



ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; 12(9): 2150-2153
© 2023 TPI

www.thepharmajournal.com

Received: xx-06-2023

Accepted: xx-07-2023

G Krishna Sree

PG, Department of Floriculture and Landscape Architecture, Dr. Y.S.R Horticultural University, College of Horticulture, Anantharajupeta, Annamayya, Andhra Pradesh, India

Dr. PT Srinivas

Professor and Head, Department of Floriculture and Landscape Architecture, Dr. YSRHU College of Horticulture, Anantharajupeta, Annamayya, Andhra Pradesh, India

Dr. AVD Dorajee Rao

Professor and Head, Department of Floriculture and Landscape Architecture, Dr. YSR Horticultural University, College of Horticulture, Venkataramannagudem, West Godavari, Andhra Pradesh, India

Dr. T Rajasekharam

Senior Scientist, Department of Plant Pathology, Dr. YSR Horticultural University, Citrus Research Station, Petluru, Nellore, Andhra Pradesh, India

Corresponding Author:

G Krishna Sree

PG, Department of Floriculture and Landscape Architecture, Dr. Y.S.R Horticultural University, College of Horticulture, Anantharajupeta, Annamayya, Andhra Pradesh, India

Growth and flowering as influenced by genotypes in *Crossandra* (*Crossandra Infundibuliformis* L.) under Rayalaseema conditions

G Krishna Sree, Dr. PT Srinivas, Dr. AVD Dorajee Rao and Dr. T Rajasekharam

Abstract

The current study was carried out during the year 2022-2023 at Dr. YSRHU College of Horticulture, Anantharajupeta, Annamayya district, Andhra Pradesh. The experiment involved ten distinct crossandra cultivars as treatments and laid in Randomized Block Design (RBD) and replicated thrice. Significant findings were observed for all the growth and flowering parameters. The findings showed that among the cultivars highest plant height (81.20 cm), plant spread (2742.35 cm²), leaf area (2595.93 cm²) was recorded in Arka Shravya. However, more number of branches per plant was recorded in Arka Chenna (20.53). Arka Shravya showed the earliest spike initiation (57.80 days) and days to first harvest (75.53 days), Duration of flowering was maximum in Arka Shravya (47.00 days). Similarly maximum number of flowers per spike (51.33) and number of spikes per plant (81.00) was noted in Arka Shravya. The improved performance was attributed to genetic factors which might have contributed to the superior adaptability for cultivation in the Rayalaseema region of Andhra Pradesh.

Keywords: Crossandra, growth & flowering parameters, Arka Shravya, genetic variables

Introduction

The word “Crossandra” was derived from Greek word ‘Krossos’ meaning ‘fringe’, ‘Aner’ meaning ‘male’, i.e., ‘fringed anthers’ and it is commonly known as firecracker flower in English, Kanaka-ambaram in Tamil, Malayalam and Telugu, Aboli in Marathi, Kanakambara in Kannada, belongs to the family Acanthaceae.

Crossandra is an important loose flower that holds significant importance in South India and is cultivated on approximately 4,000 hectares of land in the states of Karnataka, Tamil Nadu, and Andhra Pradesh (Bhattacharjee, 2006). In India, crossandra is cultivated in an area of 3,003 ha with a production of 1,65,300 T (NHB, 2022) [8]. In Andhra Pradesh, it is mostly cultivated in Chittoor, Ananthapur, Kurnool and East Godavari districts. Its flowers are very popular because of its attractive bright colour, light weight nature and impressive longevity. Varieties with long stems are particularly prized as cut flowers, making them ideal for vase decorations. The high market demand for crossandra flowers results in fetching premium prices within the Indian flower market. Furthermore, this plant serves as a valuable ornamental shrub, well-suited for adorning temples and enhancing garden landscapes. Whether cultivated in flower beds, along borders, or as potted plants, crossandra adds beauty to various settings.

