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Combining ability studies in Brinjal

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Abstract

The experimental material comprised of 56 genotypes including 10 parents, 45 hybrids and one standard check (GHB-1) was laid out in randomized block design with three replications at Vegetable Research Station, Junagadh Agricultural University, Junagadh during *Rabi* 2016-17 (E₁), *Late kharif* 2017-18 (E₂) and *Rabi* 2017-18 (E₃) to estimate, combining ability and gene effects in brinjal (*Solanum melongena* L.). Combining ability analysis revealed that both additive as well as non-additive variances were important in the inheritance of all the traits studied. However, magnitude of variances due to *sca* was comparatively larger than those of *gca* for most of the economic traits indicated preponderance of non-additive gene action. Among the parents, PLR 1, GJB-3, JBL-08-08 and JB-12-06 were good general combiners for fruit yield per plant. The crosses *viz.*, AB-09-1 × AB-12-10, AB-09-1 × AB-08-5, AB-08-5 × JBL-08-8 and GJB-3 × AB-12-10 showed significant and positive *sca* effects in addition to desirable performance for fruit yield and its component characters.

Keywords: Combining ability studies, Brinjal

Introduction

Brinjal (*Solanum melongena* L.) is widely cultivated as one of the most important vegetables in both subtropical and tropical areas of India as well as abroad, and plays a vital role in achieving the nutritional security (Sarker *et al.* 2006) [22]. Selection of parents on the basis of their *per se* performance does not necessarily lead to desired results (Rai and Asati, 2011) [17]. Therefore, devising a sound breeding strategy to improve fruit yield of this crop is of paramount importance. The combining ability analysis help breeders in choosing suitable genotypes as parents for hybridization and superior cross combinations through general and specific combining ability studies, respectively (Rodrigues and Silva, 2002) [20]. In order to select superior parents, it is imperative to study the relative ability of the parents to transfer economic traits in the hybrid combination. Combining ability is one of the important and powerful tools in identifying the best combiner that may be used in crosses to exploit heterosis (Uddin *et al.* 2015) [26]. It helps to know the genetic architecture of various characters that enables the breeders to design effective breeding plan for future improvement of the existing materials. This information is also useful to the breeders for selection of diverse parents and hybrid combinations. It is possible to develop high yielding variety through genetic manipulation and selection of superior parents. Hence, present experiment was planned to identify superior parents and better cross comparatively for genetic improvement of fruit yield and its component traits in brinjal.

Materials and methods

Vegetable research station, Junagadh agricultural university, Junagadh. An experiment was sown in randomized block design with three replications. The experimental materials for the present study comprised of ten genotypes *viz.*, Pant Rituraj, PLR 1, KS 224, GJB 2, GJB 3, Swarna Mani Black, JBGR 06-08, JBL-08-08, AB-08-14 and JB 12-06 which were used as a parents and crossed in diallel mating design following Model-I, method-II of Griffing (1956) [6]. The evaluation of 45 hybrids along with their 10 parents and one standard check (GBH-1) was done during *Rabi* 2016-17 (E₁), *Late kharif* 2017-18 (E₂) and *Rabi* 2017-18 (E₃) at vegetable research station, Junagadh agricultural university, Junagadh. An experiment was sown in randomized block design with three replications. Observations fruit yield and its component traits including fruit length (cm), fruit girth (cm), number of fruits per plant,

average fruit weight (g), number of primary branches per plant and fruit yield per plant (kg) were recorded on five randomly selected plants from each plot.

Results and Discussion

Analysis of variances for combining ability: Analysis of variance for combining ability presented in **Table 1** revealed that mean square due to general combining ability and specific combining ability for fruit yield and yield contributing characters highly were significant for all the characters in all the three environments except number of primary branches per plant in E₂ and E₃ environments indication of parents and hybrids differed significantly in their combining ability effects and importance of both additive as well as non-additive effects for their inheritance. The mean square due to SCA was considerably higher than their corresponding GCA for all the characters in all the three environments which indicated preponderance of non-additive gene action in the inheritance of these traits. Significance of general and specific combining ability variances were also reported earlier for fruit yield and yield components by Ansari and Singh (2014)^[1], Uddin *et al.* (2015)^[26], Hussain *et al.* (2017)^[7] and Pramila *et al.* (2018)^[14].

General combining ability

Estimates of general combining ability for various traits have been presented in the Table 2.

For fruit length (cm): Four parents in E₁ and E₃ as well as five parents in E₂ and pooled basis exhibited significant and positive gca effects. Gca effects was significant and positive for JBGR-06-08 in E₁ (1.05), E₂ (1.55), E₃ (1.04) and pooled (1.21); JBL-08-08 in E₁ (1.01), E₂ (0.81), E₃ (1.01) and pooled (0.94); GJB-3 in E₁ (0.76), E₂ (0.44), E₃ (0.49) and pooled (0.56); GJB-2 in E₁ (0.59), E₃ (0.60) and pooled (0.39) and PLR 1 E₂ (0.47) and pooled (0.23). Further comparison across the environments indicated that the parents *viz.*, Pant Rituraj in E₁ (-0.37), E₂ (-0.49), E₃ (-0.46) and pooled (-0.44); KS 224 in E₁ (-1.13), E₂ (-0.90), E₃ (-0.95) and pooled (-0.99); S.M.B. in E₁ (-1.26), E₂ (-1.14), E₃ (-1.13) and pooled (-1.18); AB-08-14 in E₁ (-0.42), E₂ (-0.34), E₃ (-0.44) and pooled (-0.40); and JB-12-06 in E₂ (-0.38), E₃ (-0.34) and on pooled basis (-0.34) recorded significant and negative gca effects, indicating poor general combiners for fruit length. The findings are in conformity with the reports of Bisht *et al.* (2006)^[3], Reddy and Patel (2014)^[19] and Prasad *et al.* (2015)^[15].

