Plant Archives Vol. 25, Supplement 1, 2025 pp. 1539-1544 e-ISSN:2581-6063 (online), ISSN:0972-5210

Plant Archives

Journal homepage: http://www.plantarchives.org
DOI Url : https://doi.org/10.51470/PLANTARCHIVES.2025.v25.supplement-1.212

GENETIC STUDIES OF F_4 GENERATION IN CHILLI (*CAPSICUM ANNUM* L.)

D.R. Jadhao*, V.S. Khandare, S.S. Valvate and A.B. Awasarmol
Department of Horticulture, College of Agriculture, VNMKV Campus,
Krishi Nagar Parbhani (MS) 431 402, India
*Corresponding author E-mail: dipalijadhao4444@gmail.com
(Date of Receiving : 01-09-2024; Date of Acceptance : 07-11-2024)

ABSTRACT

A field experiment entitled "Genetic Studies of F_4 Generation in chilli (*Capsicum annum* L.)" was conducted during the year 2023-24 at experimental field of Department of Horticulture, VNMKV, Parbhani. Twenty genotypes including check variety Parbhani Mirchi and Arka Tanvi with three replications to Study variability, heritability, genetic advance and correlation studies to select the superior genotype. Analysis of variance revealed that highly significant difference among accessions for all the traits studied. The genotypes PBNC-5-W4-2-3 and PBNC-6-W4-1-2 performed best in terms of yield and other horticultural traits over standard check variety. The (PCV) were higher in magnitude than their analogous (GCV) for all the studied characters, though differences were minimal in most of the characters. The highest phenotypic and genotypic coefficients of variation were found in the green fruit yield per plant, followed by green fruit yield per ha, green fruit yield per plot, pericarp thickness, number of fruits per plant, pedicel length, and capsaicin content. high heritability coupled with number of fruits per plant followed by green fruit yield per plant, green fruit yield per plot, green fruit yield per ha, plant height plant spread N-S, plant spread E-W, average weight of the fruit, days to 50% flowering, length of the fruit, days to initiation of flowering, pericarp thickness number of pickings per plant, pedicel length, diameter of the fruit, Number of primary branches and capsaicin content. This suggests that additive gene action is predominant, making direct phenotypic selection effective for these traits. The phenotypic and genotypic correlation coefficients for various traits were analysed, with genotypic correlation coefficients generally being higher than their phenotypic counterparts. At both the phenotypic and genotypic levels, the correlation coefficient between different characters observed that green fruit yield per plant was significantly and positively correlated with weight of the fruit, number of fruits per plant, diameter of the fruit, pedicel length, pericarp thickness, fruit length, plant hight, number of primary branches, capsaicin content, plant spread N-S, and plant spread E-W. Whereas negative significant correlation with days to initiation of flowering and days to 50% flowering. There is ample scope for selection, and the traits mentioned earlier should be considered when making decisions to further improve the green fruit yield per plant in chilli.
Keywords: Chilli, Correlation, Genetic advance, Heritability, Variability.)

Introduction

Chilli (*Capsicum annum* L.) is one of the most important commercial crops of India, it is grown almost throughout the country for its fruit and spice commerce. Mexico is the primary centre of origin and Guatemala is secondary centre of origin it's belong to Solanaceae family, having Chromosomes number 2n = 24 genus Capsicum and species is annuum, there are about 30 species, but only five *Capsicum annuum, C. baccatum, C. chinense, C. frutescens*, and *C. Pubescens* are regarded as domesticated, *C. annuum* is the most cultivated species among. It uses as a vegetable cum spice crop valued for its aroma taste flavour and pungency. It is grown for export as well as domestic market. Chilli contributes about 33% of total

spice export from India and share about 16% of the world spice trade (Sushmitha *et al*., 2019).

