



RESPONSE OF GROWING MEDIA ON GROWTH AND FLOWER QUALITY OF ASIATIC *LILIUM* CV. ERCALANO IN SHADE NET UNDER PRAYAGRAJ CONDITION

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Abstract

The present experiment was carried out during November to April 2019 in Department Research Field of Department of Horticulture, SHUATS, Prayagraj. The experiment was laid out under Randomized Block Design (RBD) replicated thrice. The effect of different growing media on plant growth and flower quality characters. The result revealed that the maximum plant height (42.55cm), number of leaves per plant (40.08), minimum first flower bud emergence or earliness (36.55 days), length of first flower bud (83.22 mm), diameter of first flower bud (26.55 mm), whereas the minimum Days to taken for first flowering (79.66 days), and the maximum flower diameter (175.62 mm) and stalk diameter (6.06 mm).

Keyword : Growing media, growth, flower quality and Asiatic *Lilium*

Introduction

Lilium is one among the important bulbous plants which is widely acclaimed for its use as cut flowers and pot plants. *Lilium* has been admired for its aesthetic beauty and has been depicted as a symbol of purity and regality. Genus *Lilium* belongs to family Liliaceae and is native to the Northern Hemisphere and geographically distributed over China (major centre of lily distribution in the world with 46 species and 18 varieties accounting for 50% of the total world (Zhao *et al.*, 1996), Japan, Siberia, South Canada and extends upto Florida (USA). In India, *Lilium* are found growing naturally in Nilgiri Hills and Himalayan regions (Bose and Yadav, 1998). Manures and composts not only supply many nutrients for crop production including micronutrients, but they are also valuable sources of organic matter. Increasing soil organic matter improves soil structure, increases the water-holding capacity, improves drainage, provides a source of nutrients, reduces wind and water erosion, and promotes growth of earthworms and other beneficial soil organisms. Vermicompost is finely structured mature peat-like material with high porosity and water-holding capacity and microbial activity which are stabilized by interaction between earthworm and microorganisms (Edwards and Burrows, 1988). Vermicompost contains most nutrients in plant-available forms such as nitrates, phosphates, exchangeable calcium and soluble potassium (Orozco *et al.*, 1996; Edwards, 1998). These are rich in microbial populations, particularly fungi, bacteria and actinomycetes (Edwards, 1998). Cocopeat is a by-product from the processing of coconut husks and has absolutely no nutrition in it, but has excellent water retention capacity. It is added so that the soil or medium retains more moisture for the plants. Cocopeat is considered as a good growing media component with acceptable pH, electrical conductivity and other chemical attributes (Abad *et al.*, 2002). As a growing medium, cocopeat can be used to produce a number of crop species with acceptable quality (Yahya *et al.*, 1997, 1999).

Materials and Methods

The present study entitled "Response of growing media on growth and flower quality of Asiatic *lilium* cv. Ercalano in shade net under Prayagraj condition" was carried out during winter season(2018-2019) at Department of Horticulture,

Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj. Uniform sized *lilium* bulbs (12/14 size) were selected for the experimentation. Bulbs were planted at a depth of 5-7 inches. The pots were maintained in shade net house. The experiment consisting of fourteen treatments with different combinations of growing media *viz.*, Soil + Sand (1:1), Sand + Cocopeat (1:1), Soil + FYM (1:1), Soil + Vermicompost (1:1), Soil + Sand + FYM (1:1:1), Soil + Sand + Vermicompost (1:1:1), Soil + Cocopeat + FYM (1:1:1), Soil + Cocopeat + Vermicompost (1:1:1), Soil + FYM + Vermicompost (1:1:1), Soil + sand + Cocopeat + vermicompost (1:1:1:1), Soil + Sand + Cocopeat + FYM (1:1:1:1), Soil+ Cocopeat + FYM + Vermicompost (1:1:1:1) and Soil + Sand + Cocopeat + FYM + Vermicompost (1:1:1:1:1) as compare with control T₀ (Garden Soil). The experiment was laid out under Randomized Block Design (RBD) replicated thrice. The data were analyzed by method suggested by Fisher and Yates (1949).

Results and Discussion

Effect of growing media on vegetative growth and flower quality parameters under different treatments is described. Table 1 and Fig. 1 shows the plant height (cm), number of leaves per plant, first flower bud emergence or earliness (days), length of first flower bud (mm), diameter of first flower bud (mm), days to taken for first flowering, flower diameter (mm) and stalk diameter (mm) of Asiatic *lilium*, which was significantly influenced by growing media.

Growth Parameters

The maximum plant height (42.55cm) and number of leaves per plant (40.08) was observed in treatment T₈ Soil+cocopeat +vermicompost (1:1:1) and the minimum plant height (25.33 cm) and number of leaves per plant (31.19) was found to be in treatment T₀ Garden soil. Increase in plant height in media amended with different constituents has also been reported by Singh (2013) in *Alstroemeria* and Smita *et al.* (2017) in *Lily*. Maximum number of leaves was also found in *lilium* cultivars grown on medium amended with cocopeat (Nikrazm *et al.*, 2011; Jong *et al.*, 2002 and Smita *et al.*, 2017).

Flower Parameters

The minimum days of first flower bud emergence or earliness (36.55 days) was observed in treatment T₈ Soil + cocopeat + vermicompost (1:1:1) and the maximum days of first flower bud emergence or earliness (days) (51.18) was found to be in treatment T₀ Garden soil. Our results are in close conformity with the findings of (Wazir *et al.*, 2009 and Smita *et al.*, 2017) who reported earliest flower bud formation in Asiatic *lilium* and *Alstroemeria*. The maximum length of first flower bud (mm) (83.22) was observed in treatment T₈ Soil + cocopeat + vermicompost (1:1:1) and the minimum length of first flower bud (73.66) was found to be in treatment T₀ Garden soil. According to De Hertogh (1989) and Smita *et al.* (2017) flower size is inversely related to number of flowers on a spike.

