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Per se performance of chilli (*Capsicum annuum* L.) genotypes for yield and yield related traits

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Abstract
An field experiment was conductedat College of Horticulture, Sri Konda Laxman Telangana State Horticultural University, Hyderabad during *Kharif*, 2019 and at National Bureau of Plant Genetic Resources, Regional station, Rajendranagar, Hyderabad during *Rabi*, 2019-20.Thirty five chilli genotypes were evaluated for 17 yield and yield related traits. The analysis of variance revealed that the genotypes differed significantly among themselves for all the characters under study indicating the presence of sufficient amount of variability. The results of mean performances of 35 genotypes for seventeen characters revealed that the genotype IC-347044 was superior for yield and yield contributing characters *i.e.,* fruit yield per plant (0.820 kg) and yield per plot (11.54 kg). The genotype IC-363918 was found to be superior for plant height (102.48 cm) and number of fruits per plant (166.66), genotype IC-215012 was superior for plant spread (5950.50 cm^2), and number of primary branches per plant (5.15) and ascorbic acid content (191.80 mg/100gm). Genotype IC-561655 was found to be early for days to first flowering (36.25 days), days to 50% flowering (45.78 days), days to first harvest (66.66 days) and genotype IC-447018 was found to be early for days to last harvest (131.50 days). The genotype IC-347044 was found to be superior for fruit length (14.80 cm) and IC-610381 for fruit diameter (2.21 cm). Fruit weight was maximum in genotype Sindhur (11.81 g). High chlorophyll content (2.24%) was recorded in genotypes EC-402113 and EC-399535. High capsaicin (0.83%) in IC-363993 and capsanthin content (373.52 ASTA units) in IC-561622 were recorded.

Keywords: Chilli, genotypes, yield related traits, variability

Introduction
Chilli (*Capsicum annuum* L.) is a solanaceous vegetable withdiploid chromosome number 2n = 2x = 24. It is also known as hot pepper or red pepper. Chilli originated from South Central America but the domestication of chilli first occurred in Central America, most likely in Mexico, with secondary centers in Guatemala and Bulgaria (Salvador, 2002) [16]. It is commercially grown spice cum vegetable crop. It is consumed as fresh, dried or in powder form (El-Ghoraba *et al*., 2013; Pujar *et al*., 2017) [5, 14]. It is widely cultivated in the various parts of the world.India is the world's largest producer, consumer and exporter of chilli. Chilli is often cross pollinated crop in which 2 to 96% out-crossing was observed under open pollination by means of insects (Hasanuzzaman *et al*., 2012) [7]. Unripe green fruits are used as vegetable whereas ripe red fruits are used as spice after drying.

Chilli is a good source of vitamin C (ascorbic acid) used in food and beverage industries (Bosland and Votava, 2000) [2]. Oleoresin extracted from chilli permits better distribution of color and flavor in foods. Pungency in chilli is due to a secondary metabolite called capsaicin. Due to its anti-bacterial, anti-carcinogenic, analgesic and anti-diabetic properties, capsaicin is in high demand in pharmaceutical industry. It is also used in cosmetics like prickly heat powders and skin ointments.

Collection of diverse germplasm and their systematic evaluation holds considerable importance in crop improvement programme. To initiate any breeding work, it is necessary to assess the genetic variability present in the indigenous genotypes for yield and its components. The importance of genetically diverse genotypes with desirable combinations has also been realized by several workers (Peter and Rai, 1978; Das *et al*., 1998) [12, 4]. The effectiveness of selection and development of improved varieties depends on the nature of variability expressed for yield and its yield related characters in the gene pool. In chilli breeding programme, development of high yield and yield contributing traits with improved quality parameters is one of the major objective. Studies on chilli genotypes revealed that great variation exists in ability to flowering, fruit set, yield and other qualitative attributes under different agro-

climates (Rani, 1996 and Maurya *et al*., 2016) [15, 10]. Considering the above facts the present investigation was carried out to observe the performance of thirty five chilli genotypes for seventeen yield related traits and to identify the potential genotypes which can be utilized in further breeding programme.

