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Genetic variability, Correlation and path analysis studies for yield and yield contributing characters in Pink Brinjal (*Solanum melongena* L.) under sub-tropical plains of Jammu

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ABSTRACT

The present investigation was conducted during the year 2022-2023 with the objectives i) To estimate the magnitude of genetic variability and its contribution trait ii) To find out the correlation between the traits under study and work out the path analysis for yield and yield contributing traits. The experiment was laid out in a Randomized Complete Block Design with 30 genotypes. Data on the 21 quantitative, qualitative, seed and biotic stress traits has been recorded as per standard procedure. Data on mean performance of all individual plant progenies revealed that genotype Pink long to be the highest yielder followed by long Kashmiri and also performed better for another important desirable trait viz. plant spread, fruit length, fruit diameter, fruit weight, marketable fruit yield per plant. The analysis of genotypic and phenotypic coefficient variance revealed a higher magnitude of PCV than the corresponding GCV for all characters which indicated the effect of environment on the character expression. The highest PCV and GCV were obtained for marketable and unmarketable fruit yield per plant. High heritability coupled with high genetic advance was observed for average fruit weight showing the influence of additive gene action on the characters hence, may be useful for selection. Fruit yield per hectare showed a positive and significant correlation with the number of fruits per plant, fruit diameter, fruit weight, marketable fruit yield per plant, unmarketable fruit yield per plant and total fruit yield per plant while fruit yield per hectare showed a negative and significant correlation with days to first flowering, days to first harvest. Days to first flowering, plant height, plant spread, fruit weight, marketable fruit yield per plant, total fruit yield per plant and number of seeds per fruit showed maximum direct effect on fruit yield per plant.

Keywords: *Correlation, Genotype, Heritability, Pink brinjal, Path coefficient, Variability*

Introduction

Brinjal (*Solanum melongena* L., 2n=2x=24), also known as eggplant, aubergine, or guinea squash, is an important vegetable crop belonging to the family 'Solanaceae'. It is one of the most popular vegetable crops cultivated in the tropics, subtropics, and temperate regions spreading from sea line to cold mountainous regions spreading of the world. It is a perennial crop but commercially cultivated as an annual vegetable crop for its immature, unripe fruits which are used in making various types of cooked curries. It is also known as the "king of vegetables" for its versatile use in Indian food [6]. It is the complete set of minerals, vitamins (A, B complex (B1, B6, B9) and E), nutritional fiber, protein, and antioxidants, along with some phytochemicals (caffeic, chlorogenic, glucoside, delphinidin, and nasunin) which all are desirable mainly for protecting body against infections [14] and [3].

Among different types and colours of brinjal, pink brinjal or 'Gulabi Baingan" is one of the most popular vegetables of Jammu & Kashmir.

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It is consumed as local delicacy in variety of dishes in different cuisine. It is preferred for its color, smooth texture, very small seeds and tasty flesh. It is traditionally grown in Kashmir region for a very long time. However, its cultivation in Jammu region has gained momentum from 1990's and now-a-days, a large quantity of pink brinjal grown Jammu region is being transported to the Kashmir valley during summer months. Most of the farmers grow pink brinjal from own saved seed/landraces, locally available germplasm as well as available varieties of private seed companies from local market. Non availability of high yielding variety/hybrid and of prevalence of insect pests and diseases during summer/rainy season is a big issue among pink brinjal growers of Jammu region.

Improvement in eggplant can be achieved by exploiting available sources of variability [17]. Variability is caused by both genetic and environmental factors. Understanding heritable variability more particularly its genetic component, which has a close relationship to its response to selection, is the most crucial aspect of the genetic makeup of breeding material. To find more heterotic parents for a hybridization programme, it is necessary to study genetic divergence using D^2 analysis among the existing varieties and collect germplasm. In general, diverse parents are expected to produce high hybrid vigour [9]. In view of this fact, the present study was undertaken with the aim of examining the magnitude of genetic variability, correlation and path analysis among pink brinjal genotypes for a planned breeding programme.