An inquiry was undertaken to assess the performance of different crossandra genotypes to determine their suitability for a particular geographical region. This study focused on growth and flowering characteristics, as many different public and private varieties have been introduced for commercial cultivation in the area, but their performance in this particular region had not been thoroughly evaluated.

Material and Methods

The experiment titled “Evaluation of crossandra (*Crossandra Infundibuliformis* L.) cultivars under Rayalaseema region of Andhra Pradesh” was conducted at Dr. YSRHU-College of Horticulture, Anantharajupeta, Annamayya district, Andhra Pradesh during the year 2022-2023. The experiment was laid out in Randomized Block Design (RBD) with ten genotypes as treatments and three replications. The treatments consist of the following cultivars: Arka Ambara, Arka Shreeya, Arka Shravya, Arka Chenna, Arka Kanaka, Lakshmi, Pallur Local, Mydukur Local, Piler Local, and Chitvel Local.

The plants were arranged with a spacing of 45 X 45 cm and all the standard agricultural practices were followed for general cultivation and maintenance.

The data were gathered for various growth and floral parameters, including plant height, plant spread, number of branches, leaf area, days taken for first flower bud initiation, days taken for the first harvest, flowering duration, number of flowers per spike and number of spikes per plant. The data

was analysed in ANOVA using statistical software OPSTAT at five per cent level of significance and was subsequently presented in tabular format.

Results and Discussion

The findings are detailed in Table 1 and Table 2 under the categories of growth and flower related parameters.

Table 1: Growth parameters of crossandra cultivars under Rayalaseema conditions

Cultivars	Plant height (cm) at 150 DAT	Plant spread (cm ²) at 150 DAT	Number of branches at 150 DAT	Leaf area (cm ²) at 150 DAT
T ₁ : Arka Ambara	50.03	1635.25	15.31	1511.54
T ₂ : Arka Shreeya	54.07	2100.69	18.82	1938.69
T ₃ : Arka Shravya	81.20	2742.35	15.79	2595.93
T ₄ : Arka Chenna	54.87	2208.64	20.53	2030.67
T ₅ : Arka Kanaka	51.00	1874.84	17.83	1750.85
T ₆ : Lakshmi	45.73	1559.84	13.87	1451.16
T ₇ : Pallur Local	50.33	1821.66	16.63	1615.42
T ₈ : Mydukur Local	58.00	1359.18	13.68	1325.71
T ₉ : Piler Local	44.80	1306.27	12.75	1273.61
T ₁₀ : Chitvel Local (control)	41.80	1169.87	11.99	1161.13
Mean	53.18	1777.86	15.72	1665.47
S.E.M±	1.54	61.92	0.68	88.80
CD at 5%	4.58	183.98	2.01	263.82

Table 2: Flowering parameters of crossandra cultivars under Rayalaseema conditions

Cultivars	Days taken for first flower bud initiation	Days taken for first harvest	Duration of flowering (days)	Number of flowers per spike	Number of spikes per plant
T ₁ : Arka Ambara	70.87	88.27	37.33	27.07	45.20
T ₂ : Arka Shreeya	68.93	84.80	27.60	23.07	54.87
T ₃ : Arka Shravya	57.80	75.53	47.00	51.33	82.00
T ₄ : Arka Chenna	67.27	84.33	32.67	27.07	60.67
T ₅ : Arka Kanaka	65.20	81.93	32.00	25.33	59.27
T ₆ : Lakshmi	65.40	80.53	42.33	34.00	36.20
T ₇ : Pallur Local	59.27	76.80	29.60	26.93	51.53
T ₈ : Mydukur Local	71.27	87.73	32.33	31.07	32.47
T ₉ : Piler Local	74.60	92.93	38.80	30.80	29.73
T ₁₀ : Chitvel Local (check)	81.67	98.60	40.00	31.47	24.53
Mean	68.23	85.15	35.97	30.81	47.65
S.E.M±	0.76	0.81	0.61	1.02	1.55
CD at 5%	2.27	2.41	1.82	3.04	4.62

