International Journal of Agricultural Sciences
Volume **10** | Issue 2 | June, 2014 | 498-505
e ISSN-0976-5670 | Visit us | *www.researchjournal.co.in*

RESEARCH PAPER

Evaluation of genotypes of gerbera (*Gerbera jamesonii* Bolus ex Hooker F.) under open condition at Yercaud

M. ANAND*, A. SANKARI **AND** K. NAGESWARI
Horticultural Research Station, Yercaud, SALEM (T.N.) INDIA (Email : anandhort@yahoo.com)

Abstract : The study was carried out to evaluate the performance of seventy gerbera genotypes (*Gerbera jamesonii* Bolus ex Hooker F.) under open condition at Horticultural Research Station, Tamil Nadu Agricultural University, Yercaud during 2008 and 2010. Significant differences were observed for all the characters studied. The results revealed that GJ 13 showed maximum plant height (36.30 cm) and plant spread (44.99 cm). Higher number of leaves was recorded in GJ 23 (22.97). Maximum leaf length was recorded in GJ 11 (23.40 cm) while shortest leaf width was recorded in GJ 36, GJ 53 (3.20 cm). Maximum sucker production was recorded in GJ 11 (8 nos). The highest stalk length was observed in GJ 2 (60.80 cm) while flower diameter GJ 11 (10.20 cm), cut flower production GJ 23 (70) and vase life was higher in GJ 23 (9 d). Considering correlation and path co-efficients of the characters *viz*., plant height, leaf breadth, stalk length and flower diameter were found to be positive effect on yield. It could be concluded from the present investigation that, out of seventy genotypes evaluated, genotypes GJ 23, GJ 11, GJ 2, GJ 19 and GJ 55 were found to be the best cultivars with superior in qualities for flower production under Shevaroy condition of eastern ghat.

Key Words : Gerbera, Evaluation, Correlation, Path co-efficient

View Point Article : Anand, M., Sankari, M. and Nageswari, M., (2014). Evaluation of genotypes of gerbera (*Gerbera jamesonii* Bolus ex Hooker F.) under open condition at Yercaud. *Internat. J. agric. Sci.*, **10** (2): 498-505.

Article History : Received : 26.10.2013**; Revised :** 20.03.2014**; Accepted :** 05.04.2014

INTRODUCTION

Gerbera is one among the top ten cut flowers traded in the global market. Gerbera are grown successfully both in plains and hills for cut flower production. Besides, being used as cut flower, the flowers are popularly grown in beds, borders, rock gardens and pots. Gerbera is a dwarf herbaceous perennial plant belongs to the family Asteraceae. The plants are stemless and hairy throughout, with foliage arranged in the form of a rosette at the base. Leaves are radially arranged, petiolated, lanceolate, deeply lobed, sometimes leathery, narrower at the base and wider at the tip. The flower, known as head or capitulum has conspicuous ray florets in one or two whorls. The flowers are daisy like and are 7 - 10 cm across but, may extend upto 10 -15 cm in some hybrids. Flowers are in wide range of colours like yellow, orange, cream, white, pink, brick red, scarlet, salmon, maroon and in various intermediate shades. Based on the flower heads they are grouped into three types *viz*., single, semi-double and double. In India with its varied agro climatic conditions, vast land and labour resource has great potential for commercial production of gerbera. However, no systematic efforts were made in the past history to identify suitable genotypes of bedding gerbera under open condition at Yercaud. With these views, seventy genotypes of gerbera were evaluated to identify suitable gerbera genotypes.

MATERIAL AND METHODS

The field trial was conducted in open condition at Horticultural Research Station, Tamil Nadu Agricultural University, Yercaud during June 2008, 2009 and 2010. The experimental site is geographically situated between 11° 04" to 11° 05" North latitude and 78° 05" to 78° 23" East longitude

*** Author for correspondence**

and at an altitude of 1500 m above mean sea level. The average maximum and minimum temperature was 31.0ºC and 12.4ºC. The average relative humidity was 75 per cent. The soil of the experimental plot was laterite in texture with 0.5 to 1.5 m depth. The land was thoroughly pulverized and added with red earth, sand and well decomposed farm yard manure at 2:1:1 proportion. It was then fumigated with methyl bromide (30g/ m^2) and covered with polythene sheet for 2 – 3 days. The experiment was laid out in a Randomized Block Design with three replications. Seventy genotypes of uniform sized (4-5 leaves) suckers of bedding genotypes of gerbera were planted during June 2008, maintaining a spacing of 30 x30 cm, five plants from each cultivar in each replication were used for recording observation on plant height, plant spread, leaf length, leaf breadth, number of leaves/plant, number of suckers/plant, stalk length, flower diameter, stalk diameter, number of flowers/ clump/year, shelf life and vase life in sucrose. The genotypic and phenotypic correlation co-efficients were calculated by the formulae suggested by Panse and Sukhatme (1967). Parameters of variability were calculated as per the formula given by Burton and De Vane (1953). Heritability, genetic advance and expected genetic gain were calculated by the formula suggested by Johnson *et al.* (1955). The mean and standard errors were worked out as per standard methods and co-efficients of variations were computed. The path co-efficients were worked out with the genotypic correlation co-efficients.

