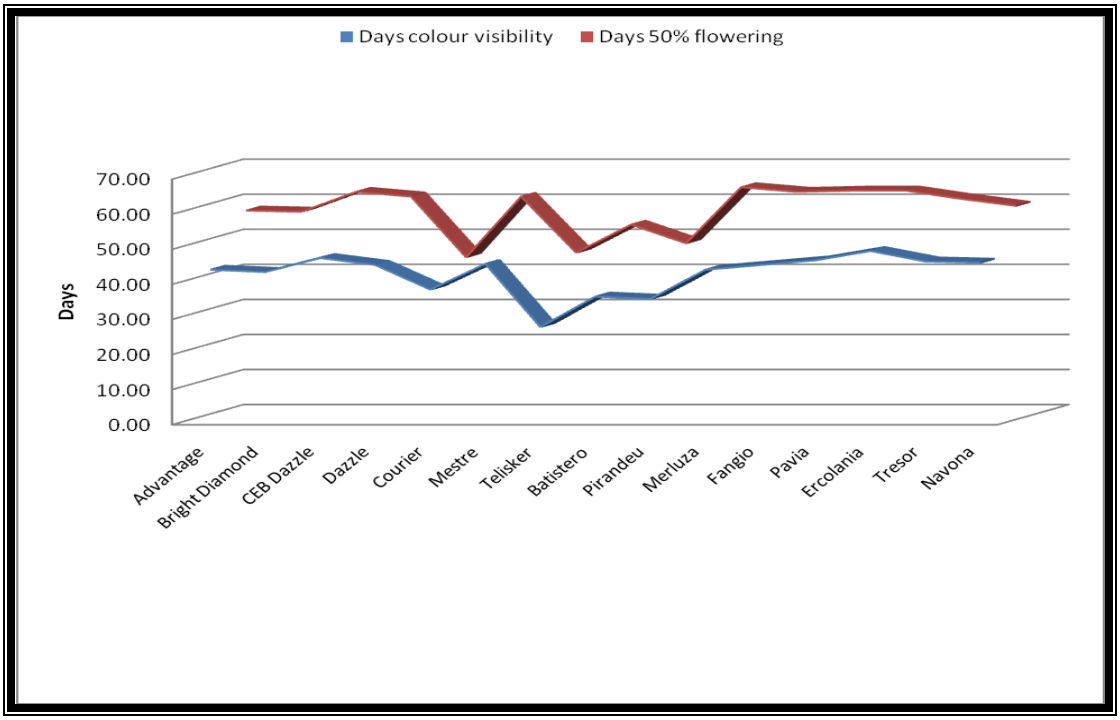
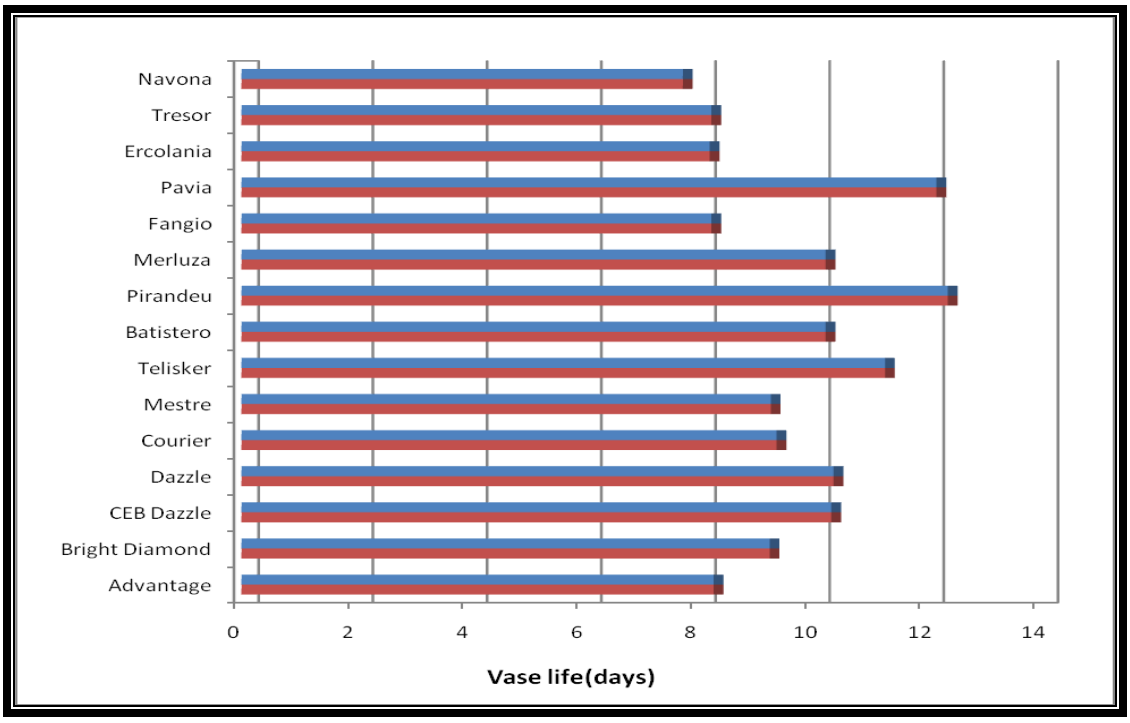


