

Original Research Article

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Evaluation of Cherry Tomato (*Solanum lycopersicum* L. var. *cerasiforme*) Genotypes for Yield and Quality Parameters

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ABSTRACT

An experiment entitled Evaluation of cherry tomato (*Solanum lycopersicum* L. var. *cerasiforme*) genotypes for yield and quality parameters was conducted in the Department of Vegetable Science, College of Horticulture, Bengaluru, Karnataka during the year 2018-19. In present study, twenty one cherry tomato genotypes were evaluated for yield and quality parameters. Among different cherry tomato genotypes, maximum number of fruits per cluster was recorded in COHBT (8.75). Genotype COHBT-198 recorded maximum average fruit weight (43.90 g). The maximum fruit yield per plant was recorded in genotype COHBT-198(2.30 kg). COHBT-70 genotype recorded maximum total soluble solids (8.55 °Brix) and minimum acidity was recorded in COHBT-31 (0.30%). Among all genotypes pericarp thickness varied between 2.50mm and 5.50 mm. The maximum number of locules per fruit was recorded in COHBT-208 (4.00). Genotype COHBT-209 recorded maximum chlorophyll (mg/g) content (9.90mg/g). The maximum lycopene content was recorded in COHBT-44 (13.5mg/100g).

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Introduction

Tomato (*Solanum lycopersicum* L.) is one of the most important solanaceous vegetable crops grown widely all over the world and is native to South America (Rick, 1969). Botanically cherry tomato is called *Solanum lycopersicum* var. *cerasiforme* having chromosome number $2n=24$. It is thought to be the ancestor of all cultivated tomatoes. It is widely cultivated in Central America and is 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 which can be consumed either fresh as a salad or after cooking as snacks. They are perfect for making processed products like sauce, soup, ketchup, puree, curries, paste, powder and sandwich. Unripe green fruit are used for preparation of pickles and chutney. The fruit

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

Materials and Methods

An experiment was carried out to study Evaluation of cherry tomato (*Solanum lycopersicum* L. var. *cerasiforme*) genotypes for growth and yield was under taken during Jun2018(Kharif season) at Department of Vegetable Science, College of Horticulture Bengaluru, University of Horticultural Sciences, Bagalkot. The experiment site is located at an of 930 meters above mean sea level (MSL) at 12.97° N latitude and 77.56° E longitudes in the Eastern Dry Zone of Karnataka (Zone-V). The 19 genotypes maintained at Department of Vegetable Science, College of Horticulture, Bengaluru are taken for the present study.

Two varieties namely Yellow Round and Red Round from Suvarna Hybrid seeds were taken as check. Cherry tomato seeds were sown in plastic pro- trays having 98 cells. Regular irrigation and plant production measure were taken to raise the good quality seedlings using growing media like mixture of coco peat and farm yard manure in 2:1 ratio. pro-trays are kept in green house.

Randomized Complete Block Design (RCBD) was adopted with two replication and 15 plants in each replication. During July 2018, field was brought to fine tilth by ploughing and harrowing. Farm yard manure was incorporated to the soil and bed covered by plastic mulch. The 25 days old seedlings were transplanted at the spacing of 90cm × 60cm. The experiment plots were kept free from weeds by hand weeding at frequent interval. All agronomic practices were taken as per the recommendations of package of practices of University of Horticultural Sciences, Bagalkot.

Results and Discussion

Number of fruits per cluster

This might be due to the prevalence of micro climate with better environmental condition with optimum temperature would helped in the better pollination and ultimately leads to fruit set. The maximum number of fruits per cluster was recorded in COHBT (8.75) and minimum was recorded in COHBT-191 (3.00).

The results are similar with Singh *et al.*, (2000) reported number of fruits per cluster ranged from 4.30 to 8.70 with over all mean of 5.90 and Mohanty (2003), Prashanth (2003), Mehta and Asati (2008) and Prema *et al.*, (2011a) also reported similar results.

Average fruit weight

Significant differences among the different cherry tomato genotypes are presented in. The maximum average fruit weight was observed in COHBT-198 (43.90g) which was followed by COHBT-70 (38.90g) and minimum was observed in COHBT- 262 (3.50g). This variation in average fruit weight might be due to inverse relationship existing between average fruit weight, and number of fruits per cluster. This was conformity with the findings of Renuka *et al.*, (2017).

Fruit yield per plant

The average fruit weight directly contributes towards the fruit yield per plant. This was in agreement with the finding of Deepa and Thakur (2008) in tomato. The fruit yield per plant showed significant differences among the different cherry tomato genotypes. The maximum fruit yield per plant was recorded in COHBT-198 (2.30kg) which was followed by COHBT- 70 (2.20kg) and minimum was recorded in COHBT- 270 (1.00kg).

