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RESEARCH ARTICLE

EVALUATION OF F_1 HYBRIDS IN SNAKE GOURD (T*richosanthes anguina* L.)

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ABSTRACT

An investigation entitled "Evaluation of F1 hybrids in snake gourd (*Trichosanthes anguina* L.)" was carried out in the Department of Horticulture, Faculty of Agriculture, Annamalai University, Tamil Nadu, India. The parents from diversified genotypes and their hybrids in snake gourd were evaluated for fruit yield per plant, yield attributing characters and quality traits Based on the *per se* performance with specific trait and genetic divergence from different clusters, six genotypes namely P_1–Hessaraghatta local (Bangalore, Karnataka), P_2–Ottanchathiram local (Dindigul district, Tamil Nadu), P_3–IC-212484, NBPGR, Trichur, P_4–Michaelpalayam local (Dindigul district, Tamil Nadu), P_5–PKM–1 (mutant variety, HC&RI, TNAU, Periyakulam), P_6–Vellayani local (Kerala) were selected for crossing in full diallel programme. The analysis of variance indicated that the selected six parents and their 30 hybrids differed among themselves for all the eleven traits studied. Among the selected six genotypes, P_4 and P_2 were identified as the best parents. The parents P_4 and P_2 are suggested to be utilized for future varietal breeding programme. The hybrids P_4xP_5, P_1xP_3, P_4xP_2, P_3xP_4, P_5xP_2 and P_2xP_4 are suggested to heterosis breeding programme for commercial cultivation.

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INTRODUCTION

Snakegourd is an annual, climbing type day neutral herbaceous vegetable crop and belongs to the family cucurbitaceae. There are a number of cultivars with wide range of variability in size, shape and color of fruits available in this country (Rashid, 1993). Snakegourd is monoecious and highly cross pollinated in nature. Such pollination mechanism can be exploited for the production of hybrid variety. Moreover, there is a bright scope of development of open pollinated variety utilizing the existing variability. Srivastaba and Bajpai, 1977) noted that Diallel cross analysis leads to a fruitful result for identification of genetic parameters related to combining ability as well as dominance relationship of the parents by studying the F_1 hybrids.

MATERIALS AND METHODS

The experimental materials comprised of seven genetically diverse genotypes namely, P_1–Hessaraghatta local (Bangalore, Karnataka), P_2–Ottanchathiram local (Dindigul district, Tamil Nadu), P_3–IC-212484, NBPGR, Trichur, P_4–Michaelpalayam local (Dindigul district, Tamil Nadu), P_5–PKM–1 (mutant variety, HC&RI, TNAU, Periyakulam), P_6–Vellayani local (Kerala)as well as 30 F_1's obtained through full diallel fashion.The 6 parents and 30 hybrids along with a standard check MDU-1were evaluated in Randomized Block Design with three replications at Department of Horticulture, Faculty of Agriculture, Annamalai University, Tamilnadu at 2 x 2 m spacing. The observations were recorded on five randomly selected competitive plants of each parent and F1 from each replication for nine various characters. The heterotic effects were computed as the percentage increase (+) or decrease (-) of F_1 mean values over better parent (heterobeltiosis) and standard check variety MDU-1 (economic heterosis) for all the characters and crosses, following the standard formula. Significance of heterosis was worked out using standard formula suggested by Wynne *et al*., (1970).

RESULTS AND DISCUSSION

A good hybrid selection should manifest high amount of heterosis for commercial exploitation. Heterobeltiosis is the genetic expression of the beneficial effects of hybridization over better parent to know the potential of parent for various traits. The F_1 hybrids of the cross combinations viz., P_4xP_2 (71.24 per cent), P_4xP_5 (64.96 per cent), P_3xP_4 (53.06 per cent), P_5xP_2 (51.09 per cent), P_2xP_4 (49.09 per cent) and P_1xP_3 (47.80 per cent) which exhibited high heterobeltiosis for fruit yield per plant showed mostly favourable significant heterobeltiosis for almost all the traits studied except flesh thickness of fruit.