Material and Methods

The experimental material comprising of 35 chilli genotypes were systematically evaluated for 17 quantitative and qualitative traits in order to identify and select genetically divergent and Horticulturally superior germplasm. The experiment was laid out in a Randomized Block Design with 35 chilli accessions as treatments at the P.G research block, Sri Konda Laxman Telangana State Horticultural University, College of Horticulture, Rajendranagar, Hyderabad during *Kharif*, 2019 and at NBPGR Regional station, Rajendranagar, Hyderabad during *Rabi*, 2019-20. Each treatment was randomly replicated thrice. The accession numbers of the respective genotypes with source are presented in Table 1.

Nursery of 35 chilli genotypes was raised in pro trays filled with vermicompost, FYM and red earth in the ratio of 2:1:1. The experimental field was brought to fine tilth by ploughing thrice followed by harrowing. Before final harrowing, FYM @ 15 tonnes/ha was applied with recommended fertilizer doses of 200:60:80 kg NPK/ha in the form of urea, single super phosphate and Muriate of potash, respectively. Urea and Muriate of potash were applied in three equal splits during the crop growth period at the time of transplanting, 30 DAT and 60 DAT, whereas single super phosphate was applied as a basal dose.

Six weeks old healthy seedlings were transplanted in the main field after allotting entries randomly in each replication. Immediately after transplanting, the field was irrigated lightly. The plots were kept free of weeds and irrigated as and when required depending on soil moisture content. Need based plant protection measures were taken up to keep the plot free from pests and diseases.

In each replication, five competitive plants were randomly selected and tagged for recording observations for 17 characters related to growth and fruit yield *viz.*, plant height (cm), plant spread (cm^2), number of primary branches $plant^{-1}$, days to first flowering, days to 50% flowering, days to first harvest, days to last harvest, fruit length(cm), fruit diameter(cm), number of fruits $plant^{-1}$, fruit weight (g), fruit yield $plant^{-1}$ (kg/plant), fruit yield $plot^{-1}$ (kg), ascorbic acid content (mg/100g of fruit), chlorophyll content of green chilli, capsaicin content (%) and capsanthin content (ASTA units).

Analysis of variance (ANOVA) for RBD

The data collected during *Kharif*, 2019 and *Rabi*, 2019-20 was pooled and subjected to the analysis of variance for Randomized Block Design as suggested by Panse and Sukhatme (1985) [11]. The significance of mean sum of squares for each character was tested against the corresponding error degrees of freedom using F-test (Fisher and Yates, 1967) [6]. The level of significance was tested at 5%, 1% and 0.1% using F-test.

Results and Discussions

The data on Analysis of Variance (ANOVA) for yield and its attributing characters under study are presented in Table 2. The mean sum of squares for genotypes was found to be significant for all the 17 characters studied. The mean performance of 35 genotypes of chilli with respect to various yield and yield attributes are presented in Table 3.

High variation was observed for the trait plant height among the genotypes which ranged from 47.53 cm to 102.48 cm with a total mean of 62.73 cm. Among the genotypes, IC-363918 showed maximum plant height (102.48 cm) followed by IC-610381 (102.41 cm) which was at par, while the minimum height (47.53 cm) was observed in EC-399567. Similarly, high variation in height of the chilli plants was observed by Chopra *et al.* (2005), Jabeen *et al.* (2011), Jyothi *et al.* (2011) Amit *et al.* (2014), Srinivas *et al.* (2017) and Prasad *et al.* (2019) [3, 8, 9, 1, 17, 13].

The trait plant spread ranged from 1707.83 cm^2 to 5950.50 cm^2 with an overall mean of 3672.08 cm^2. Among the genotypes, IC-215012 (5950.50 cm^2) showed maximum plant spread while the minimum plant spread was observed in Sindhur (1707.83 cm^2).

Number of primary branches per plant ranged from 3.26 to 5.15 with a grand mean of 4.22. Among the genotypes, IC-215012 showed maximum number of primary branches per plant (5.15) while the minimum number of primary branches per plant (3.26) was observed in IC-610383. Three genotypes *i.e.*, IC-215012 (5.15), IC-610381 (5.08) and IC-528433 (5.05) recorded statistically at par values with the best check Pusa Jwala (5.01).

