

Performance Evaluation of Different Varieties of China aster (*Callistephus Chinensis* L Ness) In Sub-Tropical Belt of West Bengal

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Abstract: The present investigation was carried out to study the performance of eight varieties of China Aster (*Callistephus chinensis* L Ness) at Mondari farm of Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, Nadia, West Bengal, during 2015-16. All characteristics were significantly varied among the varieties during investigation (Kamini, Poornima, Shashank, Aadya, Archana, Phule Ganesh White, Phule Ganesh Violet, Phule Ganesh Purple). After studied, it has been found that Variety 'Shashank' is best for cut flower production and 'Archana' is most suitable for potted plant production in this belt.

Keywords: China Aster, Varieties, Cut flower, Potted plant.

I. Introduction

China aster belongs to the family Asteraceae is native to China having excellent unparallel distinguish attractive colours used for cut flower, potted plants and garden decoration. In India china aster occupied approximately more 5000 ha grown in few states like Maharastra, Karnataka, Tamil Nadu, West Bengal and Andhra Pradesh. In scenario of West Bengal state, China aster flower has a great demand in local market as cut flower and potted plants, previously it was grown with local varieties, but quality is not up to the mark as desired by the customers due to lacking of selection of varieties as well as improper use of agro-techniques. This university was undertaken a programme on above cited problem with emphasis on selection of suitable varieties of China aster based on performance evaluation for this zone during winter season.

II. Review Of Literature

There are so many works has been done in different states of India on varietal evaluation with various perspectives. As per recommendation of researchers like Poornima *et al* (2006), five genotypes of china aster viz. Poornima, Shashank, Kamini, Violet Cushion and local types evaluated at the hills of Karnataka state and they reported that maximum number of flower as well as highest flower yield was obtained in "Shashank" (50.22 lakhs and 9.51 tonnes/ha) over others genotypes, whereas least performance was found in "Poornima". A similar work done at Karnataka by Munikrishnappa *et al* (2013), they observed that two important findings like maximum number of cut flower 40.76 lakhs/ha was noticed in the variety of "Phule Ganesh Violet" and highest weight of 100 flowers was markedly increased in 'Phule Ganesh White'(351.378g). There are another work done in Andhra Pradesh State in this subject by Zosiamlina *et al* (2013), "Phule Ganesh White" produced maximum number of flowers per plant (36.73), highest flower diameter(7.37cm) and improved stalk length(34.78cm,) over others varieties. In the state of Uttarakhand, there are three number of china aster varieties were studied by Pandey and Rao(2014) and they noted that 'Phule Ganesh Pink' is superior(126.23g/plant)in production of flowers incompariosion to other two varieties(Phule Ganesh Purple and Phule Ganesh Violet).

III. Materials And Methods

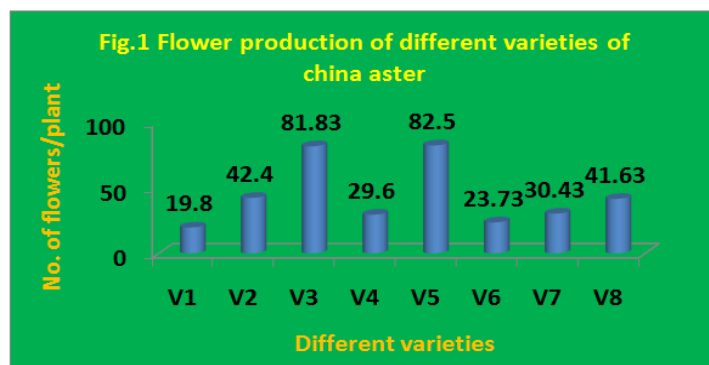
The experiment was carried out at Mondari farm of Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, Nadia, West Bengal, during 2015-16. All plant materials were collected from IIHR, Bangalore. Experiment was set up in open field and all agro-techniques were adopted as per recommendation of this university. The experiment laid out in Randimized Block Design with eight varieties replicated thrice and the statistical analysis of the data was carried out following Fisher's analysis of Variance Technique as described by Gomez and Gomez (1984). The details of treatments consists with varieties were summarizing under mentioned.

