

Combining ability for fruit quality parameters in chilli (*Capsicum annuum* L.)

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ABSTRACT

Eighteen divergent lines of chilli and 45 F₁ hybrids were studied to investigate the general combining ability (gca) and specific combining ability (sca) effects for fruit and seed related traits in chilli. Higher proportion of additive gene effect was observed for fruit related traits while seed related traits are under the control of non additive gene action. The parents having high gca like VN-2, B-Kaddi, Arkalohit, Phule-5 and LCA-312 exhibited high GCA and may be utilized for quality improvement or recurrent selection programme for improvement in fruit quality traits.

Key words : General combining ability, Specific combining ability, Heterobeltosis.

Chilli fruit forms an economical part of produce and quality parameters associated with fruit are of immense importance and provides value to the chilli produce. Very few information and little effort has been made for the improvement of fruit quality. Hence, there is a need to identify suitable parents with good combining ability for fruit parameters. Now exploitation of heterosis and selection of parents on the basis of combining ability are important breeding approaches in crop improvement.

It also provides necessary information on nature and magnitude of gene effects for fruit traits. Line x tester analysis is useful for preliminary evaluation of genetic stocks with large number for use in hybridization programme and to facilitate a sound breeding programme.

MATERIALS AND METHODS

The experiment material comprised of 45 F₁s developed from three females (Byadagi Kaddi, Byadagi dabbi, VN-2) 15 males (GPC-82, Jwala, Hissar Shakthi, CO-2, Arka Abir, LCA-301, AKC-86-39, LCA-312, BC-14-2, BC-24, KDC-1, Arkalohit, Phule-5, PMR-5 and CA-

219. The 18 parents and their 45 F₁s were evaluated in a randomised block design with two replications at Chilli Research Centre, Hanumanamatti (under University of Agricultural sciences, Dharwad) during *kharif* 1999. Each entry was planted in two rows of ten plants each, both parents and hybrids were randomised completely among themselves but grown in a continuous block. Ten random competitive plants were tagged in each entry in each replication to record the observation on dry fruit yield and its important component characters (Table 1). Combining ability analysis was computed according to the model given by Kempthorne (1957).

RESULTS AND DISCUSSION

The analysis of variance for combining ability (Table 1) for fruit quality traits revealed that mean sum of squares due to female and male were highly significant for all the characters except for ascorbic content in female and stalk length in female x male indicated the presence of genetic variability among the parents for fruit quality traits.

The ratio of GCA variance and SCA variance (Table

Table 1 : Analysis of variance of parents and hybrids for fruit and seed characters in chilli

Source	df	Fruit length	Fruit width	Fruit weight	Stalk length	Pericarp weight /fruit	Seed weight per fruit	No. seeds per fruit	1000 seed weight	Ascorbic acid content	Capsaicin content
Parents	17	12.6**	37.7*	23.5*	0.669*	6.78**	4.71**	394.5**	2.44**	3217**	0.2095**
Females	2	18.7**	88.0**	1.12*	1.126*	13.6**	11.85**	435.1**	6.31**	273.5	0.0030**
Males	14	4.5**	12.4**	0.48	0.482	3.15**	1.85**	315.78**	1.07**	3319**	0.0078**
Females x males	1	114**	290**	0.23	0.239	43.8**	30.64**	1416**	14.24**	7683**	0.2449**
Hybrids	44	3.8**	4.47**	0.66**	0.666**	2.90**	1.80**	345.3**	1.28**	2758**	0.0036**
Parent x Hybrid	1	27.4**	2.16*	0.77	0.771	20.15**	22.47**	6076**	20.29**	15.00	0.0193**
Error	62	0.528	0.462	0.285	0.2858	0.1844	0.1934	42.5426	0.1125	842.43	0.0006

* and ** indicates significance of values at P=0.05 and P=0.01, respectively.