

Original Research Article

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**Evaluation of Chrysanthemum (*Dendranthema grandiflora* Tzvelev) Genotypes for Floral and Quality Traits under Hill Zone of Karnataka, India**

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**A B S T R A C T**

Twenty varieties of chrysanthemum were evaluated with an aim to identify suitable varieties based on different characters under hill zone of Karnataka. The experiment was carried out in Randomized Complete Block Design with three replications at the experimental block of Department of Floriculture and Landscape Architecture, College of Horticulture, Mudigere, Karnataka during 2017-2018. The results revealed that genotype Kolar Local recorded minimum days for appearance of first flower and 50 percent of flowering (90.59 and 99.66 respectively.) and maximum flowering duration and crop duration (149.33 days and 239.55 days, respectively) whereas, genotype Sharad Mala recorded the maximum days for first flower appearance and 50 percent flowering (149.08 and 169.35, respectively) and minimum flowering duration and crop duration (45.43 days and 190.29 days, respectively). The genotype Kolar Local recorded significantly maximum girth of the flower stalk (5.04 mm), flower diameter (5.75cm), individual flower weight (3.24g) and number of ray florets per flower (325.14). The genotype Kolar Local manifested maximum shelf life and vase life (9.54 days and 15.17 days, respectively) whereas, the minimum was observed in genotype Autumn Joy (2.39 days and 5.22 days, respectively.)

**Keywords**

Genotypes,  
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**Introduction**

Chrysanthemum (*Dendranthema grandiflora* T.) is one of the most important flower crops grown commercially in India for cut and loose flowers and is also used for garden display. It is commonly known as Guldaudi, Autumn Queen or Queen of the East belongs to the family Asteraceae. Growth of chrysanthemum has two distinguished phases, firstly a period

of long day conditions (day length more than 12hrs) where the plants grow vegetatively and secondly short day conditions (daylengths less than 12 hrs), leading to flower induction and development. Long day and short day conditions are influenced by season and climatic conditions of that particular region. The variations among chrysanthemum varieties are large in response to environment particularly temperature and the interaction

between temperature and cultivar occur for every developmental trait. Therefore, varietal evaluation became necessary to identify the suitable variety for the specific region. The performance of any crop or variety largely depends on interaction between genotype and environment. As a result, varieties, which perform well in one region, may not perform same in other regions of varying climatic conditions. Hence, it necessary to evaluate new genotypes for their quality traits under varying climatic conditions.

### **Materials and Methods**

The experiment was carried out at College of Horticulture, Mudigere, Karnataka during 2017-2018. Twenty genotypes of chrysanthemum were evaluated. The varieties include T1: Red T2: Pink Clad, T3: Pache, T4: Star Pink, T5: Poornima White, T6: Paper Yellow, T7: White Pink, T8: Chandini, T9: White Prolific, T10: Pink, T11: Sharadmala, T12: Paper White, T13: ACC1, T14: Kolar Local (Marigold), T15: Winter Queen, T16: Ratnam Selection, T17: Dundi, T18: Autumnjoy, T19: Violet, T20: Poornima Yellow.

The experiment was laid out in RCBD with three replication. Plant spacing between two rows was 30cm and within plant 30cm. The observations were recorded at regular intervals and uniform package and practices were followed throughout the cropping season.

### **Results and Discussion**

Data pertaining to flowering characters like days taken for appearance of first flowering, days taken for 50 percent flowering, duration of flowering and duration of crop are furnished in table 1.

Among the different genotypes studied, the genotype Kolar Local recorded minimum days for appearance of first flower (90.59)

and days for 50 percent of flowering (99.66) whereas, genotype Sharad Mala recorded the maximum days for first flower appearance (149.08) and days for 50 percent flowering (169.35). The variation in time taken for flowering might be due to the genetic makeup of the genotype or the influence of genotype and environment. The variation in time to flowering of different chrysanthemum genotypes was also reported by Dilta *et al.*, (2005), Srilatha *et al.*, (2015) and Suvija *et al.*, (2016) in chrysanthemum.

