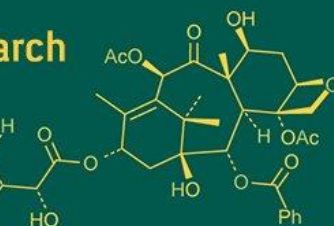
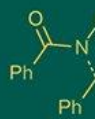


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Heterosis studies in brinjal (*Solanum melongena* L.) using Line X Tester mating design

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Abstract

The present investigation was carried out at Central research station, Vegetable Division Wakawali, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli (MH.) during *Rabi* 2023-24. The experimental materials comprised of eight genotypes, their 15 F_1 's made by LXT mating design and two checks. Experiment was laid in a Randomized Block Design with three replications. Mean sum squares due to genotypes were highly significant for all the characters studied. This stated that there was significant genetic variation across genotypes for every trait under investigation. Significant heterosis in desirable direction was found over mid, better parent, resistant and susceptible check for all characters studied. In present investigation highest significant positive heterosis was recorded by cross combinations Bandhtiware X Konkan Prabha (36.99%), followed by Kasral X Konkan Prabha (24.66%), Bandhtiware X Singnath (20.35%) over resistant check and hence were found promising for fruit yield per plant. The identified hybrids may be further tested over locations, seasons and years for commercial release for commercial cultivation.

Keywords: Brinjal, Heterosis, mid-parent (MP), Better parent (BP) and Standard check (SC)

Introduction

Brinjal (*Solanum melongena* L.), commonly known as eggplant or aubergine, is one of the most important solanaceous vegetable crops cultivated worldwide. It holds great significance in India, which is considered a center of diversity for this crop (Zeven and Zhukovsky, 1975) [24]. India is having a vast variety of eggplant genetic resources, including a wide variety of plant kinds, fruit colours, forms, sizes, yields, and other quality characteristics (Meyer *et al.*, 2012) [10].

Globally, brinjal occupies about 1.8-2.0 million hectares with an annual production exceeding 57 million tonnes, of which China and India together contribute nearly 90% (FAOSTAT, 2022) [6]. India is the second largest producer with around 0.73 million hectares under cultivation and a production of 12-13 million tonnes, giving an average productivity of about 18-19 tonnes per hectare, which is lower than the realized potential under hybrid cultivation. Within India, brinjal holds immense economic and nutritional importance, especially in states like West Bengal, Odisha, Bihar, and Maharashtra. In Maharashtra, brinjal is cultivated on approximately 0.02 million hectares, producing nearly 0.34 million tonnes, with average productivity ranging between 16-17 tonnes per hectare (NHB, First Advance estimates 2021-22). Despite being a key brinjal-producing state, productivity is often constrained by pest and disease incidence, varietal limitations, and climatic variability. To enhance yield and quality, the exploitation of heterosis (hybrid vigor) has become a crucial breeding strategy. In brinjal large number of seeds are produced in single act of pollination, crop hardiness, comparatively large size of flowers etc. features promotes breeders for exploitation of hybrid. In brinjal the cost of hybrid seed production is low as compare to other vegetable crops hence exploiting hybrid vigour has become an effective method for brinjal development (Pal and Singh 1949, Mishra 1961, Samandam 1962, Dhankar *et al.* 1980, Chadha and Sidhu, 1982) [15, 12, 20, 5, 3].

Materials and Methods

The present investigation was carried out at Central research station, Vegetable Improvement Scheme Wakawali, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli (MH.) during

Rabi 2023-24. The experimental materials comprised of eight parents out of which Bandhtiware (BDHE), Kali Ravai (KR), Kasral (KL) were used as lines whereas Konkana Prabha (KP), Swarn Pratibha (SP), Singnath (S), Lanja Local (LL), BB 64 (BB64) were used as testers. Konkana Prabha (KP) used as resistant check to bacterial wilt and Kali Ravai (KR) used as susceptible check to Bacterial wilt. 15 F₁'s made among 8 parents by using LXT mating design.

All 8 parents, 2 checks along with 15 F₁ were raised in a Randomized Block Design with three replications. All the recommended package of practices were adopted for raising a healthy crop. Five randomly selected plants, from each plot of all the three replications were tagged and used for

recording the observations on 9 traits namely Days to first flowering, Plant height (cm), Number of primary branches per plant, Number of fruits per plant, Fruit length (cm), Fruit diameter (cm), Fruit weight (g), Fruit yield per plant (kg), Terminal Bacterial Wilt Incidence (%) and average values were computed across replications. The magnitude of heterosis was estimated in relation to mid parent, better parent and standard check values. They were thus, calculated as percentage increase or decrease of F₁s over the Mid-parent (MP), Better parent (BP) and Standard check (SC).

