

## **Per se Performance of Ridge Gourd (*Luffa acutangula* (Roxb.) L.) Germplasm for Growth and Flower Characters**

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### **ABSTRACT**

An evaluation trial on ridge gourd (*Luffa acutangula* (Roxb.) L.) genotypes for growth and flower characters viz., vine length, days to first female flower anthesis, node number for first female flower appearance, number of male flowers per vine, number of female flowers per vine and sex ratio was conducted at Department of Vegetable crops, Horticultural College and Research Institute, TNAU, Coimbatore. Thirty five genotypes of ridge gourd were evaluated in randomized block design with two replications during 2012. The genotype IC 413577 and IC 339239 recorded the highest values for vine length while the genotype IC 413577 and IC 385912 showed minimum days for anthesis in female flowers. The genotype IC 413577 registered the highest and the lowest value for number of female flowers per vine and sex ratio respectively followed by CO-1. The genotype IC 413577 was found to be the most promising entry for various traits studied and hence it can be used for further crop improvement programmes like hybridization and evaluation.

**Key words** Ridge gourd-growth-Sex ratio, Genotypes

Ridge gourd (*Luffa acutangula* (Roxb.) L.) is one of the important tropical cucurbitaceous vegetables grown throughout India and south-east Asia. It is an underexploited vegetable crop and its shares a small proportion of the total vegetable production. It has immense potential as a vegetable crop. Every 100 g of the edible portion of ridge gourd contains 0.5 g of fibre, 0.5 per cent of protein, 0.34 per cent of carbohydrate, 37 mg of carotene, 5.0 mg of vitamin C, 18 mg of calcium and 0.5 mg of iron (Hazra and Som, 2006). The fruits are eaten as cooked vegetable and possess demulcent, diuretic and nutritive properties.

Development of hybrids in ridge gourd was rather limited but the scope for developing high yielding and nutritive types is large and is of immediate need due to the increased trend in consumer awareness on nutrition and quality. In spite of being in cultivation since ancient times and the presence of the wide germplasm, conscious evaluation and exploitation of germplasm has not been attended to until recently. Crop improvement through assessment of its genetic potential and exploitation of hybrid vigour is very limited. At present, urgent need of the farmers is to develop early maturing and high yielding variety/ hybrid.

Preliminary identification of early maturing genotypes can be done based on characters like days to opening of female flowers, node number to first female flowering and sex ratio. Collection and evaluation of germplasm is a prerequisite for their utilization while detailed evaluation determines the potential of a germplasm in specific crop improvement programme. Therefore, a trial for evaluating the available ridge gourd germplasm was carried out to identify the potential cultivar with desirable growth and flower characters like vine length, days to first female flower anthesis, node number for first female flower appearance, number of male flower per vine, number of female flower per vine and sex ratio for effective utilization in crop improvement programme.

### **MATERIALS AND METHODS**

Thirty five genotypes of ridge gourd available in the germplasm maintained at Department of Vegetable crops, Horticultural College and Research Institute, Tamil Nadu Agricultural University were utilized for this study. The details of the genotypes used for the study is given in Table 1. The experiment was laid out in randomized block design with two replications. Each experimental unit was represented by 10 plants spaced at 1.5 meter, row spaced 2 meter and the plants were trained on trellis system. The germplasm was evaluated for different growth and flower characters viz., vine length, days to first female flower appearance, node number for first female flower appearance, number of male flowers, number of female flowers and sex ratio. The data collected was subjected to statistical analysis adopting standard procedures of analysis (Panse and Sukhatme, 1978).

### **RESULTS AND DISCUSSION**

#### **Per se performance of genotypes for growth and flower characters:**

The mean performance of different genotypes evaluated for growth and flower characters is presented in Table 2. Vine length is an important yield component by which growth and vigour of plants are measured. In the present study, the genotypes showed significant differences for vine length and the genotype IC 413577 recorded significantly the longest (8.99 m) vine length while the