RESULTS AND DISCUSSION

The data on the pooled mean for three year values of various vegetative characters are presented in Table 1. Significant differences were recorded among cultivars for all the characters studied. The plant height was ranged from 12.50 to 36.30 cm and it was significantly higher in the GJ 13 (36.30 cm) followed by GJ 5 (35.20 cm), GJ 69 (33.60 cm), GJ 40 (32.40 cm) and GJ 39 (30.30 cm) . The lowest plant height was recorded in GJ 32 (12.50 cm). The plant height is being genetical factor, it is expected to vary among the cultivars. Similar variations in plant height among gerbera cultivars was observed by Barooah and Talukdar (2009) and Ahlawat *et al.* (2012).

Studies revealed that the highest plant spread of 44.99 cm was recorded in GJ 13 followed by GJ 40 (42.81 cm) and GJ 23 (42.48 cm). While, the lowest plant spread was observed in GJ 16 (17.74 cm). It might be due to larger sized leaves produced by respective cultivars. Variation in plant spread has been attributed in additive gene effects. These results are in accordance with the findings of Kumar and Yadav (2005). Leaf production of any crop decides the spread of plant; leaves are the prime important functional units for photosynthesis, which greatly influence the growth and flower yield. Among the genotypes studied GJ 23 (22.97), GJ 2 (21.96) and GJ 11 (21.19) were found to be significantly superior for number of leaves per plant over the others. However, the minimum number of leaf production was noticed in GJ 18 (12.16). Variation in leaf production per plant was also reported by Vasudevan and Rao (2010) in gerbera. The results revealed that there was significant difference between all the genotypes for leaf length and Leaf breadth as they are important parameters for the formation of plant spread also reported by Hasanuzzaman (2006). The genotypes GJ 11 (23.40 cm),GJ 23 (22.70 cm) and GJ 2 (21.50 cm) were found to be superior for leaf length. However, the shortest leaf width was observed in genotypes of GJ 36 and GJ 53 (3.20 cm). The differences in various growth parameters might be attributed to inherent genetic characters of the cultivars (Barooah and Talukdar, 2009). Among the cultivars, higher number of sucker production was recorded in GJ 11, GJ 47, GJ 53 and GJ 65 (8.00). Similar variations in sucker production among the cultivar of gerbera were also reported by Kumar and Yadav (2005).

Stalk length is very important parameter for gerbera flowers. It is one of the characters, which decides the quality of any cut flowers. Significant differences were observed among the different genotypes for stalk length. The largest flower stalk was observed in GJ 2 (60.80 cm), GJ 23 (55.60 cm) and GJ 5 (53.40 cm). Similar type of variation was observed by Pattanashetti (2009) and Hedau *et al.* (2012) also reported the variation in stalk length among the genotypes due to the genetic characters of particular genotype.

The diameter of the flower was the highest in GJ 11 (10.20 cm) followed by GJ 2 (10.00 cm), while the GJ 59 had the least flower diameter (4.00 cm). This might be due to the inherent character of individual varieties. Stalk diameter plays an important role in the post harvest vase life of cut flowers. It has been found that as the diameter of the stalk increases the carbohydrates content of the stalk also increases which helps in increasing the stability of vase life of the cut flowers thereby prolonging the vase life of cut flowers. Stalk diameter of the plant varied from 1.0 to 4.50 cm. Among the genotypes GJ 2, GJ 55, GJ 30 and GJ 23 were found to be superior. Similar variation in the cultivars were obtained by Deepa *et al.* (2011).

