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Performance evaluation and correlation analysis in F_2 generations of chilli (*Capsicum annuum* var. *annuum*)

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Abstract: The present investigation on mean and correlation analysis was conducted on genetically diverse thirty F_2 progenies of chilli. The observation were recorded on the following traits, plant height, branches per plant, days to 50% flowering, fruits per plant, fruit length, fruit girth, individual fresh fruit weight, individual dry pod weight, fresh fruit yield per plant and dry pod yield per plant. Significant different were observed among the progenies for all the traits. On the basis of mean performance, progenies K 1 x Pusa Jwala, K 1 x PKM 1, LCA 625 x K 1, Pusa Jwala x PKM 1 and Pusa Jwala x K 1 were superior performed for fruit yield per plant, average fresh fruit and dry pod weight, fruits per plant and took less number of days to 50% flowering. Correlation studies revealed that dry pod yield per plant was significant and positive correlated with plant height, branches per plant, fruits per plant, fruit girth, fresh fruit weight, dry pod weight and fresh fruit yield. However negative association was observed with days to 50% flowering and fruit length. Hence selecting chilli progenies with early flowering, more number of branches and fruits per plant, high fruit weight will help to improve yield per plant in chilli.

Key words: Chilli, F_2 generation, Evaluation, Correlation

Introduction

Chili has its unique place in Asian diet as a spice as well as a vegetable. It is also a high value crop grown common in almost all parts of the world. At present the extent under chilli cultivation in India is 7, 94,000 hectares and the average with the production of 1600 kg per hectare (Indian Horticulture Data base, 2013). In India the major chilli growing states are Andhra Pradesh, Karnataka, Maharashtra, Odissa, Tamil Nadu and West Bengal. The genus Capsicum is on often cross pollinated and natural cross pollination may go up to 50 per cent depending upon the extent of style exertion, time of dehiscence of anthers, wind direction and insect population (Murthy and Murthy, 1962; Hosmani, 1993). This accounts for considerable variation in fruit and yield parameters. India has the potentiality to increase the production in order to promote export besides meeting its domestic requirements. However, despite continuous efforts at various levels, the chilli productivity did not gain momentum. This could be attributed to a number of limiting factors of which the prime factor is the lack of superior genotypes for further development of superior high yielding cultivars (or) hybrids.

The success of any breeding programme primarily depends on the correct choice of parents. Gilbert (1958) opined that parents with high order of *per se* performance would be useful in producing better genotypes. Improvement in yield and quality is the main objective at which plant breeder aims, by altering their genetic architecture. Information on nature and magnitude of variability present in the material and association among the various characters is a pre-requisite for any breeding programme. Yield being a complex character, which is not only influenced by its associated traits but also governed by number of genes and influenced by environment. So, to make selection effective, it is necessary to separate genetic variability from total variability, which enables breeder to adopt suitable breeding programme. The variability studies alone will not be of much helpful for improvement of yield, as it is associated with number of component characters. Therefore, it is essential to know the degree of mutual association (correlation) prevailing between yield and its component characters, which forms the basis for selecting desirable genotypes. Hence, the study was undertaken with an objective of selecting high yielding types of chilli to determine the interrelationship of quantitative characters contributing to yield characters of chilli.

Materials and Methods

The present investigation on "Performance evaluation of F_2 generations of chilli (*Capsicum annuum* L.)" was carried out in the experimental farm of Department of Vegetable Crops, Horticultural College and Research Institute, Tamil Nadu Agricultural University, Periyakulam during 2012-14, which is situated at 10 ^{0}N latitude and 77 ^{0}E longitude with an altitude of 300 m above mean sea level. Six homozygous inbreds of chilli were selected based on their diverse background for fruit and others agronomics characters for a full diallel cross was made in 2013. The ready to open flowers bud were hand emasculated and pollinated to produce all possible combination of F_1 hybrids with reciprocals. After fruit set, the bags were removed to facilitate uninterrupted development of the fruits. Seeds were extracted from fully dried pods, cleaned for raising the progenies of F_1 and F_2 hybrids. The selfed seeds from F_1 were collected and utilized for raising F_2 generation. All the F_2 were

