International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 3 Mar 2022, pp: 612-615 www.ijaem.net ISSN: 2395-5252

Assessment of genetic variability of some newly developed glossy genotypes of Indian mustard (Brassica juncea (L)).

M.L. bhadoriya[1] and jyoti besarwal[2]

1. Principal and research supervisor (Botany), govt. college, bibirani, Alwar (Raj.).
2. Research scholar, Deptt. Of Botany, Raj rishi bhartrihari matsya university, Alwar (Raj.).

Submitted: 10-03-2022 Revised: 21-03-2022 Accepted: 23-03-2022

ABSTRACT:
49 newly developed glossy lines of Brassica juncea derived from Girraj variety evaluated with two checks viz. Rohini, and Ashirwad for 18 characters through PCV, GCV, heritability and genetic advance. Number of secondary branch had highest PCV followed by siliqua length and seed yield per plant and harvest index had highest PCV followed by number of secondary branch, number of pod on secondary branch. Number of primary branch showed highest heritability followed by harvest index and siliqua length. Harvest index showed highest GAM followed by seed yield per plant and siliqua length.

Key words: genetic variability, GCV, PCV, heritability, genetic advance.

I. INTRODUCTION:

Indian mustard is an important crop in India for edible oil production after groundnut. The average mustard production in India, that is, the mustard production between 2015 and 2019 was 7.7 million tonnes. This was produced from 5.9 million hectares of land. India imports around 70% of edible oil needs. There is a need to make India self-sufficient in oil. In order to achieve this, the govt. of india is planning to increase oil seed production. However, the problem is the low productivity, that is, mustards produced per hectare is low. Currently, Rajasthan produces 40.82% of total mustards in India. It is the highest mustard producing state in the country.

There is a huge gap between realized and potential yield. We have the varieties with high yield potential. There is a lack of variability for yield and yield component traits and biotic and abiotic stress resistance. The output of other growth programs in general and most of specific traits through selection in particular depends totally on the genetic variability present in the germplasm available for a particular crop. For the use of the program of most crops, the characteristics for the existence of variability must be highly inheritable and the progression due to the selection depends on the heritability, the intensity of the selection and the genetic advance of the character.

Keeping all the views in mind, the present study was undertaken by involving some popularly cultivated and newly developed lines of glossy lines of Indian mustard.

II. MATERIAL AND METHODS

The experiment was conducted at farmer field for the experiment of research scholar during 2019- 2020 and 2020- 2021.The material for present study consisted of 49 glossy lines and two checks namely ashirwad and rohini. Glossy genoptype is selected from Girraj mustard variety. Girraj is high yielding released variety. During both the years, trials were laid out in augmented block design, Row to row and plant to plant distance was kept 30 and 10cm, and check varieties were repeated after each 10 lines. All the agricultural practices kept for healthy crop. The data was recorded on 18 characters

III. REULTS AND DISCUSSION

Analysis of variance revealed non-significant for most of the characters under study except number of length of primary branch, number of siliqua on main shoot, days to maturity and harvest index indicating presence of wide spectrum variability (table 1). The view of the data in table 2 depicted, Estimates of Genotypic coefficient variation varied from days to maturity (5.65) to harvest index and phenotypic coefficient variation varied from oil content (3.72) to number of secondary branches. . Maximum and minimum differences between GCV and PCV were observed

for harvest index and plant height indicating the influence of environment for these characters, respectively. Heritability was maximum for number of primary branches and harvest index (0.97) followed by siliqua length and number of siliqua per plant.GCV along with heritability estimate gave the precise picture of genetic gain to be exploited through selection as suggested by Burton (1952).High values of GCV coupled with heritability were observed for harvest index and siliqua length suggesting that additive gene action might play major role in the expression these characters and selection would be rewarding in further improvement of these characters (Mahmood et al., 2003; Pant and Singh, 2001; Khulbe et al., 2000; Shalini et al., 2000 and Ghosh and Ghulati, 2001). A parameter having high heritability and high genetic advance are considered under control of additive genes which highlighted the usefulness of selection based on phenotypic performance. (Goshak and Ghulati, 2001; Khulbe et al., 2000; Chaudhary et al., 1999 and kakroo et al, 2000) genetic advance as % of mean was maximum for harvest index (2660.31) followed by seed yield per plant (190.28), siliqua lengthh (115.19), number of seed per siliqua (89.71).While a parameter having high h^2 but low G.A. is considered under control non-additive genes. High values genetic advance for number of days to maturity (57.29) and dry plant weight (22.56) depicted that mass selection based on these parameters could be useful in improving the seed yield.

