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RESEARCH ARTICLE :

Per se performance in tomato (*Solanum lycopersicum* L.) for yield attributes, yield and quality

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SUMMARY : The present investigation "Studies on heterosis, combining ability and inbreeding depression in tomato (*Solanum lycopersicum* L)." for yield and quality was carried out during *Rabi* 2010-11, *Kharif* 2011 and *Rabi*,2011-2012 at Vegetable Research Station, Rajendranagar, Hyderabad to study the genetic parameters, heterosis, combining ability, gene action governing the inheritance of the traits, correlation co-efficient analysis, path co-efficient analysis and inbreeding depression. Ten parents (EC-165749, EC-157568, EC-164838, LE-56, LE-62, LE-64, LE-65, LE-66, LE-67 and LE-68) were crosssed in diallele mating design (without reciprocals). The resultant 45 F_1's were evaluated along with their parents and two standard checks (Siri and US-618) for plant height (cm), number of primary branches per plant, days to 50% flowering, number of fruits per cluster, fruit length (cm), fruit width (cm), average fruit weight (g), fruit yield per plant (kg), number of locules per fruit, pericarp thickness (mm), TSS (°Brix), titrable acidity (%), ascorbic acid content (mg/100 g) and lycopene content (mg 100/ g).

KEY WORDS :
Tomato, *Per se*, Diallele, Yield

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BACKGROUND AND OBJECTIVES

Tomato (*Solanum lycopersicum* L.) (2n=2x=24) is one of the most important solanaceous vegetable crops of Peru-Euqador origin (Rick, 1969), especially grown in the tropics and subtropics. In many countries it is considered as "poor man's orange" because of its attractive appearance and nutritive value (Singh *et al.*, 2004). Tomato also forms an important ingredient in the cocktail known as "Bloody Marry". Tomato is a moderate nutritional crop and is considered as an important source of vitamin A, vitamin C and minerals (Hari, 1997). Under Indian condition, the fruits are mainly consumed either as raw or in the preparation of chatni, pickles etc. Cultivated forms are originated from Lycopersicum esculentum var. cerasiforme. Tomato is incredibly versatile fruit; it contains one of the most powerful anti-oxidant compounds called lycopene which have effective anti-cancer properties (Islam *et al.*,

2010). Tomato also flushes out free radicals, protect against inflammation, heart diseases and prevent DNA damage in human body. It is also used for preparation of natural beauty cosmetics (Mahajan *et al.*, 2010). In India, tomato is grown in an area of 0.882 million hectares with annual production of 18.74 million tonnes and productivity of 21.2 tennes /ha. Therefore, present study has taken upto find out genotypes which gives higher yields.

RESOURCES AND METHODS

The present experiment was carried out at Vegetable Research Station, Dr. Y.S.R. Horticultural University, Rajendranagar, Hyderabad.The experimental material consisted of ten parents (EC-165749, EC-157568, EC-164838, LE-56, LE-62, LE-64, LE-65, LE-66, LE-67 and LE-68.). Ten parents were crossed with each other in diallel mating design (excluding reciprocals) during *Rabi*, 2010-11. The resultant 45 F_1s were evaluated for yield, yield contributing and quality characters.All 57 entries comprising of ten parents and 45 F_1's along with two commercial hybrids (Siri and US-618) as checks were sown during summer, 2011 in a Randomized Block Design which was replicated thrice. Each entry was grown in two rows with 10 plants in each row by adopting inter row spacing of 60 cm and intra row spacing of 45 cm. In each entry, five plants were tagged randomly for recording data. The cultural practices and the plant protection measures were adapted uniformly to all the treatments, as recommended by Dr. YSRHU.

OBSERVATIONS AND ANALYSIS

Analysis of variance revealed significant difference among all the traits studied. From the Table 1, it is evident thatplant height varied from 57 cm (LE-67) to 112.20 cm (LE-64) among parents with a mean plant height of 85.54cm and it ranged from 59.88 cm (LE-65 x LE-67) to 142.70 cm (LE-64 x LE-66) with a mean of 91.39 cm among hybrids.Among parents, LE-64 recorded the highest plant height (112.20 cm) followed by LE-56 (108.20cm) and EC-157568 (102.40cm).