For fruit girth (cm): The gca effects of parents ranged from -0.51 (KS 224) to 0.52 (S.M.B.); -0.71 (KS 224) to 0.64 (AB-08-14); -0.56 (KS 224) to 0.48 (S.M.B.); and -0.59 (KS 224) to 0.48 (S.M.B.) in E₁, E₂, E₃ and on pooled, respectively. Gca effects was significant and positive for GJB-3 (0.21), S.M.B. (0.52), AB-08-14 (0.38) and JB-12-06 (0.19) in E₁; Pant Rituraj (0.16), S.M.B. (0.44), JBGR-06-08 (0.18) and AB-08-14 (0.64) in E₂; GJB-3 (0.18), S.M.B. (0.48), AB-08-14 (0.27) and JB-12-06 (0.23) in E₃; and Pant Rituraj (0.10), GJB-3 (0.11), S.M.B. (0.48), AB-08-14 (0.43) and JB-12-06 (0.14) on pooled basis. Hence, they were registered as good general combiners for fruit girth. Parents *viz.*, KS 224 (-0.51), GJB-2 (-0.42) and JBL-08-08 (-0.26) in E₁; PLR 1 (-0.37), KS 224 (-0.71) and GJB-2 (-0.28) in E₂; PLR 1 (-0.21), KS 224 (-0.56), GJB-2 (-0.35) and JBL-08-08 (-0.25) in E₃; and PLR 1 (-0.23), KS 224 (-0.59), GJB-2 (-0.35), and JBL-08-08 (-0.17) on pooled basis recorded significant and negative gca effects, indicating poor general combiners for fruit girth. The findings

are in conformity with the reports of Bisht *et al.* (2006)^[3], Reddy and Patel (2014)^[19] and Prasad *et al.* (2015)^[15].

For number of fruits per plant: There was three parents in E₁ and E₂; two parents in E₃ as well as four parents on pooled basis exhibited significant and positive gca effects. These parents possessing significant and positive gca effects were GJB-3 (1.68), JBGR-06-08 (1.26) and JB-12-06 (1.21) in E₁; Pant Rituraj (1.27), JBGR-06-08 (1.41) and AB-08-14 (1.52) in E₂; GJB-3 (2.13) and JB-12-06 (1.24) in E₃ and GJB-3 (1.47), JBGR-06-08 (0.95), AB-08-14 (0.79) and JB-12-06 (0.76) on pooled basis. This indicated that these respective parents were good general combiners for number of fruits per plant. Parents *viz.*, Pant Rituraj (-0.79), PLR 1 (-1.35) and KS 224 (-1.21) and S.M.B. (-1.10) in E₁; PLR 1 (-1.26) and KS 224 (-1.54) in E₂; KS 224 (-2.48) in E₃ and PLR 1 (-1.09), KS 224 (-1.74) and S.M.B. (-0.81) on pooled basis recorded significant and negative gca effects, indicating poor general combiners for number of fruits per plant. The findings are in akin with the reports of Reddy and Patel (2014)^[19], Gadhiya *et al.* (2015)^[5], Prasad *et al.* (2015)^[15] and Kumar and Arumugam (2016)^[11].

For average fruit weight (g): The gca effects of parents varied from -4.26 (GJB-2) to 5.14 (JBL-08-08); -3.24 (S.M.B.) to 3.34 (KS 224); -5.98 (Pant Rituraj) to 5.01 (PLR 1); and -3.82 (Pant Rituraj) to 3.41 (KS 224) in E₁, E₂, E₃ and on pooled basis, respectively. There were three parents in E₁, E₂; and on pooled basis; two parents in E₃ exhibited significant and positive gca effects. Significant and positive gca effects were observed for PLR 1 (2.59), KS 224 (3.89) and JBL-08-08 (5.14) in E₁; PLR 1 (2.61), KS 224 (3.34) and JBL-08-08 (2.95) in E₂; PLR 1 (5.01) in E₃ and PLR 1 (3.41), KS 224 (3.03) and JBL-08-08 (3.12) on pooled basis. Hence, they were registered as good general combiners for average fruit weight. Further comparison across the environments indicated that the parents *viz.*, Pant Rituraj (-2.32), GJB-2 (-4.26) and S.M.B. (-3.48) in E₁; Pant Rituraj (-3.16), S.M.B. (-3.24) and JBGR-06-08 (1.85) and in E₂; Pant Rituraj (-5.98) and S.M.B. (-2.41) in E₃ and Pant Rituraj (-3.82), GJB-2 (-1.68), S.M.B. (-3.04) and JBGR-06-08 (-1.29) on pooled basis recorded significant and negative gca effects, indicating poor general combiners for average fruit weight. The findings are in agreement with the reports of Bisht *et al.* (2006)^[3], Choudhary and Didel (2014)^[4] and Prasad *et al.* (2015)^[15].

For number of primary branches per plant: There was only two parents in E₁ and one parent on pooled basis exhibited significant and positive gca effects. The gca effects of parents ranged from -0.25 (S.M.B.) to 0.28 (JB-12-06) and 0.19 (JB-12-06) in E₁ and on pooled, respectively. Gca effects was significant and positive for JBGR-06-08 (0.28) and AB-08-14 (0.25) in E₁ and JBGR-06-08 (0.19) on pooled basis. Hence, they were registered as good general combiners for this trait. None of parents exhibited significant and positive gca effects in E₂ and E₃. On the other hand, only one parent S.M.B. (-0.25) in E₁ recorded significant and negative gca effect, indicating poor general combiner for number of primary branches per plant. The findings are in concordant to the reports of Bisht *et al.* (2006)^[3] and Reddy and Patel (2014)^[19].

For fruit yield per plant (kg): The gca effects of parents varied from -0.17 (GJB-2) to 0.20 (JBL-08-08); -0.14 (S.M.B.) to 0.08 (GJB-3); -0.19 (Pant Rituraj) to 0.16 (GJB-

3); and -0.14 (S.M.B.) to 0.11 (GJB-3) in E_1 , E_2 , E_3 and on pooled, respectively. Among the parents, gca effect was significant and positive for JBL-08-08 (0.20), GJB-3 (0.09), JB-12-06 (0.08) and JBGR-06-08 (0.07) in E_1 ; GJB-3 (0.08) in E_2 ; GJB-3 (0.16), PLR 1, S.M.B., and JB-12-06 (0.11) in E_3 and GJB-3 (0.11), JBL-08-08 (0.09), JB-12-06 (0.06) and PLR 1 (0.04) on pooled basis. Hence, they were registered as good general combiners for fruit yield per plant. The results are in conformity with the reports of Sao and Mehta (2010) [21], Thangavel (2011) [25], Mishra *et al.* (2013) [12], Reddy and Patel (2014) [19], Prasad *et al.* (2015) [15], Gadhiya *et al.* (2015) [5] and Kumar and Arumugam (2016) [11].

