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Short Communication

MODIFIED TRIPLE TEST CROSS ANALYSIS FOR YIELD AND YIELD COMPONENTS IN OKRA (*ABELMOSCHUS ESCULENTUS* (l) MOENCH)

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Information on gene action for yield and its related traits in different populations is pre-requisite for planning effective breeding programme. Several biometrical procedures are available for obtaining information on the nature of genetic variation, but the triple test Cross (TTC) [2] and its modification [1] is the most efficient for detection and estimation of epistatic variation. The present investigation consists of two testers (Arka Anamika and Pusa Sawani) alongwith 20 parental lines (p_i), 20 L_{1i} and $20L_{2i}$ families which were grown in a randomized block design, replicated thrice during the summer and rainy seasons of 1994 keeping inter-row and intra-row spacing of 45 and 30 cm. respectively. Observations were recorded on 5 random plants from each family in each replication on ten quantitative characters.

The variance due to sums $(\bar{L}_{1i}+\bar{L}_{2i})$ was important for all the traits during both the summer and rainy seasons except for girth of pod (Table-1). Similarly, variance due to differences $(\bar{L}_{1i}-\bar{L}_{2i})$ was important for all the traits during both the Summer and Rainy seasons except node at which first flower appears, plant height, length of pod in Summer season, girth of pod and 1000 seed weight in Rainy season.

The estimates of additive components of genetic variance was found to be highly significant for days to first flowering during both the Summer and Rainy seasons whereas the dominance components of genetic variance was found to be significant in both the seasons also. The estimates of directional elements 'F' was positive and non-significant for this trait in both the Summer and Rainy seasons.

Highly significant additive (D) genetic component was detected for plant height in both summer and Rainy seasons whereas in summer season, the dominant genetic components was non- significant. Highly significant estimates of both the components (additive and dominance) were observed for number of primary branches/plant, plant height, number of seeds and pod yield/plant in both the seasons. The negative

Table 1. **Analysis of variance (mean squares) for testing epistasis, additive and dominance components in the modified Triple Test Cross Model for ten characters in Okra**

Source	Season	Days to first flowe-ring	Node at which first flower appears	Plant height	Number of primary branches/ plant	Number of pods/ plant	Length of pod	Girth of pod	Number of seeds/ pod	1000 seed weight	Pod yield/ plant
Epistasis	S	3.05*	0.21*	133.6*	0.17**	4.58**	6.63	0.03**	28.6**	21.13**	2434.71**
$(\bar{L}_{1i}+L_{2i}-P_i)$	R	3.08**	0.60**	853.2**	0.48**	5.45**	6.93**	3.22**	36.2**	17.37*	2775.73**
Error	S	1.68	0.12	82.7	0.09	2.09	5.44	0.01	14.7	10.57	823.50
	R	1.33	0.22	240.9	0.18	1.98	2.42	0.01	17.7	10.82	929.64
Additive	S	7.93**	0.38**	31..3**	0.14**	7.35**	9.93**	0.04	95.7**	28.83**	2726.13**
component $(\bar{L}_{1i}+\bar{L}_{2i})$	R	3.02**	0.81**	1441.0**	0.32**	5.95**	6.98**	0.03	81.8**	16.68**	3503.32**
Error	S	0.72	0.05	156.2	0.05	1.12	5.47	0.01	8.8	4.89	269.65
	R	0.89	0.08	58.1	0.06	0.76	0.60	0.01	15.5	4.14	535.29
Dominance	S	1.26*	0.04	160.2	0.07*	2.57**	5.18	0.05**	36.2**	6.72*	832.90**
component $(\bar{L}_{1i}+\bar{L}_{2i})$	R	1.52	0.19**	168.5**	0.14**	1.95**	1.43	0.01	33.6**	5.44	1855.21**
Error	S	0.72	0.05	156.2	0.05	1.12	5.47	0.01	8.8	4.89	269.65
	R	0.89	0.08	58.1	0.06	0.76	0.60	0.01	15.5	4.14	535.29
Genetic components of variance											
D	S	9.61*	–0.39**	206.8**	0.12**	81.31**	5.95**	0.04	115.8**	31.99**	3239.31
	R	2.84**	0.97**	1843.8**	0.35**	6.92**	8.51**	0.02	88.4**	16.72**	3957.37**
H	S	0.72*	–0.01	5.3	0.03*	1.93**	–0.39	0.05**	36.4**	2.44*	715.00**
	R	0.84*	0.15**	147.12**	0.11**	1.59**	1.11	0.01	24.12**	1.73	1759.89**
F	S	0.04	0.01	–209.55**	–0.04	–0.62	–14.79**	0.01	–1.48	–0.07	338.42
	R	0.32	–0.02	–24.95	–0.08*	0.69	–0.02	0.01	–1.70	–0.68	285.57

*, **Significant at P = 0.05 P = 0.01 respectively, S = Summer, R - Rainy

and significant nature of 'F' noted in Rainy season for number of primary branches/plant exhibited that the relative contribution of decreasing alleles were more than that of increasing alleles towards dominance variance, whereas positive and non-significant value of 'F' in Rainy season for plant height and in both the seasons for pod yield/plant suggests the ambidirectional nature of dominance i.e. genes with increasing and decreasing effects appear to be equally important.

Highly significant estimates of additive and dominance components of genetic variance were observed for length of pod during Rainy seasons whereas the dominant genetic components of variance was found to be non-significant during the Summer season. For girth of pod, the estimates of the additive component of genetic variance (D) was non-significant in both the seasons, but for 1000 seed weight, additive component was found to be important for both the seasons.

The overall picture of degree of dominance reveals that all most all the characters were controlled predominantly by additive gene effects in both the seasons except girth of pod in summer season. However, overdominance could be seen for girth of pod in summer season, suggesting to the greater contribution of dominance in controlling the variability of the trait.

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