The genotype Kolar Local recorded maximum flowering duration (149.33 days) and crop duration (239.55 days) whereas, genotype Sharad Mala recorded minimum flowering duration (45.43 days) and crop duration (190.29 days). The variation in duration of flowering and crop among the varieties was attributed to genotype of the plant and environmental influence. Similar results were reported by Rajiv *et al.*, (2007), Kishan *et al.*, (2007) Peddi *et al.*, (2008), Kumar (2011) and Suvija *et al.*, (2016) in chrysanthemum.

The data pertaining to flower quality characters of different genotypes of chrysanthemum are provided in table 2. The genotype Kolar Local recorded significantly maximum girth of the flower stalk (5.04 mm), flower diameter (5.75cm), individual flower weight (3.24g) and number of ray florets per flower (325.14).

Whereas, minimum girth of the flower stalk (2.28mm), flower diameter (3.27 cm), flower weight (0.92g) and number of ray florets (37.36) was found in the genotype Pink Cloud. The variation among the genotypes was may be due to flower size of the genotype. Similar type of variations was observed by Beeralingappa (2016) and Suvija *et al.*, (2016) in chrysanthemum.

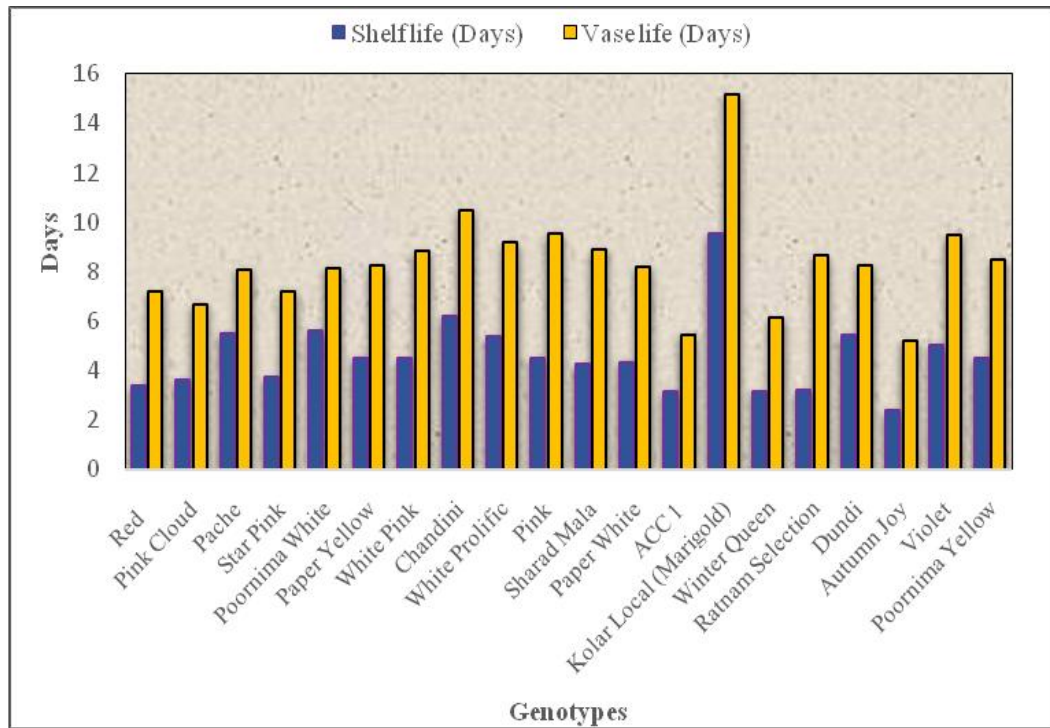
**Table.1** Performance of chrysanthemum genotypes for flowering parameters