Number of days to first flowering in the genotypes ranged from 36.25 to 59.60 with a grand mean of 50.35. Among all genotypes tested for this trait, one genotype IC-561655 (36.25) was significantly earlier in flowering, while the genotype EC-378688 took highest number of days to first flowering (59.60).

Number of days to 50 percent flowering ranged from 45.78 to 66.28 days with a total mean of 56.27 days. Among the genotypes, IC-561655 took minimum number of days to 50 percent flowering (45.78 days), while EC-378688 took maximum number of days to 50 percent flowering (66.28 days). Two check varieties LCA-625 (48.53), Pusa Jwala (48.71) and three genotypes *viz.*, IC-363993 (49.03), IC-610383 (49.51) and IC-347044 (50.43) recorded statistically on par values with IC-561655 (45.78 days).

Days to first harvest ranged from 66.66 to 98.66 days with a total mean of 85.09 days. Among the genotypes, IC-561655 took minimum number of days for first harvesting (66.66 days), while IC-610381 took maximum number of days for first harvesting (98.66 days). Four genotypes IC-447018 (68.83 days), LCA-625 (70.83 days), Pusajwala (73.83 days) and Sindhur (74.00 days) recorded statistically at par values with IC-561655 (66.66 days)

Days to last harvest ranged from 131.50 to 163.66 days with a total mean of 147.26 days. Among the genotypes, IC-447018 took minimum number of days for last harvesting (131.50 days), while IC-214965 took maximum number of days to last harvest (163.66 days). Nine genotypes and two check varieties Sindhur (138.33) and LCA-625 (138.66) recorded statistically at par values with IC-447018 (131.50).

Fruit length exhibited a range of 2.88 cm to 14.80 cm with a total mean of 7.46 cm. Among the genotypes, IC-347044 showed maximum fruit length (14.80 cm), while the minimum fruit length (2.88 cm) was observed in IC-610381. Only one genotype IC-347044 (14.80 cm) recorded significantly higher value for fruit length than the check LCA-625 (10.38 cm).

Mean values for fruit diameter ranged from 0.86 cm to 2.21 cm with a total mean of 1.26 cm. Among the genotypes, IC-

610381 showed maximum fruit diameter (2.21 cm), while the minimum fruit diameter (0.86 cm) was observed in Pusa Jwala. Only one genotype IC-610381 (2.21 cm) showed significantly higher value for fruit diameter than the best check Sindhur (1.72 cm).

The mean values for number of fruits per plant ranged from 15.16 to 166.66 with a mean of 67.80 (Table 2). Among the genotypes, IC-363918 (166.66) recorded maximum number of fruits per plant, whereas the genotype EC-378688 (15.16) recorded minimum number of fruits per plant. Two genotypes serially IC-363918 (166.66) and IC-347044 (129.16) were significantly superior to the best check LCA-625 (117.83).

The grand mean of fruit weight was 4.55g with a range of 1.78 g to 11.81 g. Among the genotypes, Sindhur showed maximum fresh fruit weight (11.81 g), while IC-526737 had minimum fresh fruit weight (1.78 g). Seven genotypes *viz.*, Sindhur (11.73 g), EC-378688 (9.40 g), IC-561655 (7.70 g), IC-214965 (7.35 g), IC-570408 (6.63 g), IC-572459 (6.43 g) and IC-347044 (6.41 g) exhibited significantly higher values for fruit weight than the second best check LCA-625 (5.60 g).

Fruit yield per plant ranged from 0.11 kg to 0.82 kg with a total mean of 0.28 kg. Among the genotypes, IC-347044 showed maximum fruit yield per plant (0.82 kg), while the minimum fruit yield per plant (0.11 kg) was observed in EC-390030 and IC-572498. Only one genotype IC-347044 (0.82 kg) recorded significantly higher value for fruit yield per plant than the best check LCA-625 (0.65 kg).