raised for further evaluation. The selections were made in the F_2 progeny on the basis of single plant fruit yield. The superior single plants were selected. The seeds from the selfed fruits were collected and stored for further evaluation. Data were collected from individual plants of F_2 generation of chilli for ten quantitative traits viz., Plant height, branches per plant, days to 50 % flowering, fruits per plant, fruit length, fruit girth, individual fresh fruit weight, individual dry pod weight, fresh fruit yield per plant, dry pod yield per plant. The statistical parameters like mean, range were calculated as per the standard methods of analysis (Panse and Sukhatme, 1957). Correlation co-efficients for yield and other traits in all thirty hybrids were worked out as suggested by Johnson *et al.* (1955).

Results and Discussion

The success of any plant breeding programme greatly depends on right choice of parents. The genetic potential of genotype is to be guided by it's *per se* performance. In any breeding programme, the cross or family with the highest mean was relatively effective in identifying the superior segregants (Finkner *et al*., 1973) as it serves to eliminate undesirable crosses (Natarajan, 1992). Hence, all 30 F_2 progenies were evaluated for growth ad yield attributes (Table-1). The F_2 progenies showed a wide range of variation in different yield components. Plant height is an important component by which the growth and vigour of the plants are measured. The crosses Pusa Jwala x K 1 (91.50 cm), K 1 x LCA 625 (86.90 cm) and PKM 1 x K 1 (86.38 cm) recorded the highest mean for plant height. These three crosses also had wider range of mean for this trait. The variation in plant height might have due to specific genetic make up of different crosses, inherent properties, hormonal factor and vigour of crop. Such information on difference in plant height was noted to be available from the studies of Sonia *et al.* (2006) and Sarkar *et al*. (2009). Number of branches per plant influences the yield to a significant extent. The primary branches as well as secondary branches decide the spread of the plant. The crosses Arka Lohit x LCA 334 (14.60), PKM 1 x LCA 625 (12.18), Pusa Jwala x PKM 1 (11.84), PKM 1 x Pusa Jwala (11.20) and LCA 625 x K 1 (10.20) had the highest mean with wider range for branches per plant.

The variation in number of branches due to own genetic make up and also due to plant height, hormonal and environmental factor. The results are in accordance with the findings of Manju and Sreelathakumary (2002) and Smitha and Basavaraja (2006). In general, earliness in chilli is measured as the days to 50 % flowering and it is considered as desirable traits in any varietal development programme. In the present studies minimum number of days taken for 50 % flower appearance was observed in the crosses K 1 x Arka Lohit (67.40 days), K 1 x PKM 1 (67.74 days), K 1 x LCA 625 (69 days), K 1 x Pusa Jwala (69.16 days) and PKM 1 x LCA 625 (70.56 days) which could be adjusted as the best progenies for development of chilli crosses with earliness. Similar results were also obtained by Shirshat *et al.* (2007) and Sharma *et al*. (2010). The selection for high yielding genotypes should be mainly based on the number of fruits (Gill *et al.*, 1973). In this study, the crosses K 1 x Pusa Jwala (158.38), LCA 625 x K 1 (158.30), K 1 x PKM 1 (153.60), Pusa Jwala x PKM 1 (153.00) and PKM 1 x LCA 625 (148.00) recorded more number of fruits per plant with wider range. This is due to fruit set percentages, genetic nature and their response to varying environmental conditions. These results are in agreement with the findings of Bhojaraja Naik (2009), Chattopadhyay *et al.* (2011) and Datta and Das (2013). Fruit length decides the individual dry pod weight thereby the yield. The length was the highest in the crosses Pusa Jwala x PKM 1 (9.35 cm), K 1 x PKM 1 (9.24 cm) Pusa Jwala x K 1 (9.23 cm), Arka Lohit x LCA 334 (8.67 cm) and K 1 x Arka Lohit (8.49 cm). Similar results for this trait were observed by Shirshat *et al*. (2007) and Pandit and Adhikary (2014). In respect of fruit girth high mean is considered and is equally important in deciding the individual fruit weight, high fruit girth leads to increased fruit yield. The crosses K 1 x Arka Lohit (3.95 cm), Pusa Jwala x K 1 (3.92 cm), Arka Lohit x LCA 334 (3.75 cm), K 1 x Pusa Jwala (3.68 cm) and Pusa Jwala x PKM 1 (3.63 cm) had the highest fruit girth and these crosses exhibited wide range. The highest fruit length and fruit girth might have due to genetic nature, environment and vigor of the crops. The present results are in conformity with finding of Sonia *et al.* (2006) and Chattopadhyay *et al*. (2011).

