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ASSESSMENT OF CORRELATION COEFFICIENT FOR GROWTH, YIELD AND QUALITY TRAITS IN CHERRY TOMATO (*SOLANUM LYCOPERSICUM VAR. CERASIFORME.*)

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Abstract

Twenty two genotypes of tomato along with variety, (*Solanum lycopersicon* L.) were evaluated evaluated for growth, yield and quality component characters in RBD with three replications at Experimental plot (Block-8) Division of vegetable crops, Indian Institute of Horticultural Research (IIHR), Hessaraghatta, Bangalore-560089 (Karnataka), during *Kharif* and *rabi* season in the year 2011-2012. Yield per plant was significantly and positively associated with plant height at the genotypic levels. Number of fruits per plant had a significant and positive correlation with total inflorescence (0.8518 and 0.831) number of fruits kg (0.6433and 0.5898) number of fruits /clusters (0.7886 and 0.7615), number of fruits per plant is an important parameter for high yield, Hence this character may be simultaneously selected to develop the high yielding varieties.

Key words: Cherry tomato (*Solanum lycopersicum var. cerasiforme.*), processed product, average fruit weight

Introduction

Cherry tomato *Solanum lycopersicum* var. *cerasiforme* is a botanical variety of the cultivated tomato or a smaller garden variety of tomato, having chromosome number 2n=24. It is thought to be the ancestor of all cultivated tomatoes. It is marketed at a premium to ordinary tomatoes. Cherry tomatoes are generally considered to be simillar but not identical to the wild relative of the domestic tomato. It is widely cultivated in Central America when the Conquistadores arrived and is distributed in California, Korea, Germany, Mexico and Florida. (Anon., 2009).

Tomato (*Solanum lycopersicon L.*) is one of the most important, popular and extensively used vegetable as fresh fruit and also in the form of processed product (Toor and Savage, 2005). The crop is widely grown all over the world (mainly tropics and sub-tropics). It is native to Peru-Eqator region (Rick, 1969). It is grown at farm and kitchen garden for slice, soup, sauce, ketchup, cooked vegetable etc. It is a rich source of vitamins A, B and C. In India tomato is grown in an area of about 0.82 mha with a production of 18.73 MT and productivity being 21.2 tonnes per ha. In Karnataka it occupies an area of 0.61 lakh hectares with a production of 20.68 lakh tonnes and productivity being 33.90 tonnes per hectare (Anon., 2014).

Correlation coefficient is statistical measure which is used to find out the degree and direction of relationship between two or more variables. Correlation coefficient measures the mutual relationship between various plant characters and determines the component characters on which selection can be based for generic improvement in yield. The present study was carried out to get the information for character association for fruit yield in twenty two genotypes of tomato.

Materials and Methods

The experiment was conducted at the research farm of Experimental plot (Block-8) Division of vegetable crops, Indian Institute of Horticultural Research (IIHR), Hessaraghatta, Bangalore-560089 (Karnataka), Twenty two genotypes of tomato were grown in randomized block design in three replications during *Kharif* and *rabi* season in the year 2011-2012. Each treatment or varieties in each

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Table 2: Phenotypic correlation coefficient for growth, yield and quality traits in cherry tomato.

Sl. No.	Plant Height	No. Of Primary Branches	Secondary Branches	Total Inflorescenc	No. of Fruits (Kg)	No. of Fruits / Clusters	Average fruit weight(g)	No. of Fruits Per Plant	Locules/ Fruit (No)	Fruit Firmness	Pericarp Thickness (M)	Fruit Yield/ Plant
1	1.0000	-0.3165	0.2122	0.4185**	0.2131	0.0239	-0.5898**	0.2014	-0.4575**	0.0958	-0.1973	0.3363*
2		1.0000	0.0622	-0.2609	-0.5115**	-0.4735**	0.7290**	-0.3537*	0.2799	0.2150	0.3964*	0.2309
3			1.0000	0.1445	0.4958**	0.4366**	-0.4196*	0.3107	0.2351	-0.4379**	-0.6400**	-0.0803
4				1.0000	0.3257	0.3645*	-0.4579**	0.8518**	-0.6303**	-0.1705	-0.3923*	0.257
5					1.0000	0.8275**	-0.7873**	0.6433**	-0.0371	-0.5705**	-0.7895**	-0.2535
6						1.0000	-0.6530**	0.7886**	-0.0316	-0.6476**	-0.8008**	-0.2815
7							1.0000	-0.5761**	0.4143*	0.3768*	0.7393**	0.1159
8								1.0000	-0.3764*	-0.4671**	-0.6612**	0.0183
9									1.0000	-0.0816	-0.0860	0.2009
10										1.0000	0.5747**	-0.0351
11											1.0000	0.2182
12												1.0000