Growth parameters

Significant findings were observed with respect to the growth parameters. Among the assessed genotypes, Arka Shravya exhibited the tallest plant height at 81.20 cm, followed by Mydukur Local at 58.00 cm, while the lowest height was recorded in the Chitvel Local variety at 41.80 cm. These findings are in line with Hosagoudar *et al.* (2022) [6], Tejaswi *et al.* (2020) [12], Priyanka *et al.* (2017a) [10] and Ramachandrudu and Thangam (2010) [11] in crossandra. Number of branches per plant were more (20.53) in Arka Chenna followed by Arka Shreeya (18.82) and less (11.99) in Chitvel Local genotype. These findings were confounded by Bhosale (2016) [3], Das (2017) in crossandra at 150 DAP.

Arka Shravya recorded max [5] inum plant spread and leaf area (2742.35 cm² and 2595.93 cm² respectively) followed by Arka Chenna (2208.64 cm² and 2030.67 cm²) and it was minimum (1169.87 cm² and 1161.13 cm²) in the genotype Chitvel Local. These results corroborate with the findings of Bhosale (2016) [3] in crossandra.

Plant spread appeared to be determined by branching habit and inter nodal length which might be specific to genotype of

cultivars. The difference in plant spread was a varietal trait and might be influenced by their genetic composition. Similar results were also reported by Prasanth *et al.* (2020) [9] in crossandra and by Kulkarni and Reddy (2004) [7] in chrysanthemum. Moreover, the differences in plant height, increased number of branches and leaf area in certain genotypes can be attributed to the genetic composition of the cultivars.

Flowering parameters

The crossandra genotypes were also assessed for floral characteristics. Arka Shravya was first to show spike initiation (57.80 DAT) which was found to be on par with cultivar Pallur Local (59.27 DAT). The cultivar Chitvel Local was late to initiate flower bud among all cultivars under study (81.67 DAT). The cultivar Arka Shravya had taken minimum number of days to first flower harvest (75.53 DAT) which was on par with the cultivar Pallur Local (76.80 DAT). However, the cultivar Chitvel Local (98.60 DAT) took more number of days for first harvest. The variations in the number of days taken for first flowering might be due to genotypic

differences that would trigger flowering differentially in response to existing temperature, light and other climatic parameters of a location. Similar variations attributable to varietal trends were also noted in China aster (Agandi, 2000) [1] and marigold (Vijayalaxmi, 1998) [13]. Chourasia *et al.* (2015) also reported that spike initiation might be primarily dependent on food reserves in plant that would significantly influence growth and development as observed in tuberose.

The genotype 'Arka Shravya' recorded the highest number of flowers per spike (51.33), while the lowest number of flowers per spike (23.07) was observed in the genotype 'Arka Shreeya' compared to all other genotypes. In terms of the number of spikes per plant, 'Arka Shravya' recorded the maximum (82.00), while the minimum number of spikes per plant was observed in 'Chitvel Local' (24.53). Further, the number of

spikes was associated or determined by the number of primary and secondary shoots arisen on plants. Variations in number of flowers per spike could be genetically controlled. Das (2017) [5] examined the variations in the number of spikes per plant and opined that the variation could be attributed to the genetic makeup of crossandra varieties.

When comparing the genotypes, it was observed that Arka Shravya exhibited a longer flowering duration (47.00 days), whereas Arka Shreeya (27.60 days) had a shorter flowering duration compared to the check (40.00 days). The extended flowering period in Arka Shravya could be attributed to its longer rachis length and the higher number of flowers on each spike. These findings are in line with Tejaswi *et al.* (2020) [12] and Das (2017) [5] in crossandra.

