



EVALUATION OF CHERRY TOMATO LINES (*SOLANUM LYCOPERSICUM* VAR. *CERASIFORME*) FOR GROWTH, YIELD AND QUALITY TRAITS

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Abstract

The present study was carried out to know the performance of cherry tomato lines and check varieties for different traits attributing for growth, yield and quality in cherry tomato at the Division of Vegetable Crops, Indian Institute of Horticultural Research (IIHR), Hessarghatta, Bangalore (Karnataka), India during the period between July 2011 to May 2012. Among the lines used for investigation IIHR-2630-3 showed highest plant height (185.33m), in IIHR-2754 highest number of branches was obtained *i.e.* 13.67. Highest yield per plant was recorded in IIHR-2687, IIHR-2681 with the yield of 2.87, 2.80kg. IIHR-2859, IIHR-2464-A-1 were high yielding of 39.79, 39.17 tonnes per hectare respectively. IIHR-2864 showed the highest TSS of 7.670B. The line IIHR-2753, IIHR-2864 recorded high pericarp thickness of 0.50mm, 0.47mm respectively. Based on their performance IIHR-2754, IIHR-2864, IIHR-2464-A-1 and IIHR-2630-1 can be used for further breeding programme and hybrids could be exploited for cultivation in cherry tomato.

Key words : Cherry tomato, growth, yield, quality and evaluation.

Introduction

Cherry tomato (*Solanum lycopersicum* var. *cerasiforme*) is a botanical variety of the cultivated tomato. It is thought to be the ancestor of all cultivated tomatoes. It has become more popular all over the world because of a good source of vitamins A and C, solids content, good taste and fruit set even at high temperature (Prema *et al.*, 2011b). It is marketed at a premium to ordinary tomatoes. Cherry tomatoes are widely cultivated in Central America and are distributed in California, Korea, Germany, Mexico and Florida. It is a warm season crop, reasonably tolerant to heat and drought and grows under wide range of soil and climatic conditions (Anon, 2009a). Cherry tomato is grown for its edible fruits; they are perfect for making processed products like sauce, soup, ketchup, puree, curries, paste, powder, rasam and sandwich. They also have good nutritional and antioxidant

properties. The size of cherry tomatoes range from thumb tip to the size of a golf ball. And can range from being spherical to slightly oblong in shape (Anon, 2009b).

The possible exploitation of hybrid vigour in cherry tomato has been taken up at few research centres however very little systematic attention has been paid by plant breeders to study performance for yield and its components in cherry tomato. The genotypes performing well can be used further in heterosis breeding programme.

Materials and Methods

The present investigation was undertaken at the Division of Vegetable Crops, Indian Institute of Horticultural Research (IIHR), Hessarghatta, Bangalore, the experimental field is located at an altitude of 890 meters above MSL. 13°38' N latitude and 78°0' E longitude. The experiment was conducted during kharif-2011. The experiment material consists of twenty cherry tomato

lines and two check varieties (table 1).

Nursery techniques

Cherry tomatoes having small seeds were usually first sown during 11 July 2011 in the pro-trays having 98 cells with coco peat as potting media. And then transplanted into the main field on 5 August 2011 in plots. The plots were drip irrigated immediately after transplanting. They were evaluated in a randomized block design in three replications during kharif-2011 with 3 replications. Each treatment or variety in each replication was represented by a plot size of 4m × 4m with four rows and each row consisting of 10 plants.

Preparation of experimental plot

The experimental plot was ploughed repeatedly and brought to a fine tilth. And FYM was applied at the rate of 25t per ha at the time of land preparation before transplanting of seedlings, and polythene mulch was used to prevent more weeds and keep the root zone wet. The entire plot was divided into subplots. The 22 varieties were assigned to different subplots in each replication by using random table. Simultaneously, all the varieties were transplanted in the main field with spacing of 1m x 0.4 m on 5th August 2011. The crop was raised as per package of practices of tomato. Observations on five randomly selected plants were recorded for various growth, yield and quality attributing traits to see the performance of cherry tomato lines and check varieties.

Results and Discussion

The per se performance of lines and check varieties for different traits like growth, yield and quality parameters were presented in table 1.

Genotypes differed significantly among themselves for plant height and it ranged from 94.33 cm (IIHR-2464-A-1) to 185.33 cm ((IIHR-2630-3), for the character number of branches per plant the ranged from 4.67 ((IIHR-2464-A-1) to 13.67 ((IIHR-2754) among the lines (table 1). More number of branches results in more production of leaves, the size of the leaf and number of leaves per plant decides the efficiency of photosynthesis activity which contributed towards better growth and yield the results were in confirmation with Deepa and Thakur (2008), Arun *et al.* (2004).

There was a significant difference for total inflorescence and it ranged from 22.33 (IIHR-2464-A-1) to 59 (IIHR-2751) and highest was recorded in IIHR-2751(59) followed by IIHR-2753(55.33) among the parents (table 1). The increased fruit set might be due to higher rate of anther dehiscence, higher pollen viability;

similar results were also reported by Shivanand (2008). Any deviation in the results with findings of others is attributed to differences in the genotypes under study, environmental condition and stage of the fruit harvest.

The lines used in experiment differed among themselves for yield per plant and highest yield was obtained in the line IIHR-2687(2.87) followed by IIHR-2681(2.80) and lowest yield per plant was recorded in IIHR-2864 (1.67) followed by IIHR-2464-A-1(1.70) among the lines (table 1). Yield per plant directly contributed towards increase in the total yield of crop. This was in agreement with findings of Deepa and Thakur (2008), Shivakumar (2000).

