Int.J.Curr.Microbiol.App.Sci (2017) *6*(11): 1922-1930

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 6 Number 11 (2017) pp. 1922-1930**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2017.611.228

Evaluation of Tomato Genotypes for Growth, Yield and Quality Attributes Under Eastern Dry Zone of Karnataka, India

B. Sureshkumara[1*], H.B. Lingaiah[2], M. Shivapriya[1] and H.B. Pavithra[2]

[1]College of Horticulture, UHS Campus, GKVK Bengaluru, Karnataka, India
[2]Directorate of Education, University of Horticultural Sciences, Bagalkot, Karnataka, India
[3]College of Agriculture, UAS Campus, GKVK Bengaluru, Karnataka, India
**Corresponding author*

Keywords

Growth, Yield, Quality, TSS: acid ratio.

Article Info

Accepted:
15 September 2017
Available Online:
10 November 2017

A B S T R A C T

The experiment was conducted to study the 24 tomato genotypes for growth, yield and quality attributes. Among the 24 genotypes, genotype D-6-1-9-6-1 and Nandi was exhibited least days taken to fifty percent flowering (26.50 days), IIHR-2201 was recorded highest number of branches at 45 DAT (5.32), 60 DAT (8.92), number of flowers cluster^{-1} (6.06), number of fruits cluster^{-1} (52.32), fruit yield plant^{-1} (3.06 kg) and fruit yield ha^{-1} (68.06). Genotype IIHR-2200 was recorded maximum average fruit weight (165.37 g) and number of locules fruit^{-1} (10). Genotype C-13-1-2-1 was recorded highest TSS (6.65 ^{0}Brix), fruit firmness in Kashi Vishesh (2.97 kg/cm2), titrable acidity in IIHR-2198 (0.57), TSS: acid ratio in Kashi Amrutha (33.03), ascorbic acid in D-12-1-6-1 (33.16 mg/100 g) and pH in A-15-3-2-1 (4.50), pericarp thickness in IIHR-2199 (5.82 mm). These findings will help to select the best genotype for further breeding programme.

Introduction

Tomato (*Solanum lycopersicum* L.) is one of the most important Solanaceous vegetable crops grown widely all over the world. It is a very versatile vegetable for culinary purposes. Ripe, tomato fruit is consumed fresh as salads and consumed after cooking and utilized in the preparation of range of processed products such as puree, paste, powder, ketchup, sauce, soup and canned whole fruits. Unripe green fruits are used for preparation of pickles and chutney. Tomatoes are important sources of lycopene (an antioxidant), ascorbic acid and β-carotene and valued for their colour and flavour. Although tomatoes are commonly consumed fresh, over 80% of tomato consumption comes from processed products such as tomato juice, paste, puree, ketchup and sauce (Takeoka *et al.*, 2001).

It's indicated the potential health benefits of a diet rich in tomatoes and tomato products (Mayeaux *et al.*, 2006).

Tomato as a source of carotenoids and polyphenols targeted to cancer prevention and red colour of fruit due to lycopene (Marti *et al.*, 2016; Boileau *et al.*, 2003; Rao *et al.*, 1998).

Materials and Methods

Field experiment was conducted at vegetable block, College of Horticulture, UHS Campus, GKVK, Bengaluru. The experimental site is located at an altitude of 930 meters above mean sea level (MSL) and 13^0 N latitude and 77.37^0 E longitude in the Eastern Dry Zone of Karnataka (Zone-5). The soil of the experimental area was red sandy loam (Alfisol) with an uniform fertility having soil pH range 6 to 7.3. The material for the present study comprised a total of 22 genotypes which were procured from Indian Institute of Vegetable Research (IIVR), Varanasi, Uttara Pradesh, Indian Institute of Horticultural Research (IIHR), Hessarghatta, Bengaluru and University of Agricultural Sciences, GKVK, Bengaluru.

The seeds were sown in protrays containing 98 holes. Coir pith was used as growing media. The sown trays were stacked and covered with polythene for three days in order to get early as well as uniform germination. Trays were irrigated daily once or twice depending up on the temperature. After fifteen days of sowing the trays were drenched with 19:19:19 (NPK) at the concentration of 1g/lit in order to get good rooting as well as growth. The prophylactic sprays were taken against pest and diseases.