An overall appraisal of general combining ability (GCA) effects revealed that parents PLR 1, GJB-3, JBL-08-08 and JB-12-06 were good general combiners for fruit yield per plant having concentration of favorable genes as indicated by significant and positive gca effects for these parents (Table 2). Besides having good combining ability effects for fruit yield per plant, parent PLR 1 was also observed good combiner for fruit length and average fruit weight; parent GJB-3 was also observed good combiner for fruit length, fruit girth, number of fruits per plant; parent JBL-08-08 was also observed good combiner for fruit length and average fruit weight and parent JB-12-06 was also observed good combiner for fruit girth and number of fruits per plant. Parent JBGR-06-08 was found good general combiner for characters viz., fruit length, number of fruits per plant, number of primary branches per plant. Likewise, Pant Rituraj was also found good general combiner for fruit girth. Similarly, KS 224 was good general combiner for average fruit weight, GJB-2 was also found good general combiner for fruit length. On other hand, parent S.M.B. was also found good general combiner for fruit girth, and AB-08-14 was good general combiner for number of fruits per plant. The similar results were also reported earlier by Kanan *et al.* (2017) [9], Kumar *et al.* (2018) [10] and Kachouli *et al.* (2019) [8].

Specific combining ability

The second important criterion for evaluation of hybrid is the SCA effects. Sarsar *et al.* (1986) [23] reported that sca effect of hybrids has been attributed to the combination of positive favourable genes from different parents or might be due to the presence of linkage in repulsion phase. Hence, it could be utilization in F_1 generation only for development of hybrid varieties. Hybrids with significantly favourable SCA effects in the present investigation are discussed here under.

The estimates of specific combining ability (*sca*) effects of 45 crosses with their corresponding standard errors for each character are presented in Table 3 and 4.

For fruit length (cm): The estimates of sca effects in hybrids varied from -2.96 (GJB-2 x GJB-3) to 3.71 (Pant Rituraj x GJB-3); -3.52 (GJB-2 x GJB-3) to 3.39 (Pant Rituraj x JBGR-06-08); -3.29 (GJB-2 x GJB-3) to 3.99 (JBGR-06-08 x JB-12-06) and -3.26 (GJB-2 x GJB-3) to 3.58 (Pant Rituraj x JBGR-06-08) in E_1 , E_2 , E_3 and on pooled, respectively. Out of 45 crosses, 13 crosses in E_1 , E_2 and E_3 each and 14 crosses exhibited significant and positive (desirable) sca effects in pooled, respectively for fruit length. The highest, significant and positive sca effect was observed 3.71 (Pant Rituraj x GJB-3), 3.39 (Pant Rituraj x JBGR-06-08), 3.99 (JBGR-06-08 x JB-12-06) and 3.58 (Pant Rituraj x JBGR-06-08) in E_1 , E_2 , E_3 and pooled, respectively for fruit length. Similar results were also observed by Aswani and Khandelwal (2005) [2], Uddin *et al.* (2015) [26] and Kumar and Arumugam (2016) [11].

For fruit girth (cm): The estimates of sca effects in hybrids ranged from -2.16 (Pant Rituraj x AB-08-14) to 1.93 (Pant Rituraj x JBGR-06-08); -1.73 (Pant Rituraj x AB-08-14) to 1.59 (Pant Rituraj x GJB-3); -2.02 (Pant Rituraj x AB-08-14) to 1.90 (Pant Rituraj x JBGR-06-08) and -1.97 (Pant Rituraj x AB-08-14) to 1.67 (Pant Rituraj x JBGR-06-08) in E_1 , E_2 , E_3 and on pooled, respectively. Out of 45 crosses, 15, 12, 12 and 16 crosses exhibited significant and positive (desirable) sca effects in E_1 , E_2 , E_3 and in pooled, respectively for fruit girth. The highest, significant and positive sca effect was observed 1.93 (Pant Rituraj x JBGR-06-08), 1.59 (Pant Rituraj x GJB), 1.90 (Pant Rituraj x JBGR-06-08) and 1.67 (Pant Rituraj x JBGR-06-08) in E_1 , E_2 , E_3 and pooled, respectively for fruit girth. The studies also corroborate with the findings of Bisht *et al.* (2006) [3]; Patel *et al.* (2013) [13].

For number of fruits per plant: The estimates of sca effects in hybrids varied from -6.03 (JBGR-06-08 x JBL-08-08) to 6.72 (GJB-2 x JBL-08-08); -6.87 (PLR 1 x GJB-3) to 6.05 (GJB-3 x JB-12-06); -8.03 (S.M.B. x JB-12-06) to 6.55 (PLR 1 x S.M.B.) and -4.68 (S.M.B. x JB-12-06) to 6.06 (Pant PLR 1 x S.M.B.) in E_1 , E_2 , E_3 and on pooled, respectively. Out of 45 crosses, 11 crosses in E_1 and E_2 and 13 crosses in E_3 and on pooled basis exhibited significant and positive (desirable) sca effects for number of fruits per plant. The highest, significant and positive sca effect was observed 6.72 (GJB-2 x JBL-08-08), 6.05 (GJB-3 x JB-12-06), 16.55 (PLR 1 x S.M.B.) and 6.06 (Pant PLR 1 x S.M.B.) in E_1 , E_2 , E_3 and pooled, respectively for number of fruits per plant. Similar results had also been reported earlier by Suneetha *et al.* (2008) [24]; Patel *et al.* (2013) [13] and Ramani *et al.* (2017) [18].

For average fruit weight (g): The estimates of sca effects in hybrids ranged from -13.28 (KS 224 x JB-12-06) to 18.21 (PLR 1 x S.M.B.); -10.13 (KS 224 x JB-12-06) to 14.65 (PLR 1 x S.M.B.); -20.05 (Pant Rituraj x KS 224) to 18.59 (GJB-2 x JBL-08-08) and -11.19 (KS 224 x JB-12-06) to 14.77 (PLR 1 x S.M.B.) in E_1 , E_2 , E_3 and on pooled, respectively. Out of 45 crosses, 15, 11, 11 and 16 crosses exhibited significant and positive (desirable) sca effects in E_1 , E_2 , E_3 and in pooled, respectively for average fruit weight. Earlier reports by Aswani and Khandelwal (2005) [2]; Patel *et al.* (2013) [13]; Raghvendra *et al.* (2014) [16] support these findings.

For number of primary branches per plant: Hybrids varied in their sca effects from -1.38 (JBL-08-08) to 1.56 (GJB-3 x JBGR-06-08); -1.09 (PLR 1 x GJB-3) to 1.30 (PLR 1 x JBL-08-08); and -0.86 (DBW PLR 1 x GJB-3) to 1.23 (PLR 1 x JBL-08-08) in E_1 , E_2 and on pooled, respectively. Out of 45 crosses, 13, 7, 10 and 14 crosses exhibited significant and positive sca effects in E_1 , E_2 , E_3 and on pooled, respectively for number of primary branches per plant. The highest, significant and positive sca effect was observed 1.56 (GJB-3 x JBGR-06-08), 1.30 (PLR 1 x JBL-08-08), 1.24 (KS 224 x JB-12-06) and 1.23 (PLR 1 x JBL-08-08) in E_1 , E_2 , E_3 and on pooled, respectively for number of primary branches per plant. Similar results had also been reported earlier by Reddy and Patel *et al.* (2014) [19] and Kumar *et al.* (2018) [10].

