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Assessment of Different Lily Types for Suitability for Commercial and Landscaping Use

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A B S T R A C T

An experiment was carried out for the assessment of different lily types of their performance with respect to growth and flowering during 2017-18 at Floriculture Research Station, Thovalai. The accessions under study showed significant variation for different characters. The experiment was laid out in a randomized block design with 8 treatments and each treatment replicated thrice. Among the lily accessions highest leaf growth has been observed in KN - 5 (Pudhugramam) with 25 leaves followed by KN - 4 (Thenthamaraikulam) with 24 leaves. Maximum leaf length (31.30 cm) and leaf breadth (31.70 cm) was observed in KN - 2 (Erachakulam). In flowering traits, among the lily accessions, the highest flower stock length (120 cm) was recorded in KN - 1 (Bhemenari) and maximum number of petals (58), petal width (3.10 cm) and flower weight (32 g) was observed in KN - 4 (Thenthamaraikulam) and petal length (8.60 cm) was observed in KN - 2 (Erachakulam). In this study, both the vegetative and flowering characters showed wider variation. The selected accessions can be used both for commercial and landscaping use under Tamil Nadu condition, also with proper management practices good quality flowers can be produced from these accessions. Hence, these accessions may be useful for further breeding program.

Introduction

Flowers are symbol of beauty, love and tranquillity; they form the soul of garden and convey the message of nature to mankind. Lilium is one of the horticultural most important genera for cut flower and pot plant production. The genus *Lilium* of the family Liliaceae comprises more than 80 species and these are divided into seven sections (Comber, 1949). Northern hemisphere, mainly Asia, North America and Europe, especially China, Nepal, Korea and Japan are the gene centres of this genus around the world. It is one of the six major genera of flower bulbs produced worldwide (Hertogh and Le Nard, 1993). It is a species of great economic importance in production and commercialization of cut flower in the international market (Jimenez *et al.*, 2012). Due to its size, beauty and longevity *Lilium* is one of the ten most superior cut flowers in the world (Thakur *et al.*, 2005). Due

to their large and attractive flowers having capacity to rehydrate after a long transportation, popularity of *Lilium* is gaining fast in our country. The cultivars of genus *Lilium* are highly appreciated by the horticulturists for their outstanding range of colour, fragrance and adaptability to several environmental conditions (Bahr and Compton, 2004). *Lilium* deserves to be called the aristocrat of the plant world. Lilies can be used for informal planting in grassland or among orchard trees, along crocuses, bluebells and tulip to create flower meadows (Beck, 2010). They can be planted in lines along formal paths (Dilon, 2010). *Lilium* hybrids have a wide range of colours and shape which are produced from interspecific hybridization. The popularity of these hybrids, especially Asiatic and oriental types is increasing both as cut flower and pot plant (Lian *et al.*, 2003).

In Tamil Nadu, *Lilium* is gaining popularity both as cut flower as well as garden plants. However, almost all the cut flowers of *Lilium* available in the florists' shop are being procured from Bangalore, Pune and other places of the country. It has been observed that Asiatic lily varieties/hybrids grown as garden plants by some amateurs in Tamil Nadu and other urban areas of the state are coming up well with a wide range of size, shape and colour. Although the agro climatic condition of the state is quite favourable for this flower crop, its commercial cultivation has not yet been started by the flower growers due to lack of knowledge about its production technology and unavailability of quality planting materials. Among several factors influencing growth, yield and quality of flowers, including *Lilium* improved varieties / hybrids play significant roles which need proper evaluation for their performance under local agro climatic condition.Hence, a systematic study was presently undertaken in assessment of different lily types for suitability for commercial and landscaping use.

Materials and Methods

This study was carried out during 2017-2018 at Floriculture Research Station, Thovalai. The experiment pertaining the assessment of different lily types for suitability for commercial and landscaping use. Eight lily accession have been collected and established in the pond. During this year silpaulin lined ponds have also been established and planting of lilies have been done. Maximum survival of 95 % of lily was observed.The experiment was laid out in a Randomized Block Design (RBD) with 8 treatments. The observations on vegetative parameters likeleaf length, leaf breadth, number of leaves, leaf stock lengthand the floral parameters *i.e.*flower stock length, number of sepals, number of whorls, number of petals, petals length, petals width, number of anthers, number of flowers and flowers weightwere taken. The experimental data were analysed statistically by ANOVA (Analysis Of Variance) technique (Panse and Sukhatme, 1985). The flower colour and survival percentage is presented in Table 1.