Among the hybrids, the highest plant height was recorded with LE-64 x LE-66 (142.70 cm) followed by LE-56 x LE-68 (136.20 cm), EC-157568 x LE-68 (129.80 cm), EC-164838 x LE-66 (124.50 cm) and EC-164838 x LE-64 (120.27 cm), while the lowest plant height was recorded with LE-65 x LE-67 (59.88 cm).Plant height of 83.70 cm and 87.30 cm recorded in Siri and US-618, respectively. Nine hybrids are significantly superior in plant height over the Siri, while seven hybrids were found to be significantly superior over US-618. Kallo *et al.* (1998); Manoj and Raghav (1998); Fayaz *et al.* (2007); Shanker *et al.*(2013) and Arun *et al.* (2016) also reported differences in plant height among cultivars/hybrids of tomato.

Number of primary branches per plant ranged from 6.4 (LE-65) to 10.47 (LE-64) with a mean of 8.15 among parents and it ranged from 5.53 (EC-165749 x LE-65) to 12.47 (LE-64 x LE-66) with a mean of 7.81 among the hybrids.Among the parents LE-64 (10.47) recorded significantly higher number of primary branches per plant followed by LE-66 (9.47) and EC-157568 (9.07).

The cross LE-64 x LE-66 recorded significantly higher number of primary branches per plant (12.47) followed by (11.13) LE-56 x LE-68, 10.47 EC-157568 x LE-68, (10.07) EC-164838 x LE-66 and (9.93) EC-164838 x LE-68 while the lowest number of primary branches per plant was recorded with EC-165749 x LE-65 (5.53).In Siri and US-618 the number of primary branches per plant was recorded as 7.47 and 8.27, respectively. Sixteen hybrids are significantly superiorin number of primary branches per plant over Siri, while nine hybrids were found to be significantly superior over both the checks, Siri and US-618. The results are in close conformity with the findings of Fayaz *et al.* (2007), Shanker *et al.* (2013) and Arun *et al.* (2016), who reported significant variation among the cultivars of tomato for the number of primary branches per plant

It is clear from the Table 1 the mean values for number of days taken to 50 % flowering varied from 31.67 days (EC-164838) to 40.67days (LE-68) with a mean of 34.77 days among parents and 29 days (EC-164838 x LE-66) to 38.67 days (LE-66 x LE-64) with a mean of 35.66 days among the hybrids.Among the parents, EC-164838 took significantly less number of days to 50% flowering (31.67) followed by EC-157568 and LE-56 (32.33).

Among the hybrids the lowest number of days was recorded by EC-164838 x LE-66 (29.00) followed by EC-157568 x LE-68 (30.00), LE-56 x LE-68 (30.33), LE-64 x LE-66 (30.33) and EC-164838 x LE-68 (33), while the highest number of days was recorded in hybrid LE-56 x LE-64 (38.67).

The commercial checks, Siri and US-618 recorded

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Table 1: *Per se* performance of hybrids, parents and commercial checks for yield components, yield and quality in tomato

