Evaluation of some genotypes of China aster [Callistephuschinensis (L.) Nees.] under the condition of Syrian coast-Lattakia.

Maryam Sultan[1], Mazen Nassour[2]

[1]*Postgraduate student, department of horticulture, faculty of agriculture, Tishreen University, Lattakia, Syria.*
[2]*Assistant Prof.,department of horticulture, faculty of agriculture, Tishreen University, Lattakia,Syria.*

Abstract
This experiment was conducted to find out the most suitable genotypes of China aster [Callistephuschinensis (L.) Nees] under Syrian coast condition for growth , flowering and yield characters. The results showed high variation in performance of all ten genotypes for growth and flowering characters. Maximum plant height (87.2cm), number of primary branches per plant (19.3) and plant spread (53.5 cm) were noted in (G5) but it was least chlorophyll (a ,b) content (3.65 mg/100g and 1.67 mg/100g .,respectively). Also it was shortest vase life (7.33 days). (G7) recorded maximum number of secondary branches per plant (15.6), leaves per plant (225), flower per plant (43), seed yield per plant (7.076g) also it took maximum number of day to first flower opening (72.3days) and day to 50% flowering (88.9days) and longest duration of flowering (31.3 days), but it was least flower head diameter (6.02cm). Whereas largest flower head diameter (8.05cm) and highest chlorophyll (a ,b) content (6.01 mg/100g and 2.75mg/100g respectively) were noted in (G10). (G3) recorded Maximum number of seed per flower (134.33) and weight of 1000 seeds(1.885g), While highest germination (80%) was noted in (G9) and longest vase life (13.50 days)was noted in (G6).

Keywords
China aster, Evaluation, Genotypes, Asteraceae .

I. INTRODUCTION

China aster[*Callistephuschinensis* (L.) Nees.] belongs to the family Asteraceae and is native of northern China[1]. It is grownas cut flower for flower arrangement , interior decoration , loose flower for garland making, worshipping, pot plant and bedding in landscaping[2]. The genus *Callistephus* derives its name from two Greek words 'kalistos' and 'Stephos' meaning most beautiful and 'acrown' respectively It was first named by Linnaeus as Aster chinensis and later Nees changed this name to *Callistephuschinensis*[3].

China aster is one of the widely due to its wide spectrum of attractive colors and comparatively longer vase life [4], this crop ranks third among annual flower next only to Chrysanthemum and Marigold [5]. Though the flower yield and quality are primarily varietal characters, they are also greatly influenced by climatic factors, like photoperiod, temperature, relative humidity and also soil moisture influence both vegetative and reproductive phases of the plant, ultimately leading to variation in the performance of genotypes.

Study the performance of desirable genotypes with respect to specific areas is therefore essential before recommending for adoption in commercial scale.

II. MATERIALS AND METHODS:

The experiment was conducted under the conditions of the Syrian coast. This research was conducted in the field of the department of Horticulture at Tishreen university, during the year 2017-2018. The experiment was laid out in randomized block design with three replications and ten genotypes of China aster were used as planting material (table 1).

TABLE 1: Flower quality traits of China aster genotypes.

Genotypes	Flower Form	Flower head colour (RHS Colour Chart)
G1	Double	Dark violet N092A
G2	Single	Light blue pink 65B
G3	Semi-double	Light blue pink 068D
G4	Double	Blue pink N066c
G5	Single	White N155A
G6	Double	White N155D
G7	Single	Blue pink 068B
G8	Semi-double	Purple red N066B
G9	Double	Light blue violet 076A
G10	Semi-double	Violet N082A

Ten plants per replication were planted at a spacing of 30×30 cm. The study was conducted under open field condition. All plants were selected for recording observation for various growth and flowering traits, viz. plant height(cm), spread (cm), number of leaves,

primary and secondary branches. Floral parameters recorded were days taken for first flowering, day taken to 50% flowering, duration of flowering (days), number of flowers per plant, flower diameter(cm), vase life (days), number of seed per flower, number of seed per plant, seed yield per plant (g /plant), 1000seed weight (g) and Germination (%). Data collected were averaged and analysed statistically. Statistical analysis were done using Costat-5.918 program.

Results and discussion

The mean performance of ten China aster genotypes for different growth characters is presented in (Table2). Genotypes G5,G7 showed good performance for growth attributes with the mean value for viz., plantheight (87.2 and 83 cm respectively), number of primary branches per plant (19.3 and 18.8 respectively), number of secondary branches per plant (12.8and 15.6 respectively), number of leaves per plant (209 and 225 respectively), plant spread (53.5 and 50.9 cm respectively). Similar variation in plant height due to Genotypes was also observed in China aster by ([6] , [7]). [8] suggested that availability of congenial environment to express the dominant gene in the genotypes might be the reason for this variation [3].