Fig.2 Performance of different Asiatic lily genotypes for vase life Grown under protected condition



The variations in the bud diameter might be due to the thickness of petals and also due to the inherent characters. Varying amount of differences was recorded among the different Asiatic lily genotypes for flower stalk length. It was maximum in the genotype Mestre which was superior over other genotypes.

The stalk length is very important parameter in Asiatic lily cut flowers. It is one of the characters which decide the quality of cut flowers. This difference among the genotypes of Asiatic lily might be due to their genetic characters of particular genotype.

Significant differences were observed with respect to flower diameter among the genotypes studied. The genotype Merluza (19.51 cm) followed by Courier (19.34 cm) produced significantly bigger sized flowers than any other genotypes. The smaller sized flowers were produced by Navona (16.41 cm).

Varying amount of differences was recorded among the different Asiatic lily genotypes for flower stalk length. It was maximum in the genotype Mestre (75.87 cm) which was superior over other genotypes, whereas it was recorded minimum in Navona (34.77 cm).

The significantly higher number of florets recorded in the genotype Pirandeu and was superior compared to all other genotypes studied. However, no significant differences were found within the genotypes of Asiatic lily for number of spikes per square meter. Wide variation in floral parameters has been reported by Dhiman (2003), Sloan and Harkness (2005), Rashmi (2006), Sindhu (2006) and Chitra and Rajamani (2009).

The genotype Pirandeu extended its vase life maximum up to (12.37 days) and found significantly superior over other genotypes and it was found to be on par with Pavia (12.17 days) whereas, minimum number of days was recorded in Navona (7.73 days).This could be due to the presence of more number of buds in flower spike which help the spike to retain attractiveness for a longer period and also might be due to inherent differences among the genotypes. Similar such results were also obtained by Song *et al.,* (1996) and Susan (2003).

Variation in vase life could also be attributed to the increased accumulation of carbohydrates since, these genotypes could produce more number of leaves and higher chlorophyll content, which might have led to increased photosynthesis and increased carbohydrates. Similar variations for vase life were also observed previously by Mahesh (1996) and Krishnappa *et al.,* (2000).

The best cultivar is decided on the basis of number of buds per spike and its quality. The data recorded on yield components *viz.,* number of florets per spike and number of spikes per square meter as influenced by different Asiatic lily genotypes are presented in the Table 4. The perusal data presented revealed that, the significantly higher (5.00) number of florets recorded in the genotype Pirandeu and was superior compared to all other genotypes studied and the genotype Advantage (2.80) recorded minimum number of florets.