Treatments	
V ₁ : Poornima	V ₅ : Archana
V ₂ : Kamini	V ₆ : Phule Ganesh White
V ₃ : Shashank	V ₇ : Phule Ganesh Violet
V ₄ : Aadya	V ₈ : Phule Ganesh Purple

IV. Result And Discussion

Significant variation in vegetative growth was recorded among the cultivars of China aster during this investigation. Maximum plant height up to 65.83 cm was recorded in Arka Shashank (V_3) followed by Phule Ganesh Purple (V_8), whereas plant height suppressed markedly in Arka Aadya (V_4) with a height of 30.66 cm over others varieties. The number of leaves per plant was obtained highest (197.50 nos./plant) in cultivar Phule Ganesh Violet (V_7) followed by Phule Ganesh Purple (V_8 :188.13 nos./plant) and fewer number (134.23 nos./plant) in Arka Aadya (V_4). In case of branches production and its luxuriant growth was found prominently better (19.40no./plant)in cultivar Arka Archana (V_5) followed by Phule Ganesh Purple (V_8 :14.90 nos./plant) and Phule Ganesh Violet (V_7 : 14.20 nos./plant) and greatly reduced(8.00 nos./plant) in Arka Poornima (V_1) and Arka Aadya (V_4 : 8.60 nos./plant). Regarding development of branch in terms of diameter of this plant observed up to 4.70 mm reached, i.e maximum in variety of Arka Shashank (V_3) followed by Arka Archana (V_5 : 4.63 mm), whereas comparatively poor growth with thin branches diameter was recorded in Phule Ganesh Violet (V_7 : 2.86 mm). Under this experiment, chlorophyll content of the leaves were studied and here the cultivar Phule Ganesh Purple (V_8) produced maximum amount of Chlorophyll-a content (7.58) followed by Phule Ganesh Violet (V_7 : 7.14) and Arka Kamini (V_2) produced lower amount of Chlorophyll-a content (4.19). The cultivar Phule Ganesh White (V_6) produced highest amount of Chlorophyll -b content (3.24) followed by Arka Poornima (V_1) (2.89) and Arka Aadya (V_2) produced minimum amount of Chlorophyll- b content (2.21).

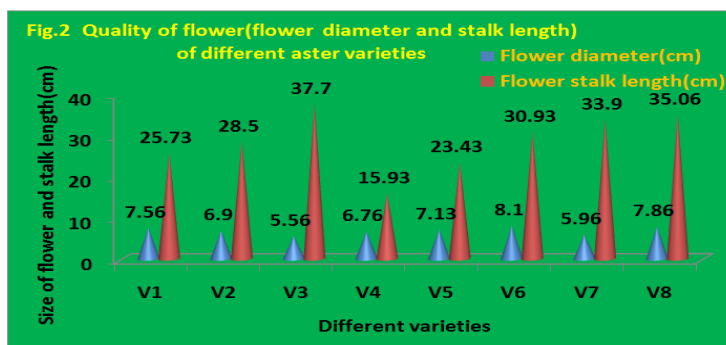
Treatments	Plant height (cm)	No. of leaves /plant	No. of branches /plant	Branch diameter (mm)	Days required for flowering (Days)	No. Of flowers /plant	Flower diameter (cm)
V_1 : Poornima	49.60	144.46	8.00	3.96	137.83	19.80	7.56
V_2 : Kamini	43.90	163.70	10.63	3.70	130.03	42.40	6.90
V_3 :Shasank	65.83	166.40	12.30	4.70	112.16	81.83	5.56
V_4 :Aadya	30.66	134.23	8.60	3.66	112.06	29.60	6.76
V_5 :Archana	48.70	158.23	19.40	4.63	120.20	82.50	7.13
V_6 :Phule Ganesh White	60.33	183.56	10.26	3.23	143.46	23.73	8.10
V_7 :Phule Ganesh Violet	57.06	197.50	14.20	2.86	140.56	30.43	5.96
V_8 :Phule Ganesh Purple	61.23	188.13	14.90	3.36	142.30	41.63	7.86
SE.m(\pm)	1.74	7.45	0.59	0.26	2.44	2.50	0.21
CD at 5 %	5.33	22.82	1.81	0.78	7.46	7.64	0.64



Different varieties showed significant differences in flowering behavior of China aster. The earliest flower appeared in Arka Aadya (V_4 :112.06 days) closely followed by Arka Shashank (V_3 :112.16 days), whereas cultivar Phule Ganesh White (V_6) took maximum number of days (143.46 days) to emergence of flower. Maximum number of flowers was recorded (fig.1) in Arka Archana (V_5 : 82.50 nos./plant) followed by Arka Shashank (V_3 : 81.83 nos./plant) and lowest number of flowers per plant was found in cultivar Arka Poornima (V_1 :19.80) over others varieties.