For fruit yield per plant (kg): The estimates of sca effects in hybrids varied from -0.57 (KS 224 x JB-12-06) to 1.21 (PLR 1 x S.M.B.); -0.74 (PLR 1 x GJB-3) to 0.95 (PLR 1 x S.M.B.); -0.85 (Pant Rituraj x KS 224) to 0.83 (PLR 1 x S.M.B.) and -0.53 (Pant Rituraj x KS 224) to 1.00 (PLR 1 x S.M.B.) and in E_1 , E_2 , E_3 and on pooled, respectively. Out of 45 crosses, 13,

12, 14 and 10 crosses exhibited significant and positive (desirable) sca effects in E_1 , E_2 , E_3 and in pooled, respectively for fruit yield per plant. The highest, significant and positive sca effect was observed for PLR 1 x S.M.B. in E_1 , E_2 , E_3 and pooled, respectively for fruit yield per plant. This cross was also having significant sca effects for one or more components characters. The significant sca effects for fruit yield and different component traits were also recorded by Kumar *et al.* (2018) [10] and Kachouli *et al.* (2019) [8].

Jinks and Jones (1958) emphasized that superiority of the hybrids might not indicate their ability to yield transgressive segregants, rather sca effect would provide satisfactory criteria. However, if a cross combination exhibiting high sca effects as well as high *per se* performance having at least one parent as good general combiner for a specific trait, it is expected that this cross combination may provide desirable transgressive segregants in later segregating generations. The highest yielding hybrid GJB-2 x JBL-08-08 also had significant and positive sca effect for fruit yield per plant which involves poor x good combiner parents. On other hand, in cross combination GJB-3 x JB-12-06 had significant and positive sca effect for fruit yield per plant which involved good x good combiner parents. Similarly, the cross combination PLR 1 x S.M.B. had also significant and positive sca effects for fruit yield per plant involved good x poor combiner parents (Table 4). These three crosses also possessed significant and desirable sca effects for many yield

components. Thus, on the basis of these results it is expected that these three crosses may give desirable segregates in subsequent generations and hence, it would be worthwhile to use them for genetic improvement of fruit yield *per se*.

A summarized account of the best performing parents, best general combiners, best performing hybrids and specific cross combinations revealed that for majority of the characters, the best performing parents were also found to be best general combiners though their relative ranking were different (Table 5).

Among best ten crosses base on sca effects, PLR x S.M.B., GJB-2 x JBL-08-08, Pant Rituraj x GJB-3, S.M.B. x JBL-08-08, GJB-2 x JB-12-06 had high sca effect involving good x poor combiners; two crosses having poor x average combiner i.e. Pant Rituraj x JBGR-06-08 and KS 224 x S.M.B. and other two crosses having average x good combiners i. e. JBGR-06-08 x JB-12-06 and GJB-3 x JBGR-06-08. One and only one cross GJB-3 x JB-12-06 involved good x good combiners (Table 5).

The correlation studies revealed that *per se* performance of parents has correlated with gca effects for fruit length, fruit girth, number of fruits per plant and average fruit weight. Likewise, a comparison of mean performance of crosses and their sca effects presented in Table 6 revealed that *per se* performance of crosses was highly correlated with their sca effects for all the characters indicating strong association of *per se* performance and sca effect of the 45 hybrids.

Table 1: Analysis of variance for combining ability of individual environment for different characters in brinjal

Source of variation	Env	df	Fruit length (cm)	Fruit girth (cm)	No. of fruits per plant	Average fruit weight (g)	Primary branches per plant	Fruit yield per plant (kg)
GCA	E_1	9	8.39**	1.35**	15.44**	114.24**	00.35*	00.18**
	E_2		8.10**	1.84**	15.24**	68.53**	00.19	00.05*
	E_3		7.25**	1.28**	18.23**	99.79**	00.11	00.14**
SCA	E_1	45	3.85**	0.80**	9.94**	82.40**	0.82**	0.24**
	E_2		3.61**	0.64**	11.01**	59.52**	0.42**	0.19**
	E_3		4.39**	0.91**	12.78**	105.25**	0.51**	0.24**
Error	E_1	108	0.34	0.05	2.16	6.80	0.12	0.02
	E_2		0.30	0.09	2.37	7.83	0.15	0.02
	E_3		0.04	0.10	2.18	15.17	0.17	0.03

Table 2: Estimates of general combining ability effects for fruit length (cm), fruit girth (cm), number of fruits/plant, average fruit weight (g), number of primary branches/plant and fruit yield per plant (kg) in brinjal

