

**Genetic variability in tomato (*Solanum lycopersicon* [Mill].Wettd.)\***

Tomato is one of the most important solanaceous vegetable crops grown for its delicious fruits. It is a versatile vegetable used for various culinary purposes. They are processed into puree, paste, ketchup, sauce, soup etc., Assessment of genetic variation and degree of transmission of desirable characters is helpful for planning a sound breeding programme. In this regard it is necessary to evaluate variability and nature of association among the various plant characters in the partitioning of the total variability into heritable and non heritable components which enables to know whether the superiority of genetic advance expected after selection (Robinson *et.al.*, 1949). Hence the present study was conducted to study the genetic variability among tomato the germplasm lines and also to study the heritability and genetic advance.

The experiment was conducted in the AICRP (Vegetables) block at the Main Agricultural Research Station of the University of Agricultural Sciences, Dharwad during *Kharif* 2006. The basic material for the study involving 30 tomato genotypes were raised in nursery and transplanted in the main field in three replication in a Randomized Complete Block Design. Five plants were tagged for recording both quantitative and qualitative traits. *Viz.*, days to first flowering, days to 50 percent flowering, plant height, number of branches per plant, average

fruit weight, pericarp thickness, number of locules per fruit, fruit shape index, total soluble solids, number of fruits per cluster, number of clusters per plant and fruit yield per plant.

The various genetic parameters *viz.*, genotypic coefficient of variation and phenotypic coefficient of variation, heritability in broad sense and expected genetic advance were calculated by the method suggested by Weber and Moorthy (1952 and Burton 1952).

The analysis of variance revealed highly significant difference among the genotypes with respect to all the characters studied, such as genotypic variance, phenotypic variance heritability and genetic advance and are presented in Table 1. A wide range of variation was observed for yield components and pest and diseases infestation. The range of variation and mean values were high for plant height, days to 50 percent flowering and average fruit weight.

High genotypic variance was observed for most of the characters indicating more contribution of genetic component for the total variation. Therefore, these characters (Table-1) could be considered and exploited for selection purpose. Whereas, the characters like plant height, number of

Table 1. Genetic variability for quantitative traits in tomato

Sl. No.	Characters	Range		Mean			PVC (%)	GCV (%)	H <sup>2</sup> (bs)	Genetic advance	Genetic advance over mean(%)
		Min.	Max.	$\sigma^2_p$							
1.	Days to first flowering	36.00	43.61	39.61	4.18	1.95	5.16	3.55	46.60	1.96	4.95
2	Days to 50 percent flowering	39.70	49.33	44.67	7.26	4.58	6.07	4.79	62.30	3.48	7.79
3	Plant height(cm)	52.53	99.10	74.36	129.33	116.82	15.29	14.54	90.30	21.16	28.45
4	Number of branches per plant	3.89	9.75	6.26	1.70	1.57	20.80	19.99	92.30	2.48	39.62
5	Number of flowers per clusters	3.80	9.77	6.06	3.11	2.72	29.05	27.18	87.50	3.18	52.48
6	Days to first fruit set	45.00	49.67	47.44	3.28	1.68	3.82	2.68	49.80	1.84	3.88
7	Number of clusters per plant	9.67	17.72	14.02	4.44	3.58	15.03	13.48	80.50	3.50	24.96
8	Number of fruits per clusters	2.27	5.80	3.20	0.75	0.34	26.98	18.33	46.10	0.82	25.63
9	Number of fruits per plant	12.47	50.13	29.91	103.76	93.09	33.94	32.14	89.60	18.75	62.68
10	Fruit shape index	0.71	1.49	0.95	0.03	0.03	18.23	17.58	93.00	0.33	34.74
11	Number of locules per fruit	2.40	6.00	3.69	0.80	0.53	22.80	19.80	75.40	1.31	12.60
12	Pericarp thickness (cm)	0.30	0.60	0.42	0.01	0.00	19.96	15.84	63.00	0.11	26.19
13	TSS (%)	3.42	6.17	4.74	0.55	0.50	15.71	14.83	89.20	1.37	28.90
14	Average fruit weight (g)	28.37	83.00	48.47	122.04	104.54	22.79	21.09	85.70	19.49	40.21
15	Fruit yield per plant(kg)	0.67	2.33	1.26	0.19	0.16	34.29	32.13	87.80	0.78	61.90
16	Fruit yield per plot (kg)	19.60	50.17	32.71	70.76	55.01	25.71	22.67	77.70	13.47	41.07
17	Fruit borer incidence	2.00	26.00	8.24	46.19	45.47	82.40	81.74	98.40	13.78	167.35
18	Bacterial wilt incidence	1.20	26.90	7.34	42.22	41.05	88.44	87.20	77.20	13.01	177.25
19	ToLCV incidence	2.20	27.00	7.09	30.93	29.95	78.38	77.11	96.80	11.09	156.42

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fruits per plant, fruit borer incidence, bacterial wilt and To LCV incidence showed high phenotypic variance indicating the strong influence of environmental factors for their expression. These results are in accordance of the results obtained by Vineet *et al.* (1997) and Singh *et al.* (2001) in tomato.

Higher genotypic coefficient of variation (GCV) and phenotypic coefficient of variation (PVC) were recorded for characters like number of branches per plant, number of fruits per plant, fruit yield per plant and number of locules per fruit indicating higher magnitude of variability for these traits. The

results are in conformity with the findings of Anandgouda (1970 and Mohanty (2002) in tomato.

High heritability (bs) and high genetic advance were observed for the characters like plant height, number of branches per plant, number of fruits per plant, average fruit weight, number of flowers per cluster, number of clusters per plant, fruit shape index, pericarp thickness and total soluble solids indicating that these traits are controlled by additive gene action which is very useful in selection. Similar results in tomato were noticed by Pujari *et al.* (1995), Parvinder *et al.* (2002) and Aradhana and Singh (2003).

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