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The present study was caried out at experimental farm Division of Vegetable Science, Sher-e-Kashmir University of Agriculture Sciences and Technology, Main campus, Chatha, Jammu (J&K) with thirty genotypes of pink Brinjal in randomized complete block design (RBD) with three replications during autumn-winter season 2022-2023. Nursery was sown on 1st August,2022 and transplanting was done on 04th September,2022 at the spacing of 90cm X 75cm in a plot having size of 3m x 1m. To ensure healthy crop, cultural operations were performed in accordance with package of practices. The data was taken for 21 traits by randomly selected five plants from each plot (Table 1). Phenotypic and genotypic coefficients of variability were calculated following the method proposed by [4],[8] and [10]. The broad-sense heritability (h^2) and expected genetic advance were also determined using these methods.

Significant differences existing among genotypes for all characters were studied. Variation for all character was reported by [11],[1],[2], [13] and [21] The broad range of variation was recorded for seed vigour index (1115.67–712.00) with a mean value of 952.There was great variation among the genotypes for yield which ranged from 131.69 to 402.94q/ha (Table 1). SJPB-22-09 was found to be best in tolerance against biotic stress, as they showed minimum infestation for Phomopsis blight, shoot borer and fruit borer. Phenotypic coefficient of variation (PCV) tends to exceed the genotypic coefficient of variation (GCV), highlighting the effect of environment on traits. Similar findings were also reported by [5], [16] and [2].

Heritability and genetic advance: Heritability gives basic information about beneficial parameters which help breeders in effective selection. The heritability values for all traits ranged from 67.98-99.88%. Days to first flowering, days to first harvest, plant height, number of branches per plant, plant spread, number of fruits per plant, fruit length, fruit diameter, fruit weight, marketable fruit yield per plant, unmarketable fruit yield per plant, total fruit yield per plant ,fruit yield per hectare, number of seeds per fruit, germination (%), seed vigour index, ascorbic acid content and total phenol content showed high value for heritability (Table 1) hence they were less influenced by the prevailing environment. The genetic gain (genetic advance as % of mean) values for all traits ranged from 7.96 – 112.29 %. High genetic gain for plant height, plant spread, number of fruits per plant, fruit length, fruit diameter, fruit weight, marketable fruit yield per plant, unmarketable fruit yield per plant, total fruit yield per plant, fruit yield per plant, number of seeds per fruit, seed vigour index, ascorbic acid content and total phenol content has been reported. [12], [7],[19] also obtained similar results for these characters.

The traits viz. plant height, plant spread, number of fruits per plant, fruit length, fruit diameter, fruit weight, marketable fruit yield per plant, unmarketable fruit yield per plant, total fruit yield per plant, fruit yield per hectare, number of seeds per fruit, seed vigour index, ascorbic acid content and total phenol content, show additive gene action, hence the selection is effective in improvement of these characters. Days to first flowering and days to first harvest showed non-additive gene action, thus heterosis breeding may be useful. [16] reported high heritability with high genetic gain for number of branches per plant and number of fruits per plant. Simillar findings were also reported by [19] and [7]

Table 1: Estimates of variability parameters for different characters in Pink Brinjal (Solanum melongena L.)

Characters	Mean ± SE	Range		Heritability (%)	Genetic Advance	Genetic Advance as % of Mean	Coefficient of variation	
		Min.	Max.				GCV (%)	PCV (%)
DFF	40.33±0.92	36.00	45.00	78.11	3.23	8.01	4.40	4.98
DFH	66.63±1.06	61.00	73.00	89.56	6.16	9.25	4.74	5.01
PH	63.38±1.32	50.33	80.00	97.41	16.79	26.49	13.03	13.20
NBP	5.96 ± 0.45	4.33	7.33	67.98	1.13	19.09	11.24	13.63
PS	67.51±1.04	50.33	86.00	99.02	21.76	32.24	15.72	15.80
NFP	24.64±0.58	14.33	31.00	97.74	8.03	32.59	16.00	16.18
FL	13.02±0.36	8.83	17.50	97.52	4.75	36.47	17.93	18.15
FD	4.08±0.11	2.67	5.50	97.77	1.53	37.63	18.47	18.68
FW	86.37±1.77	34.67	148.33	99.62	60.15	69.64	33.87	33.93
MFYP	1.51±0.04	0.79	2.42	98.85	0.24	112.29	55.34	56.18
UMFYP	0.22±0.02	0.06	0.59	97.02	0.24	112.29	55.34	56.18
TFYP	1.73±0.06	0.89	2.72	98.36	1.04	60.30	29.51	29.75
FYP	257.21±9.60	131.69	402.94	98.37	155.23	60.35	29.53	29.78
NSF	245.46±1.21	207.33	290.33	99.79	55.37	22.56	10.96	10.97
G (%)	82.25±0.87	73.67	87.33	93.23	6.55	7.96	4.00	4.14
SV	952±3.42	712.00	1115.67	99.88	206.52	21.67	10.52	10.53
AA	10.97±0.27	7.74	13.54	97.19	3.33	30.41	14.97	15.19
TPC	1.61±0.08	0.74	2.83	97.76	1.22	75.48	37.05	37.48