For yield per plot, genotypes differed significantly and highest yield was noticed the line IIHR-2630-1 (64kg) followed by IIHR-2859 (63.67kg) and lowest yield per plot was recorded in IIHR-2862 (50.67kg) followed by IIHR-2755 (53kg). Genotypes differed significantly among themselves for estimated yield per hectare and it ranged from 33.13 tonnes per hectare (IIHR-2755) to 39.79 tonnes per hectare ((IIHR-2859)) among the lines but the actual highest yield was obtained in the check variety Arka Ashish *i.e.* 41.04 tonnes per hectare (not a cherry tomato). These results are in confirmation with Madalageri and Dharmatti (1991).

Genotypes differed significantly among themselves for number of locules per fruit and it ranged from 2.00 (many lines) to 4 (IIHR-2861) and highest was recorded in IIHR-2861(4) followed by IIHR-2687 (3.33) and lowest was recorded in IIHR-2858(2) followed by IIHR-2752 (2.33). The genotypes differed significantly for the character Total soluble solids (TSS), the highest TSS was recorded in IIHR-2864 (7.670B) followed by IIHR-2865 (7.370B) and lowest was recorded in IIHR-2861 and check variety Arka Ashish (4.670B) followed by IIHR-2754 (5.070B). High total soluble solids (TSS) and low acidity are the major factors considered for manufacture of processed products. One percent increase in TSS content of fruits result in 20 percent increase in recovery of processed product (Berry *et al.*, 1988 and Shivanand, 2008). For the character pericarp thickness (mm) the highest mean value was recorded in the check variety Arka Ashish (0.67mm) followed by IIHR-2753 (0.50mm), IIHR-2864(0.47mm) and lowest mean value was recorded in IIHR-2752 (0.20mm) followed by IIHR-2754 (0.27mm) among the lines and check varieties (table 1). These results were similar to the findings of Thakur *et al.* (2005), Hazarika and Phookan (2005) and Shivakumar (2000).

Table 1 : Evaluation of cherry tomato lines and check varieties for growth, yield and quality traits.

S. no.	Lines/check Varieties	Plant height (cm)	No. of branches	Total number of clusters	Yield/plant (kg)	Yield/plot (kg)	Yield/ha (ton)	Locule no.	TSS(B)	Peri-carp thickness (mm)
1.	IIHR-2858	123.00	8.00	34.33	1.77	56.23	35.15	2.00	5.67	0.43
2.	IIHR-2859	109.00	6.00	32.33	2.37	63.67	39.79	2.00	6.07	0.37
3.	IIHR-2860	125.33	10.33	39.33	2.10	62.00	39.30	2.00	6.67	0.37
4.	IIHR-2863	116.00	10.00	44.67	2.20	60.67	38.64	2.00	6.93	0.33
5.	IIHR-2861	111.67	7.00	35.33	2.80	55.17	35.73	4.00	4.67	0.37
6.	IIHR-2687	97.33	7.33	32.33	2.87	61.00	39.13	3.33	5.40	0.33
7.	IIHR-2630-1	158.33	13.33	44.33	1.97	64.00	38.96	2.33	6.93	0.27
8.	IIHR-2659	157.00	10.00	49.33	2.37	59.67	37.29	2.33	6.13	0.30
9.	IIHR-2630-3	185.33	9.00	32.67	1.83	61.33	38.33	2.33	5.60	0.27
10.	IIHR-2864	151.00	10.00	33.33	1.67	58.33	36.46	3.00	7.67	0.47
11.	IIHR-2754	132.33	13.67	55.33	1.90	55.33	34.58	2.67	5.07	0.27
12.	IIHR-2752	142.67	12.33	52.00	1.93	58.33	36.46	2.33	6.10	0.20
13.	IIHR-2464 A-1	94.33	4.67	22.33	1.70	62.67	39.17	3.00	6.77	0.30
14.	IIHR-2751	144.67	11.00	59.00	2.33	59.33	37.08	2.00	6.80	0.23
15.	IIHR-2755	105.00	11.00	48.00	1.88	53.00	33.13	2.00	6.47	0.27
16.	IIHR-2753	145.67	13.00	55.33	2.03	53.67	35.63	2.00	5.20	0.50
17.	IIHR-2862	118.33	8.67	36.00	2.00	50.67	33.75	2.00	6.47	0.33
18.	IIHR-2865	145.67	11.33	34.33	2.20	62.33	38.96	2.00	7.37	0.33
19.	IIHR-2866	139.33	9.00	33.00	2.00	61.33	38.33	2.00	6.93	0.43
20.	IIHR-2857	110.33	7.67	40.33	2.37	56.50	36.46	2.00	6.93	0.33
21.	A. Ashish	68.33	4.67	20.00	3.07	65.67	41.04	2.67	5.00	0.67
22.	PL5515	94.67	8.33	64.00	1.73	55.83	34.90	2.00	6.73	0.25
	CD at 5%	15.33	2.40	8.13	0.30	5.87	3.67	0.65	1.15	0.10
	CV at %	7.46	16.24	12.39	8.92	6.05	6.05	16.74	11.49	18.01
	SE.m±	5.38	0.84	2.85	0.10	2.05	1.29	0.23	0.40	0.05

In this study, the lines IIHR-2754, IIHR-2864, IIHR-2464-A-1 and IIHR-2630-1 are good performing for various characters taken under study. In this perspective, they could be exploited further in different breeding programmes. The promising hybrids can be further subjected to selection to isolate desirable genotypes in cherry tomato.

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