SN.	Genotypes	Fruit length (cm)				Fruit girth (cm)				Number of fruits per plant			
		E_1	E_2	E_3	Pooled	E_1	E_2	E_3	Pooled	E_1	E_2	E_3	Pooled
1	Pant Rituraj	-0.37 *	-0.49 *	-0.46**	-0.44**	0.04	0.16 *	0.09	0.10 *	-0.79 *	1.27 **	-0.17	0.10
2	PLR 1	0.05	0.47**	0.17	0.23 *	-0.11	-0.37**	-0.21 *	-0.23 **	-1.35 **	-1.26 **	-0.67	-1.09 **
3	KS 224	-1.13**	-0.90**	-0.95**	-0.99**	-0.51 **	-0.71**	-0.56**	-0.59 **	-1.21 **	-1.54 **	-2.48 **	-1.74 **
4	GJB 2	0.59**	-0.02	0.60**	0.39**	-0.42 **	-0.28**	-0.35**	-0.35 **	-0.49	-0.34	0.13	-0.23
5	GJB 3	0.76**	0.44**	0.49**	0.56**	0.21 **	-0.07	0.18 *	0.11 *	1.68 **	0.60	2.13 **	1.47 **
6	S M B	-1.26**	-1.14**	-1.13**	-1.18**	0.52 **	0.44**	0.48**	0.48 **	-1.10 *	-0.68	-0.64	-0.81 **
7	JBGR 06-08	1.05**	1.55**	1.04**	1.21**	-0.04	0.18 *	0.11	0.09	1.26 **	1.41 **	0.19	0.95 **
8	JBL 08-08	1.01**	0.81**	1.01**	0.94**	-0.26 **	0.02	-0.25**	-0.17 **	0.54	-0.79	-0.34	-0.20
9	AB 08-14	-0.42**	-0.34 *	-0.44 *	-0.40**	0.38 **	0.64**	0.27 **	0.43 **	0.26	1.52 **	0.61	0.79 **
10	JB 12-06	-0.28	-0.38 *	-0.34 *	-0.34**	0.19 **	-0.01	0.23 *	0.14 **	1.21 **	-0.18	1.24 *	0.76 **
	SE.(gi) ±	0.16	0.15	0.17	0.09	0.06	0.08	0.09	0.05	0.40	0.42	0.71	0.24
	SE.(gi-gj) ±	0.25	0.22	0.26	0.14	0.09	0.12	0.13	0.07	0.60	0.63	1.06	0.35
SN.	Genotypes	Average fruit weight (g)				Number of primary branches per plant				Fruit yield per plant (kg)			
		E_1	E_2	E_3	Pooled	E_1	E_2	E_3	Pooled	E_1	E_2	E_3	Pooled
1	Pant Rituraj	-2.32 *	-3.16**	-5.98**	-3.82**	0.00	0.18	0.01	0.07	-0.12 **	-0.04	-0.19 **	-0.12 **
2	PLR 1	2.59**	2.61**	5.01**	3.41**	-0.17	-0.16	-0.01	-0.11	-0.00	0.00	0.11 **	0.04 *
3	KS 224	3.89**	3.34**	1.87	3.03**	0.03	-0.13	-0.18	-0.09	0.02	-0.01	-0.08	-0.03
4	GJB 2	-4.26**	0.04	-0.81	-1.68**	-0.06	0.15	-0.04	0.02	-0.17 **	-0.01	-0.02	-0.07 **
5	GJB 3	-0.19	0.26	0.86	0.31	-0.08	0.01	-0.04	-0.04	0.09 *	0.08 *	0.16 **	0.11 **
6	S M B	-3.48**	-3.24**	-2.41 *	-3.04**	-0.25**	0.01	-0.04	-0.09	-0.16 **	-0.14 **	0.11 **	-0.14 **
7	JBGR 06-08	-1.21	-1.85 *	-0.81	-1.29 *	0.28 **	0.12	0.18	0.19 **	0.07 **	0.03	-0.01	0.03

8	JBL 08-08	5.14	**	2.95	**	1.25		3.12	**	-0.11		-0.04		0.10		-0.02		0.20	**	0.06		0.01		0.09	**
9	AB 08-14	0.19		-0.84		0.01		-0.21		0.25	**	-0.18		-0.04		0.01		-0.00		0.05		0.03		0.03	
10	JB 12-06	-0.36		-0.10		1.01		0.18		0.11		0.04		0.04		0.07		0.08	**	-0.01		0.11	**	0.06	**
	SE.(gi) ±	0.71		0.76		1.07		0.50		0.09		0.12		0.11		0.06		0.03		0.04		0.04		0.02	
	SE.(gi-gj) ±	1.06		1.14		1.59		0.74		0.11		0.04		0.04		0.07		0.05		0.06		0.07		0.03	

*, ** significant at 1 and 5 percent levels respectively.

Table 3: Estimates of specific combining ability effects for fruit length (cm) fruit girth (cm) and number of fruits per plant in brinjal

SN	Crosses	Fruit length (cm)				Fruit girth (cm)				Number of fruits per plant			
		E ₁	E ₂	E ₃	Pooled	E ₁	E ₂	E ₃	Pooled	E ₁	E ₂	E ₃	Pooled
1	Pant Rituraj x PLR 1	-2.41	**	2.98	**	-2.20	**	-2.53	**	-0.12	-0.25	-0.27	-0.21
2	Pant Rituraj x KS 224	-0.33		-0.71		-0.71	**	-0.17		-1.02	-0.63	**	-3.89
3	Pant Rituraj x GJB 2	-1.53	**	-1.06		-1.92	**	-1.50	**	-0.52	*	-0.41	-0.75
4	Pant Rituraj x GJB 3	3.71	**	3.29	**	3.71	**	3.57	**	1.59	**	1.59	**
5	Pant Rituraj x S.M.B.	-0.95	*	-0.47	*	-1.24	*	-0.89	**	-0.84	**	-0.68	*
6	Pant Rituraj x JBGR 06-08	3.53	**	3.39	**	3.83	**	3.58	**	1.93	**	1.07	**
7	Pant Rituraj x JBL 08-08	-1.53	**	-1.06	*	-1.21	*	-1.26	**	-0.11		0.63	*
8	Pant Rituraj x AB 08-14	0.03		0.11		-0.02		0.04		-2.16	**	-1.73	**
9	Pant Rituraj x JB 12-06	-1.50	**	-1.78	**	-2.14	**	-1.81	**	-0.57	**	-0.52	*
10	PLR 1 x KS 224	0.05		-0.05		0.12		0.04		0.65	**	0.86	**
11	PLR 1x GJB 2	2.22	**	1.75	**	1.23	*	1.73	**	-0.10		0.47	
12	PLR 1x GJB 3	-1.57	**	-0.69		-1.62	**	-1.29	**	0.09		-0.61	*
13	PLR 1x S.M.B.	2.47	**	3.01	**	2.50	**	2.66	**	1.55	**	1.49	**
14	PLR 1x JBGR 06-08	-2.91	**	-3.10	**	-3.21	**	-3.07	**	-0.34		0.25	-0.53
15	PLR 1x JBL 08-08	2.46	**	0.59		1.93	**	1.66	**	-0.36		-0.35	-0.20
16	PLR 1x AB 08-14	1.48	**	1.55	**	2.09	**	1.71	**	-1.23	**	-0.77	**
17	PLR 1x JB 12-06	0.31		0.37		0.40		0.36		-0.31		-0.54	-0.25
18	KS 224x GJB 2	1.41	**	1.04	*	2.07	**	1.51	**	0.50	*	0.30	0.56
19	KS 224x GJB 3	-1.37	**	-1.21	*	-1.75	**	-1.44	**	-1.36	**	-1.61	**
20	KS 224x S.M.B	0.19		-1.07	*	-0.10		-0.33		0.20		0.25	0.14
21	KS 224x JBGR 06-08	-1.29	**	-0.51		-1.60	**	-1.13	**	-0.29		0.04	-0.59
22	KS 224x JBL 08-08	-1.99	**	-0.56		-2.13	**	-1.56	**	-0.32		-0.03	-0.56
23	KS 224x AB 08-14	0.46		0.92		0.98		0.79	*	0.84	**	0.83	**
24	KS 224x JB 12-06	-0.36		-1.93	**	-0.43		-0.91	**	0.89	**	0.40	0.88
25	GJB 2x GJB 3	-2.96	**	-3.52	**	-3.29	**	-3.26	**	-0.24		-0.63	*
26	GJB 2x S.M.B	0.96	*	0.04		1.92	**	0.97	**	0.82	**	0.88	**
27	GJB 2x JBGR 06-08	-1.52	**	-0.43		-1.97	**	-1.30	**	-0.27		-0.31	1.21
28	GJB 2x JBL 08-08	2.24	**	2.48	**	2.53	**	2.41	**	1.04	**	1.44	**