Total soluble solid (°Brix)

High total soluble solid (TSS) is the major factors considered for manufacture of processed products. One per cent increase in TSS content of fruits results in 20 per cent increase in recovery of processed product (Berry *et al.*, 1988 and Shivanand, 2008). The data pertaining to the total soluble solid (°B) showed significant differences among the different cherry tomato genotypes. The maximum TSS (°B) was observed in COHBT-70 (8.55°B) which was followed by COHBT- 27 (6.85°B) and minimum was observed in COHBT- 208 (4.20°B). Similar results were observed by Bajaj *et al.*, (1990), Jasmine and Ramadass (1994), Saimbhi *et al.*, (1995), Sharma *et al.*, (1996), Rathod (1997), Sivakumar (2000) and Sheferaw (2001).

Acidity (%)

Acidity (%) showed significant differences among the different cherry tomato genotypes. The maximum acidity (0.70%) was observed in COHBT- 208 and COHBT- 206 which was followed by COHBT- 199 (0.65%) and minimum acidity was observed in COHBT- 31 (0.30%). The low values of titrable acidity were because of red tomato fruits used for analysis (Rana *et al.*, 2014).

Pericarp thickness (mm)

Pericarp thickness showed significant differences among the different cherry tomato genotypes. A numerically maximum pericarp thickness was recorded in COHBT- 46, COHBT- 262 and COHBT- 206 (5.00mm) and minimum was recorded in COHBT-70 (2.50mm). Similar results were reported by Joshi *et al.*, (1998a) in tomato. Higher pericarp thickness and firmness also improves the shelf life of fruit. Present findings supported by the results obtained by Shivanand (2008) in tomato.

Number of locules per fruit

Tomato fruit with less locules are preferred for processing industries as it gives better firmness and indirectly better storability. Presence of limited number of locules in cherry tomato (2-3) is preferred then fruit having more locules as a cherry tomato is generally preferred as table fruit vegetable. The data pertaining to the number of locules per fruit showed significant differences among the different cherry tomato genotypes. The maximum number of locules per fruit observed in COHBT- 208 (4.00) which was followed by COHBT-36 and COHBT- 44 (3.40) and minimum was observed in COHBT- 253, COHBT- 70 and COHBT-262 (2.00). The results were in consonance with the finding of Kamimura *et al.*, (1985), Dundi and Mandalageri (1991) in tomato, Renuka *et al.*, (2014) and Renuka *et al.*, (2017) in cherry tomato.

Chlorophyll (mg/g)

The chlorophyll (mg/g) among the different cherry tomato genotypes. The maximum chlorophyll (mg/g) content was observed in COHBT-209 (9.90mg/g) which was followed by COHBT- 27 (9.00mg/g) and minimum was observed in COHBT-36 (3.25mg/g). The variation in chlorophyll content observed due to genotypic variability. Similar results are supported by the results of Alley *et al.*, (1976).

Lycopene (mg/100g)

Lycopene pigment in cherry tomato fruit decided the optimum stage of ripening and also an important criterion for processing. Hence, breeding for high lycopene would also help in developing tomato varieties or hybrids which would improve the general health status of consumers. Lycopene pigment in tomato fruit decides the optimum stage of ripening and also an important criterion for consumed as a salad and processing.