The significant differences were found within the genotypes of Asiatic lily for number of spikes per square meter. The number of spikes per square meter in different genotypes ranged from 16.67 to 24.00. The genotype Pirandeu, CEB Dazzle, Dazzle, Courier, Pavia and Tresor recorded maximum number of spikes per square meter (24.00) while, the genotype Batistero recorded the minimum number (16.67). The increase in flower yield might be attributed by more number of leaves per plant and chlorophyll content in the leaves that would have resulted in production and accumulation of maximum photosynthates and their utilization for build-up of new cells, thereby increasing the production of more number of buds per spike.

The results are in accordance with the findings of Pandey *et al.,* (2010) and Rajivkumar *et al.,* (2010). The variation in the flower yield might

be due to their genetic makeup. The results are in accordance with the findings of Vikas (2009), Pandey *et al.,* (2010) and Rajivkumar *et al.,* (2010).

The flowering and quality parameters are recorded maximum in the genotype Mestre which was superior over other genotypes. The stalk length is very important parameter which decides the quality of cut flowers. The differences among the genotypes of Asiatic lily for flower yield and quality might be due to their genetic characters of particular genotype. The significantly higher number of florets recorded in the genotype Pirandeu and was superior compared to all other genotypes studied.

References

Chitra, R. and Rajamani, K., 2009. Evaluation of different glory lily (*Gloriosa superba* L.) genotypes for vegetative, floral and yield characters. *Agric. Sci. Digest*, 29 (3): 190-193.

Dhiman, M. R., 2003. Evaluation of Lilium hybrids under Kullu conditions. *J. Orn. Hort. (New Series)*, 6 (2): 154-155.

Krishnappa, K. S., Shivreddy, N. and Anjanappa, 2000. Effect of floral preservatives on the vase life of Carnation cut flower cultivars. *Karnataka J. Agric. Sci.,* 13(2): 395-400.

Mahesh, K., 1996. Variability studies in Carnation (*Dianthus caryophyllus* L.). *M.Sc. Thesis*, University of Agric. Sci., Bangalore.

Pandey, R. K., Dogra, S., Jamwal, S. and Bhat, D., 2010, Performance of Asiatic lily under Jammu conditions. *Environment and Ecology*, 28(2): 775-776.

Rajivkumar, Bidyut, C., and Patel, V. V., 2010, Evaluation of Asiatic lilium under sub-tropical mid hills of Meghalaya. *J. Orn. Hort.*, 13(4): 257-260.

Rashmi, L., 2006. Evaluation of promising hybrids of gladiolus, *M.Sc. (Agri.) Thesis*, Uni. Agric. Sci., Dharwad.

Sindhu, S. S., 2006, Evaluation of Lilium cultivars under North Indian conditions. *Haryana J. Hort. Sci.*, 35(3&4): 270.

Sloan, R. C. and Harkness, S. S., 2005. Hybrid lily cultivar evaluation. *Mississippi Agriculture & Forestry Experiment Station Information Bulletin*, 419: 267-275.

Song, C., Bang, C., Chung, S., Kim, Y., Lee, J. and Lee, D., 1996, Effects of postharvest pretreatments and preservative solutions on vase life and flower quality of Asiatic hybrid lily. *Acta Hort.*, 414: 277-285.

Susan, H, S., 2003. Role of sugar in the vase solution on postharvest flower and leaf quality of Oriental Lily 'Stargazer', *Hort Science*, 38(3): 412-416.

Van, T., Jaap, M., Arens, M. S., Ramanna, A., Shahin, N. K., Xie, A., Lim, M. A. and Rodrigo, B., 2011. Lilium. Chapter In: Kole, C. *Wealth of Wild Species: Genetic, Genomic and Breeding Resources* Volume 9 - Plantation and Orn. Crops. Springer-Verlag Series, in press.

Vikas, H. M., 2009. Performance of dahlia (*Dahlia variabilis* L.) accessions under transitional zone of Karnataka. *M.Sc. Thesis*, University of Horticultural Sci., Dharwad.

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