The field was brought to fine tilth by disc ploughing followed by harrowing and cross cultivation. Farm yard manure at the rate of 25 tonnes per hectare was also incorporated at the time of land preparation. Ridges and furrows were prepared at 60 cm spacing. The half dose of the nitrogen and full dose of phosphorus and potash at the rate of 150:150:150 kg (NPK) per hectare was applied at the time of planting. Twenty five days old seedlings were transplanted in the main field with a spacing of 45 cm between plants, on one side, half way up the ridges. Light irrigation was given at the time of planting. Subsequent irrigations were provided whenever it was required. Just prior to earthing up i.e. 30 days after transplanting, half of nitrogen was given as top dress. Regular weeding was carried out and staking was provided forty five days after transplanting (Anon., 2013).

Five plants were selected and labeled at random from each replication in each treatment for recording the following observations and the average from these plants was worked out for the purpose of statistical computation (analysis). The details of observations recorded in each experiment and techniques adopted for the recording the observations were as follows.

Results and Discussion

Mean performance of 24 genotypes for both quantitative and qualitative traits are presented in Table 1 and 2.

Among the observed characters all the characters showed significant differences among the genotypes except for plant height at 30 DAT and number of branches at 30 DAT.

The range for days taken to fifty per cent flowering was from 26.50 days (D-6-1-9-6-1 and Nandi) to 30.25 days (Megha), with over all mean of 28.05. The range of variation for plant height at 30 DAT from 26.31 cm (Kashi Amruth) to 34.35 cm (IIHR-2196) with over all mean of 30.27 cm. At 45 DAT, the maximum and minimum plant height among the genotypes was from 44.53 cm (Kashi Anupam) to 35.37 cm (IIHR-2201) with over all mean 40.31 cm respectively. At 60 DAT, Kashi Amruth showed maximum plant height of 57.86 cm and Arka Ashish showed minimum plant height of 36.50 cm with over all mean of 52.05 cm (Table 2).

Table.1 *Per se* performance of various growth parameters in 24 tomato genotypes during summer 2012

Sl. No.	Genotypes	Days taken to 50% flowering	Plant height at 30 DAT (cm)	Plant height at 45 DAT (cm)	Plant height at 60 DAT (cm)	Number of branches at 30 DAT	Number of branches at 45 DAT	Number of branches at 60 DAT	Average fruit weight (g)	Number of locules per fruit	Pericarp thickness (mm)	Number of flowers per cluster
1	IIHR-2195	28.0	33.24	39.75	50.18	2.40	4.15	7.91	82.90	2.60	4.66	5.00
2	IIHR-2196	27.5	34.35	42.48	57.84	2.37	4.40	6.00	79.75	3.80	4.19	4.73
3	IIHR-2197	28.0	29.26	36.86	49.77	2.40	4.28	8.00	75.23	2.60	5.14	5.20
4	IIHR-2198	27.5	32.77	41.80	49.11	2.24	5.10	8.10	82.62	7.20	5.26	5.43
5	IIHR-2199	27.5	34.08	40.40	52.63	2.74	5.20	8.21	75.02	2.80	5.82	5.78
6	IIHR-2200	28.5	29.47	39.75	53.96	2.75	4.76	7.90	165.37	10.10	3.94	5.15
7	IIHR-2201	28.0	28.25	35.37	57.95	2.59	5.32	8.92	82.55	7.10	3.74	6.06
8	A-15-3-2-1	28.5	29.97	39.75	50.88	2.51	4.72	7.81	105.82	5.20	5.49	5.04
9	D-6-1-9-6-1	26.5	32.72	43.21	57.35	2.49	5.25	8.60	62.80	5.50	4.93	5.90
10	D-12-1-6-1	27.5	27.50	37.86	51.26	3.12	4.82	8.13	86.72	3.50	4.39	5.32
11	D-12-1-1-3-1	27.5	31.86	41.81	57.38	2.64	4.46	7.46	33.25	2.80	4.27	5.07
12	C-14-15-3-1	27.5	27.51	36.87	51.31	1.78	4.30	6.99	58.80	2.90	4.34	5.02
13	C-13-1-2-1	29.0	30.95	42.82	57.20	2.39	4.47	7.60	47.00	2.60	4.23	5.11
14	Kashi Amruth (DVRT-1)	27.5	26.31	38.45	57.86	2.21	4.23	7.60	58.20	2.30	3.42	5.07
15	Kashi Anupam (DVRT-2)	27.5	31.21	44.53	54.31	2.40	4.94	7.30	49.30	2.80	4.33	5.27

Continued...