Chilli occupies an important place in Indian diet. It is an indispensable item in the kitchen, as it is consumed daily as a condiment in one form or other. Among the spices consumed per head, dried chilli fruits constitute a major share. Currently, chillies are used throughout the world as a spice and in the making of beverages and medicines. If some varieties of chillies are famous for red colour because of the pigment 'capsanthin,' others are known for biting pungency attributed to 'capsaicin.' India is the only country which is rich in many varieties with different quality factors. Chillies are rich in vitamins, especially in vitamin A and C. They are also packed with potassium, magnesium and iron. Chillies have long been used for pain relief as they are known to inhibit pain messengers, extracts of chilli peppers are used for alleviating the pain of arthritis, headaches, burns and neuralgia. It is also claimed that they have the power to boost immune system and lower cholesterol. They are also helpful in getting rid of parasites of gut. Chilli are major ingredients of curry powder in the culinary preparations. Extracts of chillies are used in the production of ginger beer and beverages. Chillies are also rich in 'rutin' which is of immerse pharmaceutical needs. It is specially used for its pungency, spicy taste, besides the appealing colour it adds to the food. It is used in pickles, sauces, ketchup, essences, oleoresins and it is an inevitable ingredient in Indian dishes. Capsaicin has beneficial physiological action which is used in many pharmaceutical preparations like ointments for cold, throat infection, chest congestion etc. It is also used in cosmetics like prickly heat powders and skin ointments. Capsanthin which is colouring principle in chilli is used as colouring agent for preparation of jams and sauces. Due to its wide utility, demand of chilli cultivation is increasing day by day.

The assessment of nature and magnitude of variability in the available germplasm is the prerequisite of any breeding programme. The effectiveness of selection and development of improved varieties depends on the nature of variability expressed for yield and its contributing characters in the gene pool. High yield and yield contributing characters with improved quality parameters have been the major objective of chilli breeding programme. The importance of genetically diverse genotypes with desirable combinations has also been realized by several workers keeping in view the above facts, the present investigation was undertaken to observe the performance of genotypes of chilli for quantitative and qualitative traits and to screen the best performing genotypes for utilization in further breeding programme. In Maharashtra diverse types of chilli are found with varying characters. The large variability in respect of fruit size, shape and growth habits. However, no systematic research work in respect of selection and evaluation of suitable types undertaken so far. Hence there is need to evaluate chilli types under Maharashtra for excellent quality, yield and growth performance, and resistant to biotic and abiotic stress. In view of this, present investigation was undertaken in chilli

Materials and Methods

The present investigation entitled, "Genetic Studies of F4 Generation in Chilli (*Capsicum annum* L.)" was conducted at the Instructional-Cum- Research Farm, Department of Horticulture, College of Agriculture, Parbhani, V.N.M.K.V., Parbhani, during *kharif* season 2023-24.

Observations were recorded from five randomly selected plants in each experimental plot for growth and yield related traits namely Plant height (cm), Plant spread East-West (cm), Plant spread North-South (cm), Number of primary branches, Days to initiation flowering, Days to 50 per cent flowering, Fruit length (cm), Fruit diameter, pedicel length (cm), pericarp thickness (mm), Average fresh fruit weight (g), Number of fruits per plant, Green fruit yield yield per plant (g), green fruit yield per plot (kg), green fruit yield per hectare (q) and capsaicin content. The estimates of genotypic and phenotypic coefficient of variation were calculated according to Burton and Devane (1953), heritability in broad sense (Falconer, 1981) and expected genetic advance as per the procedure of Johnson *et al*.