SN	Crosses	Fruit length (cm)				Fruit girth (cm)				Number of fruits per plant			
		E ₁	E ₂	E ₃	Pooled	E ₁	E ₂	E ₃	Pooled	E ₁	E ₂	E ₃	Pooled
29	GJB 2x AB 08-14	0.45		0.99		0.90		0.78	*	-0.49	*	-0.40	-
30	GJB 2x JB 12-06	-0.54		1.17	*	0.18		0.27		-0.28		0.39	-
31	GJB 3x S.M.B	-2.06	**	-2.16	**	-1.89	**	-2.03	**	0.91	**	0.50	0.95
32	GJB 3x JBGR 06-08	2.46	**	2.55	**	2.99	**	2.67	**	0.13		0.53	0.05
33	GJB 3x JBL 08-08	-1.27	**	-0.02		-0.97		-0.75	*	-0.44	*	-0.47	-
34	GJB 3x AB 08-14	-2.24	**	-2.02	**	-2.37	**	-2.21	**	1.28	**	1.01	**
35	GJB 3x JB 12-06	3.65	**	3.58	**	3.47	**	3.57	**	0.86	**	0.57	*
36	S.M.B x JBGR 06-08	-1.80	**	-0.50		-1.74	**	-1.35	**	-0.49	*	0.20	0.35
37	S.M.B x JBL 08-08	2.06	**	3.12	**	2.12	**	2.43	**	-0.58	**	0.39	-
38	S.M.B x AB 08-14	-1.08	*	0.29		-1.13		-0.64	*	-0.61	**	-0.98	**
39	S.M.B x JB 12-06	-1.49	**	-1.40	*	-1.24	*	-1.37	**	-1.05	**	-0.85	**
40	JBGR 06-08x JBL 08-08	-1.08	*	-1.00	*	-0.59		-0.89	**	0.14		-0.39	0.11
41	JBGR 06-08x AB 08-14	-1.69	**	-2.82	**	-2.38	*	-2.30	**	0.51	*	0.39	0.29
42	JBGR 06-08x JB 12-06	3.43	**	3.14	**	3.99	**	3.52	**	1.17	**	0.57	*
43	JBL 08-08x AB 08-14	-1.49	**	-1.10	*	-1.47	*	-1.35	**	0.94	**	0.27	0.93
44	JBL 08-08x JB 12-06	0.91		-0.81		0.24		0.11		0.07		-0.06	-
45	AB 08-14x JB 12-06	-0.96	*	0.14		-1.51	**	-0.77	*	0.18		0.73	**
	SE (Sij)	0.48		0.50		0.58		0.31		0.21		0.28	0.29
	SE (Sij-Sik)	0.79		0.74		0.86		0.46		0.31		0.41	0.43

SE (Sij-Skl)	0.75	0.71	0.82	0.42	0.30	0.39	0.41	0.20	1.89	1.98	1.90	1.06
Number of significant crosses in desirable direction	13.0	13.0	13.0	14.0	15.0	12.0	12.0	16.0	11.0	11.0	13.0	13.0

*,** significant at 1 and 5 percent levels respectively.

Table 4: Estimates of specific combining ability effects for average fruit weight (g), number of primary branches/plant and fruit yield/plant in brinjal