Sl. No.	Genotypes	Days taken to 50% flowering	Plant height at 30 DAT (cm)	Plant height at 45 DAT (cm)	Plant height at 60 DAT (cm)	Number of branches at 30 DAT	Number of branches at 45 DAT	Number of branches at 60 DAT	Average fruit weight (g)	Number of locules per fruit	Pericarp thickness (mm)	Number of flowers per cluster
16	Kashi Vishesh (H-86)	29.50	27.80	43.02	53.97	2.61	4.66	7.09	44.50	2.50	3.96	5.11
17	H-24	28.50	27.35	37.35	53.34	2.45	4.80	7.39	45.10	5.20	4.66	4.98
18	Vaibhav	27.00	30.87	40.97	55.24	2.35	4.45	7.62	76.96	4.60	4.42	4.87
19	Nandi	26.50	31.06	43.25	47.11	2.78	4.46	7.70	45.80	3.10	3.99	4.97
20	Arka Sourabh	28.50	31.40	39.42	48.84	2.42	4.10	6.90	53.90	5.40	3.87	4.61
21	Arka Ashish	28.50	29.76	40.20	36.50	2.56	4.19	7.12	44.10	2.70	4.74	4.59
22	Arka Ahuti	28.50	29.92	40.92	49.24	2.41	4.17	7.20	54.30	5.80	4.18	4.06
23	Megha (L-15)	30.30	30.25	42.40	51.76	2.77	4.17	7.35	41.80	4.30	3.80	4.55
24	PKM-1	29.60	28.75	38.20	50.75	2.85	4.85	7.00	43.30	3.70	3.87	4.51
	Mean	28.05	30.27	40.30	52.05	2.51	4.64	7.58	66.46	4.21	4.40	5.08
	SE m±	0.49	1.85	1.24	2.69	0.22	0.21	0.30	1.63	0.36	0.26	0.071
	CD at 5 %	1.43	NS	3.63	7.88	NS	0.61	0.86	4.77	1.04	0.75	0.21

NS = Non Significant

Table.2 *Per se* performance of various yield and quality parameters in 24 tomato genotypes during summer 2012

Sl. No.	Genotypes	Number of fruits per cluster	Number of clusters per plant	Number of fruits per plant	Yield per plant (kg)	Yield per hectare (t)	Total Soluble Solids (^{o}Brix)	Fruit Firmness (kg/cm^{2})	Titrable acidity (%)	TSS : Acid ratio	Ascorbic acid (mg/100g)	pH
1	IIHR-2195	4.22	11.00	24.78	2.04	45.27	5.04	2.12	0.49	10.39	12.88	4.25
2	IIHR-2196	4.60	10.70	34.23	2.15	47.77	5.14	2.36	0.53	9.79	14.89	4.05
3	IIHR-2197	5.00	11.07	43.30	2.51	55.85	5.44	2.42	0.35	15.59	23.64	3.95
4	IIHR-2198	5.17	10.75	45.73	2.64	58.77	4.50	2.47	0.57	7.98	24.65	3.62
5	IIHR-2199	5.19	12.06	45.76	2.85	63.37	4.68	2.53	0.26	19.32	26.85	4.15
6	IIHR-2200	5.10	11.01	27.23	2.47	54.83	5.63	2.80	0.30	19.52	20.17	4.25
7	IIHR-2201	5.49	13.63	52.32	3.06	68.06	4.46	2.20	0.21	22.17	20.39	3.17
8	A-15-3-2-1	4.84	10.10	43.86	2.13	47.31	3.95	1.95	0.21	18.98	18.40	4.50
9	D-6-1-9-6-1	5.31	11.15	47.77	2.97	66.02	4.59	2.22	0.24	19.54	25.95	3.95
10	D-12-1-6-1	5.10	10.85	44.31	2.55	56.64	5.07	2.47	0.28	18.81	33.16	3.21
11	D-12-1-1-3-1	4.76	10.70	23.26	1.44	32.06	4.43	2.18	0.29	15.59	30.55	4.35
12	C-14-15-3-1	4.12	10.50	26.23	1.77	39.29	4.09	2.09	0.39	10.49	25.40	4.30
13	C-13-1-2-1	4.17	10.80	34.98	2.45	54.47	6.65	2.04	0.23	29.68	24.35	4.40
14	Kashi	4.62	10.00	34.49	1.86	41.41	5.44	2.96	0.17	33.03	19.25	4.40
15	Kashi	4.87	10.24	23.11	1.92	42.64	4.77	2.03	0.30	15.98	27.41	4.35
16	Kashi	4.69	10.00	27.90	2.15	47.80	5.15	2.97	0.27	19.07	20.90	4.05
17	H-24	4.86	10.30	34.60	2.06	45.82	5.69	2.28	0.18	31.75	21.65	4.10
18	Vaibhav	4.90	8.18	30.94	2.15	47.80	4.81	1.65	0.25	19.27	23.55	4.40