Fruit weight is the most important components that contribute directly to the yield in chilli. K 1 x PKM 1 (4.16 g) K 1 x Arka Lohit (4.15 g), Pusa Jwala x K 1 (4.10 g), Pusa Jwala x PKM 1 (4.08 g) and K 1 x Pusa Jwala (3.91 g) registered comparatively higher fruit weight in favorable direction. The presence of highest number of better recombinants in the population would have resulted in higher fruit weight. These results are in accordance with the findings of Sonia *et al.* (2006), Bhojaraja Naik (2009) and Sarkar *et al.* (2009). Yield is mainly dependent on fruit weight and number of fruits per plant (Studentsova, 1976). With respect to dry pod weight, the progenies Pusa Jwala x PKM 1 (0.90 g), Pusa Jwala x K 1 (0.90 g), LCA 625 x K 1 (0.89 g), K 1 x Arka Lohit (0.89 g) and Arka Lohit x LCA 334 (0.89 g) recorded the highest favourable *per se* value among the chilli progenies of study. The above said crosses become good source for selection of desirable recombinants for more number of fruits per plant. Similar results were earlier reported by Bhojaraja Naik (2009) and Pandit and Adhikary (2014). Yield is a composite character and is dependent on many constituent traits. Any change in these constituent traits would reflect on total yield. In case of fresh fruit yield and dry pod yield, the crosses K 1 x PKM 1 (680.50 and 135.48 g), Pusa Jwala x PKM 1 (623.80 and 128.12 g), K 1 x Arka Lohit (595.61 and 125.49 g), LCA 625 x K 1 (592.38 and 131.73 g) and K 1 x Pusa Jwala (570.00 and 124.52 g) had the highest mean with wider range. Grafius (1959), who had suggested that there could be no separate gene system for yield *per se* as yield is an end product of multiplicative interactions between its component characters. The variation in fruit yield per plant might have been due to fruit set percentage, number of fruits per plant, fruit length, fruit girth, genetic nature, environmental factor and vigour of the crop. These findings are in accordance with Varkey *et al.* (2005), Chattopadhyay *et al*. (2011) and Datta and Das (2013).

The mean performance of 30 F_2 progenies revealed that yield contributing characters *viz*., number of fruits per plant, fruit length, fruit girth, individual fresh fruit weight and individual dry pod weight were observed in K 1 x PKM 1, LCA 625 x K 1, K 1 x Pusa

Table-1: Mean performance of F_2 populations of chilli for yield and its related characters