The maximum Diameter of first flower bud (mm) (26.89) was observed in treatment T₈ Soil + cocopeat + vermicompost (1:1:1) and the minimum Diameter of first flower bud (mm) (22.55) was found to be in treatment T₀ Garden soil. The superiority of cocopeat and vermicompost amended media for growth and flowering in *lilium* has already been established in the present studies and reported by many workers. Increased bulb size (perimeter) in cocopeat as a media has been reported by Nikrazm *et al.* (2011) in *lilium* and Smita and Puja (2017). The minimum days to taken for first flowering (79.66) was observed in treatment T₈ Soil + cocopeat + vermicompost (1:1:1) and the maximum Days to taken for first flowering (89.40) was found to be in treatment T₀ Garden soil. Our findings are also supported by Matsuo

and Arisumi (1979) and Krause (1996) in *Lilium longiflorum* cultivars; Singh (2002) in Asiatic cultivars and Sharma *et al.* (2007) in Oriental lilies and Smita and Puja (2017). The maximum Flower diameter (mm) (175.62) was observed in treatment T₈ Soil + cocopeat + vermicompost (1:1:1) and the minimum Flower diameter (mm) (153.48) was found to be in treatment T₀ Garden soil. Our findings are also supported by Matsuo and Arisumi (1979) and Krause (1996) in *Lilium longiflorum* cultivars; Singh (2002) in Asiatic cultivars and Sharma *et al.* (2007) in Oriental lilies and Smita and Puja (2017). The maximum Stalk diameter (mm) (6.06) was observed in treatment T₈ Soil + cocopeat + vermicompost (1:1:1) and the minimum Stalk diameter (mm) (4.21) was found to be in treatment T₀ Garden soil. Our findings are also supported by Matsuo and Arisumi (1979) and Krause (1996) in *Lilium longiflorum* cultivars; Singh (2002) in Asiatic cultivars and Sharma *et al.* (2007) in Oriental lilies and Smita and Puja (2017).

Conclusion

On the present investigation conducted in Asiatic *lilium*, it is concluded that with application of T₈ soil + cocopeat + vermicompost (1:1:1) gave plant height (42.55 cm), number of leaves per plant (40.08), minimum first flower bud emergence or earliness (36.55 days), length of first flower bud (83.22 mm), diameter of first flower bud (26.55 mm), whereas the minimum Days to taken for first flowering (79.66 days), and the maximum flower diameter (175.62mm) and stalk diameter (6.06 mm).

Table 1: Response of growing media on growth and flower quality of Asiatic *lilium* cv. Ercalano in shade net under Prayagraj condition

Treatment No.	Treatment combination	Plant height (cm)	Number of leaves per plant	first flower bud emergence or earliness (days)	length of first flower bud (mm)	Diameter of first flower bud (mm)	Days to taken for first flowering	Flower diameter (mm)	Stalk diameter (mm)
T ₀	Garden soil	25.33	31.19	51.18	73.66	22.55	89.40	153.48	4.21
T ₁	Soil+Sand(1:1)	40.60	33.37	39.66	82.51	25.55	83.66	168.37	5.32
T ₂	Soil + Cocopeat (1:1)	39.09	32.44	42.11	81.33	25.55	83.55	166.53	5.18
T ₃	Soil + FYM (1:1)	34.52	33.39	38.22	81.28	25.89	83.89	163.63	4.92
T ₄	Soil + Vermicompost(1:1)	36.23	34.00	50.19	81.65	26.00	83.44	173.32	5.00
T ₅	Soil+Sand+FYM(1:1:1)	39.54	37.79	39.22	80.00	25.22	82.93	170.39	4.77
T ₆	Soil+Sand+Vermicompost (1:1:1)	32.92	35.11	44.10	79.44	25.66	85.00	161.90	5.03
T ₇	Soil+Cocopeat+FYM(1:1:1)	39.95	38.04	43.99	82.84	25.51	83.92	163.63	5.11
T ₈	Soil+Cocopeat +Vermicompost (1:1:1)	42.55	40.08	36.55	83.22	26.89	79.66	175.62	6.06
T ₉	Soil + FYM +Vermicompost(1:1:1)	41.16	34.28	49.84	80.99	24.77	81.88	162.55	4.29
T ₁₀	Soil+Sand+ Cocopeat+Vermicompost (1:1:1:1)	40.49	36.65	37.84	78.68	25.55	83.55	172.53	4.74
T ₁₁	Soil+ Sand+Cocopeat+FYM (1:1:1:1)	39.64	33.34	37.32	80.11	25.66	80.11	164.62	5.40
T ₁₂	Soil+ Cocopeat+FYM+ Vermicompost (1:1:1:1)	37.82	36.42	40.24	81.75	26.22	83.66	170.02	5.67
T ₁₃	Soil + Sand + Cocopeat + FYM + Vermicompost (1:1:1:1:1)	38.90	36.52	41.91	79.55	26.55	83.47	158.79	4.59
	F-test	S	S	S	S	S	S	S	S
	C.D. at 0.5%	8.373	4.566	7.366	3.239	1.525	4.436	10.115	0.788
	S.Ed. (±)	4.073	2.221	3.584	1.576	0.742	2.158	4.921	0.384

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