Continued...

Sl. No.	Genotypes	Number of fruits per cluster	Number of cluster per plant	Number of fruits per plant	Yield per plant (kg)	Yield per hectare (t)	Total Soluble Solids (^{0}Brix)	Fruit Firmness (kg/cm^2)	Titrable acidity (%)	TSS : Acid ratio	Ascorbic acid (mg/100g)	pH
19	Nandi	4.17	9.13	36.67	2.14	47.52	4.12	1.85	0.28	14.71	21.35	4.40
20	Arka Sourabh	4.18	7.24	27.08	1.77	39.28	5.26	2.14	0.41	12.93	17.20	4.15
21	Arka Ashish	4.12	7.16	32.03	1.65	36.62	5.44	2.29	0.24	23.12	10.21	4.25
22	Arka Ahuti	4.13	6.45	36.21	2.17	48.25	4.52	2.53	0.27	17.25	15.62	4.45
23	Megha (L-15)	4.00	6.63	26.55	1.91	42.44	4.21	1.63	0.27	15.37	13.85	3.85
24	PKM-1	4.12	6.22	26.79	1.78	39.50	4.09	1.86	0.22	18.97	11.75	3.95
	Mean	4.65	9.88	34.58	2.19	48.70	4.88	2.25	0.29	18.30	20.99	4.10
	SEm±	0.14	1.44	0.03	0.61	0.40	0.19	0.19	4.11	0.02	1.73	0.16
	CD @ 5%	0.41	4.22	0.08	1.77	1.16	0.56	0.58	12.03	0.06	5.07	0.48

The highest number of branches observed in genotype D-12-1-6-1 (3.12) followed by PKM-1 (2.88) and lowest number of branches were observed in C-14-15-3-1 (1.78) with over all mean of 2.51 at 30 DAT (Table 1).

Genotype IIHR-2201 recorded highest number of branches of 5.32 followed by D-6-1-9-6-1 (5.25) and genotype Arka Sourabh recorded lowest number of branches of 4.10 followed by IIHR-2195 (4.15) with over all mean of 4.64 at 45 DAT (Table 1). At 60 DAT, the highest number of branches observed in IIHR-2201 (8.92) followed by D-6-1-9-6-1 (8.60) and least in IIHR-2196 (6.00) with over all mean of 7.58 (Table 1).

The highest *per se* value for average fruit weight plant^{-1} was observed in IIHR-2200 (165.37 g) followed by A-15-3-2-1 (105.82 g), D-12-1-6-1 (86.72 g) and the lowest in D-12-1-1-3-1 (33.25 g) followed by Megha (41.80 g) with over all mean of 66.46 g (Table 1). The maximum *per se* performance for number of locules fruit^{-1} was observed in IIHR-2200 (10.10) followed by IIHR-2198 (7.20) and the lowest value was observed in Kashi Amruth (2.30) with over all mean of 4.21 (Table 1

Pericarp thickness varies from 5.82 mm (IIHR-2199) to 3.42 mm (Kashi Amruth) with over all mean of 4.30 mm (Table 1). The highest number of flowers per cluster was observed in genotype IIHR-2201 (6.06) followed by D-6-1-9-6-1 (5.90) and the lowest was observed in Arka Ahuti (4.06) followed by PKM-1 (4.51) with over all mean of 5.08 (Table 1).

The maximum number of fruits cluster^{-1} was recorded in IIHR-2201 (5.49) followed by D-6-1-9-6-1 (5.31), IIHR-2199 (5.19) and the minimum was observed in Megha (4.00) followed by Arka Ashish and PKM-1 (4.12 each) with over all mean of 4.65 (Table 2).

