Vegetable Science (2011) 38(2) : 203-205

Short communication

Combining ability studies in Cucumber (*Cucumis sativus* L.)

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Received : June 2010 / Accepted : May 2011

Cucumber (*Cucumis sativus* L.) is one of the important and popular vegetable crop grown through out India is also. It is a warm season fruit vegetable used as salad and for pickling purpose. The study aim to determine the combining ability which not only provides necessary information regarding choice of the parents but simultaneously also illustrate the nature and magnitude of gene effects.

The experimental material for present investigation consisted of 40 entries including three female's,? nine males ? with their 27 hybrids. The experiment was laid out Line x Tester method in a randomized block design (RBD) with three replications during *Kharif* – 2009 at experimental farm, N. M. College of Agriculture, Navsari Agricultural University, Navsari. Each entry was planted in a single row consist of 10 plant in each row with a spacing 2 x 1m. The standard agronomical practices were followed to raise the experimental crop. Five competitive plants were randomly selected to record the observation on ten *viz.*, node number on which first male flower appeared, node number on which first female flower appeared, days to 50 per cent flowering (female), number of lateral branches per vine, fruit length, fruit diameter, average fruit weight, vine length, number of fruits per vine and fruit yield per vine.

General combining ability effects (Table 1) of the parents revealed that among males SPP-44 was good general combiner for all the traits except vine length. Parent CC-9 showed good gca effect for all traits except node number on which first male flower appeared, fruit diameter and vine length. The male parent PCUC-28 also good combiner for fruit length, vine length and number of fruit per vine. K-90 showed good combining ability for fruit length only. On the other hand female parent Gujarat local showed good general combining ability for all the traits studied except node number on which first male flower appeared, days to 50 per cent flowering (female) and number of lateral branches.

All the crosses having best specific combination (Table. 2) for fruit yield per vine were obtained either through poor x average, good x average and average x good parental combination. The best specific combination i.e. Pilibhit Local x K-90 recorded desirable significant SCA effects for most of the traits *viz.* node number on which first male flower appeared, node number on which first female flower appeared, days to 50 per cent flowering, number of lateral branches, fruit length, fruit diameter, average fruit weight, number of fruits per vine and fruit yield per vine. The second best cross *i.e.*, Gujarat Local x SPP-93 had desirable significant SCA effects for node number on which first male flower appeared, node number on which first female flower appeared, days to 50 per cent flowering, number of

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Table 1: Estimation of general combining ability effects of parents for different characters in Cucumber.

Parents	NFM	NFF	DFF	NLB	FL	FD	AFW	VL	NFP	FYV
Females										
Sheetal	-0.059	0.178	0.728	0.185	-0.851***	-0.014	-3.655	-1.020	0.265	0.126
Gujarat local	-0.013	-0.29.*	-0.605	0.222	1.280	0.271	10.264**	8.640**	1.562**	0.381**
Pilibhit local	0.072	0.112	-0.123	-0.407**	-0.429*	-0.257*	-6.609**	-7.619**	-1.827**	-0.507**
SE(gi)	0.079	0.132	0.450	0.136	0.178	0.108	1.994	2.696	0.259	0.067
SE(gi-gi)	0.112	0.187	0.637	0.193	0.252	0.153	2.820	3.813	0.366	0.095
Males										
SPP-44	-0.337*	-0.807**	-2.901**	0.519*	3.065**	0.600**	19.394**	-6.453	2.006**	0.380**
K-90	0.049	0.313	0.321	0.074	1.052**	-0.006	5.816	-10.283*	-0.772	0.211
CV-5	-0.193	0.309	1.432	-0.593**	-1.224**	-0.397*	-12.984**	6.594	-1.216**	-0.107
SPP-93	0.250	0.050	-1.568*	0.407	-0.189	-0.102	-4.551	-8.819	0.106	-0.112
CC-9	-0.177	-0.843**	-2.123**	0.630*	1.442**	0.372	10.849**	1.440	2.784**	0.506**
SPP-63	0.230	0.105	-0.235	-0.481*	-2.157**	-0.255	-0.173	3.263	-0.994*	-0.229
DC-2	0.114	0.535*	3.099**	0.185	-1.746**	-0.080	-11.64**	5.228	-0.549	-0.334**
PCUC-8	0.280*	0.572*	1.321	-0.815**	-1.319**	-0.360	-3.70	-5.383	-2.372**	-0.462**
PCUC-28	-0.215	-0.190	0.654	0.074*	1.076**	0.227	-2.970	10.414**	1.006*	0.147
SE(gi)	0.137	0.230	0.781	0.236	0.309	0.188	3.454	4.670	0.449	0.116
SE(gi-gi)	0.194	0.325	1.10	0.334	0.437	0.266	4.885	6.604	0.635	0.165