Flower yield decides the significance of the particular genotypes, which are suitable for commercial cultivation. In the present investigation, genotypes *viz*., GJ 23, GJ 11, GJ 2,GJ 19 and GJ 55 produced maximum number of flowers per clump per year (70, 54, 53, 52 and 52) and those genotypes were found to be superior over rest of the genotypes studied whereas, GJ 60 recorded minimum (13) number of flowers per clump per year. The increased in flower yield might be attributed to the greater leaf area and more number of leaves per plant as well as plant spread would have resulted in production and accumulation of maximum photosynthates, resulting the production of more number of flowers with bigger size. The results are in accordance with the findings of Wankhedeb and Gajbhiyue (2012), Hemla Naik *et al.* (2006) in gerbera. With respect to genotypes (Table 2), longer vase-life

Table 1 : ***Per sec*** **performance of bedding gerbera under Shevaroy conditions of 3 years-growth attributes and floral characters and yield parameters (Pooled Mean 2008, 2009 & 2010).**

Accession	Plant height (cm)	Plant spread (cm)	No. of leaves/ plant	Leaf length (cm)	Leaf breath (cm)	No of suckers / plant	Stalk length (cm)	Flower diameter (cm)	Stalk diameter (cm)	No of flowers/ clump/year
GJ 1	22.40	31.26	20.02	6.60	5.20	4.00	29.80	7.20	2.10	46.00
GJ 2	13.40	25.23	21.96	21.50	4.30	5.00	60.80	10.00	4.50	53.00
GJ 3	23.50	27.01	17.56	15.20	6.20	3.00	32.40	7.30	1.20	46.00
GJ 4	23.60	30.20	20.27	15.30	5.20	7.00	35.20	8.20	1.00	40.00
GJ 5	35.20	22.81	16.55	21.30	7.20	4.00	53.40	9.00	1.30	48.00
GJ 6	12.60	34.91	20.17	15.20	5.30	4.67	27.90	8.00	1.20	40.00
GJ 7	30.60	26.04	19.93	10.00	5.20	6.00	26.60	7.80	1.40	50.00
GJ 8	19.50	28.07	19.80	13.20	7.30	3.00	29.70	7.20	3.00	48.00
GJ 9	29.40	27.41	12.84	17.30	6.50	4.00	36.80	9.00	3.20	52.00
GJ 10	22.00	24.32	12.38	13.77	4.83	4.00	31.33	8.33	1.87	48.00
GJ 11	17.60	37.87	21.19	23.40	4.50	8.00	47.40	10.20	1.20	54.00
GJ 12	19.40	24.93	18.74	15.60	6.00	3.00	42.20	6.20	1.20	43.00
GJ 13	36.30	44.99	18.92	14.30	6.20	7.00	48.30	8.30	1.30	52.00
GJ 14	15.30	23.05	15.20	18.30	4.00	3.00	24.30	6.20	1.20	44.00
GJ 15	14.60	24.67	16.82	17.40	5.00	4.00	33.40	5.00	1.30	48.00
GJ 16	23.80	17.74	15.77	18.20	6.00	2.00	29.40	8.20	1.30	47.00
GJ 17	21.30	31.16	12.50	12.40	4.50	2.00	31.40	8.60	1.30	46.00
GJ 18	21.60	27.21	12.16	13.20	5.20	4.00	29.40	7.50	1.40	46.00
GJ 19	20.60	24.32	19.12	16.30	7.30	3.00	38.30	8.30	1.20	52.00
GJ 20	21.30	32.38	13.51	15.60	5.40	4.00	39.20	8.00	1.30	47.00
GJ 21	20.30	27.01	14.16	15.30	4.60	5.00	29.40	7.10	1.20	50.00
GJ 22	17.40	27.16	11.82	11.60	5.20	3.00	26.30	8.00	1.20	40.00
GJ 23	19.20	42.48	22.97	22.70	6.00	5.00	55.60	9.80	3.50	70.00
GJ 24	23.40	34.35	15.20	12.20	7.20	3.00	28.40	8.80	2.20	44.00
GJ 25	20.40	31.31	13.17	15.10	5.70	3.00	30.40	9.00	2.30	44.00
GJ 26	25.30	29.90	15.20	20.20	6.00	3.00	48.30	7.90	3.10	40.00
GJ 27	21.30	35.47	19.86	14.30	4.00	4.00	34.20	8.20	3.25	45.00
GJ 28	18.80	41.04	18.58	18.20	9.60	5.00	18.40	5.80	2.50	42.00
GJ 29	24.60	35.42	13.51	16.30	7.20	6.00	45.40	6.30	3.12	45.00
GJ 30	27.30	34.45	18.92	21.20	8.70	4.00	33.40	7.00	3.70	40.00
GJ 31	31.40	37.80	17.85	13.30	7.20	2.00	37.40	8.20	4.30	50.00
GJ 32	12.50	19.61	18.85	7.30	4.20	4.00	27.20	7.30	2.65	50.00
GJ 33	15.40	26.50	19.19	9.80	4.60	7.00	21.60	5.00	2.75	44.00
GJ 34	16.60	31.67	19.25	12.20	5.50	7.00	29.30	9.20	2.30	39.00
GJ 35	27.40	39.98	21.00	15.60	6.30	5.00	29.30	7.20	2.10	38.00
GJ 36	15.60	31.26	19.57	9.30	3.20	7.00	23.40	6.20	1.30	46.00
GJ 37	21.40	25.23	18.00	6.20	6.30	5.00	28.30	5.40	2.20	51.00
GJ 38	19.50	27.01	18.58	12.30	5.20	4.00	28.40	4.30	2.30	49.00
GJ 39	30.30	30.20	18.41	17.30	10.20	3.00	48.30	9.20	3.60	50.00
GJ 40	32.40	42.81	17.50	18.20	8.40	5.00	40.60	7.40	3.00	51.00
GJ 41	19.40	34.91	16.92	15.40	4.50	6.00	29.30	6.20	2.20	47.00