Fruit yield per plot ranged from 1.52 kg to 11.54 kg with a total mean of 3.93 kg. Among the genotypes, IC-347044 showed maximum fruit yield per plant (11.54 kg), while the minimum fruit yield per plant (1.52 kg) was observed in EC-390030 and IC-572498. Only one genotype IC-347044 (11.54 kg) recorded significantly higher value for fruit yield per plant than the best check LCA-625 (8.87 kg).

The quality character ascorbic acid content ranged from 44.71 to 191.80 mg/100g with a total mean of 93.36 mg/100g. Among the genotypes, IC-215012 showed maximum ascorbic acid content (191.80 mg/100g) followed by Pusajwala (191.43mg/100g) which was at par, while the minimum ascorbic acid content (44.71mg/100g) was observed in IC-319335.

The mean values for chlorophyll content of green chillies ranged from 1.13% to 2.24% with the grand mean value of 1.90%. Maximum chlorophyll content (2.24%) was recorded in EC-402113 and EC-399535, while the minimum content of chlorophyll (1.13%) was recorded in Pusa Jwala. Six genotypes *viz.*, IC-610383 (2.16%), IC-561655 (2.16%), IC-215012 (2.16%), EC-390030 (2.13%), IC-610381 (2.12%), IC-319335 (2.10%) recorded statistically at par values with EC-402113 (2.24%) and EC-399535 (2.24%).Two genotypes *viz.*, EC-402113 (2.24%) and EC-399535 (2.24%) recorded significantly higher chlorophyll content than the check LCA 625 (2.02%).

The mean values for the quality trait capsaicin content ranged from 0.21% to 0.83% with a total mean of 0.44%. Among the genotypes, maximum capsaicin content (0.83%) was observed in IC-363993 followed by IC-570408 (0.80%) which was at par, while EC-399567 showed minimum capsaicin content (0.21%). Eleven genotypes *viz.*, IC-363993 (0.83%), IC-570408 (0.80%), IC-363918 (0.74%), IC-526448 (0.71%), IC-319335 (0.70%), IC-410423 (0.67%), EC-399535 (0.59%), IC-561622 (0.58%), IC-505237 (0.51%), EC-390030 (0.51%) and IC-561648 (0.50%) recorded significantly higher values for capsaicin content than the check LCA-625 (0.42%).

Capsanthin content ranged from 137.55 ASTA units to 373.52 ASTA units with a grand mean of 240.08 ASTA units. Among the genotypes, IC-561622 showed maximum capsanthin content (373.52 ASTA units), while the minimum capsanthin content (137.55 ASTA units) was observed in IC-610381. Eight genotypes serially IC-561622 (373.52 ASTA units), IC-526448 (322.18 ASTA units), EC-390030 (319.60 ASTA units), EC-378632 (311.15 ASTA units), IC-610383 (286.18 ASTA units), IC-215012 (283.67 ASTA units), IC-363918 (285.33 ASTA units) and IC-410423 (279.05 ASTA units) recorded significantly higher values for capsanthin content than the check LCA-625 (275.77 ASTA units).

Table 1: List of chilli genotypes used for evaluation along with their sources c-check variety