DFF- days to first flowering, **DFH**-days to first harvest, **PH**- plant height (cm), **NPB**- number of branches per plant, **PS**-plant spread(cm^2),

NFP-number of fruits per plant, **FL**-fruit length (cm), **FD**- fruit diameter (cm), **FW**- fruit weight (g), **MFYP**- marketable fruit yield per plant (kg), **UMFYP**- unmarketable fruit yield per plant (kg), **TFYP**- total fruit yield per plant (kg), **FYH**- fruit yield per hectare (q/ha), **NSF**- number of seeds per fruit, **G (%)** – germination (%), **SV**- seed vigour, **AA**- Ascorbic acid (mg/100g), **TPC**- total phenol content (mg/100g).

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Table 2: Genotypic(G) and Phenotypic(P) correlation coefficients among various characters in Pink Brinjal (Solanum melongena L.)

Traits		DFF	DFH	PH	NBP	PS	NFP	FL	FD	FW	MFYP	UMFYP	TFYP	NSF	G (%)	SV	AA	TPC	FYH
DFF	G	1.000	0.7648**	-0.3129	-0.3432	-0.2822	-0.3418	0.0933	-0.1317	0.1741	0.0443	-0.0216	0.0289	0.0588	0.1930	0.1831	0.1736	0.2950	-0.0547**
	P	1.000	0.7314**	-0.2538	-0.2180	-0.24248	-0.2987*	0.0907	-0.1046	0.1493	0.0355*	-0.0269*	0.0203**	0.0541	0.1397	0.1627	0.1521	0.2589*	-0.0429**
DFH	G		1.000	-0.3198	-0.4861**	-0.3814**	-0.4183**	0.0625	-0.4725**	0.2366	0.0648	-0.0347	0.0412	-0.0621	0.1413	0.1267	0.3750**	0.4357**	-0.0740**
	P		1.000	-0.2868*	-0.3429	-0.3527**	-0.3855**	0.0692	-0.4306	0.2204	0.0612**	-0.0381*	0.0377**	-0.0539	0.1261	0.1220	0.3569**	0.4158**	-0.0684**
PH	G			1.000	0.1640	0.1293	0.0376	-0.0502	-0.2753	-0.1960	-0.1966	0.0509	-0.1429	0.0743	0.2501	0.2236	-0.2442	-0.2530	-0.1399
	P			1.000	0.1325	0.1265	0.0311	-0.0450	-0.2568	-0.1933	-0.1971	0.0490	-0.1441	0.0716	0.2446*	0.2211*	-0.2275	-0.2521*	-0.1410
NBP	G				1.000	1.1663**	1.1067**	-0.1070	-0.0351	0.0299	0.4442	0.4157**	0.4643	0.0296	-0.2589	-0.3134	0.0288	-0.1195	0.4656
	P				1.000	0.9789**	0.9171**	-0.0892	-0.0189	0.0263	0.3748	0.3469*	0.3913*	0.0343	-0.2012	-0.2581	0.0185	-0.0667	0.3918*
PS	G					1.000	0.9623**	-0.0929	0.0012	-0.0031	0.3617	0.3399	0.3787	0.0455	-0.2127	-0.2607	0.1035	0.0076	0.3782
	P					1.000	0.9510**	-0.0900	0.0033	-0.0045	0.3591	0.3370**	0.3763*	0.0478	-0.2034	-0.2580*	0.1011	0.0142	0.3758*
NFP	G						1.000	-0.1106	0.0975	0.0954	0.4685	0.3718**	0.4720**	-0.0044	-0.3490	-0.3773**	0.1400	0.0684	0.4489**
	P						1.000	-0.1051	0.0939	0.0915	0.4695**	0.3695**	0.4729**	-0.0029	-0.3304**	-0.3722**	0.1300	0.0747	0.4499**
FL	G							1.000	0.0914	0.3394	0.3101	0.1467	0.2856	0.9256**	-0.1485	-0.2604	0.1344	0.0712	0.2928
	P							1.000	0.0913	0.3309**	0.3024	0.1440	0.2792	0.9128**	-0.1420	-0.2562*	0.1305	0.0655	0.2863
FD	G								1.000	0.2908	0.2728**	0.2039**	0.2714**	0.1718	-0.3758**	-0.3142	-0.1998	-0.0955	0.2444**
	P								1.000	0.2076**	0.2680**	0.1998**	0.2668**	0.1695	-0.3181**	-0.3102**	-0.1923	-0.0937	0.2404**
FW	G									1.000	0.9058**	0.7433**	0.9172**	0.2626	-0.6302**	-0.6463**	0.0839	0.1750	0.9144**
	P									1.000	0.9030**	0.7385**	0.9150**	0.2613*	-0.6078**	-0.6448**	0.0829	0.1721	0.9124**
MFYP	G										1.000	0.7039**	0.9819**	0.2848	-0.6139**	-0.6576**	0.1761	0.2354	0.9574**
	P										1.000	0.6971**	0.9815**	0.2831	-0.5899**	-0.6541**	0.1688**	0.2358*	0.9572**
UMFYP	G											1.000	0.8258**	0.1308	-0.7621**	-0.7356**	0.0435	0.0085	0.8544**
	P											1.000	0.8215**	0.1303	-0.7304**	-0.7323**	0.0399	0.0102*	0.8520**