Table 1: Contd.……

Table 1 : Contd.……

GJ 42	15.50	26.04	18.87	12.30	6.40	2.00	34.30	9.30	3.30	44.00
GJ 43	22.30	28.07	20.45	12.20	6.30	5.00	30.30	5.20	2.50	44.00
GJ 44	16.30	27.41	19.48	13.40	5.40	4.00	30.20	7.30	3.50	46.00
GJ 45	15.77	24.32	20.98	12.73	5.93	3.33	36.94	7.77	3.70	40.67
GJ 46	18.30	37.87	20.80	9.30	5.30	6.00	28.30	7.20	2.40	50.00
GJ 47	21.40	24.93	17.02	17.30	3.30	8.00	42.40	8.30	2.80	41.00
GJ 48	23.60	34.99	22.49	11.40	5.20	6.00	45.30	9.00	2.30	38.00
GJ 49	24.30	23.05	20.95	16.20	9.30	7.00	29.50	6.20	2.20	38.00
GJ 50	21.20	24.67	19.97	12.40	6.00	2.00	27.50	7.40	2.10	42.00
GJ 51	16.40	17.74	23.08	13.30	3.60	7.00	23.40	5.00	3.20	40.00
GJ 52	17.60	31.16	22.38	9.20	5.30	5.00	18.30	4.20	2.90	46.00
GJ 53	16.60	27.21	24.25	9.50	3.20	8.00	32.30	6.00	2.90	49.00
GJ 54	19.40	24.32	17.83	12.20	6.30	4.00	45.40	7.30	3.40	51.00
GJ 55	19.50	32.38	17.29	14.40	8.20	2.00	43.60	6.90	4.10	52.00
GJ 56	19.40	27.01	20.72	15.20	6.40	4.00	36.30	7.80	2.00	40.0
GJ 57	21.60	27.16	21.76	15.60	7.20	4.00	33.60	6.00	2.50	39.00
GJ 58	26.50	32.48	20.73	15.40	6.70	8.00	19.40	6.30	2.70	40.00
GJ 59	21.40	34.35	20.08	14.50	6.30	3.00	20.60	4.00	1.50	38.00
GJ 60	14.70	31.31	20.34	9.30	4.20	4.00	31.70	7.20	3.70	13.00
GJ 61	22.40	29.90	18.92	15.40	6.30	3.00	36.40	7.30	2.80	39.00
GJ 62	27.50	35.47	19.85	16.30	5.50	2.00	36.30	8.00	3.30	48.00
GJ 63	27.40	41.04	17.62	15.40	7.00	3.00	35.60	6.00	2.80	45.00
GJ 64	21.60	35.42	16.29	11.40	6.60	4.00	30.30	5.20	2.40	37.00
GJ 65	20.30	34.45	18.92	16.30	5.60	8.00	25.40	5.30	2.60	38.00
GJ 66	25.40	37.80	18.37	12.30	5.40	6.00	16.60	7.30	2.80	49.00
GJ 67	19.60	19.61	19.32	14.40	7.20	3.00	22.40	11.20	3.40	51.00
GJ 68	22.20	26.50	17.79	15.50	6.40	3.00	23.60	7.20	3.90	48.00
GJ 69	33.60	31.67	20.45	20.60	9.50	5.00	20.00	5.00	3.50	40.00
GJ 70	23.40	39.98	21.10	18.40	6.50	3.00	23.00	6.00	3.20	41.00
SED	0.96	1.32	3.89	0.39	0.25	0.11	1.58	0.25	0.15	0.94
CD	1.91	2.62	7.69	0.77	0.50	0.22	3.13	0.50	0.30	1.85