REFERENCES

[1]. Dewy, D.R. and K.H. Lu, 1959. A correlation and path coefficient analysis of component of crested wheat grass seed production. Agron. J., 51: 515-518.

[2]. Chaudhary, A.D., P.K. Barua and P.K. Duara, 1999.Siliquas traits for determining seed yield in Indian rapeseed. J. Agric. Sci. Society North East India, 12: 60-63.

[3]. Ghosh, S.K. and S.c. Gulati, 2001.Genetic variability and association of yield components in Indian mustard (B.juncea L). Crop Res. Hisar, 21: 345-349.

[4]. Kakroo, S.K., L.N. jindla and D.R. Satija, 2000. Genetic determination of seed yield through its components in Indian mustard (B.juncea L.). Crop Improvement, 27: 247-249.

[5]. Khulbe R.K., D.P. Pant and Naveen Saxena, 2000. Variability, heritability and genetic advance in Indian mustard (B.juncea L.). Crop. Res. Hisar, 20: 551-552.

[6]. Mahmood, T.,M. Ali, S.iqbal and M.Anwar, 2003. Genetic variability and hweritability estimaters in summer mustard (B.juncea L). Asian J. PL. sci., 2: 77-79

[7]. Pant, S.C. and P.Singh, 2001. Genetic variability in Indian mustard. Agric. Sci. Digest, 21: 2-30.

[8]. Shalini, T.S., R.A. Sheriff, R.S. Kulkarni and p. Venkataraimana, 2000.Variability studies in Indian mustard (B.juncea L). Res.On Crops, 1: 230-234.

[9]. Sudan, R.S., Singh, S.P. and Kashyap, S.C., 2004, Path analysis of yield and its components in Indian mustard (Brassica juncea (L.) Czern and Coss). Ann. Agric. Bio. Res.,9(2): 119-122.

[10]. Tusar, P., Maiti, S. and Mitra, B., 2006, Variability, correlation and path analysis of the yield attributing characters of mustard (Brassica sp.). Res. Crops, 7(1): 191-193.

[11]. Poonam, S. and Singh, D.N., 2004, Path coefficient analysis in Indian mustard (Brassica juncea L.). J. Res., Bisra Agric. Univ., Ranchi, 16(2): 293-295.

[12]. Sharad, P. and Basudeo Singh, 2005, Inter character association and path analysis in Indian mustard (Brassica juncea L.). Adv. Pl. Sci., 18(2): 511-514.

[13]. Bikram Singh, 2004, Character association and path analysis under dry land condition in India mustard (B. juncea). Cruciferae Newslet., **25**: 99-100.

[14]. Kardam, D.K. and Singh, V.V., 2005, Correlation and path analysis in Indian mustard (Brassicajuncea (L.) Czern and Coss) grown under rainfed condition. J. Spices Arom. Crops, 14(1): 56-60.

International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 3 Mar 2022, pp: 612-615 www.ijaem.net ISSN: 2395-5252