Table 1: Experimental Details

1.	Name of the crop	:	Chilli (*Capsicum annum* L.)
2.	Family	:	Solanaceae
3.	Experimental design	:	Randomized Block Design
4.	Number of treatments	:	20 (18 genotype + 2 Standard check)
5.	Number of replications	:	3
6.	Season	:	*Kharif* 2023
7.	Spacing	:	60 cm x 50 cm
8.	Plot size	:	4.2 m x 3.5 m

Table 2 : List of genotype and checks used in the study

Treatment	Genotype	Source
T1	PBNC-1-W4-1	VNMKV Parbhani
T2	PBNC-3-W4-1-1	VNMKV Parbhani
T3	PBNC-3-W4-2-1	VNMKV Parbhani
T4	PBNC-5-W4-1-1	VNMKV Parbhani
T5	PBNC-5-W4-2-3	VNMKV Parbhani
T6	PBNC-6-W4-1-2	VNMKV Parbhani
T7	PBNC-7-W4-1	VNMKV Parbhani
T8	PBNC-8-W4-1	VNMKV Parbhani
T9	PBNC–2	VNMKV Parbhani
T10	PBNC–6	VNMKV Parbhani
T11	PBNC–10	VNMKV Parbhani
T12	PBNC–21	VNMKV Parbhani
T13	PBNC–26	VNMKV Parbhani
T14	PBNC– 30	VNMKV Parbhani
T15	Parbhani Tejas	VNMKV Parbhani
T16	Phule Jyoti	MPKV Rahuri
T17	Konkan Kirti	BSKKV Dapoli
T18	Pusa Jwala	IARI New Delhi
T19	Parbhani Mirchi (check)	VNMKV Parbhani
T20	Arka Tanvi (check)	IIHR Bangalore

Result and Discussion

Mean performance of the genotypes

When the genotypes for all the studied horticultural traits were analysed, it was found that there were considerable variations between the genotypes. The genotype PBNC-5-W4-1-1 and PBNC-5-W4-2-3 was shown to have the highest plant height (92.62 cm) and (91.53 cm) respectively. Also, the genotype PBNC-5-W4-2-3 highest number of primary branches (6.10) with maximum plant spread (67.06 cm) and the highest number of fruits per plant (271.40) ultimately green fruit yield per plant (1609.39 g) per plot (78.86 kg) and per hectare (536.45 q) is also high. The genotype PBNC-6-W4-1-2 highest number of pickings with (7.25) good yield (421.48 q) per hectare

Parameters of Variability

The phenotypic coefficients of variation (PCV) were higher in magnitude than their analogous genotypic coefficients of variation (GCV) for all the studied characters, though differences were minimal in the majority of the characters. The highest phenotypic and genotypic coefficients of variation were found in the green fruit yield per plant (45.64 % and 45.58 %), followed by green fruit yield per ha (45.63 % and 45.59 %), green fruit yield per plot (45.63 % and 45.58 %), pericarp thickness (34 % and 33.04 %), number of fruits per plant (33.12 % and 33.12 %), pedicel length (26.13 % and 25.10 %) and capsaicin content % (21.63 % and 18.48 %). The moderate phenotypic) and genotypic coefficient of variation were observed in average weight of the fruit (19.63 % and 19.48 %), followed by length of fruit (15.68 % and 15.45 %), plant spread (E-W) (15.26 % and 15.22%) , plant spread (N-S) (15.10 % and 15.08 %), number of picking per plant (13.28 % and 12.90 %), diameter of the fruit (12.76 % and 12.21 %) plant height (12.67 % and 12.65 %) and number of primary branches (11.09 % and 10.27 %) were the characteristics with the moderate PCV and GCV The presence of significant variability suggests ample opportunity for improvement through selection.

High heritability along with high genetic advancement as percent mean was observed for traits such as number of fruits per plant, green fruit yield per plant, green fruit yield per plot, green fruit yield per hectare, plant height, plant spread, average weight of the Fruit, days to fifty percent flowering, days to initiation of flowering, fruit length, pericarp thickness, diameter of the fruit, pedicel length, number of pickings per plant, number of primary branches and capsaicin content. This indicates that these traits are strongly influenced by additive gene action, making phenotypic selection an efficient method for their improvement. Maximum heritability in broad sense was reported for number of fruits per plant (100 %) followed by green fruit yield per plant (99.8 %), green fruit yield per plot (99.8 %), green fruit yield per ha (99.8 %), plant height (99.7 %), plant spread N-S (99.6