Results and Discussion

Analysis of variance (ANOVA)

Table 1: Analysis of variance for various characters in Line X Tester analysis of Brinjal (*Solanum melongena* L.)

Source of variation	DF	Days to first flowering	Plant Height (cm)	No. of primary branches per plant	No. of fruits per plant	Fruit Length (cm)	Fruit Diameter (cm)	Fruit Weight (g)	Fruit Yield per plant (kg)	Terminal Bacterial Wilt Incidence (%)
Replication	2	26.71	32.76	0.43	4.14	0.75	0.01	49.83	0.01	2.54
Genotypes	22	54.93**	174.65**	4.82**	74.29**	14.67**	1.06**	579.60**	0.21**	2113.87**
Parents	7	59.98**	217.90**	10.55**	123.75**	22.07**	1.95**	967.54**	0.10**	2404.61**
Crosses	14	43.45**	164.79**	2.25**	52.41**	11.41**	0.68**	405.83**	0.16**	2119.05**
Parents Vs Crosses	1	180.35**	9.96	0.62*	34.36**	8.63**	0.26**	296.82**	1.68**	6.11
Error	44	14.21	34.73	0.26	3.60	0.66	0.09	37.75	0.03	11.25

*Significant at 5% level of significance

** Significant at 1% level of significance

The analysis of variance for various characters has been represented in Table.1. It is showed that mean sum squares due to genotypes were highly significant for all the characters studies. This stated that there was significant genetic variation across genotypes for every trait under investigation. Further dividing of genotypic variance into components viz., parents, crosses and parents vs. crosses were highly significant for all traits studied except for plant height and terminal bacterial wilt incidence due to parent vs. crosses. This suggested that there were significant variations between the parents and crosses

Heterosis

Days to first flowering

Negative heterosis for this trait indicates earliness. The ranges of average heterosis, heterobeltiosis, heterosis over check Konkana Prabha and heterosis over check Kali Ravai were -6.96 (Bandhtiware X Konkana Prabha) to 23.31 (Bandhtiware X Singnath), -7.97 (Bandhtiware X Konkana Prabha) to 18.84 (Bandhtiware X Singnath), -9.29 (Bandhtiware X Konkana Prabha) to 22.14 (Kali Ravai X BB 64) and -16.99 (Bandhtiware X Konkana Prabha) to 11.76 (Kali Ravai X BB 64) respectively. One cross (Bandhtiware

X Konkana Prabha) manifested significantly negative heterosis over susceptible check Kali Ravai. None of the cross shown significantly negative heterosis over resistant check Konkana Prabha. This result is in accordance with the results of Rani *et al.* (2018)^[18] and Samatha *et al.* (2021)^[21]

Plant Height (cm)

Negative heterosis for this trait is desirable. Maximum and significant negative heterosis (-21.41%) over mid parent and (-23.87%) over better parent was found in cross Bandhtiware X Swarn Pratibha. Significantly negative heterosis was displayed by one cross over mid parent, four crosses over better parent. None of the cross showed significantly negative heterosis over resistant check Konkana Prabha and susceptible check Kali Ravai. Similar results were depicted by Kalaiyarasi *et al.* (2018)^[7] and Susmitha *et al.*, (2023)^[23]

Number of primary branches per plant

Significantly positive as well as negative heterosis over mid parent, better parent, resistant check Konkana Prabha and susceptible check Kali Ravai was observed for this character.

Table 2: Estimates of heterosis (%) over mid parent, better parent and standard checks (KP, KR) for Days to first flowering, Plant height (cm) and Number of primary branches per plant grown in naturally bacterial wilt sick plots