Tr. No	Genotype	Source	Tr. No	Genotype	Source
T_1	IC-347044	NBPGR Regional Station, Hyderabad	T_{19}	IC-528442	NBPGR Regional Station, Hyderabad
T_2	IC-363918	NBPGR Regional Station, Hyderabad	T_{20}	EC-399535	NBPGR Regional Station, Hyderabad
T_3	IC-363993	NBPGR Regional Station, Hyderabad	T_{21}	EC-378632	NBPGR Regional Station, Hyderabad
T_4	IC-561676	NBPGR Regional Station, Hyderabad	T_{22}	IC-215012	NBPGR Regional Station, Hyderabad
T_5	IC-561622	NBPGR Regional Station, Hyderabad	T_{23}	EC-378688	NBPGR Regional Station, Hyderabad
T_6	IC-610381	NBPGR Regional Station, Hyderabad	T_{24}	IC-214966	NBPGR Regional Station, Hyderabad
T_7	IC-505237	NBPGR Regional Station, Hyderabad	T_{25}	IC-319335	NBPGR Regional Station, Hyderabad
T_8	IC-447018	NBPGR Regional Station, Hyderabad	T_{26}	IC-394819	NBPGR Regional Station, Hyderabad
T_9	IC-572459	NBPGR Regional Station, Hyderabad	T_{27}	IC-572498	NBPGR Regional Station, Hyderabad
T_{10}	IC-610383	NBPGR Regional Station, Hyderabad	T_{28}	EC-399581	NBPGR Regional Station, Hyderabad
T_{11}	IC-214965	NBPGR Regional Station, Hyderabad	T_{29}	IC-526737	NBPGR Regional Station, Hyderabad
T_{12}	EC-402113	NBPGR Regional Station, Hyderabad	T_{30}	IC-570408	NBPGR Regional Station, Hyderabad
T_{13}	IC-410423	NBPGR Regional Station, Hyderabad	T_{31}	IC-561648	NBPGR Regional Station, Hyderabad
T_{14}	IC-526448	NBPGR Regional Station, Hyderabad	T_{32}	IC-334383	NBPGR Regional Station, Hyderabad
T_{15}	EC-399567	NBPGR Regional Station, Hyderabad	T_{33}	SINDHUR^c	RARS, Lam, Guntur, AP
T_{16}	IC-561655	NBPGR Regional Station, Hyderabad	T_{34}	LCA-625^c	RARS, Lam, Guntur, AP
T_{17}	EC-390030	NBPGR Regional Station, Hyderabad	T_{35}	PUSA JWALA^c	IARI, New Delhi
T_{18}	IC-528433	NBPGR Regional Station, Hyderabad			

Table 2: Analysis of Variance for 17 yield and yield attributes in 35 genotypes of chilli

S. No.	Character	Mean Sum of Squares		
		Replications (df=2)	Treatments (df=34)	Error (df=68)
1	Plant height (cm)	11.96	946.55***	118.49
2	Plant spread (cm^2)	77.69	7555136.93***	1434964.10
3	No. of primary branches per plant	0.36	1.62***	0.50
4	Days to first flowering	8.82	161.99***	14.84
5	Days to 50% flowering	5.10	148.81***	18.96
6	Days to first harvest	29.39	357.60***	57.25
7	Days to last harvest	21.60	400.60***	114.50
8	Fruit length (cm)	0.02	30.32***	1.52
9	Fruit diameter (cm)	0.0008	0.47***	0.03
10	No. of fruits/plant	18.14	6347.56***	74.04
11	Fruit weight (g)	0.05	29.51***	0.27
12	Fruit yield per plant (Kg)	0.0005	0.16***	0.003
13	Fruit yield per plot (Kg)	0.15	31.62***	0.61
14	Ascorbic acid (mg/100g)	3.20	11554.87***	2.50
15	Chlorophyll content (%)	0.01	0.34***	0.01
16	Capsaicin content (%)	0.0001	0.16***	0.001
17	Capsanthin content (ASTA units)	0.63	15796.45***	5.36

*** Significant at P= 0.01 level

Table 3: Mean performance Mean values of plant height (cm), plant spread (cm^2), no. of primary branches per plant, days to first flowering, days to 50% flowering, days to first harvest, days to last harvest, fruit length(cm) and fruit diameter (cm) in 35 chilli genotypes