Sr. No.	Hybrids	Plant height (cm)	No. of primary branches/ Plant	Days to 50% flowering	No. of fruits/ Cluster	Average fruit weight (g)	Fruit yield/ Plant (kg)	Pericarp thickness (mm)	Total soluble solids (°Brix)	Titrable acidity (%)	Ascorbic acid content (mg/100g)	Lycopene content (mg/100 g)
1.	P_1xP_2 EC-165749xEC-157568	101.2	7.2	37	2.47	60.48	2.2	5.04	3.83	0.31	19.57	5.57
2.	P_1xP_3 EC-165749xEC-164838	98.3	8.4	36	2.73	74.35	2.31	4.81	4.23	0.35	17.73	8.03
3.	P_1xP_4 EC-165749xLE-56	99.63	6.47	35	2.4	73.1	2.14	4.75	3.63	0.52	20.37	4.67
4.	P_1xP_5 EC-165749xLE-62	77.88	6.33	37.33	2.6	67.98	2.25	4.95	4.07	0.43	22.23	8.13
5.	P_1xP_6 EC-165749xLE-64	81.15	6.87	36.33	2.8	69.21	2.18	4.52	3.87	0.55	26.65	8.3
6.	P_1xP_7 EC-165749xLE-65	69.53	5.53	37	2.4	62.62	2.06	4.43	3.7	0.49	20.51	7.63
7.	P_1xP_8 EC-165749xLE-66	82.52	7.53	38	2.67	75.4	1.92	4.63	3.67	0.59	25.73	6.57
8.	P_1xP_9 EC-165749xLE-67	66.65	6.67	34.33	2.4	57.19	2.1	4.07	4.1	0.4	22.72	8.23
9.	P_1xP_{10} EC-165749xLE-68	79.5	6.67	35.67	2.4	73.31	1.95	4.77	3.83	0.48	19.53	6.17
10.	P_2xP_3 EC-157568xEC-164838	114.88	9.33	38	2.8	53.02	2.26	5.34	3.57	0.46	22.36	4.47
11.	P_2xP_4 EC-157568xLE-56	117.58	7.53	35	2.8	57.22	2.55	5.61	3.6	0.45	19.92	4.8
12.	P_2xP_5 EC-157568xLE-62	95.83	7.87	34.83	3	47.85	2.2	5.27	3.6	0.48	25.86	4.47
13.	P_2xP_6 EC-157568xLE-64	99.1	7.93	36	3	57.05	2.31	5.68	3.63	0.4	24.34	6.2
14.	P_2xP_7 EC-157568xLE-65	87.48	6.87	37.67	2.8	47.98	2.09	5.20	3.97	0.43	19.95	3.43
15.	P_2xP_8 EC-157568xLE-66	100.47	8.27	36.67	3	61.75	2.1	5.28	3.47	0.52	19.49	5.43
16.	P_2xP_9 EC-157568xLE-67	84.6	7.67	38	3	44.13	2.31	4.90	3.33	0.44	20.96	6.03
17.	P_2xP_{10} EC-157568xLE-68	129.8	10.47	30	3.33	74.31	3	5.58	6.23	0.23	17.51	8.64
18.	P_3xP_4 EC-164838xLE-56	77.83	9.47	36.67	2.93	66.26	2.32	4.64	3.63	0.48	22.01	6.5
19.	P_3xP_5 EC-164838xLE-62	98.52	8.53	35.33	3	58.42	2.28	4.56	5.13	0.27	24.59	8.57
20.	P_3xP_6 EC-164838xLE-64	120.27	9.73	33.33	3.27	66.24	2.5	4.76	5.9	0.22	28.7	8.57
21.	P_3xP_7 EC-164838xLE-65	90.17	8.47	34.33	3.00	61.45	2.40	4.77	4.83	0.21	22.98	6.57
22.	P_3xP_8 EC-164838xLE-66	124.50	10.07	29.00	3.27	73.10	2.70	4.75	6.03	0.26	20.66	8.47
23.	P_3xP_9 EC-164838xLE-67	87.28	9.00	35.33	2.40	53.35	2.15	4.23	4.20	0.32	19.34	5.67
24.	P_3xP_{10} EC-164838xLE-68	100.13	9.93	33.00	3.07	70.95	2.14	5.08	3.80	0.38	22.75	6.50
25.	P_4xP_5 LE-56xLE-62	101.22	6.53	35.67	3.07	59.10	2.21	4.72	3.67	0.48	20.56	8.50
26.	P_4xP_6 LE-56xLE-64	104.48	8.13	38.67	3.00	68.07	2.30	4.95	3.87	0.47	29.63	8.20
27.	P_4xP_7 LE-56xLE-65	92.87	6.40	35.00	3.07	60.41	2.13	4.54	3.60	0.52	34.99	8.64
28.	P_4xP_8 LE-56xLE-66	105.85	7.40	35.67	3.00	70.72	2.32	4.76	3.23	0.57	29.90	8.30
29.	P_4xP_9 LE-56xLE-67	89.98	7.20	36.00	2.93	56.92	2.16	4.25	3.77	0.35	25.45	8.07
30.	P_4xP_{10} LE-56xLE-68	136.20	11.13	30.33	3.40	75.35	3.33	4.70	5.23	0.33	21.16	8.43
31.	P_5xP_6 LE-62xLE-64	82.73	6.67	36.00	2.60	54.83	2.01	4.27	4.23	0.32	21.92	4.70
32.	P_5xP_7 LE-62xLE-65	71.12	6.20	37.67	2.60	48.44	2.13	4.47	3.90	0.50	33.87	4.53
33.	P_5xP_8 LE-62xLE-66	84.10	6.73	35.00	2.80	64.46	1.92	4.76	4.13	0.33	20.95	8.17
34.	P_5xP_9 LE-62xLE-67	68.23	7.00	38.00	2.40	45.38	2.00	4.05	4.20	0.30	19.23	4.87
35.	P_5xP_{10} LE-62xLE-68	81.08	7.60	36.67	2.80	61.45	2.06	4.71	3.60	0.32	23.20	7.63
36.	P_6xP_7 LE-64xLE-65	74.38	7.27	38.00	2.73	57.36	1.95	4.19	4.60	0.36	29.31	6.13
37.	P_6xP_8 LE-64xLE-66	142.70	12.47	30.33	3.73	79.40	3.70	4.52	5.23	0.29	20.53	5.00

Table 1 contd...