Table 2 : Floral characters and vase life studies in bedding gerbera (Pooled Mean 2008, 2009 & 2010)

Accession	Flower type (Double/Single /Multiple)	Flower colour	Vase life in sucrose (d)	Vase life in plant (d)
GJ 1	Double	Red	7	4
GJ 2	Double	Pink	6	4
GJ 3	Single	Red	6	4
GJ 4	Single	Red	5	3
GJ 5	Single	Yellow	6	4
GJ 6	Double	Orange	5	3
GJ 7	Single	Red	6	5
GJ 8	Double	rose	7	5
GJ 9	Single	Red	5	3
GJ 10	Multiple	Orange	6	4
GJ 11	Double	White	6	4
GJ 12	Single	Yellow	6	5
GJ 13	Multiple	Pink	6	4
GJ 14	Multiple	Pink	6	4
GJ 15	Single	Red	6	5

Table 2 : Contd.……..

Table 2 : Contd……..

GJ 16	Single	Red	6	5
GJ 17	Multiple	Red	6	5
GJ 18	Multiple	Red	6	4
GJ 19	Multiple	Red	8	6
GJ 20	Multiple	Orange	7	5
GJ 21	Multiple	Light Yellow	6	4
GJ 22	Single	Red	7	5
GJ 23	Mutiple	Light yellow	9	7
GJ 24	Single	Light Orange	6	4
GJ 25	Multiple	Red	7	5
GJ 26	Multiple	Orange	6	3
GJ 27	Multiple	Pale Red	6	3
GJ 28	Multiple	Yellow	5	2
GJ 29	Single	Pale Red	6	4
GJ 30	Single	Orange	5	4
GJ 31	Double	Deep Orange	5	4
GJ 32	Single	Pale Red	6	4
GJ 33	Single	Red	6	4
GJ 34	Single	Pink	6	5
GJ 35	Multiple	Red	6	5
GJ 36	Multiple	Orange	7	5
GJ 37	Double	Reddish Orange	6	4
GJ 38	Single	Orange	5	3
GJ 39	Double	Red	6	4
GJ 40	Single	Red	6	4
GJ 41	Multiple	Pink	6	5
GJ 42	Single	Red	7	4
GJ 43	Single	Red	7	4
GJ 44	Single	Yellow	6	4
GJ 45	Multiple	White	6	5
GJ 46	Single	Orange	7	5
GJ 47	Single	Red(dark)	5	3
GJ 48	Single	Pink	6	4
GJ 49	Single	Whitish Pink	6	4
GJ 50	Multiple	Red	6	4
GJ 51	Single	Red	6	3
GJ 52	Single	Pink	6	3
GJ 53	Single	Red	6	4
GJ 54	Single	Red	7	6
GJ 55	Single	Orange base	7	5
GJ 56	Single	Light Yellow	5	4
GJ 57	Single	Red	6	5
GJ 58	Single	Orange	5	3
GJ 59	Multiple	Red	6	4
GJ 60	Single	Red	7	5
GJ 61	Multiple	Liver Red	6	3
GJ 62	Single	Red	6	3
GJ 63	Double	Orange	6	3
GJ 64	Multiple	Orange	5	3
GJ 65	Single	Deep Red	6	4
GJ 66	Single	Red	6	4
GJ 67	Single	Red	6	3
GJ 68	Single	Yellow	5	3
GJ 69	Multiple	Yellow	5	3
GJ 70	Multiple	Red	6	4

in sucrose was recorded in GJ 23 (9 days) followed by GJ 19 (8 days) and in bedding gerbera vase-life in plant was noticed in GJ 23 (7 days). Seventy bedding gerbera genotypes are classified based upon flower types and flower colour. Among flower types 38 nos *viz.*, GJ 3, GJ 4, GJ 5, GJ 7, GJ 9, GJ 12, GJ 15, GJ 16, GJ 22, GJ 24 ,GJ 29, GJ 30, GJ 32, GJ 33, GJ 34, GJ 38, GJ 40, GJ 42 GJ 43, GJ 44, GJ 46 GJ 47, GJ 48, GJ 49 GJ 51, GJ 52, GJ 53 GJ 54, GJ 55, GJ 56 GJ 57, GJ 58, GJ 60, GJ 62, GJ 65, GJ 66, GJ 67 and GJ 68 recorded single flower type. Nine types *viz.*, GJ 1, GJ 2, GJ 6, GJ 8, GJ 11, GJ 31, GJ 37, GJ 39 and GJ 63 were observed double types and 23 types *viz.*, GJ 10, GJ 13, GJ 14, GJ 17, GJ 18, GJ 19, GJ 20, GJ 21, GJ 23 GJ 25 GJ 26, GJ 27, GJ 28, GJ 35, GJ 36, GJ 41, GJ 45, GJ 50, GJ 59, GJ 61 ,GJ 64, GJ 69 and GJ 70 were observed multiple types.