S No.	Genotype	Plant height (cm)	Plant spread (cm^2)	No of primary branches per plant	Days to first flowering	Days to 50% flowering	Days to first harvest	Days to last harvest	Fruit length (cm)	Fruit diameter (cm)
1.	IC-347044	52.63	2491.33	4.61	44.81	50.43	87.16	151.16	14.80	1.25
2.	IC-363918	102.48	4512.78	3.58	45.56	50.98	84.33	148.50	6.45	0.98
3.	IC-363993	71.98	2109.15	3.65	43.26	49.03	81.16	139.33	5.41	0.99
4.	IC-561676	65.68	3368.91	3.40	46.66	52.75	81.66	139.16	6.40	1.49
5.	IC-561622	71.30	3960.16	4.23	51.98	57.85	90.00	153.83	6.93	1.10
6.	IC-610381	102.41	5823.88	5.08	55.01	63.26	98.66	162.83	2.88	2.21
7.	IC-505237	61.50	3273.66	4.21	52.37	58.88	84.83	152.50	8.55	1.17
8.	IC-447018	61.21	2463.78	3.95	51.16	57.11	68.83	131.50	6.75	1.19
9.	IC-572459	58.33	2579.50	4.01	51.35	57.33	90.66	148.16	9.95	1.32
10.	IC-610383	55.16	3829.58	3.26	41.05	49.51	83.66	132.83	5.90	1.52
11.	IC-214965	64.35	4514.09	4.28	56.48	62.80	90.00	163.66	9.95	1.50
12.	EC-402113	54.75	3762.91	4.06	50.30	57.15	89.76	152.50	7.36	1.25
13.	IC-410423	68.31	5025.05	4.81	50.65	55.88	81.13	152.33	5.53	1.08
14.	IC-526448	65.31	4960.23	4.83	53.23	57.41	87.65	153.50	7.13	1.04
15.	EC-399567	47.53	2835.66	3.81	48.316	55.86	91.11	157.83	6.55	1.49
16.	IC-561655	57.46	2830.96	3.71	36.25	45.78	66.66	134.66	7.86	1.71
17.	EC-390030	48.78	3401.95	3.60	53.43	57.70	82.66	159.66	9.13	1.11
18.	IC-528433	48.60	2910.15	5.05	43.43	51.78	83.33	138.83	6.86	1.28
19.	IC-528442	57.11	4444.16	4.38	53.91	57.76	89.16	152.50	6.80	1.27
20.	EC-399535	53.33	2231.65	4.18	51.40	55.23	81.16	138.33	7.48	1.08
21.	EC-378632	75.66	4859.68	4.40	51.16	56.66	85.16	140.83	6.30	0.88
22.	IC-215012	65.75	5950.50	5.15	54.61	61.41	92.16	149.16	7.41	1.42
23.	EC-378688	52.76	2576.41	3.46	59.60	66.28	90.66	147.16	9.98	1.35
24.	IC-214966	68.63	2884.80	4.30	54.63	58.18	90.66	145.50	7.83	1.08
25.	IC-319335	63.51	4840.38	4.78	49.51	54.56	84.83	146.00	6.70	0.91
26.	IC-394819	58.73	4297.90	4.26	53.16	58.05	93.00	154.33	5.21	0.98
27.	IC-572498	68.78	3551.73	4.53	52.28	59.03	97.00	151.66	3.71	1.47
28.	EC-399581	48.40	1993.29	4.11	54.31	59.30	88.16	151.00	6.55	1.29
29.	IC-526737	60.68	3206.78	3.51	57.03	62.03	97.50	151.66	6.21	1.04
30.	IC-570408	71.46	5072.14	4.53	53.63	61.73	80.83	146.33	10.26	1.18
31.	IC-561648	52.80	3022.21	3.66	46.18	52.50	78.33	139.00	7.68	1.59
32.	IC-334383	54.81	4121.28	4.46	49.96	53.31	87.66	143.33	4.68	1.13
33.	SINDHUR	53.61	1707.83	4.48	57.66	64.86	74.00	138.33	9.51	1.72
34.	LCA-625	60.11	4074.16	4.40	45.18	48.53	70.83	138.66	10.38	1.18
35.	PUSA JWALA	71.71	5034.33	5.01	42.61	48.71	73.83	147.66	10.15	0.86
	Mean	62.73	3672.08	4.22	50.35	56.27	85.09	147.26	7.46	1.26
	C.D. (5%)	12.40	1365.25	0.80	4.39	4.96	8.62	12.19	1.40	0.20
	S.E. (m)	4.44	489.04	0.28	1.57	1.77	3.08	4.36	0.50	0.07

Table 4: Mean values of no. of fruits per plant, fruit weight (g), fruit yield per plant (Kg), fruit yield per plot (Kg), ascorbic acid (mg/100g), chlorophyll (%), capsaicin (%) and capsanthin (ASTA units) in 35 chilli genotypes