TABLE2: Mean performance of 10 genotypes for growth characters of China aster

Genotypes	Plant height (cm)	No. of primary branches/ plant	No. of secondary branches/ plant	No. of leaves/ plant	Plant spread (cm)	Chlorophyll (a) content mg/100g F.M	Chlorophyll (b) content mg/100g F.M
G1	29.8	6.3	4.2	73.9	23.6	5.51	2.28
G2	45.6	6.7	6.3	87.5	33.8	4.12	1.95
G3	38.5	5.6	5.5	68.3	40.5	4.15	2.02
G4	36.4	5.5	5.4	79.6	30.9	4.15	1.98
G5	87.2	19.3	12.8	209	53.5	3.65	1.67
G6	28.5	5.2	4.3	62	22.3	4.8	2.18
G7	83	18.8	15.6	225	50.9	3.75	1.88
G8	41.4	5.3	5.2	71.2	38.4	3.98	1.91
G9	37.5	6	3.5	81.9	31.6	4.33	2.14
G10	41.7	5.6	4.2	68.7	33.5	6.01	2.75
S.E m ±	1.17	1.86	1.03	2.95	0.44	0.32	0.16
C.D $_{0,05}$	2.49	3.65	3.2	6.88	1.08	1.14	0.36

Mean performance of genotypes for flowering characters

The ten genotypes evaluated during the study showed significant variation for flowering characters (Table 3). The genotypes G2 and G3 have taken least number of days for commencement of flowering (53.9 and 55.3 days respectively), days taken for 50% (61.5 and 62 days respectively). Number of days taken to first flower opening signifies the early or later flowering habit of the genotype. [9] suggested that more dry matter accumulation during favorable climatic condition might be the reason for earliness in this trait. Variation in days to first flower opening has also been reported by([10],[3]).The maximum number of flower was produced by genotypes G5and G7 this was due to production of more number of branches with good number of developed flower buds on the branches. While, the minimum number of flowers (10.3) were observed in genotype G9 because this genotype recorded comparatively lees number of secondary branches per plant (3.5). The similar result observed in china aster by([6],[7]). The observed variation can be attributed to the genotype of the plant. Variation in flowering duration has been reported by [11] in China aster.

Maximum flower head diameter (8.05 cm) was recorded in G10. The observed variation among genotypes for flower head diameter could be attributed to the inherent genetic and environmental factors. The results are in confirmation with the findings of([12] ,[3]) in China aster. The longest vase life was recorded in G6 (13.50 days) while the shortest vase life was recorded in G5 (7.33 days). The varietal variation in vase life among genotypes of china aster has also been reported[13].

TABLE3: Mean performance of 10 genotypes for flower yield and quality characters of china aster

Genotypes	Days to first flowering	Days to 50% flowering	Duration of flowering (days)	No. of flowers/ plant	Flower head diameter (cm)	Vase life (days)
G1	56.3	65.6	16.9	16.8	7.58	10.53
G2	53.9	61.5	18.5	18.5	6.82	9.36
G3	55.3	62	13.9	16.3	6.35	11.0
G4	60.5	66.9	15.6	14.6	6.66	9.90
G5	70.6	86.5	25.9	39.6	6.23	7.33
G6	59.3	67.6	14.5	12.4	6.55	13.50
G7	72.3	88.9	31.3	43	6.02	8.36
G8	58.9	65	20.5	12.7	6.90	10.16
G9	55.6	63.3	14	10.3	7.81	12.06
G10	56.9	66.5	21.3	12.2	8.05	9.23
S.E m ±	1.35	1.65	1.28	2.23	0.19	0.932
C.D $_{0,05}$	4.29	4.68	4.92	6.56	0.73	2.896

Mean performance of genotypes for yield characters

Signification differences for yield parameters were found among the China aster genotypes (Table 4)**.**

(G3) recorded maximum number of seed per flower (134.33) and weight of 1000 seeds(1.885g) while G7 recorded maximum number of seed per plant (4914) and seed yield per plant (7.076g). The variation might be due to the genotype ability to set seeds as it as being a genetically controlled factor. The results on yield of seeds were in agreement with the finding of([14] ,[6]) in china aster genotypes.

The germination percentage of genotype G9 (80%) was maximum and it was followed by G7 (76%), the control factor on germination percentagewas average weight of 1000 seeds. The finding of [14] in different china aster genotypes.

Currently, genetic study to identification chromosome number and molecular markers are being conducted on these models in order to give them an identity compared to internationally–known varieties.

TABLE4:Mean performance of 10 genotypes for seed yield and quality of china aster

Genotypes	No. of seed per flower	No. of seed per plant	Seed yield per plant (g)	1000 seed weight (g)	Germination %
G1	85.17	1430.8	1.383	0.966	48
G2	68.25	1262.6	1.217	0.964	44
G3	134.33	2189.6	4.128	1.885	64
G4	68.75	1003.7	1.099	0.996	48
G5	60.6	2399.7	2.227	0.958	24
G6	51.17	634.5	0.569	0.893	16
G7	114.28	4914	7.076	1.44	76
G8	74.5	946.2	1.167	1.233	60
G9	58	597.4	1.074	1.786	80
G10	105	1281	2.405	1.877	72
S.E m ±	2.58	6.65	0.33	0.12	2.11
C.D $_{0,05}$	6.56	18.92	1.31	0.32	4.45

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