F_2 progenies	Plant height (cm)		Branches per plant		Days to 50% flowering		Fruits per plant		Fruit length (cm)	
	Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean
Arka Lohit x K 1	32.76 -78.51	65.81	5.00 -11.00	8.39	67.00-79.00	73.00	69.00-126.00	91.00	5.05-8.65	7.98
Arka Lohit x LCA 334	38.09-98.19	80.69	6.00-20.00	14.60	68.00-80.00	74.00	78.00-192.00	138.00	5.27-9.87	8.67
Arka Lohit x LCA 625	38.70-87.80	72.50	5.00-13.00	8.48	67.00-84.00	76.00	55.00-120.00	95.00	5.87-8.34	7.23
Arka Lohit x PKM 1	35.00-82.10	58.62	5.00-14.00	9.25	68.00-82.00	72.78	48.00-96.00	76.00	6.25-8.69	8.09
Arka Lohit x Pusa Jwala	36.50-87.59	76.36	6.00-15.00	9.40	70.00-84.00	76.00	72.00-138.00	107.50	4.54-6.80	6.05
K 1x Arka Lohit	38.20-98.50	84.50	6.00-16.00	10.10	63.00-74.00	67.40	72.00-196.00	143.83	5.68-9.81	8.49
K 1 x LCA 334	27.41-81.21	60.20	5.00-14.00	9.64	68.00-83.00	75.10	50.00-121.00	80.30	5.06-8.10	7.36
K 1 x LCA 625	35.14-98.50	86.90	6.00-18.00	10.54	63.00-74.00	69.00	58.00-164.00	126.80	5.24-9.25	8.85
K 1 x PKM 1	30.37-85.40	63.45	5.00-14.00	8.97	62.00-72.00	67.74	69.00-197.00	153.60	5.58-10.93	9.24
K1 x Pusa Jwala	30.15-88.64	71.58	5.00-15.00	9.80	63.00-75.00	69.16	64.00-198.00	158.38	5.00-9.18	8.69
LCA 334 x Arka Lohit	39.50-89.48	83.50	4.00-9.00	6.50	71.00-84.00	78.22	35.00-92.00	65.00	5.24-7.85	7.21
LCA 334 x K1	26.50-82.70	74.28	5.00-11.00	8.40	70.00-83.00	76.14	41.00-104.00	76.00	5.66-8.84	7.93
LCA 334 x LCA 625	29.85-68.39	53.13	5.00-12.00	8.57	71.00-85.00	77.96	56.00-116.00	86.27	5.62-8.65	7.85
LCA 334 x PKM 1	30.00-85.36	76.90	4.00-12.00	7.90	71.00-85.00	77.16	35.00-108.00	65.00	5.21-8.59	7.53
LCA 334 x Pusa Jwala	36.57-86.87	75.10	5.00-9.00	7.40	70.00-83.00	76.62	36.00-108.00	84.00	4.00-7.32	5.80
LCA 625 x Arka Lohit	42.69-93.57	72.50	8.00-16.00	11.30	68.00-82.00	73.12	48.00-125.00	108.00	5.00-8.65	7.57
LCA 625 x K 1	31.97-87.28	76.50	5.00-16.00	10.20	65.00-78.00	71.00	68.00-198.00	158.30	5.92-9.78	8.64
LCA 625 x LCA 334	28.54-75.67	57.36	6.00-13.00	8.20	73.00-83.00	79.00	49.00-137.00	100.00	5.28-8.85	8.04
LCA 625 x PKM 1	29.45-86.71	73.50	6.00-15.00	9.12	67.00-79.00	73.84	55.00-158.00	115.00	6.35-9.65	8.84
LCA 625 x Pusa Jwala	34.15-92.18	80.65	6.00-15.00	9.80	68.00-80.00	73.44	55.00-140.00	104.00	5.18-8.20	7.23
PKM 1 x Arka Lohit	37.28-93.56	83.20	6.00-12.00	8.42	70.00-84.00	75.56	65.00-145.00	108.50	5.98-8.85	7.58
PKM 1 x K1	34.67-96.09	86.38	4.00-15.00	11.50	65.00-76.00	71.30	72.00-170.00	132.00	6.00-9.85	9.10
PKM 1x LCA 335	33.82-87.17	78.47	5.00-11.00	8.37	70.00-84.00	76.06	47.00-120.00	98.00	5.98-8.65	7.80
PKM 1 x LCA 625	32.89-94.86	81.65	5.00-18.00	12.18	67.00-77.00	70.56	82.00-193.00	148.00	6.58-9.68	8.59
PKM 1x Pusa Jwala	39.58-86.00	75.60	5.00-16.00	11.20	65.00-76.00	72.04	58.00-158.00	107.00	5.00-8.85	8.00
Pusa Jwala x Arka Lohit	24.08-69.04	54.00	6.00-11.00	9.34	67.00-79.00	73.24	75.00-139.00	148.00	5.12-8.25	6.85
Pusa Jwala x K 1	38.68-102.63	91.50	5.00-13.00	8.70	66.00-78.00	71.60	73.00-191.00	138.00	6.54-11.39	9.23
Pusa Jwala x LCA 334	28.50-72.62	65.28	4.00-9.00	7.88	71.00-84.00	75.54	45.00-105.00	78.00	3.90-7.95	5.82
Pusa Jwala x LCA 625	27.93-81.50	72.68	5.00-14.00	9.56	69.00-80.00	74.40	62.00-148.00	95.00	5.26-8.95	7.83