**Table 1. Details of germplasm and their sources**

S. No.	Name of the germplasm	Source
1.	IC 92618	NBPGR, New Delhi
2.	IC 92660	NBPGR, New Delhi
3.	IC 92685	NBPGR, New Delhi
4.	IC105554	NBPGR, New Delhi
5.	IC 105579	NBPGR, New Delhi
6.	IC 110892	NBPGR, New Delhi
7.	IC 196589	NBPGR, New Delhi
8.	IC 339239	NBPGR, New Delhi
9.	IC 385912	NBPGR, New Delhi
10.	IC 392334	NBPGR, New Delhi
11.	<i>Arka Sumeet</i>	IIHR, Bangalore
12.	<i>Arka Sujat</i>	IIHR, Bangalore
13.	<i>Deepthi</i>	KAU, Thrissur
14.	<i>Coimbatore Local</i>	Coimbatore
15.	<i>Notchimedu Local</i>	Vaiyampatty
16.	UP Variety Local (var:100)	Karnataka
17.	UA 040	Karnataka
18.	UA 050	Karnataka
19.	SG 020	Karnataka
20.	SG 030	Karnataka
21.	070	Karnataka
22.	090	Karnataka
23.	IC 413592	TNAU, Coimbatore
24.	IC 373361	TNAU, Coimbatore
25.	IC 362481	TNAU, Coimbatore
26.	IC 393014	TNAU, Coimbatore
27.	IC 393016	TNAU, Coimbatore
28.	IC 413577	TNAU, Coimbatore
29.	IC 413587	TNAU, Coimbatore
30.	LA 1	TNAU, Coimbatore
31.	LA 2	TNAU, Coimbatore
32.	2S 134	TNAU, Coimbatore
33.	CO 1	TNAU, Coimbatore
34.	CO 2	TNAU, Coimbatore
35.	PKM – 1	TNAU, Coimbatore

genotype IC SG 020 recorded the shortest (6.00 m) vine length. The mean value for vine length recorded among the thirty five genotypes of ridge gourd was 7.46 m. the maximum vine length offers the possibility for setting up of more number of flowers thus ultimately increasing the yield per plant. Similar results of maximum vine length and better fruit yield was reported by Munshi and Sirohi, 1994 in bitter gourd.

Earliness is one of the important attributes for good variety / hybrid which is measured in terms of days to first female flower anthesis and node at which first female flower appears. The ridge gourd genotypes showed significant differences for earliness and the genotype IC 413577 was observed to show minimum number of days for first female flower anthesis (39.24) and IC SG 020 recorded the maximum number of days for opening of first female flower. The mean number of days taken for opening of female flowers was 49.79 days. Similarly, the genotype IC 413577 registered the lowest values for the node number at which the first female flower appears (15.25) while IC 92660 recorded the maximum value (30.51). The mean position of node from base at which the first female flower appears was 24.98 among the thirty five genotypes of ridge gourd. Similar results for variability in earliness was obtained during the evaluation of genotypes maintained in germplasm by Harika, *et al.*, 2012 in bottle gourd, Hitesh, *et al.*, 2012 in ivy gourd and Suganthi, 2008 in bottle gourd.

In crop improvement programme of cucurbits, for breeding varieties/hybrids, more number of female flowers is expected in genotypes than the male flowers since the yield can be maximized with high possibility of fruit setting per cent. In this study, the genotype, IC 413577 was observed with maximum number of female flowers (61.48) while the lowest number of female flowers was observed in LA 2 (35.45). It was noted that the entry IC 413577 with more number of female flowers had low number of male flowers (401.6) while the genotype with low number of female flowers had high number of male flowers (573.6). The mean number of male and female flowers recorded among the thirty five genotypes of ridge gourd was 487.6 and 49.20 respectively. A similar result with variability in flower number was reported by Sundaram, 2006 in bitter gourd.

Low sex ratio is a favorable trait in cucurbits and in the present study, the genotype IC 413577 (6.53) and IC 92685 (7.55) registered the low sex ratio followed by 090 (7.22) and IC 362481 (7.28). The results obtained were in accordance with the findings of Harika, *et al.*, 2012 in bottle gourd. The thirty five genotypes evaluated showed significant differences for different characters studied.

In general, the earliness in cucurbits is advantageous and is measured as the days taken for first female flower to open and also the node number at which the first female flower appears. The genotype IC 413577 registered the highest value for vine length, lowest days for opening of first female flower, least node number for first female flower appearance, the highest number of female flowers and low sex ratio followed by the genotype CO 1. The genotypes LA 2 produced the highest number of male flowers and hence, it may be used as a better male parent in crop