The analysis of variance reveled that mean square of treatments were significant for most of the characters indicating varietal differences for all the characters studied (Table 3). The estimates of phenotypic co-efficient of variance (PCV) were found higher than genotypic co-efficient of variance (GCV) for all the ten characters studied indicating that the apparent variation was not only due to genotypes but was also due to the influence of environmental in the

Table 3 : Analysis of genetic parameters for quantitative parameters of bedding gerbera genotypes under Shevaroys condition (Pooled Mean 2008, 2009 and 2010)

Characters	Range	Mean	GCV (%)	PCV (%)	ECV (%)	Heritablity (h2) (%)	GA(%) of Mean
Plant height (cm)	12.50-39.98	21.70	24.22	24.82	5.44	95.19	48.67
Plant spread (cm)	17.74 – 44.99	30.28	20.31	21.00	5.36	93.48	40.44
No. of Leaves/plant	12.16 – 24.25	18.46	26.98	37.34	25.81	52.22	40.17
Leaf length	6.60-23.40	14.57	25.12	25.33	3.28	98.32	51.31
Leaf breath	3.20-10.20	5.97	24.85	25.38	5.15	95.88	50.13
No of suckers / plant	2.00- 8.00	4.47	38.63	38.75	3.07	99.37	79.33
Stalk length	18.30 – 60.80	32.85	28.04	28.66	5.90	95.75	56.53
Flower diameter	4.00 – 11.20	7.27	20.71	21.15	4.27	95.91	41.79
Stalk diameter	1.00 – 4.50	2.47	36.96	37.72	7.52	96.02	74.62
No of flowers/clump/year	13.00 – 70.00	45.04	15.02	15.23	2.55	97.19	30.51

Table 4 : Genotypic and phenotypic co-efficient of correlation for yield attributing parameters of bedding gerbera genotypes under Shevaroys condition

Characters		Plant height (cm)	Plant spread (cm)	Leaf length	Leaf breadth	No. of leaves/ plant	No of suckers / plant	Stalk length	Flower diameter	Stalk diameter	No of flowers/ clump/year
Plant height (cm)	G	1	0.504**	0.530**	0.527**	-0.028	-0.054	0.431**	0.138	0.083	0.063
	P	1	0.522**	0.540**	0.546**	-0.001	-0.050	0.449**	0.169	0.117	0.074
Plant spread (cm)	G		1	0.293*	0.264*	0.205	0.112	0.102	-0.011	0.025	-0.133
	P		1	0.305*	0.292*	0.154	0.121	0.138	0.035	0.053	-0.095
Leaf length	G			1	0.481**	-0.085	-0.247	0.224	0.242	0.122	-0.051
	P			1	0.491**	-0.052	-0.244	0.236	0.255*	0.141	-0.044
Leaf breadth	G				1	0.010	-0.301*	0.225	0.079	0.350	0.017
	P				1	0.025	-0.292*	0.254*	0.112	0.372**	0.027
No. of leaves/plant	G					1	0.511**	-0.031	-0.134	0.052	-0.380**
	P					1	0.365**	-0.005	-0.081	0.054	-0.275*
No of suckers / plant	G						1	-0.148	-0.250*	-0.231	-0.202
	P						1	-0.141	-0.238	-0.229	-0.186
Stalk length	G							1	0.549**	0.119	0.152
	P							1	0.566**	0.147	0.161
Flower diameter	G								1	0.071	0.151
	P								1	0.097	0.166
Stalk diameter	G									1	-0.069
	P									1	-0.067
No of flowers/clump/year	G										1
	P										1

* and ** indicate significance of values at P=0.01 and 0.05, respectively

Table 5 : Path co-efficient analysis of bedding gerbera genotypes under Shevaroys condition