Pusa Jwala x PKM 1	38.91-93.05	81.35	5.00-17.00	11.84	68.00-77.00	71.96	78.00-198.00	153.00	6.25-11.52	9.35
Arka Lohit x K 1	2.20-3.56	2.90	2.49-3.91	3.34	0.58-0.92	0.79	125.00-463.68	298.72	25.00-83.25	65.60
Arka Lohit x LCA 334	2.39-4.29	3.75	2.87-4.43	3.65	0.49-1.01	0.89	198.20-872.45	500.35	25.68-158.04	120.87
Arka Lohit x LCA 625	2.45-3.60	3.04	2.00-3.30	2.58	0.60-0.88	0.81	125.80-388.21	250.13	29.38-88.82	76.87
Arka Lohit x PKM 1	2.64-4.10	3.41	2.54-3.74	3.25	0.58-0.81	0.69	160.00-390.47	245.68	30.25-87.33	54.04
Arka Lohit x Pusa Jwala	2.58-3.36	3.01	1.78-3.07	2.47	0.45-0.72	0.63	137.40-384.56	264.20	29.58-79.50	67.00
K 1 x Arka Lohit	2.57-4.69	3.95	2.35-4.90	4.15	0.58-1.19	0.89	385.71-891.95	595.61	38.62-169.18	125.49
K 1 x LCA 334	2.15-3.69	3.00	1.75-3.35	2.52	0.51-0.86	0.75	98.50-354.00	200.30	18.39-74.70	57.07
K 1 x LCA 625	2.69-3.90	3.47	2.32-4.85	4.09	0.59-1.01	0.88	196.86-685.73	515.70	33.97-143.89	108.62
K 1x PKM 1	2.78-4.05	3.59	2.39-4.90	4.16	0.52-1.00	0.85	215.50-857.18	680.50	43.83-184.38	135.48
K 1 x Pusa Jwala	2.98-4.15	3.68	2.96-4.58	3.91	0.48-1.02	0.86	237.46-809.58	570.00	56.82-172.37	124.52
LCA 334 x Arka Lohit	2.59-3.60	3.13	2.81-3.74	3.41	0.50-0.85	0.72	85.00-305.20	220.06	16.44-59.82	45.71
LCA 334 x K 1	2.31-3.81	3.20	1.58-3.15	2.48	0.38-0.78	0.65	94.79-320.13	187.62	18.35-70.02	48.45
LCA 334 x LCA 625	2.15-3.69	3.12	2.14-3.69	2.81	0.40-0.79	0.67	90.20-330.51	241.58	17.41-70.25	56.20
LCA 334 x PKM 1	2.01-3.36	2.84	2.06-3.69	3.00	0.42-0.78	0.67	81.30-284.57	193.83	16.44-66.38	42.62
LCA 334 x Pusa Jwala	2.00-3.29	2.76	1.85-3.52	2.90	0.38-0.65	0.51	114.19-336.48	242.90	16.44-69.50	41.02
LCA 625 x Arka Lohit	2.15-3.45	2.80	2.24-3.95	3.37	0.45-0.88	0.78	182.24-524.00	383.47	27.41-99.86	78.34
LCA 625 x K 1	2.95-4.15	3.47	2.48-4.52	3.75	0.40-1.05	0.89	253.60-868.50	592.38	54.74-173.53	131.73
LCA 625 x LCA 334	2.65-3.87	3.31	1.49-3.20	2.45	0.42-0.75	0.65	116.89-444.38	280.00	20.10-77.25	65.15
LCA 625 x PKM 1	2.00-3.70	3.10	2.10-4.15	3.50	0.42-0.86	0.76	185.61-553.72	402.38	32.50-98.00	78.95
LCA 625 x Pusa Jwala	2.15-3.54	3.05	1.95-3.21	2.58	0.49-0.81	0.70	148.63-394.62	251.57	21.92-80.35	62.05
PKM 1 x Arka Lohit	2.14-3.52	2.84	1.93-3.53	2.98	0.36-0.69	0.58	175.32-538.98	321.68	28.42-69.36	52.82
PKM 1 x K1	3.00-4.21	3.62	3.00-4.58	3.85	0.49-0.98	0.82	189.57-664.38	507.00	29.23-110.00	90.17
PKM 1x LCA 335	1.86-2.97	2.54	1.75-3.21	2.51	0.34-0.69	0.59	161.69-398.00	245.30	22.84-68.95	48.18
PKM 1 x LCA 625	2.35-3.98	3.52	2.45-4.51	3.80	0.48-0.94	0.80	298.61-838.57	560.76	35.63-137.33	109.51
PKM 1x Pusa Jwala	2.65-3.92	3.40	3.09-4.68	3.96	0.46-0.95	0.80	234.25-597.58	387.28	24.66-93.59	73.88
Pusa Jwala x Arka Lohit	1.59-3.04	2.51	1.54-2.84	2.35	0.42-0.72	0.63	215.07-409.50	347.10	23.75-81.13	74.27
Pusa Jwala x K 1	2.36-4.65	3.92	2.53-4.98	4.10	0.52-1.07	0.90	272.22-824.36	565.00	37.35-150.82	111.15
Pusa Jwala x LCA 334	1.56-2.85	2.37	1.51-2.95	2.10	0.33-0.61	0.50	89.05-295.20	152.49	14.62-45.33	33.96
Pusa Jwala x LCA 625	2.00-3.02	2.87	1.89-3.85	3.00	0.48-0.85	0.71	113.51-492.66	285.00	22.84-83.23	66.55
Pusa Jwala x PKM 1	2.91-4.36	3.63	2.48-4.75	4.08	0.51-1.08	0.90	253.60-849.53	623.80	55.49-166.50	128.12