Table.1 Variation of cherry tomato genotypes for yield and quality parameters

Treat ment	Genotypes	No. of fruits per cluster	Avg. fruit weight (g)	Fruit yield per plant (kg)	TSS(°B)	Acidity (%)	Pericarp thickness (mm)	No. of locules per fruit	Chlorophyll l (mg/g)	Lycopene (mg/100g)
T ₁	COHBT-253	5.25 ^{cd}	26.25 ^{gh}	2.00 ^b	4.75 ^{ghi}	0.40 ^{efg}	4.00	2.00 ^f	5.40 ^{hi}	5.78 ^j
T ₂	COHBT -46	4.00 ^f	31.55 ^e	1.30 ^{fgh}	5.55 ^{ef}	0.45 ^{def}	5.00	2.80 ^{cd}	7.05 ^{cd}	7.68 ^{ef}
T ₃	COHBT-27	4.50 ^{def}	35.70 ^c	1.30 ^{fgh}	6.85 ^b	0.55 ^{bcd}	4.50	3.30 ^b	9.00 ^b	9.12 ^d
T ₄	Red Round	6.55 ^b	20.90 ^{kl}	2.10 ^{ab}	5.15 ^{fgh}	0.50 ^{cde}	4.00	2.00 ^f	4.80 ^j	8.81 ^d
T ₅	COHBT-68	5.10 ^{cde}	14.00 ⁿ	1.50 ^{def}	5.45 ^{efg}	0.60 ^{abc}	4.00	2.30 ^{ef}	8.55 ^b	3.70 ^k
T ₆	COHBT-270	5.50 ^{ced}	22.75 ^j	1.00 ⁱ	4.45 ^{hi}	0.50 ^{cde}	4.50	2.10 ^{ef}	6.40 ^{ef}	5.80 ^j
T ₇	COHBT -262	4.50 ^{def}	3.50 ^{op}	1.25 ^{gh}	6.60 ^{bc}	0.50 ^{cde}	5.00	2.00 ^f	5.70 ^{gh}	12.10 ^b
T ₈	COHBT-217	4.00 ^f	23.50 ^j	1.75 ^c	5.90 ^{cdef}	0.35 ^{fg}	4.00	2.50 ^{de}	5.00 ^{ij}	10.83 ^c
T ₉	COHBT-70	4.00 ^f	38.90 ^b	2.20 ^{ab}	8.55 ^a	0.45 ^{def}	2.50	2.00 ^f	6.85 ^{de}	1.40 ^l
T ₁₀	COHBT-44	4.00 ^f	26.95 ^{fg}	1.40 ^{efg}	5.85 ^{cdef}	0.60 ^{abc}	3.50	3.40 ^b	5.55 ^{hi}	13.50 ^a
T ₁₁	Yellow Round	5.25 ^{cd}	20.25 ^l	1.70 ^{cd}	5.50 ^{efg}	0.50 ^{cde}	4.50	2.00 ^f	6.25 ^{df}	1.40 ^l
T ₁₂	COHBT -198	6.60 ^b	43.90 ^a	2.30 ^a	6.40 ^{bcd}	0.60 ^{abc}	4.50	2.50 ^{de}	8.45 ^b	6.54 ^{gh}
T ₁₃	COHBT-209	4.75 ^{def}	34.95 ^c	1.40 ^{efg}	5.20 ^{fgh}	0.60 ^{abc}	4.00	3.10 ^{bc}	9.90 ^a	3.90 ^k
T ₁₄	COHBT -71	4.75 ^{def}	15.50 ^m	1.10 ^{hi}	5.65 ^{def}	0.40 ^{efg}	4.50	2.50 ^{de}	7.55 ^c	7.50 ^{fg}
T ₁₅	COHBT -48	5.75 ^{bc}	20.85 ^{kl}	1.20 ^{ghi}	6.10 ^{bcde}	0.40 ^{efg}	4.00	2.20 ^{ef}	5.60 ^h	7.35 ^{fgh}
T ₁₆	COHBT-31	4.00 ^f	21.70 ^k	1.15 ^{hi}	5.90 ^{cdef}	0.30 ^g	3.50	2.50 ^{de}	6.40 ^{ef}	12.00 ^b
T ₁₇	COHBT-36	4.25 ^{ef}	25.20 ⁱ	1.55 ^{cde}	5.25 ^{fg}	0.50 ^{cde}	4.00	3.40 ^b	3.25 ^l	12.75 ^{ab}
T ₁₈	COHBT -199	8.75 ^a	33.35 ^d	2.20 ^{ab}	6.40 ^{bcd}	0.65 ^{ab}	4.50	2.40 ^{def}	6.65 ^{df}	6.20 ^{ig}
T ₁₉	COHBT-208	5.00 ^{cde}	25.55 ^{hi}	2.00 ^b	4.20 ⁱ	0.70 ^a	3.50	4.00 ^a	4.05 ^k	7.44 ^{fg}
T ₂₀	COHBT -206	4.00 ^f	34.85 ^c	1.40 ^{efg}	4.45 ^{hi}	0.70 ^a	5.00	3.20 ^{bc}	3.75 ^{kl}	8.36 ^{de}
T ₂₁	COHBT -191	3.00 ^g	27.65 ^f	1.50 ^{def}	5.45 ^{efg}	0.55 ^{bcd}	4.00	2.40 ^d	3.60 ^{ef}	6.71 ^{ghi}
	Mean	4.90	26.08	1.58	5.69	0.51	4.14	4.14	6.30	7.56
	S.Em±	0.31	0.94	0.09	0.26	0.03	0.59	0.16	0.20	0.28
	CD at 5%	0.92	2.80	0.22	0.78	0.10	NS	0.48	0.59	0.85
	CV	8.96	5.24	6.61	6.54	9.21	11.80	8.96	4.52	5.39

Recently it has been identified as a nutritional factor because of its antioxidant. The lycopene (mg/100g) showed significant differences among the different cherry tomato genotypes (Table 12). The maximum lycopene content was recorded in COHBT-44 (13.5mg/100g) which was followed by COHBT-36 (12.75mg/100g) and minimum was recorded in COHBT-70 (1.40mg/100g). Similar results are reported by Najeema *et al.*, (2018).

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