Characters	Plant height (cm)	Plant spread (cm)	Leaf length	Leaf breath	No. of leaves/ plant	No of suckers / plant	Stalk length	Flower diameter	Stalk diameter	No of flowers/ clump/year
Plant height (cm)	0.11529	-0.04466	-0.09641	0.0348	0.00978	0.001	0.03902	0.01078	-0.00661	0.11529
Plant spread (cm)	0.05815	-0.08854	-0.05329	0.01747	-0.07138	-0.00209	0.00923	-0.00084	-0.002	-0.08854
Leaf length	0.06113	-0.02595	-0.18182	0.03181	0.02952	0.00459	0.02026	0.01896	-0.00976	-0.18182
Leaf breadth	0.06073	-0.02341	-0.08753	0.06607	-0.00335	0.0056	0.02037	0.00617	-0.02798	0.06607
No. of leaves/ plant	-0.00324	-0.01818	0.01544	0.00064	-0.34769	-0.00949	-0.00282	-0.01044	-0.00414	-0.34769**
No of suckers / plant	-0.00622	-0.00996	0.04494	-0.0199	-0.17761	-0.01858	-0.01338	-0.01958	0.01846	-0.01858
Stalk length	0.04969	-0.00903	-0.04068	0.01487	0.01082	0.00274	0.09055	0.04296	-0.00951	0.09055
Flower diameter	0.01589	0.00096	-0.04408	0.00521	0.04642	0.00465	0.04973	0.07822	-0.00567	0.07822
Stalk diameter	0.00952	-0.00221	-0.02218	0.02309	-0.01799	0.00428	0.01076	0.00554	-0.08005	-0.08005

* and ** indicate significance of values at P=0.01 and 0.05, respectively

expression of genotypes. The results are in agreement with the results of Chobe *et al*. (2010). But, there was a close correspondence between GCV and PCV for certain characters like plant height, leaf length, number of suckers plant, stalk length and numbers of flowers per clump per year indicating little influence of environment on these characters. The estimates of heritability in broad sense give a measure of transmission of characters from one generation to another, thus giving an idea of heritable portion of variability and enabling the plant breeder in isolating the elite selection in the crop.

In the present study revealed that number of suckers per plant, leaf length, number of flowers per clump per year showed the high heritability along with genetic advance of mean followed by stalk diameter. Thus, selection on the basis of number of suckers per plant, leaf length and number of flowers per clump per year would be more effective for further breeding programme, as also reported by Nair and Shiva (2003). These findings are in accordance with the results of Chobe *et al.* (2010) who reported high heritability along with genetic advance as per cent of mean for number of suckers per plant and leaf length. Kumari *et al.* (2011) reported high heritability along with lower genetic advance for number of flowers per clump per year exhibiting non additive gene effects.

In the present study, it was observed that genotypic correlation co-efficient was higher than phenotypic correlation co-efficient for most of the characters (Table 4 and 5). Similar trend was also observed by Anuradha *et al.* (2002) in cut gerbera for most of the characters. These findings indicated that though there is a strong inherent association between various characters, the phenotypic expression is reduced under the influence of environment. In some cases, phenotypic and genotypic correlations were very close indicating less environmental influences.

The present genotypic correlation studies revealed that the characters in Table 4 *viz.*, plant height (0.063) leaf breadth (0.017), stalk length (0.152) and flower diameter were found to be positively correlated with yield. While the characters *viz.*, plant spread (-0.133),leaf length (-0.051), number of leaves (-0.38), number of sucker/plant(-0.202) and stalk diameter (-0.069) showed negative correlation with yield. This is in consonance with the results of Magar *et al.* (2010) and Kumari *et al.* (2011) and Rao and Vasudevan (2009).

Path co-efficient analysis revealed that plant height (0.11529), leaf breadth (0.06607), stalk length (0.09055) and flower diameter (0.07822) showed positive correlation with yield (Table 5) while plant spread (-0.08854), leaf length (-0.18182) ,number of leaves (-0.34769), number of suckers per plant(-0.01858) and stalk diameter (-0.08005) showed negative correlation with yield. The direct effect was the highest (0.11529) for plant height followed by stalk length (0.09055) and flower diameter (0.07822). Leaf breadth had the highest indirect effect on number of flowers per plant per year (0.02037) through stalk length. Considering correlation and path co-efficients of the characters *viz.*, plant height, leaf breadth, stalk length and flower diameter emerged out as important component of flower yield in gerbera in the present study. This is in consonance with results of Hasanuzzaman (2006). It could be concluded from the present investigation that, out of seventy genotypes evaluated, genotypes *viz.*, GJ 23, GJ 11, GJ 2,GJ 19 and GJ 55 were found to be the best cultivars with superior in qualities for flower production under Shevaroy condition of eastern ghat.

