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Evaluation of gerbera (*Gerbera jamesonii*) cultivars under naturally ventilated polyhouse in Chhattisgarh plain

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Abstract
A study was undertake to evaluate six gerbera cultivars under naturally ventilated polyhouse. Experiment was carried out during the year 2015-16 in winter season at the Centre of Excellence on protected cultivation (DTTC), Department of Floriculture and Landscape Architecture, IGKV, Raipur (C.G.). The cultivars evaluated were 1133, Alcochete, Toscana, Corona, Fredi and Livia. The plants were grown on raised bed at 25 cm × 25 cm. Maximum plant height and leaf length (55.51cm), (42.16cm) was registered for cv Livia, Corona had higher plant spread, Leaf breadth and number of suckers per plant (86.05cm), (11.44cm) and (2.18) was observed. Fredi was recorded more number of leaves (20.15) and flowers (10.26) per plant.

Keywords: Gerbera, evaluation, polyhouse, cultivars

Introduction
Gerbera (*Gerbera jamesonii*) belongs to the family Asteraceae. It is an important cut flower, native to tropical Asia and Africa. Success of Gerbera under protected conditions has encouraged farmers to take up its protected cultivation extensively during the past few years in India. Gerbera (*Gerbera jamesonii* Bolus ex. Hooker F.) is an important cut flower, ideal for both export and domestic purposes. There is a great demand for gerbera particularly in European markets during the winter season and almost through out the year in India. Performance of gerbera cultivars varies with the region, season and growing conditions (Horn *et al.*, 3) [4]. To meet the quality standards, gerbera should preferably be grown under protected conditions. There is a need to evaluate new cultivars for their quantitative and qualitative parameters when grown under polyhouses or greenhouses. There is also a dearth of information regarding the effect of protected cultivation on the yield and quality of gerbera. Therefore, the present trial was carried out to study the performance of gerbera cultivars under naturally ventilated polyhouse in the Saurashtra region of Gujarat with respect to growth, quality and yield of flowers.

To meet the qualitative and quantitative standards, hybrid cultivars have to be grown under protected conditions. Previously, in a performance study of gerbera varieties, Singh and Ramachandran (2002) [5], Singh and Mandhar (2002) and Kandpal *et al*. (2003) grew gerbera under protected conditions and observed better growth, yield and quality characteristics. In protected conditions, gerbera grows faster and produces larger and greener leaves with high dry matter content. As a result, the yield of the flower increases and more side shoots are formed.

Protected conditions provide favorable environment for the growth of the plants by protecting the crop from heavy winds, pests, diseases and other adverse climatic conditions (Khan, 1995). Good drainage is essential for protected cultivation of gerbera (Labeke and Dambre, 1999).

Material and Methods
Evaluation of some gerbera cultivars was conducted at the Centre of Excellence on protected cultivation (DTTC), Department of Floriculture and Landscape Architecture, Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.) to assess the varieties suitable for growing under naturally ventilated polyhouse. The experiment was laid out in Randomized Block Design (RBD) with four replications and six treatments (cultivars). The cultivars evaluated were 1133, Alcochete, Toscana, Corona, Fredi and Livi. Plants are grown in rised beds with distance between (25×25cm). Observations were recorded on plant height (cm), number of leaves/plant, leaf length (cm), Leaf breadth (cm), Plant spreads (cm), Fresh weight of leaves (g),

Dry weight of leaves (g), Number of flowers/plant/ ½ year and Number of suckers/plant/ ½ year. The mean data on various biometrical parameters recorded during the period of study were subjected to statistical analysis.