SN	Crosses	Average fruit weight (g)				Number of primary branches per plant				Fruit yield per plant (kg)			
		E ₁	E ₂	E ₃	Pooled	E ₁	E ₂	E ₃	Pooled	E ₁	E ₂	E ₃	Pooled
1	Pant Rituraj x PLR 1	2.25	-2.80	3.24	0.90	-0.08	0.08	-0.23	-0.08	0.12	0.15	0.15	0.14
2	Pant Rituraj x KS 224	-5.56**	-7.25**	-20.0**	-10.9**	-0.60	-0.28	0.27	-0.21	-0.41**	-0.32**	-0.85**	-0.53**
3	Pant Rituraj x GJB 2	-1.13	-1.75	-7.28	-3.39*	0.15	0.44	-0.20	0.13	-0.19	-0.04	-0.32**	-0.18*
4	Pant Rituraj x GJB 3	13.7**	11.6**	12.7**	12.7**	1.17**	0.58	0.80*	0.85**	0.76**	0.78**	0.65**	0.73**
5	Pant Rituraj x S.M.B.	-3.17	-4.07	-1.42	-2.89	0.01	-0.75*	0.13	-0.21	-0.20	-0.20	-0.14	-0.18*
6	Pant Rituraj x JBGR 06-08	10.4**	13.1**	15.4**	12.9**	1.15**	0.80*	0.58	0.84**	0.88**	0.67**	0.74**	0.76**
7	Pant Rituraj x JBL 08-08	-9.92	-7.27	-12.5**	-9.89**	0.20	-0.36	-0.34	-0.17	-0.45**	-0.09	-0.45**	-0.33**
8	Pant Rituraj x AB 08-14	-0.61	-1.57	-8.44*	-3.54*	0.51	0.44	0.13	0.36	-0.04	0.08	-0.46**	-0.14
9	Pant Rituraj x JB 12-06	-6.35**	-4.89	5.14	-2.03	-1.35**	0.22	0.05	-0.36	-0.36**	-0.27*	0.39**	-0.08
10	PLR 1 x KS 224	-8.61**	3.70	-2.84	-2.58	-0.10	-0.28	0.63	0.08	-0.36**	0.35**	-0.47**	-0.16
11	PLR 1x GJB 2	-7.52**	2.55	6.37	0.47	0.65*	-0.23	-0.17	0.08	-0.31**	-0.10	0.23	-0.06
12	PLR 1x GJB 3	-0.78	-9.20**	-2.22	-4.07	-0.99**	-1.09**	-0.51	-0.86**	-0.22**	-0.74**	-0.23	-0.40
13	PLR 1x S.M.B.	18.2**	14.6**	11.4**	14.8**	1.51**	0.91*	1.16**	1.19**	1.21**	0.95**	0.83**	1.00**
14	PLR 1x JBGR 06-08	5.41*	-1.01	-12.2**	-2.59	-0.69	0.47	0.27	0.02	0.16	-0.03	-0.34**	-0.07
15	PLR 1x JBL 08-08	1.23	0.93	5.28	2.48	1.37**	1.30**	1.02**	1.23**	-0.10	0.19	-0.23	-0.05
16	PLR 1x AB 08-14	2.02	4.99	1.54	2.85	-0.33	-0.56	0.16	-0.24	0.04	0.15	0.41**	0.20*
17	PLR 1x JB 12-06	1.14	5.06*	4.72	3.64**	-0.85**	-0.11	-0.59	-0.52*	-0.01	-0.34**	0.23	-0.04
18	KS 224x GJB 2	11.6**	6.30*	12.3**	10.1**	0.45	0.08	0.33	0.29	0.30*	-0.03	0.57**	0.28**
19	KS 224x GJB 3	2.93	4.69	6.06	4.56**	0.15	0.55	-0.67	0.01	-0.08	0.18	0.24	0.12
20	KS 224x S.M.B.	6.79**	1.25	7.80*	5.28**	-0.02	0.89*	-0.01	0.29	0.47**	0.30*	0.48**	0.42**
21	KS 224x JBGR 06-08	-7.26**	-7.24**	-3.32	-5.94**	-0.22	-0.23	-0.56	-0.33	-0.18	-0.16	-0.49**	-0.28**
22	KS 224x JBL 08-08	3.75	1.05	-14.1**	-3.09	-0.49	-1.06**	-0.15	-0.57**	0.33**	-0.36**	-0.15	-0.06
23	KS 224x AB 08-14	-3.03	-3.21	1.23	-1.67	-0.85**	0.75*	-0.67	-0.26	0.20	-0.12	-0.05	0.01
24	KS 224x JB 12-06	-13.3**	-10.1**	-10.2**	-11.2**	0.29	0.86*	1.24**	0.80**	-0.57**	-0.42**	-0.34	-0.44**
25	GJB 2x GJB 3	-7.17	-0.57	-4.40	-4.05*	0.56	-0.73	0.85*	0.23	-0.32**	-0.11	-0.32**	-0.25**
26	GJB 2x S.M.B.	-4.04	-3.71	-3.94	-3.89*	-0.60	-0.06	-0.15	-0.27	-0.06	-0.43**	-0.11	-0.20*
27	GJB 2x JBGR 06-08	-2.14	-4.53	-4.96	-3.88*	-0.13	0.50	-0.04	0.11	-0.21	-0.11	-0.22	-0.18*
28	GJB 2x JBL 08-08	13.8**	11.6**	18.6**	14.7**	0.92**	0.66	0.02	0.77**	1.02**	0.95**	0.90**	0.96**

SN	Crosses	Average fruit weight (g)				Number of primary branches per plant				Fruit yield per plant (kg)			
		E ₁	E ₂	E ₃	Pooled	E ₁	E ₂	E ₃	Pooled	E ₁	E ₂	E ₃	Pooled
29	GJB 2x AB 08-14	1.39	-4.39	0.05	-1.02	-0.10	0.14	0.19	0.07	0.09	0.07	0.04	0.07
30	GJB 2x JB 12-06	11.7**	3.82	9.05*	8.19**	-0.30	-0.42	-0.56	-0.43	0.42**	0.37**	0.33*	0.37**
31	GJB 3x S.M.B.	-9.32	-11.0**	-11.5**	-10.6**	-0.91	-0.25	-0.48	-0.55	0.32**	0.48**	0.36**	0.39**
32	GJB 3x JBGR 06-08	8.16**	11.1**	6.68	8.65**	1.56**	0.64	0.97*	1.06**	0.48**	0.54**	0.51**	0.51**
33	GJB 3x JBL 08-08	7.68**	5.05	6.75	6.49**	-1.38	0.47	-0.62	-0.51	0.00	0.19	0.10	0.10
34	GJB 3x AB 08-14	6.37**	-2.51	8.51**	4.12*	-1.08	0.61	-0.15	-0.21	0.47**	-0.20	0.53**	0.27**
35	GJB 3x JB 12-06	14.3**	10.2**	11.9**	12.1**	1.06**	0.38	0.77*	0.74**	0.79**	0.87**	0.64**	0.77**
36	S.M.B x JBGR 06-08	0.35	-0.01	4.82	1.72	-0.27	-0.36	-0.04	-0.22	-0.05	0.18	0.26	0.13
37	S.M.B x JBL 08-08	13.7**	13.8**	9.73**	12.4**	0.45	-0.20	1.05**	0.43*	0.60**	0.53**	0.39**	0.50**
38	S.M.B x AB 08-14	6.66**	10.9**	6.29	7.96**	0.42	0.28	0.52	0.41*	-0.04	0.34**	0.13	0.14
39	S.M.B x JB 12-06	-4.98	-4.04	-2.12	-3.71*	0.23	0.72*	-0.56	0.13	0.52**	-0.20	0.55**	0.42**
40	JBGR 06-08x JBL 08-08	-10.2	-8.32**	-6.42	-8.30**	0.92**	0.03	0.49	0.48*	0.74**	0.40**	0.33*	0.49**
41	JBGR 06-08x AB 08-14	3.50	3.41	5.74	4.22*	1.23**	-0.17	0.97*	0.68**	0.36**	0.28*	0.44**	0.36**
42	JBGR 06-08x JB 12-06	12.9**	11.8**	14.0**	12.9**	0.70*	0.61	0.55	0.62	0.89**	0.60**	0.74**	0.74**
43	JBL 08-08x AB 08-14	-4.77	-0.39	1.91	1.09	-1.38	0.33	-0.29	-0.45	0.28*	0.17	0.06	0.13
44	JBL 08-08x JB 12-06	-8.94	-6.85**	-15.6**	-10.5**	0.76*	-0.23	0.30	0.28	0.09	0.37**	0.52**	0.33**
45	AB 08-14x JB 12-06	-	-	-	-	1.06**	-0.09	0.77*	0.58**	-	-	-	-

		9.68	6.90	14.4	10.3						0.37	0.25	0.47	0.36
	SE (Sij)	2.40	2.57	3.58	1.68	0.32	0.36	0.37	0.20	0.11	0.12	0.15	0.08	
	SE (Sij-Sik)	3.53	3.78	5.27	2.46	0.47	0.53	0.55	0.30	0.17	0.18	0.22	0.11	
	SE (Sij-Skl)	3.36	3.61	5.02	2.23	0.45	0.50	0.52	0.27	0.16	0.17	0.21	0.10	
	Number of significant crosses in desirable direction	15.0	11.0	11.0	16.0	13.0	07.0	10.0	14.0	13.0	12.0	14.0	10.0	

*,** significant at 1 and 5 percent levels respectively.