The highest number of cluster plant^{-1} was observed in IIHR-2201 (13.63) followed by IIHR-2199 (12.06), D-6-1-9-6-1 (11.15) and the least was observed in PKM-1 (6.22) followed by Arka Ahuti (6.45) with over all mean of 9.88 (Table 2).

The highest number of fruits plant^{-1} was recorded in IIHR-2201 (52.32) followed by D-6-1-9-6-1 (47.77), IIHR-2199 (45.76) and the minimum was recorded in Kashi Anupam (23.11) with over all mean of 34.58 (Table 2). The highest fruit yield plant^{-1} was observed in IIHR-2201 (3.06 kg) followed by D-6-1-9-6-1 (2.97 kg), IIHR-2199 (2.85 kg) and the lowest was observed in D-12-1-1-3-1 (1.44 kg) followed by Arka Ashish (1.65 kg) with over all mean of 2.19 kg (Table 2).

The highest fruit yield hectare^{-1} was observed in IIHR-2201 (68.06 t) followed by D-6-1-9-6-1 (66.02 t), IIHR-2199 (63.37 t) and the lowest was observed in D-12-1-1-3-1 (32.06 t) followed by Arka Ashish (36.62 t) with over all mean of 48.70 t (Table 2).

The genotype C-13-1-2-1 (6.65) was recorded highest total soluble solid followed by H-24 (5.69) and the genotype IIHR-2197 (2.67) recorded lowest total soluble solids with over all mean of 4.88. The range for fruit firmness was varied from 2.97 kg/cm^2 (Kashi Vishesh) to 1.63 kg/cm^2 (Kashi Amruth) with the overall mean of 2.25 kg/cm^2. The highest titratable acidity was observed in IIHR-2198 (0.57) followed by IIHR-2196 (0.53) and the lowest is observed in Kashi Amruth (0.17) with over all mean of 0.30. The maximum TSS:Acid ratio was recorded in Kashi Amruth (33.03) followed by H-24 (31.75) and the minimum was recorded in IIHR-2198 (7.98) with over all mean of 18.30 (Table 2).

Genotype D-12-1-6-1 (33.16 mg/100g) recorded highest ascorbic acid which is followed by D-12-1-1-3-1 (30.55 mg/100g)

and the genotype Arka Ashish (10.21 mg/100g) recorded lowest ascorbic acid with over all mean of 21.00 mg/100g. The maximum pH was recorded in A-15-3-2-1 (4.50) followed by Arka Ashish (4.45) and the minimum was recorded in IIHR-2201 (3.17) with over all mean of 4.10 (Table 2).

With respect to earliness, genotype D-6-1-9-6-1 and Nandi recorded lowest days (26.50 days) to 50% flowering (Table 1). Genotype IIHR-2196 recorded highest plant height (34.35 cm) at 30 DAT and Kashi Anupam (44.53 cm) at 45 DAT and Kashi Amruth (57.86 cm) at 60 DAT (Jyothi, 2015 and Bharathkumar, 2014) indicated that, different genotypes recorded the different heights at three different intervals due to each genotype having different capacity of growth. With regard to number of branches at different interval, genotype D-12-1-6-1 (3.12) recorded maximum branches at 30 DAT, genotype IIHR-2201 recorded highest number of branches of 5.32 and 8.92 during 45 and 60 DAT respectively (Jyothi, 2015; Bharathkumar, 2014; Renuka, 2013; Shalini, 2009 and Jaiprakashnarayan, 2007).

Among yield and yield related attributes (Table 1 and 2) yield per plant is very important trait as it is dependent character. The highest yield per plant was recorded in genotype IIHR-2201 (3.06 kg) followed by D-6-1-9-6-1 (2.97 kg) and IIHR-2199 (2.85 kg) because increase in yield per plant in these hybrids was due to higher number of fruits per plant in IIHR-2201 (52.32), D-6-1-9-6-1 (47.77) and IIHR-2199 (45.76) (Jyothi, 2015; Bharathkumar, 2014), higher number of clusters per plant in IIHR-2201 (13.63), D-6-1-9-6-1 (11.15) and IIHR-2199 (12.06) (Shalini, 2009 and Jaiprakashnarayan, 2007), higher number of fruits per cluster in IIHR-2201 (5.49), D-6-1-9-6-1 (5.31) and IIHR-2199 (5.19) (Jyothi, 2015), higher number of flowers per clusters in IIHR-2201 (6.06), D-6-1-9-6-1 (5.90) (Shalini, 2009) and higher pericarp thickness in IIHR-2199 (5.82 mm) (Jyothi, 2015). Maximum average fruit weight is observed in IIHR-2200 (165.37 g) and highest number of locules per fruit is observed in Kashi Amruth (2.30) (Jyothi, 2015; Bharathkumar, 2014; Renuka, 2013; Shalini, 2009 and Jaiprakashnarayan, 2007).