Table-2: Correlation co-efficient for yield and its related characters in F_2 populations of chilli

Characters	PH	BPP	DFF	FPP	FL	FG	IFFW	IDPW	FFYPP	DPYPP
PH	1	0.097	-0.062	0.064	0.024	0.166*	0.275**	0.199*	0.159	0.175*
BPP		1	-0.147	0.241**	-0.091	0.199*	0.254**	0.241**	0.248**	0.255**
DFF			1	-0.357**	0.082	-0.266**	-0.365**	-0.309**	-0.410**	-0.384**
FPP				1	-0.055	0.346**	0.382**	0.346**	0.534**	0.507**
FL					1	-0.105	-0.027	-0.216*	-0.084	-0.141
FG						1	0.499**	0.458**	0.462**	0.467**
IFFW							1	0.539**	0.578**	0.568**
IDPW								1	0.488**	0.567**
FFYPP									1	0.692**
DPYPP										1

*Significant at 5 per cent level **Significant at 1 per cent level; PH: Plant height, FG: Fruit girth, BPP: Branches per plant, IFFW: Individual fresh fruit weight, DFF: Days to 50 per cent flowering; IDPW: Individual dry pod weight, FPP: Fruits per plant, FFYPP: Fresh fruit yield per plant, FL: Fruit length, DPYPP: Dry pod yield per plant

Jwala, Pusa Jwala x PKM 1and K 1 x Arka Lohit. The hybrids Arka Lohit x LCA 334 and Pusa Jwala x K 1 recorded better values for plant height, fruit length, branch number and individual dry pod weight. The traits which showed higher mean thereby lending scope for selection.