%), plant spread E-W (99.5 %), average weight of the fruit (98.6 %), days to 50% flowering (97.2 %), length of the fruit (97.2 %), days to initiation of flowering (95.4 %) , pericarp thickness (94.4 %), number of picking per plant (94.3 %), pedicel length (92.3 %), diameter of the Fruit (91.7 %), number of primary branches (85.7 %) and capsaicin content (73 %)

Similar results were also reported in chilli by Manju and Sreelatha Kumary, Bijalwan, Kadwey *et al.* and Meena *et al.*

Correlation studies

The phenotypic and genotypic correlation coefficients for various traits were analysed, with genotypic correlation coefficients generally being higher than their phenotypic counterparts. At both the phenotypic and genotypic levels, the correlation coefficient between different characters observed that green fruit yield per plant was significantly and positively correlated with weight of the fruit, number of fruits per plant, diameter of the fruit, pedicel length, pericarp thickness, fruit length, plant height, number of primary branches, capsaicin content, plant spread N-S, and plant spread E-W. Whereas negative significant correlation with days to initiation of flowering and days to 50% flowering. There is therefore plenty of room for selection, and the aforementioned traits should be taken into account when making a decision and further enhancement of green fruit yield per plant in chilli.

Table 3: Estimate of phenotypic and genotypic coefficients of variation, heritability, genetic advance and genetic advance as % mean for various characters in Chilli

Characters	Range	Mean	PCV	GCV	Heritability %	Genetic advancement	Genetic Adv. As% Mean
Plant hight (cm)	52.06 – 92.62	76.37	12.67	12.65	99.7	19.87	26.033
No. of primary branches	4.00 – 6.10	4.83	11.09	10.27	85.7	0.94	19.6
Plant Spread (cm) N-S	36.33 – 67.06	54.77	15.1	15.08	99.6	16.98	31
Plant Spread (cm) E-W	36.06 – 66.60	55.2	15.26	15.22	99.5	17.26	31.27
Days to Initiation of Flowering	39.53 – 48.43	43.07	5.45	5.33	95.4	4.61	10.72
Days to 50% Flowering	51.40 – 61.13	56.32	4.77	4.7	97.2	5.38	9.55
Length of fruit (cm)	8.20 - 12.68	10.59	15.68	15.45	97.2	3.32	31.38
Diameter of the Fruit (mm)	5.87 - 12.94	9.07	12.76	12.21	91.7	2.04	24.1
Pedicel length (cm)	1.48 - 4.30	2.56	26.13	25.1	92.3	1.27	49.68
Pericarp Thickness(mm)	0.78 - 2.01	1.11	34	33.03	94.4	0.73	66.13

Table 4: Estimate of phenotypic and genotypic coefficients of variation, heritability, genetic advance and genetic advance as % mean for various characters in Chilli

Characters	Range	Mean	PCV	GCV	Heritability	Genetic advancement	Genetic Adv. As Mean %
No. of fruit/ plant	100.20-271	155.41	33.12	33.12	100	106.04	68.23
Average wt. of the Fruit (g)	2.73-6	4.44	19.62	19.48	98.6	1.77	39.84
Green fruit yield/plant (g)	309.7-1609.4	707.14	45.64	45.58	99.8	663.24	93.79
Green fruit yield/ plot kg	15.18 -78.26	34.67	45.63	45.58	99.8	32.53	93.81
No. of picking/ plant	4.74 – 7.25	5.59	13.28	12.90	94.3	1.44	25.80
Green fruit yield/ ha (q)	103.25 –536.45	235.90	45.63	45.59	99.8	221.32	93.81
Capsaicin (%)	0.24 – 49	0.37	21.63	18.48	73.0	0.12	32.53
PDI of leaf curl Virus %	13.60 – 21.76	16.89	14.62	12.53	73.0	3.74	22.13
PDI of Powdery Mildew %	1.36 – 11.56	6.93	58.05	53.91	86.2	7.15	103.1
White fly (%)	4.08 – 15.64	9.72	37.99	33.06	75.7	5.76	59.27
Thrips (%)	4.76 – 13.60	9.11	32.57	30.53	87.9	5.37	58.96