Table 1 contd.....

Sr. No.	Parents	Plant height (cm)	Primary branches/ Plant	Days to 50% flowering	Fruits/ Cluster	Fruit weight (g)	Fruit yield/ Plant (kg)	Pericarp thickness (mm)	Total soluble solids (°Brix)	Titrable acidity (%)	Ascorbic acid content (mg/100 g)	Lycopene content (mg/100 g)
38.	P_6xP$_9$ LE-64xLE-67	71.50	7.53	36.67	2.60	53.85	2.23	4.10	4.50	0.30	23.48	4.63
39.	P_6xP$_{10}$ LE-64xLE-68	84.35	8.20	36.00	2.93	68.10	2.01	4.51	4.60	0.40	22.98	6.57
40.	P_7xP$_8$ LE-65xLE-66	75.75	6.60	36.00	2.40	64.04	1.98	4.63	3.90	0.40	20.66	8.47
41.	P_7xP$_9$ LE-65xLE-67	59.88	6.33	37.00	2.00	47.88	1.85	3.89	4.20	0.38	19.34	5.67
42.	P_7xP$_{10}$ LE-65xLE-68	72.73	6.53	35.33	2.40	61.00	1.74	4.67	3.93	0.43	22.75	6.50
43.	P_8xP$_9$ LE-66xLE-67	72.87	7.40	38.00	2.80	56.67	2.20	4.19	4.20	0.31	20.56	8.50
44.	P_8xP$_{10}$ LE-66xLE-68	85.72	7.60	37.00	2.87	72.55	2.09	4.83	4.47	0.33	29.63	8.20
45.	P_9xP$_{10}$ LE-67xLE-68	69.85	7.67	35.67	2.13	55.52	1.85	4.39	3.67	0.41	34.99	8.64
46.	P_1 EC-165749	75.97	7.20	32.67	2.13	62.25	1.81	4.86	3.60	0.53	14.63	6.30
47.	P_2 EC-157568	102.40	9.07	32.33	2.60	67.68	2.04	7.07	3.33	0.61	19.96	4.70
48.	P_3 EC-164838	88.73	8.40	31.67	2.47	67.14	1.99	5.44	3.30	0.72	28.67	4.10
49.	P_4 LE-56	108.20	9.47	32.33	2.73	69.89	2.07	5.41	3.33	0.63	23.36	4.30
50.	P_5 LE-62	79.47	7.33	35.67	2.33	63.20	1.87	4.97	4.07	0.39	27.05	6.80
51.	P_6 LE-64	112.20	10.47	36.33	2.80	72.95	2.20	5.04	4.00	0.34	20.54	6.96
52.	P_7 LE-65	62.77	6.40	35.00	2.00	60.61	1.67	4.93	4.13	0.45	17.44	6.77
53.	P_8 LE-66	86.00	8.40	37.33	2.47	65.42	1.96	5.06	4.30	0.31	26.51	7.20
54.	P_9 LE-67	57.00	6.40	33.67	1.87	59.58	1.67	3.83	3.53	0.52	20.72	6.40
55.	P_{10} LE-68	82.70	8.33	40.67	2.40	63.63	1.93	5.73	5.20	0.28	21.28	7.50
	Commercial check											
	SIRI	83.70	7.47	36.67	1.73	42.01	1.91	4.06	4.33	0.40	20.79	5.77
	US-618	87.30	8.27	35.33	2.07	61.54	2.21	5.10	3.93	0.42	22.76	5.50
	Mean	90.16	7.87	35.51	2.69	62.18	2.17	4.79	4.10	0.41	23.40	6.45
	C.V.	13.84	3.51	3.17	7.59	8.34	9.50	5.71	9.04	18.89	6.40	9.27
	S.E. ±	7.20	0.16	0.65	0.12	2.99	0.12	0.16	0.21	0.04	0.86	0.35
	C.D. (P=0.05)	20.18	0.45	1.82	0.33	8.39	0.33	0.44	0.60	0.13	2.42	0.97
	C.D. (P=0.01)	26.69	0.59	2.41	0.44	11.09	0.44	0.59	0.79	0.17	3.21	1.28

36.67 days, and 35.33 days, respectively with regard to days to 50% flowering. Four hybrids recorded on par with Siri whereas twenty seven hybrids recorded significantly high over Siri. Three hybrids recorded in days to 50% flowering on par with US-618and thirteen hybrids recorded significantly high over US-618.