28source of variation	df	plant height	number of primary branches	no of secondary branches	length of main shoot	length of primary branches	length of secondary branches	number of pod on main shoot	number of pod on primary branch	number of pod on secondary branch	length of pod	pod angle	number of seed per pod	dry plant weight	per plant seed weight	oil content	seed yield per plant	day of maturity	hi
Among entries	58	171.50	1.47	11.76	89.32	275.05**	177.20	25.00	30.40	38.26	0.14	1.93	2.68	167.61	17.69	0.81	0.33	313.32**	0.012**
Among checks	1	15.88	2.12	18.50	107.58	193.60	108.90	136.90**	54.76	36.10	0.01	1.02	0.02	132.50	14.88	0.00	0.68	44.10	0.011
Among varieties	48	168.09	1.42	11.23	86.62	269.34**	172.46	21.49	28.78	36.96	0.13	1.90	2.68	162.84	17.08	0.80	0.31	312.01**	0.011**
check vs. varieties	1	147.84	0.15	6.55	21.83	80.55	118.87	31.18	23.20	26.24	0.11	0.36	0.19	96.56	14.61	0.49	0.18	18.89	0.022**
Error	.4	59.23	2.48	8.44	76.92	50.49	91.89	19.80	28.17	17.63	0.04	2.33	0.87	38.71	4.93	1.46	0.49	12.55	0.002
mean		164.04	5.16	5.59	71.94	88.69	25.24	42.32	28.43	10.52	5.00	29.21	13.19	28.71	9.69	40.52	5.23	131.99	0.22
Sed1 between two checks		7.70	1.57	2.91	8.77	7.11	9.59	4.45	5.31	4.20	0.20	1.53	0.93	6.22	2.22	1.21	0.70	3.54	0.05
CD 1%		12.85	2.63	4.85	14.65	11.87	16.01	7.43	8.86	7.01	0.34	2.55	1.55	10.39	3.71	2.02	1.17	5.92	0.08
Sed1 between two varieties		10.88	2.23	4.11	12.40	10.05	13.56	6.29	7.51	5.94	0.29	2.16	1.32	8.80	3.14	1.71	0.99	5.01	0.07
CD 5%		18.18	3.72	6.86	20.71	16.78	22.64	10.51	12.53	9.92	0.48	3.61	2.20	14.69	5.25	2.86	1.65	8.37	0.11
Sed1 between a check		9.43	1.93	3.56	10.74	8.70	11.74	5.45	6.50	5.14	0.25	1.87	1.14	7.62	2.72	1.48	0.86	4.34	0.06
CD 5%		15.74	3.22	5.94	17.94	14.53	19.61	9.10	10.86	8.59	0.42	3.12	1.90	12.73	4.54	2.47	1.43	7.25	0.10

	MEAN	Range	PCV	GCV	h^2	GA	GAM
plant height	164.04	134.4 - 192.6	9.26	7.64	15.18	2.61	1.59
number of primary branches	5.16	3.6 - 7.6	38.56	82.45	100.00	3.06	59.36
no of secondary branches	5.59	1.2 -9.8	80.37	29.16	17.75	2.31	41.28
length of main shoot	71.94	66 -78.4	17.92	10.58	4.38	1.99	2.76
length of primary branches	88.69	63.8 - 126.6	20.34	6.03	22.89	11.22	12.65
length of secondary branches	25.24	10.8 -42	65.00	7.51	9.13	6.48	25.69
number of pod on main shoot	42.32	36.2 - 46.6	15.81	20.00	10.33	3.91	9.24
number of pod on primary branche	28.43	22 -36.4	26.92	18.14	5.04	2.49	8.75
number of pod on secondary branch	10.52	3.2 -24.2	71.05	16.17	20.48	9.70	92.21
length of pod	5.00	5.12 -5.16	8.46	270.51	88.01	5.76	115.19
pod angle	29.21	29 -29.4	7.07	72.00	14.95	2.99	10.22
number of seed per	13.19	12.0 - 14.0	14.28	61.04	60.89	11.83	89.71

International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 3 Mar 2022, pp: 612-615 www.ijaem.net ISSN: 2395-5252

pod							
dry plant weight	28.71	14.4 -60.4	50.03	7.72	22.68	22.56	78.58
per plant seed weight	9.69	5.2 -19	49.07	23.77	42.00	18.45	190.28
oil content	40.52	38.36 - 40.56	3.72	111.37	31.08	7.27	17.95
seed yield per plant	5.23	5.4 -5.64	17.28	175.25	24.64	3.39	64.83
day of maturity	131.99	135 - 145	13.68	5.65	58.02	57.29	43.40
HI	0.22	.09 -0.38	53.74	928.27	97.64	5.84	2660.31