**Table 2. Mean performance of ridge gourd genotypes for growth and flower characters**

Parents	Vine length (m)	Days to first female flower anthesis	Node number for first female flower appearance	Number of male flowers per vine	Number of female flowers per vine	Sex ratio (M/F)
IC 92618	7.27	50.73	19.50	513.2	42.70	12.02
IC 92660	7.54	46.86	30.51	436.5	56.69	7.70
IC 92685	6.26	42.18	27.72	436.2	57.76	7.55
IC105554	7.36	55.42	22.66	486.4	52.53	9.26
IC 105579	7.76	60.14	26.38	461.2	55.16	8.36
IC 110892	7.33	54.27	27.75	499.4	47.55	10.50
IC 196589	6.66	56.34	29.25	484.7	53.36	9.08
IC 339239	8.83	56.87	28.50	477.5	54.53	8.76
IC 385912	6.36	46.52	27.27	433.1	58.39	7.42
IC 392334	7.24	53.61	27.52	488.5	51.57	9.47
<i>Arka Sumeet</i>	7.17	47.66	28.19	440.1	55.49	7.93
<i>ArkaSujat</i>	6.66	46.23	19.37	445.2	55.21	8.06
<i>Deepthi</i>	8.56	48.52	15.75	540.6	39.72	13.61
Coimbatore Local	8.22	41.42	26.47	551.5	37.31	14.78
Notchimedu Local	7.22	57.73	24.77	556.7	35.69	15.60
UP Variety Local (var:100)	6.44	43.82	18.12	488.3	52.37	9.32
UA 040	7.53	59.40	25.62	516.3	41.88	12.33
UA 050	8.23	44.44	23.87	480.5	53.39	9.00
SG 020	6.00	61.76	27.25	490.7	51.17	9.59
SG 030	8.02	39.82	23.70	436.4	57.39	7.60
070	7.43	44.83	24.19	534.5	40.46	13.21
090	8.78	49.39	26.45	431.4	59.73	7.22
IC 413592	8.47	42.83	27.23	478.3	53.65	8.92
IC 373361	8.14	55.59	26.25	511.5	43.36	11.80
IC 362481	7.05	45.42	17.57	431.5	59.28	7.28
IC 393014	6.71	45.76	28.72	495.5	48.23	10.27
IC 393016	8.57	57.40	29.62	521.3	40.70	12.81
IC 413577	8.99	39.24	15.25	401.6	61.48	6.53
IC 413587	8.12	48.60	28.12	499.5	47.51	10.51
LA 1	6.45	58.76	29.36	546.6	37.55	14.56
LA 2	7.12	50.25	24.50	573.6	35.45	16.18
2S 134	6.14	44.87	29.40	541.6	38.46	14.08
CO 1	7.63	43.58	22.50	408.6	61.43	6.65
CO 2	8.37	58.12	17.75	519.3	41.45	12.53
PKM – 1	6.52	47.13	27.25	509.5	43.76	11.64
Mean	7.46	49.79	24.98	487.6	49.20	10.22
Maximum	8.99	61.76	30.51	573.6	61.48	16.18
Minimum	6.00	39.24	15.25	401.6	35.45	6.53
SEd	0.12	0.26	0.26	0.36	0.96	0.25
CD (5%)	0.24	0.53	0.54	0.74	1.97	0.51

improvement through hybridization. The performance of genotypes viz., IC 413577, CO-1, IC – 339239 and IC 385912 maintained in the germplasm for flower and growth characters indicated their genetic potential to be used as parents for developing promising early maturing and high yielding varieties / hybrids.

#### LITERATURE CITED

- Harika, M. V., D. Gasti, T. Shantappa, R. Mulge, A. M. Shirol, A. B. Mastiholi and M. S.Kulkarni. 2012. Evaluation of bottle gourd genotypes [*Lagenaria siceraria* (Mol.) Standl.] for various horticultural characters. *Karnataka J. Agric. Sci.*, **25**(2): 241-244.
- Hazra.P and M.G.Som. 2006. Vegetable Science. Kalyani publishers, New Delhi.
- Hitesh Nag, Devi Singh, Vijay Bahadur and Collis, J. P. 2012. Evaluation of ivy gourd (*Coccinia cordifolia* L.) genotypes in Allahabad agro-climatic condition. *Hort Flora Research Spectrum*, **1**(3): 259-262.
- Panase, V.G and P.V. Sukhatme. 1978. Statistical methods for Agricultural Workers. I.C.A.R., New Delhi.
- Suganthi, M. 2008. Line x tester analysis in bottle gourd (*Lagenaria siceraria* M.) M.Sc. Thesis. Tamil Nadu Agricultural University, Coimbatore.
- Sundaram, V. 2006. Studies on genetics of yield and yield components in bitter gourd (*Momordica charantia* L.) under salinity. Ph.D (Hort.) Thesis, Tamil Nadu Agricultural University, Coimbatore.

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