S No.	Genotype	No. of fruits per plant	Fruit weight (g)	Fruit yield per plant (Kg)	Fruit yield per plot (Kg)	Ascorbic acid (mg/100g)	Chlorophyll (%)	Capsaicin (%)	Capsanthin (ASTA units)
1.	IC-347044	129.16	6.41	0.82	11.54	62.33	1.68	0.38	218.37
2.	IC-363918	166.66	2.56	0.42	5.95	72.72	1.84	0.74	283.53
3.	IC-363993	67.83	1.90	0.13	1.82	55.65	1.31	0.83	212.48
4.	IC-561676	46.00	3.18	0.14	1.97	82.95	1.98	0.35	255.80
5.	IC-561622	92.66	4.35	0.40	5.61	53.89	1.78	0.58	373.52
6.	IC-610381	53.33	6.04	0.32	4.49	45.52	2.12	0.24	137.55
7.	IC-505237	78.00	5.06	0.39	5.49	109.58	1.93	0.51	274.80
8.	IC-447018	70.83	4.30	0.30	4.20	48.85	1.95	0.32	252.91
9.	IC-572459	31.00	6.43	0.19	2.75	101.10	1.86	0.44	207.03
10.	IC-610383	58.16	4.14	0.23	3.31	114.71	2.16	0.37	286.18
11.	IC-214965	64.50	7.35	0.47	6.72	175.03	1.92	0.27	225.21
12.	EC-402113	57.00	5.35	0.30	4.29	76.90	2.24	0.32	266.82
13.	IC-410423	102.66	2.73	0.28	3.90	58.00	1.95	0.67	279.05
14.	IC-526448	89.33	2.26	0.20	2.88	48.42	1.91	0.71	322.18
15.	EC-399567	50.50	5.50	0.27	3.83	112.05	1.91	0.21	232.80
16.	IC-561655	19.83	7.70	0.14	2.11	119.98	2.16	0.39	243.93
17.	EC-390030	36.16	3.15	0.11	1.52	109.26	2.13	0.51	319.60
18.	IC-528433	57.00	3.13	0.17	2.45	51.35	2.01	0.38	230.05
19.	IC-528442	94.50	4.05	0.39	5.46	154.95	1.82	0.31	140.88
20.	EC-399535	53.66	2.96	0.15	2.24	62.03	2.24	0.59	212.66
21.	EC-378632	81.66	3.50	0.28	3.94	56.28	1.81	0.40	311.15
22.	IC-215012	68.50	4.00	0.27	3.78	191.80	2.16	0.32	283.67
23.	EC-378688	15.16	9.40	0.13	1.92	127.66	1.97	0.31	199.42
24.	IC-214966	37.83	4.89	0.18	2.58	67.60	1.83	0.46	191.92
25.	IC-319335	72.16	2.56	0.18	2.52	44.71	2.10	0.70	203.17
26.	IC-394819	58.83	2.42	0.14	1.99	111.24	1.65	0.31	165.33
27.	IC-572498	22.66	4.95	0.11	1.54	100.74	1.98	0.24	253.41
28.	EC-399581	50.00	4.09	0.20	2.83	172.06	1.96	0.42	227.98
29.	IC-526737	79.83	1.78	0.13	1.92	45.03	2.03	0.26	186.36
30.	IC-570408	85.16	6.63	0.56	7.85	113.51	1.81	0.80	175.06
31.	IC-561648	40.83	4.43	0.17	2.46	59.41	1.82	0.50	222.41
32.	IC-334383	67.83	1.93	0.13	1.82	52.70	1.98	0.38	247.00
33.	SINDHUR	39.83	11.81	0.46	6.53	123.01	1.51	0.35	240.95
34.	LCA-625	117.83	5.60	0.65	8.87	95.06	2.02	0.42	275.77
35.	PUSA JWALA	116.33	2.70	0.31	4.34	191.43	1.13	0.41	243.82
	Mean	67.80	4.55	0.28	3.93	93.36	1.90	0.44	240.08
	C.D. (5%)	9.80	0.59	0.06	0.89	1.80	0.14	0.04	2.63
	S.E. (m)	3.51	0.21	0.02	0.31	0.64	0.05	0.01	0.94

Conclusion

The traits showing wide range of variation provide an ample scope for selecting superior types which can be used in breeding programme for introgression of their desired genes into the high yielding varieties. The genotypes which perform better for various yield traits may be further evaluating to find the best one at other location to use in breeding programme or can be utilized as parents in developing high yielding varieties.