Table 4: Three best crosses selected on the basis of best performing parents, good general combiners, best performing crosses with SCA effects for different characters in brinjal

S. N. 1	Characters 2	Best performing parent 3	Best general combiners 4	Best performing F ₁ 5	Sca Effect 6	Best specific F ₁ cross Combination 7	Sca Effect 8
1.	Fruit length (cm)	JBGR-06-08	JBGR-06-08	GJB-3 x JBGR-06-08	2.67**	Pant Rituraj x JBGR-06-08	3.58**
		GJB-3	JBL-08-08	JBGR-06-08 x JB-12-06	3.52**	Pant Rituraj x GJB-3	3.57**
		JBL-08-08	GJB-3	Pant Rituraj x JBGR-06-08	3.58**	GJB-3 x JB-12-06	3.57**
2.	Fruit girth (cm)	AB-08-14	S.M.B.	Pant Rituraj x GJB-3	1.67**	Pant Rituraj x GJB-3	1.67**
		Pant Rituraj	AB-08-14	Pant Rituraj x JBGR-06-08	1.63**	Pant Rituraj x JBGR-06-08	1.63**
		S.M.B.	JB-12-06	GJB-3 x AB-08-14	1.24**	PLR 1 x S.M.B.	1.51**
3.	Number of fruits per plant	AB-08-14	GJB-3	GJB-3 x JB-12-06	3.93**	PLR 1 x S.M.B.	6.06**
		JB-12-06	JBGR-06-08	Pant Rituraj x GJB-3	4.37**	GJB-2 x JBL-08-08	4.92**
		GJB-3	AB-08-14	GJB-3 x JBGR-06-08	2.96**	Pant Rituraj x GJB-3	4.37**
4.	Average fruit (g) Weight	KS 224	PLR 1	GJB-2 x JBL-08-08	14.7**	PLR 1 x S.M.B.	14.8**
		JBL-08-08	JBL-08-08	PLR 1 x S.M.B.	14.8**	GJB-2 x JBL-08-08	14.7**
		AB-08-14	KS 224	GJB-3 x JB-12-06	3.93**	Pant Rituraj x JBGR-06-08	12.9**
5.	Number of primary branches/plant	KS 224	JBGR-06-08	GJB-3 x JBGR-06-08	1.06**	PLR 1 x JBL-08-08	1.23**
		Pant Rituraj	Pant Rituraj	PLR 1 x JBL-08-08	1.23**	PLR 1 x S.M.B.	1.19**
		PLR 1	JB-12-06	PLR 1 x S.M.B.	1.19**	GJB-3 x JBGR-06-08	1.06**
6.	Fruit yield per plant (kg)	KS 224	GJB-3	GJB-2 x JBL-08-08	0.96**	PLR 1 x S.M.B.	1.00**
		AB-08-14	JBL-08-08	GJB-3 x JB-12-06	0.77**	GJB-2 x JBL-08-08	0.96**
		JBL-08-08	JB-12-06	PLR 1 x S.M.B.	1.00**	GJB-3 x JB-12-06	0.77**

* and ** indicates significant at P=0.05 and P=0.01 levels, respectively

Table 5: Top ten crosses based on SCA effects for fruit yield on pooled basis and its component characters across the environment

S.N.	Crosses	Fruit yield per plant (kg)	Fruit length (cm)	Fruit girth (cm)	Number of fruits per plant	Average fruit weight (g)	Number of primary branches per plant
1.	PLR 1 x S.M.B.	1.00** (G x P)	2.66**	1.51**	6.06**	14.8**	1.19**
2.	GJB-2 x JBL-08-08	0.96** (P x G)	2.41**	1.19**	4.92**	14.7**	0.77**
3.	GJB-3 x JB-12-06	0.77** (G x G)	3.57**	0.71**	3.93**	12.1**	0.74**
4.	Pant Rituraj x JBGR-06-08	0.76** (P x A)	3.58**	1.63**	3.77**	12.9**	0.84**
5.	JBGR-06-08 x JB-12-06	0.74** (A x G)	3.52**	0.88**	3.34**	12.9**	0.62
6.	Pant Rituraj x GJB-3	0.73** (P x G)	3.57**	1.67**	4.37**	12.7**	0.85**
7.	GJB-3 x JBGR-06-08	0.51** (G x A)	2.67**	0.23	2.96**	8.65**	1.06**
8.	S.M.B. x JBL-08-08	0.50** (P x G)	2.43**	-0.18	1.39	12.4**	0.43**
9.	KS 224 x S.M.B.	0.42** (A x P)	-0.33	0.20	4.04**	5.28**	0.29
10.	GJB-2 x JB-12-06	0.37** (P x G)	0.27	0.01	1.86**	8.19**	-0.43

Table 6: Correlation coefficient between *per se* performance and gca effects as well as *per se* performance and sca effects in brinjal on pooled basis

S. N.	Characters	Per se performance and gca effects	Per se performance and sca effect
1.	Fruit length (cm)	0.75*	0.89**
2.	Fruit girth (cm)	0.76**	0.88**
3.	Number of fruits per plant	0.70*	0.89**
4.	Average fruit weight (g)	0.66*	0.92**
5.	Number of primary branches per plant	-0.55	0.98**
6.	Fruit yield per plant (kg)	0.44	0.97**

Conclusion

Overall, PLR 1, GJB-3, JBL-08-08 and JB-12-06 were good general combiners for fruit yield per plant and its contributing traits as indicated by significant and positive *gca* effects and good *per se* performance. Therefore, these parents could be preferred in breeding programme as these are expected to give desirable transgressive segregants in the succeeding generations. Three crosses *viz.*, GJB-2 x JBL-08-08, GJB-3 x JB-12-06 and Pant Rituraj x GJB-3 displayed high *per se* performance and high *sca* effects for fruit yield per plant. The high *sca* effects of the hybrids indicated that substantial role was also played by dominance and epistatic interaction. Such crosses can be utilized for enhancing the brinjal fruit yield and other characters.

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