Treatments	Flower stalk length (cm)	Flowering duration (Days)	Vase life in tap water (Days)	“Chlorophyll a” content (mg/100gm of leaf)	“Chlorophyll b” content (mg/100gm of leaf)
V_1 : Poornima	25.73	36.43	12.20	5.64	2.89
V_2 : Kamini	28.50	32.26	10.23	4.19	2.57
V_3 :Shasank	37.70	39.80	16.16	5.36	2.43
V_4 :Aadya	15.93	31.36	9.06	6.35	2.21
V_5 :Archana	23.43	39.76	14.33	6.76	2.69
V_6 :Phule Ganesh White	30.93	33.83	15.56	6.54	3.24
V_7 :Phule Ganesh Violet	33.90	35.10	14.46	7.14	2.70
V_8 :Phule Ganesh Purple	35.06	32.66	16.50	7.58	2.67
SE.m(\pm)	1.37	1.642	0.813	0.342	0.148
CD at 5 %	4.18	5.029	2.489	1.047	0.452

As shown in the data for improvement of quality flower like (fig.2) flower diameter was highest in cultivar Phule Ganesh White (V₆: 8.10 cm) and closely followed by Phule Ganesh Purple (V₈: 7.86 cm), whereas lowest in Arka Shashank (V₃) as 5.56 cm. The observed data indicated that Arka Shashank (V₃) markedly improved stalk length up to 37.70 cm closely followed by Phule Ganesh Purple (V₈: 35.06 cm) and comparatively shortest flower stalk (15.93 cm) was recorded with Arka Aadya (V₄). In the investigation cultivar Arka Shashank (V₃) retained its freshness for more number of days in the field over others cultivars. From the data, it has been found that the flower of cultivar Arka Shashank (V₃) recorded maximum self-life (39.80 days) followed by Arka Archana (V₅: 39.76 days) and minimum self-life (31.36 days) was recorded in Arka Aadya (V₄). Total vase life of the eight different cultivars showed significant differences. The range for total vase life among the cultivar was from 9.06 to 16.50 days and variety Phule Ganesh Purple (V₈) was found best (16.50 days) followed by Arka Shashank (V₃:16.16 days) and least of vase-life (9.06 days) was in Arka Aadya (V₃).

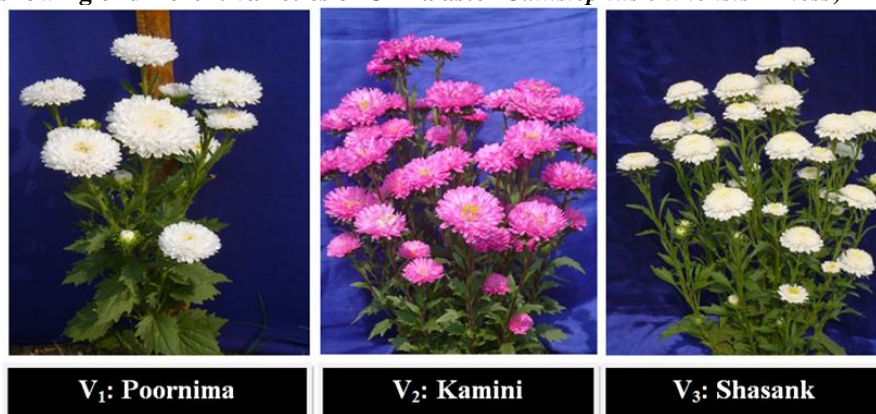


During investigation from planting to harvesting, luxuriant vegetative growth of the plant was found in Arka Shashank, Phule Ganesh White, Phule Ganesh Violet, Phule Ganesh Purple and comparatively dwarfing plant was observed in Aadya, Archana, Kamini and Poornima. For early harvesting of flower, Aadya, Shasank and Archana are the best and comparatively late in Kamini and Poornima, whereas too much late in Phule Ganesh White, Phule Ganesh Violet, Phule Ganesh Purple. Regarding cut flower production, which is based on stalk length, number of flowers/plant and duration of vase life and here, most suitable variety performed in this aspect is Shashank (Stalk length: 37.70cm, number of flowers/plant: 81 and vase life; 16.16 day) incomparision to others varieties. For pot grown China aster, here among these varieties, most appreciate variety is Archana was the full filled the criteria of potted plant characteristics like dwarfing(48.70cm), maximum number of branches/plant19.40)as well as produced huge quantity of flowers/plant(82.50).

References

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Photographs showing of different varieties of China aster *Callistephus chinensis* L Ness)





V₄: Aadya



V₅: Archana



V₆: Phule Ganesh White



V₇: Phule Ganesh Violet



V₈: Phule Ganesh Purple