References

1. Amit K, Ahad I, Kumar V, Thakur S. Genetic variability and correlation studies for growth and yield characters in chilli (*Capsicum annuum* L.). Journal of Spices and Aromatic Crops 2017;23(2):170-7.
2. Bosland PW, Botava EJ. Peppers: vegetable and spice capsicums. CABI.Publishing, Wallingford, United Kingdom 2000,204.
3. Chopra S, Gupta AK, Samnotra RK, Bhushan A. Performance of Chilli (Capsicum annum L.) Genotypes under Sub-Tropical Conditions of Jammu. Environment and Ecology 2005;23(2):323.
4. Das B, Hazarica MS, Das PK. Studies on variability and correlation studies in fruit characters of tomato (*Lycopersicon esculentum* Mill.). Ann. Agri. Res 1998;19(1):77-80.
5. El Ghoraba AH, Javedb Q, Anjumb FM, Hamedc SF, Shaabana HA. Pakistani bell pepper (*Capsicum annum* L.): Chemical compositions and its antioxidant activity. International Journal of Food Properties 2013;16(1):18-32.
6. Fisher RA, Yates F. Statistical tables for biological, agricultural and medical research, Longman Group Limited, London 1967.
7. Hasanuzzaman M, Hakim MA, Fersdous J, Islam MM, Rahman L. Combining ability and heritability analysis for yield and yield contributing characters in chilli (*Capsicum annuum*) landraces. Plant Omics 2012;5(4):337.
8. Jabeen N, Shahnaz M, Khan SH, Hussain K, Tasaduk S. Comparative performance of chilli genotypes and hybrids under Kashmir valley conditions (*Capsicum annum* L.). Asian Journal of Horticulture 2011;6(2):471-3.
9. Jyothi KU, Kumari SS, Ramana CV. Variability studies

in chilli (*Capsicum annuum* L.) with reference to yield attributes. Journal of Horticultural Science 2011;6(2):133-5.
10. Maurya AK, Kushwaha ML, Jain VK, Singh N. Evaluation of chilli (*Capsicum annuum* L.) genotypes for yield and performance against diseases. Progressive Research – An International Journal 2016;11(vii):4615-4617.
11. Panse VG, Sukhatme PV. Statistical methods for Agricultural workers. Indian council of Agriculture Research, New Delhi 1985,134-192.
12. Peter KV, Rai B. Heterosis as a function of genetic distance in tomato. Indian Journal of Genetics and Plant Breeding 1978;38(2):173-178.
13. Prasad BP, Usha NDH, Arumugam T, Karthikeyan M. Growth and performance of different chilli genotypes for yield and yield attributing characters. Journal of Pharmacognosy and Phytochemistry 2019;8(4):210-213.
14. Pujar UU, Tirakannanavar S, Jagadeesha RC, Gasti VD, Sandhyarani N. Analysis of genetic divergence in Chilli (*Capsicum annum* L.) genotypes. International journal pure applied biosciences 2017;5(5):503-508.
15. Rani PU. Fruit seed weight and seed attributes on the quality characteristics in chilli. Madras Agricultural Journal 1996;83:259-264.
16. Salvador MH. Genetic resources of chilli (*Capsicum annuum* L.) in Mexico, Proceedings of the 16th International Pepper Conference, Tampico, Tamaulipas, Mexico 2002,10-12.
17. Srinivas J, Ravinder RK, Saidaiah P, Anitha K, Pandravada SR. Performance of Chilli Genotypes for Yield and Yield Attributes of Fruit Quality in Southern Telangana, India. International Journal of Current Microbiology and Applied Sciences 2017;6(11):469-477.