Table 5 : Phenotypic coefficient of Correlation in different traits of chilli

Characters	PH	PB	PSN	PSE	DIF	DFF	LF	DF	PL	PT	NFP	AWF	FYP	NPP	FYH	CC
PH	**1.00**															
PB	0.146	**1.00**														
PSN	0.554**	0.478**	**1.00**													
PSE	0.498**	0.515**	0.881**	**1.00**												
DIF	-0.508**	-0.296*	-0.454**	-0.485**	**1.00**											
DFF	-0.632**	-0.371**	-0.494**	-0.572**	0.854**	**1.00**										
LF	0.296*	0.356**	0.390**	0.434**	-0.280*	-0.329*	**1.00**									
DF	0.404**	0.397**	0.319*	0.290*	-0.497	-0.422	0.100	**1.00**								
PL	0.483**	0.476**	0.621**	0.662**	-0.531**	-0.709**	0.578**	0.239	**1.00**							
PT	474**	0.565**	0.615**	0.532**	-0.536**	-0.416**	0.408**	0.555**	0.404**	**1.00**						
NFP	0.547**	0.550**	0.713**	0.664**	-0.681**	-0.572**	0.347**	0.578**	0.486**	0.934**	**1.00**					
AWF	0.066	0.542**	0.177	0.181	-0.262*	-0.262*	0.425**	0.287*	0.244	0.519**	0.382**	**1.00**				
FYP	0.461**	0.668**	0.633**	0.585**	-0.596**	-0.537**	0.430**	0.571**	0.472**	0.937**	0.925**	0.685**	**1.00**			
NPP	0.578**	0.417**	0.534**	0.427**	-0.519**	-0.433**	0.227	0.623**	0.298*	0.858**	0.892**	0.264*	0.810**	**1.00**		
FYH	0.461**	0.668**	0.633**	0.585**	-0.596**	-0.537**	0.430**	0.571**	0.472**	0.237**	0.925**	0.685**	1	0.810**	**1.00**	
CC	0.204	0.129	0.471**	0.383**	-0.318*	-0.286*	0.155	0.273*	0.237	-0.056	0.263*	-0.039	0.196	0.185	0.195	**1.00**

*Significant at 5% and 1% level of significance

PH: Plant height (cm)
PB.: Number of primary branches
PSN.: plant Spread (cm) N-S
PSE.: Plant spread (cm) E-W
DIF.: Days to Initiation of flowering
DFF.: Days to 50% flowering
LF.: Length of fruit (cm)
DF.: Diameter of fruit (mm)
PL.: Pedicel length (cm)
PT.: Pericarp Thickness (mm)
NFP.: Number of fruit/ plants
AWF.: Average weight of fruit (g)
FYP.: green fruit yield/plot (g)
NPP.: Number of picking/plants
FYH.: green fruit yield per ha
CC.: Capsaicin %
LCV.: PDI of leaf curl Virus %
PM.: PDI of Powdery Mildew %
WF.: white fly %
TH.: Thrips %