Sl. No.	Genotypes	Days taken for appearance of first flowering	Days taken for 50 per cent flowering	Duration of Flowering (days)	Duration of the crop (days)
1	Red	97.74	112.50	108.84	204.27
2	Pink Cloud	96.48	118.88	105.30	201.33
3	Pache	115.88	123.97	87.40	202.33
4	Star Pink	127.55	132.98	104.59	230.44
5	Poornima White	103.57	125.23	102.95	204.40
6	Paper Yellow	112.44	130.22	105.30	217.49
7	White Pink	130.51	148.76	74.37	208.16
8	Chandini	115.17	129.51	123.31	228.41
9	White Prolific	93.22	119.03	100.32	193.35
10	Pink	92.64	103.06	118.40	211.00
11	Sharad Mala	149.08	169.35	45.43	190.29
12	Paper White	111.89	129.28	96.31	208.33
13	ACC 1	109.96	126.87	117.40	225.31
14	Kolar Local (Marigold)	90.59	99.66	149.33	239.55
15	Winter Queen	142.34	156.31	76.40	218.19
16	Ratnam Selection	115.18	123.93	102.29	214.99
17	Dundi	93.19	102.87	119.43	213.42
18	Autumn Joy	99.74	115.94	101.53	202.53
19	Violet	101.86	117.57	81.33	202.45
20	Poornima Yellow	111.27	129.61	86.00	215.29
S. Em±		<b>3.70</b>	<b>3.45</b>	<b>4.08</b>	<b>6.84</b>
CD at 5 %		<b>10.59</b>	<b>9.89</b>	<b>11.69</b>	<b>19.50</b>

**Table.2** Performance of chrysanthemum genotypes for flower quality parameters

Sl. No.	Genotypes	Girth of the flower stalk(mm)	Flower diameter(cm)	Flower weight(g)	Number of ray florets per flower
1	Red	2.32	4.27	1.07	42.68
2	Pink Cloud	2.28	3.27	0.92	37.36
3	Pache	2.54	4.77	1.33	94.36
4	Star Pink	3.43	5.34	3.18	155.58
5	Poornima White	2.43	4.45	1.74	120.30
6	Paper Yellow	2.52	4.24	1.65	129.59
7	White Pink	2.41	3.54	2.40	142.64
8	Chandini	4.58	4.29	1.28	159.24
9	White Prolific	3.42	3.49	1.66	124.91
10	Pink	2.45	3.82	1.44	117.30
11	Sharad Mala	3.42	3.67	1.31	130.50
12	Paper White	2.69	4.42	1.35	68.85
13	ACC 1	2.69	4.49	1.66	71.13
14	Kolar Local (Marigold)	5.04	5.75	3.24	325.14
15	Winter Queen	2.67	3.50	1.31	68.35
16	Ratnam Selection	3.42	4.36	1.28	70.36
17	Dundi	3.51	5.31	2.28	102.57
18	Autumn Joy	3.41	3.71	0.99	69.29
19	Violet	2.51	4.44	1.49	105.98
20	Poornima Yellow	2.54	4.28	1.61	135.80
S. Em±		<b>0.13</b>	<b>0.14</b>	<b>0.16</b>	<b>3.87</b>
CD at 5 %		<b>0.37</b>	<b>0.39</b>	<b>0.45</b>	<b>11.08</b>

**Fig.1** Performance of chrysanthemum genotypes for shelf life and vase life



**Plate.1** Best performing genotypes for flower quality traits.



Shelf life and vase life of flowers varied significantly among the genotypes of chrysanthemum. Genotype Kolar Local manifested maximum shelf life and vase life (9.54 days and 15.17days, respectively.) whereas, the minimum was observed in genotype Autumn Joy (2.39days and 5.22days, respectively.) which is represented in figure 1. This variation may be due to different genetic makeup of genotypes and

influenced by prevailing environmental conditions which affect the physiological processes of flower like cell turgidity, water loss through evapotranspiration and breakdown of the reserve food which governs the shelf life and vase life of the flower. Similar results were noted by Joshi *et al.*, (2009), Beeralingappa (2016) in chrysanthemum.

In conclusion, from this study it was concluded that genotype Kolar Local (Marigold) was early in flowering and can catch the early market advantage. However, it had good acceptance in the local market due to their colour and quality and suitable for successful cultivation under hill zone of Karnataka.

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