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TFYP	G P												1.000 1.000	0.2609 0.2599	-0.6914** -0.6649**	0.7194** -0.7167**	0.1509 0.1445**	0.1886 0.1869	0.9882** 0.9882
NSF	G P													1.000 1.000	-0.0051 -0.0049	-0.1216 -0.1207	0.1940 0.1911	0.1459 0.1461*	0.2619 0.2609
G (%)	G P														1.000 1.000	1.0098** 0.9740**	-0.0482 -0.0516	-0.0222 -0.0229	-0.6874 -0.6612
SV	G P															1.000 1.000	-0.0484 -0.0461**	-0.0130 -0.0129	-0.7182 -0.7156
AA	G P																1.000 1.000	0.9741** 0.9481**	0.1240 0.1183
TPC	G P																	1.000 1.000	0.1466 0.1480
FYH	G P																		1.000 1.000

DFF- days to first flowering, **DFH**-days to first harvest, **PH**- plant height (cm), **NPB**- number of branches per plant, **PS**-plant spread(cm^2), **NFP**-number of fruits per plant, **FL**-fruit length (cm), **FD**-fruit diameter (cm), **FW**- fruit weight (g), **MFYP**- marketable fruit yield per plant (kg), **UMFYP**- unmarketable fruit yield per plant (kg), **TFYP**- total fruit yield per plant (kg), **FYH**- fruit yield per hectare (q/ha), **NSF**- number of seeds per fruit, **G (%)** – germination (%), **SV**- seed vigour index, **AA**- Ascorbic acid content (mg/100g), **TPC**- total phenol content (mg/100g).

Table 3: Genotypic path-coefficient analysis among different component characters on yield in pink brinjal