* Significant at p = 0.05 probability (0.329) ** Significant at p = 0.01 probability (0.424)

replication was represented by a plot size of 4m × 4m with four rows and each row consisting of 10 plants, for each genotype were planted with 75 cm inter row spacing, whereas plant distance were kept at 40 cm. All cultural practices were done according to Chaudhary, and Shahid, (2000). Data on plant height, number of primary branches, number of primary branches, number of flowers cluster^{-1}, number of fruits cluster^{-1}, fruits kg^{-1}, average fruit weight, number of fruits plant^{-1}, locules number fruit^{-1}, fruit firmness, pericarp thickness and finally fruit yield plant^{-1}. were recorded from all the selected tagged plants. The genotypic and phenotypic correlation coefficient of yield and its contributing characters were estimated as described by Singh and Choudhary (1985).

Results and Discussion

Coefficients of correlation were worked out at genotypic and phenotypic level for twelve characters in the present investigation (Table 1 and Table 2). In general, genotypic correlation coefficients were higher in magnitude than phenotypic correlation coefficients, indicating that there is strong association between two characters genetically, but the phenotypic correlation value is lessened by the significant interaction of environment. These results agree with Harer *et al.* (2002) and Prashant *et al.,* (2008), who reported that the genotypic correlation coefficient was higher than the phenotypic correlation for all characters examined in tomato under different environments.

The phenotypic and genotypic correlation coefficients among different characters indicated that yield per plant was significantly and positively associated with plant height at the genotypic levels. Number of fruits per plant had a significant and positive correlation with total inflorescence (0.8518 and 0.831) number of fruits kg (0.6433and 0.5898) number of fruits/clusters (0.7886 and 0.7615), number of fruits per plant is an important parameter for high yield, hence improve fruit per plant in cherry tomato, selection should be based on these traits. This was reported by Mohanty (2003), Rani *et al.* (2010) and M. Kumar and Dudi (2011). Whereas, significant and negative correlation with average fruit weight (0.5761 and 0.5276), fruit firmness (0.4671 and 0.4136), pericarp thickness (0.6612 and 0.5911) at both genotypic and phenotypic levels. Number of fruits per clusters had a significant and positive correlation with number of fruits kg, number of fruits per plant at both levels and with secondary branches at both genotypic level only. Similar results were observed by Tanuja *et al.* (2012), Ghosh and

Table 1: Genotypic correlation coefficient for growth, yield and quality traits in cherry tomato.

Sl. No.	Plant Height	No. Of Primary Branches	Secondary Branches	Total Inflorescenc	No. of Fruits (Kg)	No. of Fruits / Clusters	Average fruit weight(g)	No. of Fruits Per Plant	Locules/ Fruit (No)	Fruit Firmness	Pericarp Thickness (M)	Fruit Yield/ Plant
1	1.0000	-0.1937	0.1774	0.3931 *	0.2028	0.0171	-0.5782 **	0.1952	-0.2280	0.0917	-0.1901	0.3062
2		1.0000	0.0395	-0.2386	-0.3574 *	-0.2475	0.4833 **	-0.2479	0.0456	0.1247	0.2421	0.0700
3			1.0000	0.1468	0.4412 **	0.3208	-0.3669 *	0.2684	0.0908	-0.3855 *	-0.5462 **	-0.0723
4				1.0000	0.3070	0.3132	-0.4218 *	0.8310 **	-0.3431 *	-0.1488	-0.3519 *	0.2147
5					1.0000	0.7347 **	-0.7827 **	0.5898 **	0.0017	-0.5581 **	-0.7700 **	-0.2394
6						1.0000	-0.5869 **	0.7615 **	-0.0539	-0.5722 **	-0.7023 **	-0.2608
7							1.0000	-0.5276 **	0.1992	0.3716 *	0.7262 **	0.1081
8								1.0000	-0.2549	-0.4136 *	-0.5911 **	-0.0016
9									1.0000	-0.0380	-0.0233	0.1249
10										1.0000	0.5599 **	-0.0277
11											1.0000	0.2133
12												1.0000

* Significant at p = 0.05 probability (0.329) ** Significant at p = 0.01 probability (0.424)

Syamal (1994). Significant and positive correlation was found between other important characters i.e average fruit weight with locules per fruit, pericarp thickness plant height with total inflorescence. A positive correlation between desirable characters is favourable to the plant breeder because it helps in simultaneous improvement of both the characters.

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