Results and Discussion

Vegetative characters

The data pertaining to the vegetative characters like flower colour, leaf length, leaf breadth, number of leaves and leaf stock length is presented in Table 1 and 2. Another vegetative traits like leaf colour, leaf hairs, leaf margin and leaf netting was presented in Table 3. Significant differences were observed in leaf length, leaf breadth, number of leaves and leaf stock length at the end of vegetative stage.

The flower colour of accessions like KN - 1 Bhemenaritype (White with Pink tip), KN - 2 Erachakulamtype (Pink), KN - 3 Layamtype (Dark red), KN - 4 Thenthamaraikulamtype

(Pale Yellow), KN - 5 Pudhugramamtype (white with blue tip), KN - 6 Nagercoiltype (Violet), KN - 7 Salemtype (Pure Yellow) and KN - 8 Yercaudtype (Peach). Among the lily accessions maximum leaf growth has been observed in KN - 5 (Pudhugramam) with 25 leaves followed by KN - 4 (Thenthamaraikulam) with 24 leaves while the least was observed in KN - 7 (Salem) with 5 leaves. Maximum leaf length (31.30 cm) and leaf breadth (31.70 cm) was observed in KN - 2(Erachakulam) while least leaf length (16.80 cm) and leaf breadth (16.00 cm) was observed in KN – 8 (Yercaud). The maximum leaf stock length (99.20 cm) was recorded in KN - 3 (Layam) and minimum leaf stock length (77.80 cm) was recorded in KN - 4 (Thenthamaraikulam). Similar variations in leaf width of Asiatic lilium varieties were also recorded by Pandey *et al.,* (2008) and Natraj *et al*.(2014). Similarly variation in vegetative traits of lilium has been reported by Mishra (1997), Naik*et al*.(2006), Barik (2013), Singh *et al.,* (2016), Barik andMohanty (2015) and Deka*et al.,* (2010)[6]. Differences in vegetative characters of different cultivars of lilium may be due to varied growth rates and their genetic potential resulted in variation in phenotypic expression. Kim *et al.,* (2013) and Pandey *et al.,* (2008) reported similar result of vegetative growth in Asiatic hybrid lily.

Table.1 Survey and collection of lily types under Thovalai conditions

Acc. No	Place of collection	Flower colour	Survival (%)
KN - 1	Bhemenari	White with Pink tip	90 %
KN - 2	Erachakulam	Pink	80 %
KN - 3	Layam	Dark red	90 %
KN - 4	Thenthamaraikulam	Pale Yellow	95 %
KN - 5	Pudhugramam	White with Blue tip	90 %
KN - 6	Nagercoil	Violet	80 %
KN - 7	Salem	Pure Yellow	50 %
KN - 8	Yercaud	Peach	60 %

Table.2 Vegetative parameters of lily types under Thovalai conditions

Acc. No.	Place of collection	Leaf length (cm)	Leaf breadth (cm)	No of Leaves	Leaf stock length (cm)
KN - 1	Bhemenari	22.00	18.50	16	83.50
KN - 2	Erachakulam	31.30	31.70	20	92.00
KN - 3	Layam	21.00	18.50	20	99.20
KN - 4	Thenthamaraikulam	22.20	23.20	24	77.80
KN - 5	Pudhugramam	21.30	19.00	25	80.00
KN - 6	Nagercoil	21.80	20.50	17	85.50
KN - 7	Salem	21.50	21.60	5	82.30
KN - 8	Yercaud	16.80	16.00	17	83.50
Mean		**22.24**	**21.12**	**18**	**85.47**
SEd		**0.67**	**0.90**	**2.50**	**2.67**
CD (0.05)		**0.13****	**0.18****	**0.50****	**0.53****