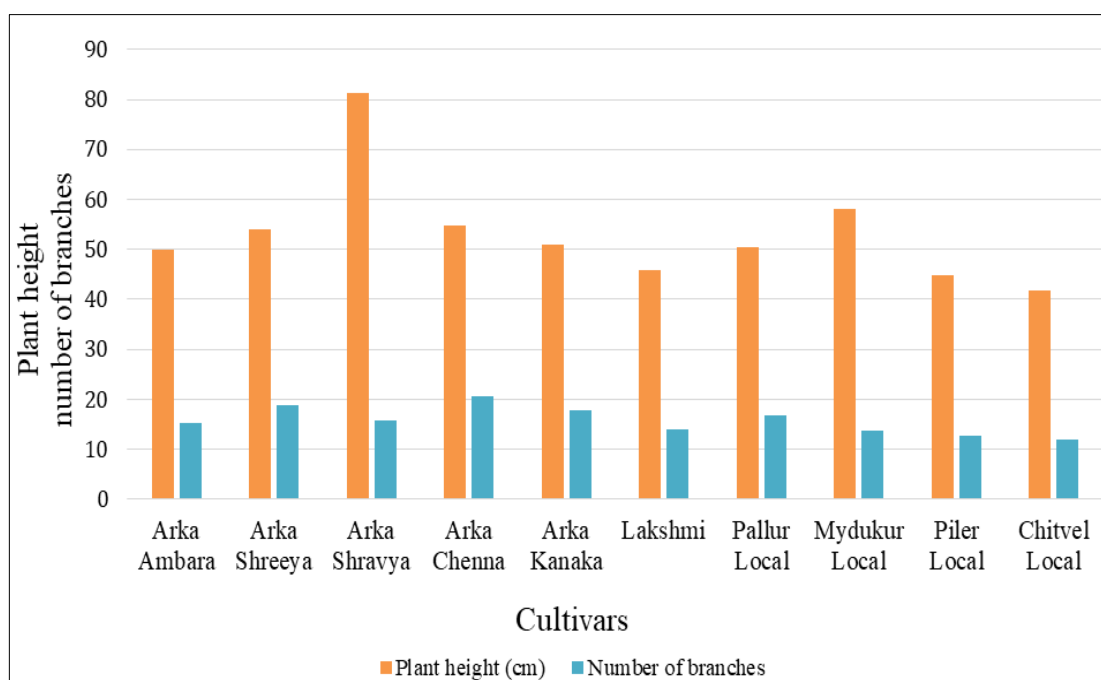


Fig 1: Vegetative characteristics of crossandra cultivars under Rayalaseema condition