*,** 5 and 1 % Significant, respectively

NFM = Node number on which first male flower appeared, NFF= Node number on which first female flower appeared, DFF= Days to 50 per cent flowering,NLB= Number of lateral branches, FL= Fruit length (cm), FD= Fruit diameter (cm), AFW= Average fruit weight(g), VL=Vine length(cm), NFP= Number of fruit per vine, FYV= Fruit yield per vine (kg)

Table 2: A table showing the best specific combination along with the general combining ability effects of the parents involved the combination for different characters in cucumber

Characters	Best specific combination	SCA	Per se performance	Gca effects of the parents involved
Node number on which first male flower appeared	Pilibhit Local x K-90	-0.83**	1.95	A x A
	Gujarat Local x DC -2	-0.50*	2.26	A x A
	Pilibhit Local x SPP-93	--0.44	2.52	A x A
Node number on which first female flower appeared	Pilibhit Local x K-90	-1.17**	4.83	A x A
	Gujarat Local x SPP-93	-1.14**	4.15	G x A
	Gujarat Local x PUCU-28	-0.87*	4.22	G x A
Days to 50 per cent flowering (female)	Pilibhit Local x K-90	-5.98**	39.00	A x A
	Sheetal x CC-9	-4.72**	38.67	A x G
	Gujarat Local x SPP-93	-4.61**	38.00	A x G
Number of lateral branches	Gujarat Local x PUCU-28	1.22**	5.67	A x A
	Sheetal x DC -2	1.14**	5.67	A x A
	Pilibhit Local x SPP-63	1.07*	4.33	P x P
Fruit length	Pilibhit Local x K-90	2.55**	19.84	P x G
	Gujarat Local x SPP-44	2.06**	23.07	G x G
	Gujarat Local x PUCU-28	1.25*	16.13	G x G
Fruit Daimeter	Pilibhit Local x K-90	1.30**	5.70	P x A
	Gujarat Local x SPP-93	1.06**	5.60	G x A
	Sheetal x DC -2	0.89*	5.47	A x A
Average Fruit Weight	Pilibhit Local x K-90	25.92**	192.53	P x A
	Gujarat Local x PUCU-28	18.50**	193.20	G x A
	Gujarat Local x SPP-93	18.44**	191.57	G x A
Vine Length	Pilibhit Local x K-90	21.99**	176.40	P x A
	Pilibhit Local x CV-5	21.06*	178.80	P x A
	Pilibhit Local x CC-9	13.02	162.04	G x A
Number of Fruit per Vine	Pilibhit Local x K-90	4.38**	12.00	P x A
	Gujarat Local x SPP-93	3.11**	15.00	G x A
	Sheetal x SPP-44	2.50**	15.00	A x G
Fruit yield Per Vine	Pilibhit Local x K-90	0.82**	2.45	P x A
	Gujarat Local x SPP-93	0.50**	2.70	G x A
	Sheetal x SPP-44	0.40*	2.84	A x G

*,** 5 and 1 % Significant, respectively

lateral branches, fruit diameter, average fruit weight, number of fruits per vine and fruit yield per vine, whereas the third best cross Sheetal x SPP-44 had significant sca effects for test number of fruits per vine and fruit yield per vine. These results are in conformity with the findings of Prasad and Singh.(1992), Verma *et al.* (2000), Kumbhar *et al.* (2005), Singh and Sharma (2006), Nehe *et al.* (2007), Prajapati *et al.* (2008), Lodam *et al.* (2009)

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