Table 6 : Genotypic coefficient of Correlation in different traits of chilli

Characters	PH	PB	PSN	PSE	DIF	DFF	LF	DF	PL	PT	NFP	AWF	FYP	NPP	FYH	CC
PH	**1.00**															
PB	0.154	**1.00**														
PSN	0.556**	0.513**	**1.00**													
PSE	0.500**	0.556**	0.883*	**1.00**												
DIF	-0.524**	-0.341**	-0.466**	-0.498**	**1.00**											
DFF	-0.642**	-0.397**	-0.502**	-0.583**	0.895**	**1.00**										
LF	0.301*	0.406**	0.396**	0.442**	-0.286*	-0.333*	**1.00**									
DF	0.421**	0.448**	0.336**	0.307*	-0.550**	-0.441**	0.104	**1.00**								
PL	0.502**	0.568**	0.651**	0.698**	-0.560**	-0.760**	0.604**	0.280*	**1.00**							
PT	0.491**	0.631**	0.636**	0.552**	-0.559**	-0.442**	0.439**	0.602**	0.431	**1.00**						
NFP	0.548**	0.594**	0.715**	0.665**	-0.697**	-0.581**	0.352*	0.604**	0.505**	0.961**	**1.00**					
AWF	0.065	0.586**	0.180	0.184	-0.276*	-0.269*	0.441**	0.291*	0.259*	0.545**	0.385**	**1.00**				
FYP	0.462**	0.722**	0.635**	0.587**	-0.614**	-0.546**	0.438**	0.592**	0.495**	0.966**	0.926**	0.685**	**1.00**			
NPP	0.596**	0.478**	0.551**	0.442**	-0.566**	-0.453**	0.241	0.659**	0.322*	0.929**	0.919**	0.265*	0.833**	**1.00**		
FYH	0.462**	0.722**	0.635**	0.587**	-0.614**	-0.546**	0.438**	0.592**	0.495**	0.966**	0.926**	0.685**	1**	0.833**	**1.00**	
CC	0.250	0.206	0.540**	0.443**	-0.370**	-0.327	0.171	0.345**	0.296*	0.273*	0.307*	-0.023**	0.237	0.225	0.237	**1.00**

* Significant at 5% and 1% level of significance.

PH: Plant height (cm)
PB.: Number of primary branches
PSN.: plant Spread (cm) N-S
PSE.: Plant spread (cm) E-W
DIF.: Days to Initiation of flowering
DFF.: Days to 50% flowering
LF.: Length of fruit (cm)
DF.: Diameter of fruit (mm)
PL.: Pedicel length (cm)
PT.: Pericarp Thickness (mm)
NFP.: Number of fruit/ plants
AWF.: Average weight of fruit (g)
FYP.: green fruit yield/plot (g)
NPP.: Number of picking/plants
FYH.: green fruit yield per ha
CC.: Capsaicin %
LCV.: PDI of leaf curl Virus %
PM.: PDI of Powdery Mildew %
WF.: white fly %
TH.: Thrips %

Conclusion

All of the traits studied in the 20 genotypes showed a wide and considerable range of variability. For all traits evaluated, the phenotypic coefficient of variation (PCV) was found to be higher than the genotypic coefficient of variation (GCV). However, the small differences between them suggest that these traits are minimally influenced by the environment, making phenotypic selection for these traits effective. All the traits analyzed exhibited high heritability along with high genetic advance as a percentage of the mean, indicating that their expression is governed by additive gene effects. Therefore, direct selection would be an efficient approach for improving these traits. At both genotypic and phenotypic levels, the correlation analysis revealed that green fruit yield per plant was significantly and positively associated with traits such as fruit weight, number fruits per plant, plant height, number of primary branches, fruit length, and fruit diameter, pericarp thickness, plant Spread. This emphasizes the importance of these traits in selecting for green fruit chilli yield.

Based on the current study, the genotypes PBNC-5-W4-2-3 and PBNC-6-W4-1-2 showed promise in terms of yield and yield-contributing traits, outperforming the standard check in other horticultural characteristics. Therefore, these genotypes could be

included in future breeding programs to achieve desired outcomes.

References

Ahmed, I., Nawab, N.N., Kabir, R., Muhammed, F., Intikhab, A., Rehman, A.U., Farid, M.Z., Jellani, G., Nadeem, S., Quresh, W., Ali, M., Hussain, M.M. & Ali, I. (2022). Genetic diversity for production traits in hot chilli (*Capsicum annuum* L.). *Pakistan Journal of Botany*, **54,** 215-766.