Table.3 Morphological parameters in Lily

Acc. No.	Name of lily	Leaf colour	Leaf hairs	Leaf margin	Leaf netting
KN - 1	Bhemenari	Green on both sides	Absent	Serrated	Absent
KN - 2	Erachakulam	Greenish red on both sides	Absent	Serrated	Present
KN - 3	Layam	Deep red on both sides	Present	Serrated	Present
KN - 4	Thenthamaraikulam	Dark green on upper side and dark brown on lower side	Absent	Entire	Absent
KN - 5	Pudhugramam	Dark green on upper side and light Maroon on lower side	Absent	Serrated	Present
KN - 6	Nagercoil	Dark green on upper side and Maroon on lower side	Absent	Serrated	Present
KN - 7	Salem	Green on upper side and light brown on lower side	Absent	Entire	Absent
KN - 8	Yercaud	Green on upper side and Maroon on lower side	Absent	Entire	Absent

Table.4 Flower characters of lily

Acc. No.	Flower Stalk length (cm)	No. of Sepals	No. of Whorls	No. of Petals	Petals length (cm)	Petals width (cm)	No. of Anthers	No. of flower	Flower weight (g)
KN - 1	120.00	3	3	21	6.30	2.40	30.00	7	21
KN - 2	85.00	4	5	33	8.60	2.50	62.00	5	22
KN - 3	93.00	4	3	28	6.00	2.00	32.00	7	18
KN - 4	88.50	2	5	58	8.30	3.10	65.00	10	32
KN - 5	79.00	4	3	24	6.10	1.80	19.00	19	16
KN - 6	85.50	4	3	28	4.50	1.60	88.00	8	18
KN - 7	83.00	3	3	31	4.10	1.50	90.00	3	17
KN - 8	86.00	4	4	40	6.80	2.00	38.00	4	19
Mean	**90.00**	**3.50**	**3.63**	**32.87**	**6.34**	**4.36**	**53.00**	**7.88**	**20.38**
SEd	**4.62**	**0.25**	**0.25**	**4.62**	**0.56**	**2.31**	**8.87**	**2.00**	**2.00**
CD (0.05)	**0.92****	**0.05****	**0.05****	**0.92****	**0.11****	**0.46****	**1.77****	**0.40**	**0.40**

Flower characters

The data pertaining to the flower characters like flower stock length, number of sepals, number of whorls, number of petals, petals length, petals width, number of anthers, number of flowers and flowers weight is presented in Table 4. Significant differences were observed in flower stock length, number of sepals, number of whorls, number of petals, petals length, petals width, number of anthers, number of flowers and flowers weight at the flowering stage.

Among the lily accessions, the highest flower stock length (120 cm) was recorded in KN - 1

(Bhemenari) and lowest (79 cm) was recorded in KN - 5 (Pudhugramam). Maximum number of petals (58), petal width (3.10 cm) and flower weight (32 g) was observed in KN - 4 (Thenthamaraikulam) and petal length (8.60 cm) was observed in KN - 2 (Erachakulam). Maximum number of anthers (90) was recorded in KN - 7 (Salem) and number of flowers (19) was recorded in KN - 5 (Pudhugramam). The least petals length (4.10 cm), petals width (1.50 cm) and minimum number of flowers (3) was recorded in KN - 7 (Salem). The flower characters showed wider variation among the accessions. Similar variation among the cultivar traits was also reported by Kumar *et al.,* (2011), Sindhu and Singh (2012) in Lilium. Maximum number of flower per plant is an important parameter of Lilium crops are always preferred which fetch maximum price in market. In present study significant variation in number of flower was observed due to different cultivars tried. Similar trend of flower character has been observed by Negi *et al.,* (2014), Deka *et al.,* (2010) and Srinivas (2002) in lilium cultivar. Wide variation in flower traits due to cultivars has also been reported by Dhiman (2003)[7] and Singh *et al.,* (2016). Pandey *et al.,* (2012) reported the same variation in gladiolus.

It is concluded that the variation in accessions may be due to genetic and environmental interaction. The selected accessions can be used both for commercial and landscaping use under Tamil Nadu condition, also with proper management practices good quality flowers can be produced from these accessions. Hence, these accessions may be useful for further breeding program.

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