Traits	DFF	DFH	PH	NBP	PS	NFP	FL	FD	FW	MFYP	UMFYP	TFYP	NSF	G (%)	SV	AA	TPC	FYH
DFF	**0.0008**	0.0006	-0.0002	-0.0002	-0.0002	-0.0002	0.0001	-0.0001	0.0001	-0.0002	-0.0002	-0.0002	0.0000	0.0001	0.0001	0.0001	0.0002	-0.3124
DFH	-0.0010	**-0.0014**	0.0004	0.0005	0.0005	0.0005	-0.0001	0.0006	-0.0003	0.0004	0.0004	0.0004	0.0001	-0.0002	-0.0002	-0.0005	-0.0006	-0.3249
PH	-0.0002	-0.0003	**0.0009**	0.0001	0.0001	0.0000	0.0000	-0.0002	-0.0002	-0.0001	0.000	-0.0001	0.0001	0.0002	0.0002	-0.0002	-0.0002	-0.1006
NBP	-0.0005	-0.0008	0.0003	**0.0023**	0.0023	0.0021	-0.0002	0.0000	0.0001	0.0006	0.0008	0.0007	0.0001	-0.0005	-0.0006	0.0000	-0.0002	0.2961
PS	0.0010	0.0014	-0.0005	-0.0040	**-0.0041**	-0.0039	0.0004	0.0000	0.0000	-0.0008	-0.0013	-0.0010	-0.0002	0.0008	0.0010	-0.0004	-0.0001	0.2552
NFP	-0.0003	-0.0004	0.0000	0.0010	0.0010	**0.0011**	-0.0001	0.0001	0.0001	0.0004	0.0004	0.0004	0.0000	-0.0004	-0.0004	0.0001	0.0001	0.3803
FL	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	**0.0001**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.2181
FD	-0.0001	-0.0003	-0.0002	0.0000	0.0000	0.0001	0.0001	**0.0007**	0.0002	0.0003	0.0003	0.0003	0.0001	-0.0003	-0.0002	-0.0001	-0.0001	0.4691
FW	0.0001	0.0001	-0.0001	0.0000	0.0000	0.0001	0.0002	0.0002	**0.0006**	0.0003	0.0004	0.0004	0.0002	-0.0004	-0.0004	0.0001	0.0001	0.5919
MFYP	0.0008	0.0008	0.0003	-0.0007	-0.0005	-0.0009	-0.0005	-0.0011	-0.0013	**-0.0026**	-0.0014	-0.0026	-0.0005	0.0009	0.0011	0.0008	0.0006	0.9741
UMFYP	0.0003	0.0003	0.0000	-0.0004	-0.0004	-0.0004	-0.0002	-0.0004	-0.0007	-0.0006	**-0.0011**	-0.0008	-0.0002	0.0009	0.0009	0.0002	0.0002	0.6961
TFYP	-0.3132	-0.3255	-0.1011	0.2971	0.2561	0.3813	0.2189	0.4698	0.5929	0.9766	0.6978	**1.0025**	0.2091	-0.4909	-0.5504	-0.2967	-0.2612	1.0000
NSF	-0.0001	0.0001	-0.0001	0.0000	-0.0001	0.0000	-0.0011	-0.0002	-0.0003	-0.0002	-0.0002	-0.0003	**-0.0012**	0.0000	0.0001	-0.0002	-0.0002	0.2084
G (%)	0.0006	0.0005	0.0010	-0.0009	-0.0009	-0.0014	-0.0006	-0.0015	-0.0026	-0.0015	0.0032	-0.0021	0.0000	**0.0043**	0.0042	-0.0002	-0.0001	-0.4900
SV	-0.0008	-0.0006	-0.0010	0.0012	0.0012	0.0018	0.0012	0.0015	0.0031	0.0020	0.0037	0.0026	0.0006	-0.0046	**-0.0047**	0.0002	0.0001	-0.5493
AA	0.0001	0.0002	-0.0001	0.0000	0.0001	0.0001	0.0001	-0.0001	0.0001	-0.0002	-0.0001	-0.0002	0.0001	0.0000	0.0000	**0.0006**	0.0006	-0.2958
TPC	0.0001	0.0002	-0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	-0.0001	-0.0001	-0.0001	0.0001	0.0000	0.0000	0.0004	**0.0004**	-0.2651

Residual effect: 0.0012

DFF- days to first flowering, **DFH**-days to first harvest, **PH**- plant height (cm), **NPB**- number of branches per plant, **PS**-plant spread(cm^2), **NFP**-number of fruits per plant, **FL**-fruit length (cm), **FD**-fruit diameter (cm), **FW**- fruit weight (g), **MFYP**- marketable fruit yield per plant (kg), **UMFYP**- unmarketable fruit yield per plant (kg), **TFYP**- total fruit yield per plant (kg), **FYH**- fruit yield per hectare (q/ha), **NSF**- number of seeds per fruit, **G (%)** – germination (%), **SV**- seed vigour index, **AA**- Ascorbic acid content (mg/100g), **TPC**- total phenol content (mg/100g).