Important quality parameters of tomato are TSS, fruit firmness, titrable acidity, TSS:Acid ratio, ascorbic acid and pH (Table 2). Genotype C-13-1-2-1 is recorded maximum TSS of 6.65 ^{o}Brix (Jyothi, 2015 and Bharathkumar, 2014). Kashi Vishesh recorded maximum fruit firmness (2.97 kg/cm^2), Kashi Amruth recorded lowest titrable acidity (0.17) and highest TSS:Acid ratio (33.03) (Jyothi, 2015 and Bharathkumar, 2014)., D-12-1-6-1 recorded highest ascorbic acid (33.16 mg/100g) and genotype A-15-3-2-1 recorded highest pH of 4.50. (Renuka, 2013; Shalini, 2009 and Jaiprakashnarayan, 2007).

References

Bharathkumar, M.V. 2014. Development of F_1 hybrids with resistance to early blight (*Alternaria solani*) in tomato (*Solanum lycopersicum* L.), *M.Sc. Hort. Thesis*, Univ. Hortil. Sci., Bagalkot.

Boileau, T.W., Liao Z., Kim S., Lemeshow S., Erdman J.W., Clinton S.K. 2003. Prostate Carcinogenesis in N-methyl-Nnitrosourea (NMU)-Testosterone Treated Rats Fed Tomato Powder, Lycopene, or Energy-Restricted Diets. *J. Nat. Cancer Institute*, 95: 1578–1586.

Jaiprakashnarayan, R.P. 2007. Genetics of yield attributes and resistance to tomato leaf curl virus (ToLCV) and bacterial wilt in tomato (*Solanum lycopersicum* L.), *Ph.D Thesis*, Univ. Agric. Sci., Bengaluru.

Jyothi, K. 2015. Inheritance of bacterial wilt

resistance in tomato (*Solanum lycopersicum* L.), *Ph.D. Hort. Thesis*, Univ. Hortic. Sci., Bagalkot.

Martí, R., Salvador, R. and Cornejo J.C. 2016.Tomato as a Source of Carotenoids and Polyphenols Targeted to Cancer Prevention, *Cancers (Basel)*, 8(6).

Mayeaux, M., Xu, Z., King, J.M. and Prinyawiwatkul, W. 2006. Effects of cooking conditions on the lycopene content in Tomatoes. *J. Food Sci.*, 71: 461-464.

Rao, A.V. and Agarwal, S. 1998. Bioavailability and in vivo antioxidant properties of lycopene from tomato products and their possible role in the prevention of cancer. *Nutrition and Cancer*, 31: 199-203.

Renuka, D.M. 2013. Half diallel analysis in a set of cherry tomato lines for increased growth, yield and quality parameters, *M.Sc.(Hort.) Thesis*, Univ. Hortil. Sci., Bagalkot.

Shalini, M. 2009. Studies on heterosis and combining ability in tomato, (*Solanum lycopersicum* L.), *Ph.D. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad.

Takeoka, G.R., Dao, L., Flessa, S., Gillespie, D.M., Jewell, W.T. and Huebner, B. 2001. Processing effects on lycopene content and antioxidant activity of tomatoes. *J. Agri. Food Chem.*, 49: 3713-3717.

How to cite this article:

Sureshkumara, B., H.B. Lingaiah, M. Shivapriya and Pavithra, H.B. 2017. Evaluation of Tomato Genotypes for Growth, Yield and Quality Attributes Under Eastern Dry Zone of Karnataka, India. *Int.J.Curr.Microbiol.App.Sci.* 6(11): 1922-1930.
doi: https://doi.org/10.20546/ijcmas.2017.611.228