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Performance of the best six crosses selected for fruit yield per plant of snake gourd based on heterobeltiosis (d_{ii}), for other traits in per cent

S.No	Characters	P_4xP_2	P_4xP_5	P_3xP_4	P_5xP_2	P_2xP_4	P_1xP_3
		71.24**	64.96**	53.06**	51.09**	49.09**	47.80**
1.	Days to first male flower opening	0.84**	-38.81**	-111.48**	-43.24**	-19.54**	-12.14**
2.	Days to first female flower opening	-10.07**	-31.17**	-43.33**	-40.00**	-38.41**	-10.00**
3.	Number of fruits per plant	61.64**	75.71**	102.81**	32.54**	41.27**	-18.15**
4.	Fruit length	-14.62**	-12.16**	-46.86**	-76.94**	-43.59**	-26.51**
5.	Fruit girth	1.75**	0.16**	10.63**	1.40**	16.03**	-6.50**
6.	Flesh thickness	-19.80**	6.38**	-16.78**	-19.78**	-7.72**	-0.99**
7.	Fruit weight	8.75**	4.75**	-18.48**	2.40**	2.97**	-12.99**
8.	Number of seeds per fruit	-55.63**	-50.59**	-26.98**	-0.51**	-47.43**	-8.13**
9.	Vitamin C content	42.53**	38.79**	6.56**	38.53**	40.52**	4.27**
10.	Acidity	-26.32**	-19.30**	-15.79**	-8.16**	-35.58**	2.04**

** Significant at 1 per cent level

Performance of the best six crosses selected for fruit yield per plant based on standard heterosis (d_{iii}), for other traits in per cent

S.No	Characters	P_4xP_2	P_4xP_5	P_3xP_4	P_2xP_4	P_1xP_3	P_4xP_3
		139.81**	131.02**	114.35**	108.80**	101.85**	96.76**
1.	Days to first male flower opening	-13.45**	-30.58**	-47.74**	-30.94**	-18.83**	-42.87**
2.	Days to first female flower opening	-10.27**	-27.84**	-43.46**	-38.54**	-25.81**	-38.61**
3.	Number of fruits per plant	23.48**	12.53**	29.90**	7.88**	24.85**	29.90**
4.	Fruit length	15.21**	144.74**	10.90**	7.07**	53.51**	39.85**
5.	Fruit girth	-5.72**	-7.19**	2.52**	7.52**	-30.14**	7.52**
6.	Flesh thickness	45.73**	93.29**	51.22**	67.66**	21.95**	67.68**
7.	Fruit weight	137.15**	128.44**	77.78**	124.54**	86.48**	107.13**
8.	Number of seeds per fruit	-16.77**	-20.37**	-22.28**	-1.38**	-2.22**	-27.64**
9.	Vitamin C content	46.31**	42.48**	15.04**	44.25**	35.34**	15.34**
10.	Acidity	7.69**	17.95**	23.08**	0.01**	28.21**	15.38**

** Significant at 1 per cent level

Thus, the characters studied in the present inquiry are justifiable for the fruit yield improvement of snake gourd. Among the three types of heterosis, the need for computing standard heterosis for exploitation of hybrid vigour has been stressed by Kadambavanasundaram (1983). Hence, in the present study, the hybrids were evaluated based on standard heterosis over the standard variety MDU-1 and promising hybrids were selected based on standard heterosis.

The six hybrids viz., P_4xP_2 (139.81 per cent), P_4xP_5 (131.02 per cent), P_3xP_4 (114.35 per cent), P_2xP_4 (108.80 per cent), P_1xP_3 (101.85 per cent) and P_4xP_3 (96.76 per cent) which recorded the maximum standard heterosis over standard parent MDU-1 for fruit yield per plant exhibited favourable significant standard heterosis for most of the traits except fruit length, fruit girth and acidity content of fruit out of eleven traits studied. However, above hybrids except P_1xP_3 exhibited more or less onpar fruit girth with MDU1. But long fruit length and high acidity content were observed in all above high yielding hybrids compared with MDU1. None of the hybrids have recorded standard heterosis for all the eleven characters studied. Similar observations are made by Singh and Randhawa (1990) in musk melon. However, majority of hybrids showed superiority over the standard variety for more than one trait.

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