	Hybrids	Days to first flowering				Plant Height (cm)				No. of primary branches per plant			
		MP	BP	SC 1 (Resistant)	SC 2 (Susceptible)	MP	BP	SC 1 (Resistant)	SC 2 (Susceptible)	MP	BP	SC 1 (Resistant)	SC 2 (Susceptible)
H ₁	BDHE X KP	-6.96	-7.97	-9.29	-16.99**	-10.25	-15.16	-4.08	0.25	15.91	14.18	18.70	15.73
H ₂	BDHE X SP	2.51	1.42	2.14	-6.54	-21.41**	-23.87**	-8.19	-4.04	2.55	-17.35**	40.42**	36.91**
H ₃	BDHE X S	23.31**	18.84**	17.14*	7.19	2.00	-5.72	25.60**	31.27**	9.57	-19.37**	77.66**	73.22**
H ₄	BDHE X LL	7.28	-1.22	15.71*	5.88	-5.04	-12.69	17.66	22.98*	-8.64	-27.11**	27.23**	24.05*
H ₅	BDHE X BB64	6.14	5.76	5.00	-3.92	14.17*	12.66	30.83**	36.74**	44.85**	30.54**	69.12**	64.90**
H ₆	KR X KP	1.77	-2.70	2.86	-5.88	29.37**	26.67**	27.53**	33.29**	21.97**	20.15*	24.90*	21.79*
H ₇	KR X SP	2.42	0.00	5.71	-3.27	14.94*	3.44	24.74**	30.38**	-8.22	-26.03**	25.68*	22.54*
H ₈	KR X S	18.12**	10.14	16.43*	6.54	-5.89	-18.87**	8.08	12.96	-22.49**	-42.96**	25.68*	22.54*
H ₉	KR X LL	1.92	-3.05	13.57	3.92	-6.52	-19.80**	8.08	12.96	-12.65*	-30.31**	21.64*	18.61
H ₁₀	KR X BB64	19.16**	15.54*	22.14**	11.76	3.71	-5.07	10.24	15.22	40.86**	26.95**	64.47**	60.36**
H ₁₁	KL X KP	2.67	-6.67	10.00	0.65	-7.00	-17.78*	7.76	12.63	1.43	-5.33	10.16	7.41
H ₁₂	KL X SP	4.58	-3.03	14.29*	4.58	2.80	-1.30	29.35**	35.20**	-7.59	-22.15**	32.27**	28.97**
H ₁₃	KL X S	10.58	-1.82	15.71*	5.88	-3.66	-4.44	27.30**	33.06**	-13.82**	-34.15**	45.07**	41.45**
H ₁₄	KL X LL	-6.38	-6.67	10.00	0.65	-11.07	-12.29	18.20	23.54*	-13.07*	-27.56**	26.45**	23.30*
H ₁₅	KL X BB64	9.21	0.61	18.57**	8.50	5.32**	-0.68	30.17**	36.05**	-2.21	-7.19	20.25*	17.25
	SE±	2.75	3.18	3.18	3.18	4.66	5.38	5.38	5.38	0.36	0.41	0.41	0.41
	CD 5%	5.53	6.39	6.39	6.39	9.37	10.82	10.82	10.82	0.72	0.83	0.83	0.83
	CD 1%	7.38	8.52	8.52	8.52	12.50	14.44	14.44	14.44	0.96	1.11	1.11	1.11
	Min value	-6.99	-7.97	-9.29	-16.99	-21.41	-23.87	-8.19	-4.04	-22.49	-42.96	10.16	7.41
	Max value	23.31	18.84	22.14	11.76	29.37	26.67	30.83	36.74	44.85	30.54	77.66	73.22
	Range	-6.96 to 23.31	-7.97 to 18.84	-9.29 to 22.14	-16.99 to 11.76	-21.41 to 29.37	-23.87 to 26.67	-8.19 to 30.83	-4.04 to 36.74	-22.49 to 44.85	-42.96 to 30.54	10.16 to 77.66	7.41 to 73.22

Maximum and significant positive heterosis (44.85%) over mid parent and (-30.54%) over better parent was found in cross Bandhtware X BB 64, whereas cross Bandhtware X Singhath shown significant positive heterosis (77.66%) over resistant check Konkan Prabha and (73.22%) over susceptible check Kali Ravai. This is supported by Sivakumar *et al.* (2017) [22], Samantha *et al.* (2021) [21]

Number of fruits per plant

The estimated heterosis was found significantly positive as well as negative heterosis over mid parent, better parent, resistant check and susceptible check. Maximum and significant positive heterosis (76.74%) over mid parent (39.96%) over better parent was found in cross Kali Ravai X Lanja Local. Out of 15 crosses Six crosses displayed significantly positive heterosis over mid parent, four crosses manifested significantly positive heterosis over better parent, none of the cross recorded significantly positive heterosis over standard check Konkan Prabha and six crosses recorded significantly positive heterosis over check Kali Ravai. Similar findings were supported by Balawani *et al.* (2017) [2], Khapte *et al.* (2017) [8].