REFERENCES

Ahlawat, T.R., Barad, A.V. and Jat, Giriraj (2012). Evaluation of gerbera (*Gerbera jamesonii*) cultivars under naturally ventilated poly house. *Indian J. Hort.,* **69**(4) : 606-608.

Anuradha, N., Satyanarayana, M. and Manjunatha, K.R. (2002). Satellite Associations in Recurrent Aborters. *Internat. J. Hum. Genet.*, **2**(1): 61-64.

Barooah, Luna and Talukdar, Madhumta Choudhury (2009). Evaluation of different gerbera cultivars under agro climatic conditions of Jorhat, Assam. *J. Orna. Hort.,* **12**(2): 106-110.

Burton, G.W. and De Vane, E.H. (1953). Estimating heritability in tall fesque (*Festucu arundinacea*) from replicated clonal material. *Agron. J.*, **45** : 478-481.

Chobe, R.R., Pachankar, P.B. and Warade, S.D. (2010). Studies on genetic variability and heritability in gerbera. *Asian J. Hort.*, **5**(2): 356-358.

Deepa, M.S., Reddy, Sattyanarayana and Kulkarni, Balaji S. (2011). Evaluation of gerbera (*Gerbera jamesonii*) under different conditions for growth and quality parameters. *Res. J. Agric. Sci.*, **2**(3): 50-53.

Hasanuzzaman, M.D. (2006). Performance of gerbera genotypes. M.Sc. (Hort.) Thesis, Sher-e-Bangla Agricultural University, DHAKA, BANGLADESH.

Hedau, N.K., Singh, Bharti, Mishra, Pranav (2012). Evaluation of gerbera genotypes under protected conditions. *Prog. Agric.*, **44**(2): 336-337.

Hemla Naik, B., Chauhan, Neelam, Patil, A.A., Patil, V.S. and Patil, B.C. (2006). Comparative performance of gerbera (*Gerbera jamesonii*) cultivars under naturally ventilated polyhouse. *J. Orna. Hort.*, **9**(3) : 204-207.

Johnson, H.W., Robinson, H.F. and Comstock, R.E. (1955). Estimates of genetic and environmental variability in soybean. *Agron. J.*, **47**: 314-318.

Kolte, S.L. (2008). Studies on genetic diversity in gerbera (*Gerbera jamesonii*). M.Sc. Thesis, Mahatma Phule Krishi Vidyapeeth, Rahuri, Ahmednagar, M.S. (INDIA).

Kumar, Rajiv and Deka, Bidyut (2012). Evaluation of gerbera (*Gerbera jamesonii*) for vegetative and flowering characters under cost effective polyhouse. *Prog. Agric.*, **12**(1) : 180-185.

Kumar, Rajiv and Yadav, D.S. (2005). Evaluation of gerbera (*Gerbera jamesonii*) cultivars under subtropical hills of Meghalaya. *J. Orna. Hort.*, **8**(3) : 212-215.

Kumari, Anoop, Patel, K.S. and Choudhary, Mahesh (2011). Genetic variability studies in gerbera, *Res. Plant Bio.*, **1**(5) : 01-04.

Magar, S.D., Warade, S.D., Nalge, N.A. and Nimbalkar, C.A. (2010). Correlation and path analysis studies in gerbera (*Gerbera jamesonii*). *Internat. J. Pl. Sci.*, **5**(2) : 553-555.

Nair, S.A. and Shiva, K.N. (2003). Genetic variability, correlation and path co-efficient analysis in gerbera. *J. Orna. Hort.*, **6**(3): 180-187.

Panse, V.G. and Sukhatme P.V. (1967). *Statistical methods for agricultural worker*. I.C.A.R., New Delhi, pp: 68-75.

Pattanashetti, C.N. (2009). Evaluation of gerbera cultivars under protected conditions. M.Sc (Hort.) Thesis, Dharwad University of Agricultural Sciences, Dharwad, KARNATAKA (INDIA).

Rao, V.K. and Vasuden, V. (2009). Correlation studies in gerbera (*Gerbera jamesonii*) genotypes. *Prog. Agric.*, **41**(1) : 43-45.

Vasuden, V. and Rao, V.K. (2010). Evaluation of gerbera (*Gerbera jamesonii*) genotypes under mid hill conditions of garhwal Himalayas. *J. Orna. Hort.*, **13**(3) : 195-199.

Wankhedeb, Shruti and Gajbhiyue, R.P. (2012). Performance of gerbera varieties for flowering, yeld and quality parameters under shade net. *Indian. J. Hort.*, **69**(1) : 98-100.