The mean number of fruits per cluster ranged from 1.87 (LE-67) to 2.80 (LE-64) among parents and it ranged from 2.00 (LE-65 x LE-67) to 3.73 (LE-64 x LE-66) among hybrids. The mean number of fruits per cluster was higher in hybrids (3.73) compared to parents (2.80).Among the parents, LE-64 (2.80) showed significantly higher number of fruits per cluster which was on par with LE-66 (2.73), EC-157568 (2.60) and EC-164838 (2.47).

Among the crosses, LE-64 x LE-66 (3.73) recorded significantly highest number of fruits per cluster, while the lowest number of fruits per cluster was recorded in LE-65 x LE-67 (2.00).All hybrids were significantly superior in number of fruits per cluster over Siri and forty four hybrids were significantly superior in number of fruits per cluster over US-618.

The data presented in Table 1 revealed that average fruit weight varied from 59.58 g (LE-67) to 72.95 g (LE-65) with a mean of 65.24 g among parents and 44.13 g (EC-157568 x LE-67) to 79.40 g (LE-64 x LE-66) with a mean of 61.96 g among hybrids. Among the parents LE-65 (72.95 g) showed significantly highest average fruit weight.

The hybrids LE-64 x LE-66 (79.40 g) recorded significantly highest average fruit weight, while the lowest Average fruit weight was recorded in EC-157568 x LE-67 (44.13 g). Thirty nine hybrids were significantly superior in average fruit weight over Siri and twenty one hybrids were significantly superior to US-618.

Fruit yield per plant of tomato genotypes evaluated varied from 1.67 kg (LE-65 and LE-67) to 2.20 kg (LE-64) among the parents and 1.74 kg (LE-65 x LE-68) to 3.70 kg (LE-64 x Le-66) among the hybrids. Among the parents, LE-64 (2.20 kg) recorded significantly higher fruit yield per plant.

Among the hybrids, LE-64 x LE-66 (3.70 kg) recorded significantly highest fruit yield per plant followed by LE-56 x LE-68 (3.33 kg), EC-157568 x LE-68 (3.00 kg), EC-164838 x LE-66 (2.70 kg), EC-157568 x LE-56 (2.55 kg) and EC-164838 x LE-64 (2.50 kg) while the lowest fruit yield per plant was recorded in LE-65 x LE-68 (1.74 kg).

The checks, Siri and US -618 recorded 1.91 and 2.21 kg yield per plant, respectively. Sixteen hybrids were significantly superior in fruit yield per plant over Siri and five hybrids were significantly superior in fruit yield per plant over US-618.

Pericarp thickness varied from 3.83 mm (LE-67) to 7.07 mm (EC-157568) among parents and 3.89 mm (LE-65 x LE-67) to 5.68 mm (EC-157568 x LE-64) among hybrids. The mean pericarp thickness was higher in hybrids (4.71 mm) compared to parents (5.23 mm).

Among the parents EC-157568 (7.07 mm) recorded significantly higher pericarp thickness followed by LE-68 (5.73 mm), EC-164838 (5.44 mm) and LE-56 (5.41 mm)

Among the hybrids, the highest pericarp thickness was recorded by EC-157568 x LE-64 (5.68 mm) which was on par with EC-157568 x LE-56 (5.61 mm), EC-157568 x LE-68 (5.58 mm), EC-157568 x EC-164838 (5.34 mm) EC-157568 x LE-66 (5.28 mm) and EC-157568 x LE-62 (5.27 mm). While the lowest pericarp thickness was recorded with LE-65 x LE-67 (3.89 mm).

In Siri and US-618, pericarp thickness of fruit was recorded as 4.06 mm and 5.10 mm, respectively. Forty three hybrids were significantly superior in pericarp thickness over Siri and seven hybrids were significantly superior to US-618.