**Significance at 1% level of significance and * Significance at 5% level of signifance

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Character association: It refers to the mutual relationship between two or more traits. It entails observing how traits relate to each other; a positive association indicates that the traits change in the same direction, while a negative association suggests they change in opposite directions.

This study revealed that correlation was genotypically found to be higher than phenotypically, which shows that genetic factor are more involved in causing variation (Table 2).

Fruit yield per hectare was positively and significantly correlated with the number of fruits per plant, fruit diameter, fruit weight, marketable fruit yield per plant and unmarketable fruit yield per plant. Fruit yield per hectare was negatively and significantly correlated with days to first flowering and days to first harvest. These correlations were found in the same trends both at genotypic and phenotypic levels Fruit yield per hectare was positively and significantly correlated with the number of branches per plant and plant spread at phenotypic level only. Ascorbic acid was found significantly associated with total phenol content.

Path coefficient analysis revealed that the maximum positive direct effect on fruit yield per hectare (Table 3) was shown by total fruit yield per plant followed by marketable fruit yield per plant, fruit weight , fruit length, plant spread, fruit diameter, number of seeds per fruit, seed vigour index and ascorbic acid content while, maximum negative direct effect was shown by days to first harvest , germination, days to first flowering, number of fruits per plant , unmarketable fruit yield per plant, number of branches per plant. These results are in accordance with the findings of [15] and [20].

Knowledge of germplasm about their genetic parameters, viz. transmission from parents to offspring, variability, association and more over improvement after one selection cycle is helpful in the selection of best genotypes and also for their further improvement. Thus, Pink Long and Long Kashmir were found superior for fruit yield per hectare and other important horticultural traits, viz. plant spread, fruit length, fruit diameter, fruit weight, marketable fruit yield per plant, unmarketable fruit yield per plant and total fruit yield per plant are recommended as the best genotypes for a sub-tropical region of Jammu. These genotypes can be recommended to farmers for cultivation or for use in further breeding programs.

SUMMARY

Pink Brinjal is an important member of the family Solanaceae having potential applications across many sectors. Thirty genotypes were evaluated at the Experimental farm, Division of Vegetable Science, (Sher-e-Kashmir University of Agricultural Sciences & Technology of Jammu), during September to January 2022-2023 for studying variability in quantitative, qualitative, seed traits. In studying genetic parameters, fruit weight, marketable fruit yield per plant, unmarketable fruit yield per plant, total fruit yield per plant, fruit yield per hectare and total phenol content, traits showed high estimates of PCV and GCV, indicating the considerable amount of variation was present in germplasm. Most of the traits under study showed high heritability with high to low genetic advance as a per cent of mean, which showed the influence of additive gene action for controlling traits. Thus, selection is effective for improvement in these pink brinjal genotypes. Correlation association and path analysis showed that number of fruits per plant, plant spread, fruit length, fruit diameter, fruit weight, marketable fruit yield per plant and unmarketable fruit yield per plant these traits were considered during the selection of superior genotypes among the thirty genotypes. Thus, in this study, Pink Long and Long Kashmiri were higher yielders and can be used for further breeding programs after multi-location traits.

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REFERENCE

1. Balasubramaniyam, K., Haripriya, K., Kumar, T. B. and Elangaimannan, R. 2021. Assessment of genetic variability, heritability and genetic advance in brinjal (*Solanum melongena* L.). *Plant Archives*, 21(1): 1784-1786.

2. Barik, S., Ponnam, N., Acharya, G. C., Singh, T. H., Dash, M., Sahu, G. S. and Mahapatra, S. K. 2021. Genetic variability, character association and diversity studies in brinjal (*Solanum melongena* L.). Electronic Journal of Plant Breeding, 12(4): 1102-1110.

3. Bhaskar, B. and Ramesh, K. P. 2015. Genetically modified (GM) crop face an uncertain future in India: Bt Brinjal Appraisal – A perspective. *Annals of Plant Sciences,* 4(2): 960-975.