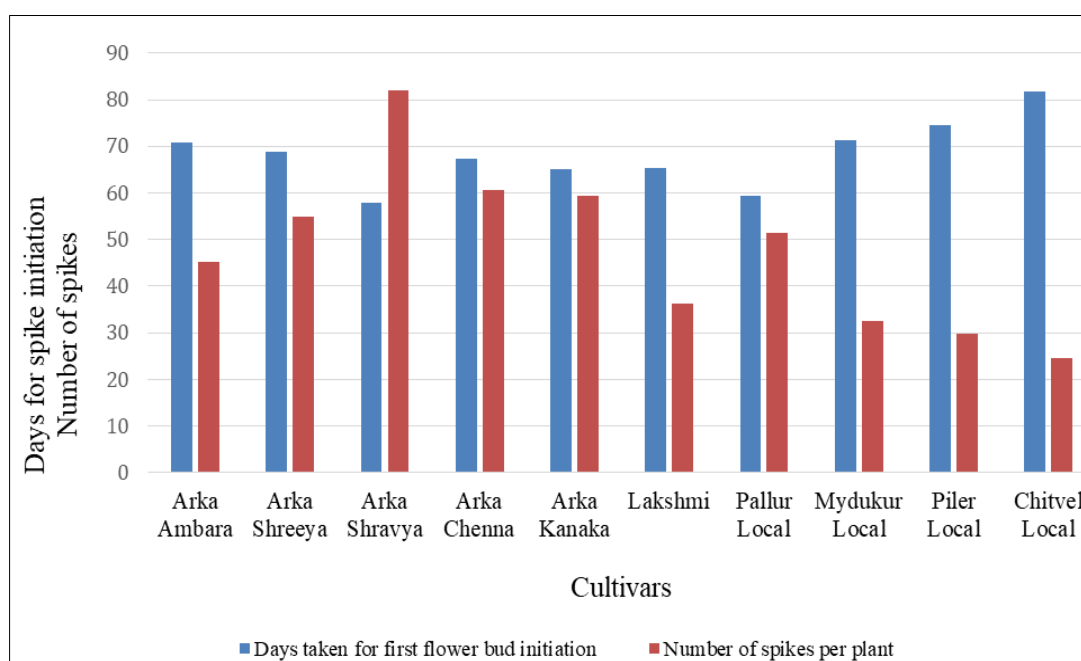


Fig 2: Flowering characteristics of African marigold cultivars under Rayalaseema conditions

Conclusion

Based on the findings presented in the study, it was determined that among the *Crossandra* genotypes examined, Arka Shravya exhibited superior performance in terms of both vegetative and floral characteristics, followed by Arka Chenna under Rayalaseema agroclimatic conditions. Superiority of these two *crossandra* cultivars over other could be perhaps due to their inherent and genetically controlled variables in respect of yield attributing traits under local conditions of Rayalaseema in Andhra Pradesh.

References

1. Agandi SM. Studies on the performance of China aster (*Callistephus chinensis* Ness.) cultivars. M.Sc. Thesis. University of Agricultural Sciences, Dharwad; c2000.
2. Bhattacharjee SK. Advances in Ornamental Horticulture: Vistas in Floriculture. Pointer Publishers, Jaipur, Rajasthan. 2006;1(6):115.
3. Bhosale PB. Evaluation of different genotypes of *crossandra* (*Crossandra* spp.). M.Sc. Thesis. Mahatma Phule Krishi Vidyapeeth, Rahuri, India; c2016.
4. Chourasia A, Viradia R, Ansar H, Madle SN. Evaluation of different gladiolus cultivars for growth, flowering, spike yield and corm yield under Saurashtra region of Gujarat. The Bioscan. 2015;10(1):131-34.
5. Das R. Evaluation of *crossandra* (*Crossandra Undulaefolia* Salisb.) Genotypes under eastern dry zone of Karnataka. M.Sc. Thesis. University of Horticultural Sciences Bagalkot, India; c2017.
6. Hosagoudar AS. Evaluation of *crossandra* genotypes for vegetative, floral and yield parameters for commercial production. The Pharma Innovation Journal. 2022;SP-11(6):2554-57.
7. Kulkarni BS, Reddy BS. Vegetative growth, flower yield and quality of different chrysanthemum cultivars. Journal of Ornamental Horticulture. 2004;7(3and4):32-36.
8. NHB. State wise area and production of loose flowers. Horticultural Statistics at a Glance 2021-22, National Horticulture Board, Ministry of Agriculture and Farmers welfare, Government of India, Gurgaon. New Delhi; p. 222. www.nhb.gov.in.
9. Prasanth, P, Zehra Salma, Praneeth Kumar S. Suitability evaluation of *crossandra* genotypes under Hyderabad conditions. International Journal of Chemical Studies. 2020;8(6):484-86.
10. Priyanka TK, Kamble BS, Anuradha RW, Kumar N, Shirol AM. Evaluation of different *crossandra* genotypes under ghataprabha command area. Journal of Pharmacognosy and Phytochemistry. 2017a;6(6):252-54.
11. Ramachandrudu K, Thangam M. Characterization and evaluation of local Germplasm of *crossandra* (*Crossandra Undulaefolia* Salisb.). Journal of Ornamental Horticulture. 2010;13(2): 138-41.
12. Tejaswi R, Zehra Salma, Aditya G. Study on the performance of ten genotypes of *crossandra* for vegetative, yield and quality parameters under coastal region of Andhra Pradesh. Journal of Pharmacognosy and Phytochemistry. 2020;SP6:262-266.
13. Vijayalaxmi P. Evaluation of dwarf marigold (*Tagetes patula* L.) varieties under Northern traditional tract of Karnataka. M.Sc. (Agri.) Thesis. University of Agricultural Sciences, Dharwad, Karnataka, India; c1998.