TSS varied from 3.30 ^{o}Brix (EC-164838) to 5.20 ^{o}Brix (LE-68) with a mean of 3.88 °Brix among parents and it varied from 3.23 ^{o}Brix (LE-56 x LE-66) to 6.23 ^{o}Brix (EC-157568 x LE-68) among the hybrids. Among the parents, significantly higher TSS was recorded by LE-68 (5.20 ^{o}Brix) followed by LE -66 (4.30 ^{o}Brix), LE-65 (4.13 ^{o}Brix) and LE-62 (4.07^{o}Brix).

The hybrid EC-157568 x LE-68 (6.23) was recorded significantly high TSS, which was on par with EC-164838 x LE-66 (6.03) and EC-164838 x LE-64 (5.90), while lower TSS was recorded in EC-157568 x LE-67 (3.33) and LE-56 x LE-66 (3.23).Six hybrids were significantly superior in TSS over Siri and nine hybrids were significantly superior to US-618.

Titrable acidity ranged from 0.28 % (LE-68) to 0.72% (EC-164838) with a mean of 0.48% among parents and 0.21% (EC-164838 x LE-65) to 0.59% (EC-165749 x LE-66) with a mean of 0.39% among the hybrids. Among the parents, LE-68 (0.28%) recorded significantly lower titrable acidity.

Among the hybrids, the lowest titrable acidity was recorded with EC-164838 x LE-65 (0.21 %) which was on par with EC-164838 x LE-64 (0.22 %), EC-157568 x LE-68 (0.23%), EC-164838 x LE-66 (0.26%) and EC-164838 x LE-62 (0.27%), while the highest titrable acidity was recorded with EC-165749 x LE-66 (0.59 %).Three hybrids were significantly superior in titrable acidity over Siri and two hybrids were significantly superior to US-618.

Ascorbic acid content of the fruit varied from 14.63 mg/100 g (EC- 165749) to 28.67 mg/100 g (EC-164838) with a mean of 22.02 mg/100 g among parents and 17.51 mg/100 g (EC-157568 x LE-68) to 34.99mg/100 g (LE-56 x LE-65) with a mean of 23.78 mg/100 g among the hybrids.Among parents significantly highest ascorbic acid content was recorded by EC-164838 (28.67 mg/100 g). The hybrid LE-56 x LE-65 (34.99mg/100 g) recorded significantly highest ascorbic acid, while the lowest ascorbic acid content was recorded with EC-157568 x LE-68 (17.51 mg/100 g). Eighteen hybrids were significantly superior in ascorbic acid content over the Siri and fifteen hybrids were significantly superior in ascorbic acid content over US-618.

Lycopene content varied from 4.10 mg/100 g (EC-164838) to 7.50 mg/100 g (LE-68) with a mean of 6.10 mg/100 g among parents and 2.57 mg/100 g (LE-64 x LE-68) to 8.64 mg/ 100 g (EC-157568 x LE-68) with mean of 6.56 mg/100 g among the hybrids. Among the parents, LE-68 (7.50 mg/100 g) recorded significantly higher Lycopene content followed by LE-66 (7.20 mg/100 g), LE-64 (6.96 mg/100 g), LE-62 (6.80 mg/100 g) and LE-65 (6.77 mg/100 g).

The hybrids EC-167568 x LE-68 (8.64 mg/100 g) and LE-56 x LE-65 (8.64 mg/100 g recorded significantly the highest lycopene content, while the lowest lycopene content was recorded with LE-64 x LE-68 (2.57 mg/100 g). Twenty eight hybrids were significantlysuperior in lycopene content over Siri and thirty hybrids were significantly superior to US-618.

Conclusion :

The choice of parents, in general, is based on the general principle that the parents under selection should have a high per se performance for the desirable traits. Hence, the breeders are in absolute need of desirably high or low mean value, which is considered as a main criterion for effective selection forever. The potential crosses *viz.*, LE-64 x LE-66, LE-56 x LE-68, EC-157568 x LE-68 and EC-164838 x LE-66 exhibited high per se performance for fruit yield per plant. A study of mean of different characters for parents and hybrids revealed that mean of hybrids for plant height, number of primary branches per plant, number of flowers per cluster, number of fruits per cluster, fruit length, fruit width, average fruit weight, fruit yield per plant, pericarp thickness, ascorbic acid content and lycopene content was desirably higher than parents, while the mean of hybrids for days to 50% flowering, number of locules per fruit and pericarp thickness was desirably lower than parents.

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