Ain, Q.U., Hussain, K., Khan, S.H., Parveen, K., Afroza, B., Dar Z.A., Nazir, N. & Din, M.S. (2019). Genetic evaluation of biometrical traits in chilli (*Capsicum annuum* L.). *Journal of Pharmacognosy and Phytochemistry*, **8**, 34-7.

Ajjapplavara, P.S. and Channagoudra, R.F. (2009). Studies on variability, heritability and genetic advance in chilli (*Capsicum annuum* L.). *Asian Journal of Horticulture*, **4**(1), 99-101.

Bijalwan, P., Madhvi, N. (2015). Genetic variability, heritability and genetic advance of growth and yield components of chilli (*Capsicum annuum* L.) *genotypes. Int. J. Sci. Res.*, **5**(7): 1305-1307.

Johnson, H.W., Robinson, H.F., Comstock, R.E. (1955). Estimation of genetic and environmental Variability in soybeans. *Agron. J.*, **47**: 314-318

Kadwey, S., Dadiga, A. and Prajapati, S. (2016). Genotypes performance and genetic variability studies in hot chilli (*Capsicum annuum* L.). *Indian J. Agric. Res.*, **50**(1): 56-60.

Manju, P.R., Sreelathakumary, I. (2002). Genetic variability, heritability and genetic advance in chilli (*Capsicum chinensejacq.*). *J. Trop. Agric.,* **40**, 4-6.

Meena, M.L., Kumar, N., Meena, J.K. and Rai, T. (2016). Genetic variability, heritability and genetic advances in chilli (*Capsicum annuum* L.), *Biosci. Biotech. Res. Comm.,* **9**(2): 258-262.

Pandit, M.K. and Adhikary, S. (2014). Variability and heritability estimates in some reproductive characters and yield in chilli (*Capsicum annuum* L.). *International Journal of Plant and Soil Sciences*, **3**(8), 45-53.

Pandiyaraj, P., Saraladevi, D., Juliet, H. S. and Das, A. (2017). Genetic variability, heritability and genetic advance for quantitative and qualitative traits in chilli (*Capsicum annuum* L.). *International Journal of Agriculture Sciences,* **9**(40), 81-83.

Suraj, W., Lakshmidevamma, T. N., Fakrudin, B., Shankarappa, K.S., Meenakshi, S. and Dhananjaya P. (2024). Assessment of relationship among yield and fruit quality traits in chilli germplasm through correlation analysis, *International Journal of Advanced Biochemistry Research*, **8**(4), 377-381.

Syeda, F., Hussain, K., Rizvi, S., Syed, M.H., Rashid, M. and Saleem, S. (2020). Genetic variability, heritability and genetic advance studies in chilli (*Capsicum annuum* L.) *genotypes.International Journal of Chemical Studies,* **8**(3), 1328-1331.

Timmarao, K.S. (2020). Variability studies in local chilli germplasm. M.Sc. Thesis. Department of Vegetable Science, YSP University of Horticulture and Forestry, Solan. 86p.

Tirupathamma, L.T., Naidu, L.N., Ramana, C.V. and Sasikala, K. (2018). Genetic association analysis for qualitative traits in paprika (*Capsicum annuum* L.) genotypes. *International Journal of Current Microbiology and Applied Sciences,* **7**(12), 73-81.

Zehra, S.B., Khan, S.H., Ahmad, A., Afroza, B., Parveen, K. & Hussain, K. (2017). Genetic variability, heritability and genetic advance for various quantitative and qualitative traits in chilli (*Capsicum annuum* L.). *Journal of Applied and Natural Science,* **9**(2), 62-73.

Zhani, K., Hamdi, W., Sedraoui, S., Fendri, R., Lajimi, Q. and Hannachi, C. (2015). Agronomic evaluation of Tunisian accessions of chilli pepper *(Capsicum frutescens* L.*). International Journal of Engineering Research and Technology*. **2**(4), 28-34.