4. Burton, G. W. and DeVane, E. H. 1953. Estimating heritability in tall fescue (*Festuca arundiaceae*) from replicated clonal material. *Agronomy Journal*, 45: 478-481.

5. Devaraju, I. K., Srinivasa, V., Lakshmana, D., Singh, T. H., Devappa, V. and Venugopalan, R. 2020. Studies on variability components for yield and its attributes in brinjal (*Solanum melongena* L.) under hill zone of Karnataka. *Journal of Pharmacognosy and Phytochemistry*, 9(2): 2200-2203.

6. Dhaka, S. K., Kaushik, R. A., Jat, J. and Choudhary, R. 2017. Heterosis breeding in eggplant: A Review. *Journal of Pharmacognosy and Phytochemistry*, 6: 181–185.

7. Dhaka, S. K. and Soni, A. K. 2021. Genetic variability and response to selection in brinjal (*Solanum melongena* L.). *The Pharma Innovation Journal*, 10(12): 3102-3105.

8. Hanson C H, Robinson H F and Comstock R E. 1956. Biometrical studies of yield in segregating population of Korean lespedse. Agronomy Journal 48: 267–82.

9. Harrington, J. B. 1940. Yielding capacity of wheat crosses as indicated by bulk hybrid tests. *Haryana Journal of Horticultural Sciences*, 34(1/2):111-112.

10. Johnson, H. W., Robinson, H. F. and Comstock, R. E. 1955 (a). Estimates of genetic and environmental variability in soyabean. *Agronomy Journal*, 47: 314-318.

11. Konyak, W. L., Kanaujia, S. P., Jha, A., Chaturvedi, H. P. and Ananda, A. 2020. Genetic variability, correlation and path coefficient analysis of brinjal. *Journal of Agriculture*, 18(1): 13-21.

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12. Kumar, M. K., Mishra, H. N., Manas, P. and Nayak, D. P. 2020. Genetic variability and correlation studies in brinjal (*Solanum melongena* L.). *The Pharma Innovation,* 9(2): 416-419.

13. Kumar, R. D. and Ravikesavan, R. 2022. Genetic variability and correlation analysis in F2 segregating population in brinjal (Solanum melongena L.). *Journal of Applied and Natural Science*, 14(SI): 151-154.

14. Noda, Y., Kaneyuki, T., Igarashi, K. and Mori, A. 2000. Antioxidant activity of nasunin, an anthocyanin in eggplant peels. *Toxicology,* 148(2-3): 119-123.

15. Pal, A. K., Yadav, G. C., Kumar, L., Tiwari, R. and Verma, H. S. 2021. Path coefficient analysis in brinjal (*Solanum melongena* L.). *The Pharma Innovation Journal*, 10(9): 194-196.

16. Patil, S. and Hole, U. 2021. Biochemical basis of resistance in brinjal to *Leucinodes orbonalis* Guenee and their correlation with shoot and fruit damage. *The Pharma Innovation Journal*, 10(7): 566-573.

17. Prabakaran, S. 2010. *Evaluation of local types of brinjal*. M.Sc. thesis, Department of Horticulture, Tamil Nadu Agricultural University, Coimbatore, India.

18. Rao, C.R. 1952. *Advanced Statistical Method in Biometric Research*, John Wiley and Sons, Inc, New York. 15(10): 130-134.

19. Sajjan, T. S., Devaraju, S. V., Lakshmana, D. and Singh, T. H. 2021. Genetic variability, interrelationships and path analysis for growth and yield attributes in F_4 segregating population of brinjal (*Solanum melongena* L.). *The Pharma Innovation Journal*, 10(12): 1376-1379.

20. Sakriya, S. G., Vaddoria, M. A., Gohil, P. P., Babreeya, K. K. and Gamit, G. C. 2022. Path analysis studies in brinjal (*Solanum melongena* L.). *The Pharma Innovation Journal*, 11(4): 953-955.

21. Sharma, P., Nair, R., Bhan, K. S. and Tiwari, S. 2022. Genetic variability for quantitative in brinjal (*Solanum melongena* L.). Biological Forum- An International Journal, 14(1): 47-49

22. Singh, R. K. and Chaudhary, B. D. 1977. *Biometrical methods in quantitative genetic analysis*, pp. 318, Kalyani Publishers, New Delhi.

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