Correlation analysis: Simple correlation plays significant role to study the interrelationship and relative contribution of each character for crop improvement. Yield is a complex character and it is a function of several component characters and their interaction. Hence selection based on yield performance alone may give a biased result and led to ambiguity. A study on the nature and degree of association of component characters with yield assumes greater importance for fixing up characters that play a decisive role in influencing yield. Selection would therefore be more effective, if it is based on component characters rather than directly on yield. Correlation co-efficient analysis measures the mutual relationship between various characters. It is used to determine the component characters on which selection can be done for improvement in yield. Jabeen *et al*. (2009) Sharma *et al*. (2010) and Chattopadhyay *et al*. (2011) reported positive association of yield with various yield components. Dry pod yield per plant showed significant positive association with the traits plant height, branches per plant, fruits per plant, fruit girth, individual fresh fruit weight, individual dry pod weight and fresh fruit yield per plant (Table 2). . This information suggests that yield could be improved through selection based on plant height, branches per plant, fruits per plant, fruit girth, individual fresh fruit weight, individual dry pod weight and fresh fruit yield per plant. These results are in consonance with Dipendra and Gautam (2003), Krishna *et al*. (2007) and Reddy *et al*. (2008).

Considering the inter relationship, differential association was observed among the yield component characters. Plant height had positive and significant correlation with fruit girth, individual fresh fruit weight and individual dry pod weight. This indicates that higher the plant height, better the genetic complement for enhanced production. Similar results were reported by Mubarak (2002), Reddy *et al*. (2008) and Jabeen *et al*. (2009). Branches per plant in chilli was positive and significantly correlated with fruits per plant, fruit girth, individual fresh fruit weight, individual dry pod weight and fresh fruit yield per plant. This shows that higher branches per plant influence the yield to a significant extent through facilitating the production of more number of flowers. These results are in accordance with the reports of Ibrahim *et al*. (2001) and Yadwad (2005).

Days to 50% flowering showed significant negative correlation with fruits per plant, fruit girth, individual fresh fruit weight, individual dry pod weight and fresh fruit yield. This indicated that early flowering resulted in increased number of fruits, fruit girth, fruit weight and thereby increased yield. The result of the present investigation is in consonance with findings of Mubarak (2002) and Lingana and Ravindra (2003). A significant positive correlation was found in the trait number of fruits per plant. It also showed significant positive association with the traits, fruit girth, individual fresh fruit weight, individual dry pod weight and fresh fruit yield per plant indicating that the selection towards number of fruits per plant and number branches per plant would result in simultaneous selection towards fresh and dry fruit weight. Similar results for correlation of fruits per plant with other component characters were also cited by Yadwad (2005), Reddy *et al*. (2008) and Jabeen *et al*. (2009). Fruit length expressed negative correlation with fruit girth, individual fresh fruit weight, individual dry pod weight and fresh fruit yield per plant. Similar results were reported by Ibrahim *et al*. (2001) and Smitha and Basavaraja (2006). The fruit girth had positive correlation with dry pod yield per plant. This indicated that increase in fruit girth will increases weight of fruit and ultimately the yield will be increased. Similar results were also observed by Yadwad (2005) and Krishna *et al*. (2007). The association between individual fresh fruit weight, individual dry pod weight and fresh fruit yield per yield was significant and positive. This indicated that the fruit weight and fresh fruit yield increase will eventually increases the dry pod yield. These results are in consonance with Krishna *et al*. (2007) and Jabeen *et al*. (2009).

From the foregoing discussion on correlation, it could be concluded that the traits, plant height, number of branches per plant, fruits per plant, fruit girth, individual fresh fruit weight, individual dry pod weight and fresh fruit yield per plant registered significant positive correlation with dry pod yield in F_2 generation. Hence, dry pod yield could be improved through the intentional selection of

genotypes/hybrids with these traits. Selection of parents with high fruit yield is the prime objective in any hybrids/ varieties developmental programme. Based on the present study, among the 30 chilli progenies, the progenies K 1 x PKM 1(135.48 g) followed by Pusa Jwala x PKM 1 (128.12 g) with highest mean dry pod yield. Further the crosses LCA 625 x K 1 (131.73 g), K 1 x Arka Lohit (125.49) and K 1 x Pusa Jwala (124.52 g) also recorded higher value of fruit yield per plant. The crosses viz., K 1 x Pusa Jwala, K 1 x PKM 1 and LCA 625 x K 1 could be adjusted as the ideal crosses for yield as it produced its potential to serve as the best progenies for earliness and fruit number per plant. These five crosses were selected and recorded for carrying forward to further generation for evaluation.

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