Results and Discussion

It is evident from Table 1 that the varieties under evaluation differed significantly for plant height and plant spread. The maximum plant height was recorded in Livia (55.51 cm) and followed by Corona (54.54 cm) Fredi (51.17), 1133 (42.71 cm) and Toscana (42.52 cm) data were at par. The lowest plant height was recorded in Alcochete (39.75 cm). Sarmah *et al.,* (2014) [1] highest plant height was reported in Dune (54.70cm) cultivar of gerbera. The data regarding more number of leaves per plant were recorded in Fredi (20.50) followed by Livia (19.40). The minimum number of leaves were recorded in Alcochete (14.20) and was at par with 1133 (14.43) and Toscana (15.10). The treatment Corona (16.75) were at par with each other and statistically differed from the rest of the treatments. The longest leaf length was observed in Livia (42.16 cm) and followed by Corona (40.78 cm), Fredi (37.74 cm), Toscana (35.53 cm) and 1133 (30.67 cm). The lowest leaf length was recorded in Alcochete (26.64 cm). The highest leaf breadth was recorded in Corona (11.44 cm). The lowest leaf breadth was recorded in Livia (9.11 cm), Alcochete (9.88 cm), Toscana (10.24 cm), Fredi (10.33 cm) and 1133 (10.40 cm). Significant difference was also observed among cultivars for plant spread. With respect to cultivars, maximum plant spread was recorded in Corona (86.05 cm) followed by Livia (80.35cm), Fredi (69.25 cm, 1133 (61.25cm) and Toscana (60.53) while it was least in Alcochete (55.23 cm) at par. The results are in accordance with the findings of Singh and Ramachandran (2002) [5] and Thomas *et al*. (2004). Variation in plant spread was due to the additive gene effects (Vidalie *et al.,* 1985)

This variation in growth parameters may be due to varietal characters. Such variation in the growth parameters was earlier reported in gerbera cultivars by Dhane *et al.* (2) [3], and Sema Akali *et al*. (8) [6]. The maximum fresh weight of the leaves was reported in Corona (13.75 g) and it was highly superior over all the treatments. The minimum fresh weight of the leaves was recorded in Alcochete (6.05 g) and was significantly inferior over the rest of the treatments. Dry weight of the leaves per plant reveals that there is a significant treatment difference within the cultivars. Average dry weight was 1.28g; while maximum dry weight was recorded in Corona (2.12g) and was significantly superior all other treatments. The minimum dry weight of leaves was recorded in Alcochete (0.78 g) and was at par with 1133 (0.81 g).

Flower yield and its quality parameter decide the significance of the particular variety, which are suitable for commercial cultivation. Number of flower/plant was significantly varied within the cultivars. Maximum number (10.26/plant/½ year) of flower was recorded from the variety Fredi followed by 1133 (9.28), Toscana (9.03), Alcochete (8.61) and Livia (8.32), while minimum (7.45/plant/½ year) was recorded from variety Corona. Maximum number of flowers per plant observed in variety Fredi 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 photosynthesis, resulting the production of more number of flowers with bigger size. The results are in accordance with the findings of Sarmah *et al.,* (2014) [1] in gerbera under protected conditions.

Number of suckers/plant was significantly varied within the cultivars. Maximum number (2.18/plant) of flower was recorded from the variety Corona followed by Fredi (2.00), 1133 (1.93), Livia (1.89) and Toscana (1.81) while minimum (1.24/plant) was recorded from variety Alcochete. Maximum number of flowers per plant observed in variety Corona 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 photosynthesis, resulting the production of more number of suckers. Vasudevan *et al.,* (2010) [2] reported the similar results as that of the present investigation.

Table 1: Performance of gerbera cultivars under a naturally ventilated polyhouse for various growth parameters, Flowering traits and flower yield.

Treatments	Plant height (cm)	Number of leaves/ plant	Leaf length (cm)	Leaf breadth (cm)	Plant spreads (cm)	Fresh weight of leaves	Dry weight of leaves	Number of flowers/plant/ ½ year	Number of suckers/plant/ ½ year
T_1 - 1133	42.71	14.43	30.67	10.40	61.25	6.53	0.81	9.28	1.93
T_2- Alcochete	39.75	14.20	26.64	9.88	55.23	6.05	0.78	8.61	1.24
T_3 - Toscana	42.52	15.10	35.53	10.24	60.53	10.60	1.29	9.03	1.81
T_4 – Corona	54.54	16.75	40.78	11.44	86.05	13.75	2.12	7.45	2.18
T_5- Fredi	51.17	20.15	37.74	10.33	69.25	9.08	1.20	10.26	2.00
T_6- Livia	55.51	19.40	42.16	9.11	80.35	10.68	1.47	8.32	1.89
SEm±	1.26	0.82	1.18	0.25	2.44	0.46	0.06	0.28	0.08
C.D. (P = 0.05)	3.81	2.48	3.56	0.77	7.37	1.41	0.18	0.86	0.25

Conclusion

It could be concluded that outstanding characters of the identified cultivars can also be exploited in the improvement programme for evolving superior quality gerbera hybrids. Flower yield and its quality parameter decide the significance of the particular cultivar, which are suitable for commercial cultivation.

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