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## Short communication

## GENETIC ANALYSIS OF YIELD AND ITS COMPONENTS IN TOMATO

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Tomato is an important fruit vegetable which is grown throughout the country. Red ripe tomatoes are rich in vitamin A mainly lycopene which are beneficial for good health and also act as antioxidants. A wide range of variability is available for yield and its related characters in tomato. The knowledge on genetics of yield components is essential. Hence, a study was conducted to obtain information on gene action of six important yield components using diallel analysis which is a quickest possible method for assessing the gene action.

The experimental materials consisted of 8 lines/varieties namely, EC-164336, EC-368860, EC-339074,

EC-369060-A, EC-386021, Sonali, BT-17 and BT-18 and their 28 F<sub>1</sub> hybrids. The 28 F<sub>1</sub> hybrids and 8 parents were grown in a randomized block design with 2 replications. The crop was transplanted on 17.9.2002 at a spacing of 60 cm x 40 cm. Out of 20 plants per treatment per application, 10 plants were selected randomly for recording the observation on 6 characters namely, average fruit weight, fruit length, fruit diameter, TSS, number of locules/fruit and yield (q/ha). The diallel analysis was carried out as suggested by Hayman (1954).

The result of diallel analysis revealed that the estimates of dominance components were higher than these of

Table 1. Estimates of components of variation and various statistical parameters for different characters

Statistics	Yield (q/ha)	Average weight	Fruit (cm)	Fruit length (cm)	Diameter TSS%	No. of locules/fruit
D	36660.38**	1144.58**	0.68**	0.48**	2.25**	0.13
SE +	1837.93	199.78	0.12	0.05	0.14	0.15
F	-15573.61	1072.49	-0.40	0.04	2.25**	-0.35
SE +	43430.08	472.07	0.28	0.13	0.34	0.36
H1	181553.62** 1877.20**		0.83*	0.29*	1.66**	1.01*
SE +	42252.75	459.27	0.28	0.12	0.33	0.35
H2	121978.81	1312.82*	0.77*	0.26	1.08*	0.94*
SE +	36759.86	399.57	0.24	0.11	0.29	0.31
H2	227050.21 ** 204.36		0.00	0.28**	0.25	-0.04
SE +	24652.72	267.97	0.16	0.07	0.19	0.20
E	19858.09*	95.74	0.05	0.16* *	0.17*	0.22*
SE +	6126.64	66.59	0.04	0.02	0.05	0.05
HdD	2.23	1.28	1.10	0.77	0.86	2.73
H2/4H1	0.17	0.17	0.23	0.23	0.16	0.23
KO/KR	0.83	2.15	0.58	1.10	3.78	0.36
H2/H2	0.595	0.037.38	42.3068	134.5315	88.2006	6.08702
R	0.5123	0.1000	0.6191	0.7772	0.9988	0.4570
T2	5.9514	0.0003	3.0989	0.6193	0.4666	1.4822

\*\* Significant at 5% and 1% level, respectively

additive component for average fruit weight, fruit length, TSS and yield per plant. The significance of both additive and dominance components of genetic variance revealed that both type of gene action were important for controlling the characters except number of locules per fruit. Among the studied characters, the total soluble solids revealed an excess of dominant genes (Kalloo et al., 1974). The average degree of dominance showed over dominance for average fruit weight, fruit length, number of locules per fruit and yield per plant (Ghose et al., 1996). The distribution of genes in the parents with positive and negative effect was symmetrical for fruit length, fruit diameter and no. of locules per fruit. Therefore the conclusion drawn for these characters regarding degree of dominance and valid and the prediction about the progenies derived from such parents are expected to be within the limit of standard error. The proportion of dominant and recessive genes among the parents determine the extent of genetic advance that can be made in a particular direction, because if the gene present in population are pre-dominantly of recessive nature while, expression of characters sought to be improved through selection are controlled by dominant genes, the extent of genetic advance will be limited

and vice versa. The ratio of recessive and dominant allele indicated that the dominant alleles were distributed more frequently than the recessive ones for all characters except fruit length, no. of locules per fruit and yield per plant.

The ratio of ( $h^2/H^2$ ) indicated the superiority of dominant genes for all characters except average fruit weight. Some time their ratio is frequently reduced by complementary gene action and give some what suspensive results (Mathur and Jinks, 1971). The results indicated both additive as well as dominance gene action for the inheritance of these characters suggested the both selection and Heterosis breeding for improving these characters.

### References

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