Fruit Length (cm)

For this character out of 15 crosses nine crosses displayed significantly positive heterosis over mid parent, two crosses manifested significantly positive heterosis over better parent, two crosses and fifteen crosses recorded significantly positive heterosis over resistant check and susceptible check respectively. Maximum significant positive heterosis (20.56%) over mid parent was shown by cross Kasral X Lanja Local, 19.56% over better parent shown by Karal X BB64. Bandhtware X Konkan Prabha depicted maximum significant positive heterosis (13.18%) over resistant check. Similar results were depicted by Chintan *et al.* (2018) [4], Susmitha *et al.*, (2023) [23]

Fruit Diameter (cm)

Thirteen crosses recorded significantly positive heterosis over check Konkan Prabha. None of the cross displayed significantly positive heterosis over mid parent and over

better parent and susceptible check Kali Ravai. Maximum significant positive heterosis (52.40%) over resistant check Konkan Prabha was shown by Karal X BB64. Ramani *et al.* (2015) [16], Balwani *et al.* (2017) [2] found similar results for fruit diameter.

Fruit weight (g)

Maximum significant positive heterosis (75.56%) over resistant check Konkan Prabha and 75.68% over susceptible check was shown by Karal X BB64. Three crosses displayed significantly positive heterosis over mid parent, none of the cross manifested significantly positive heterosis over better parent, twelve crosses recorded significantly positive heterosis over check Konkan Prabha and Kali Ravai. These findings were supported by Ramireddy *et al.* (2011) [17], Reddy and Patel (2014) [19].

Fruit yield per plant (kg)

Significantly positive as well as negative heterosis over mid parent, better parent, resistant check Konkan Prabha and susceptible check Kali Ravai was observed for this character. Maximum significant and positive heterosis over mid parent (45.23%), better parent (32.08%), resistant check (36.99%) and susceptible check (82.77%) observed in the cross Bandhtware X Konkan Prabha This result was similar to results obtained by Nikhila *et al.* (2022) [14] and Mishra *et al.* (2023) [11].

Terminal Bacterial Wilt Incidence (%)

Negative heterosis for this trait is desirable. Bandhtware X Konkan Prabha and Kasral X Konkan Prabha both shown significant and negative heterosis (-100%) over mid parent, better parent, resistant check and susceptible check. Out of 15 crosses eight crosses displayed significantly negative heterosis over mid parent, thirteen crosses manifested significantly negative heterosis over better parent, two crosses and fourteen crosses recorded significantly negative heterosis over check Konkan Prabha and Kali Ravai respectively. This is supported by Ajappalavara *et al.* (2013) [1], Kurhade *et al.* (2017) [9] and Mishra *et al.* (2023) [11].

In present investigation Bandhtiware X Konkani Prabha recorded maximum significant positive heterosis for the character fruit length, fruit yield per plant and significant negative heterosis for terminal bacterial wilt incidence. Out of 15 cross combinations Bandhtiware X Konkani Prabha, Kasral X Konkani Prabha, Bandhtiware X Singnath, were

found promising for fruit yield per plant with heterosis component showing significant desired heterosis. Hybrids in brinjal not only provide higher yields but also ensure improved fruit quality, resistance to diseases, thereby strengthening the productivity and profitability of this crop

Table 3: Estimates of heterosis (%) over mid parent, better parent and standard checks (KP, KR) for Number of fruits per plant, Fruit Length (cm) and Fruit diameter (cm) grown in naturally bacterial wilt sick plots

	Hybrids	No. of fruits per plant				Fruit Length (cm)				Fruit Diameter (cm)			
		MP	BP	SC 1 (Resistant)	SC 2 (Susceptible)	MP	BP	SC 1 (Resistant)	SC 2 (Susceptible)	MP	BP	SC 1 (Resistant)	SC 2 (Susceptible)
H ₁	BDHE X KP	24.07**	0.45	1.76	63.51**	16.86**	12.67*	13.18*	128.74**	-8.34	-17.82**	4.99	-29.41**
H ₂	BDHE X SP	21.17*	2.84	-35.48**	3.66	10.12*	9.77	2.36	106.86**	-16.16**	-24.56**	20.51**	-18.98**
H ₃	BDHE X S	-0.57	-16.41**	-23.04**	23.66**	10.98*	3.30	11.79*	125.92**	-4.42	-14.80*	8.84	-26.82**
H ₄	BDHE X LL	27.44**	23.09**	-22.77**	24.09**	-7.66	-14.58**	-20.35**	60.96**	-3.59	-4.94	24.93**	-16.00**
H ₅	BDHE X BB64	0.49	-0.87	-36.07**	2.71	13.71*	-4.77	-11.20*	79.46**	-10.09*	-16.08**	23.71**	-16.82**
H ₆	KR X KP	2.22	-16.39**	-15.30**	36.09**	6.64	-19.91**	-19.54**	62.60**	-3.86	-19.37**	20.60**	-18.91**
H ₇	KR X SP	15.52	-3.01	-37.52**	0.39	13.16*	-12.61*	-19.04**	63.63**	-13.38**	-16.14**	33.96**	-9.93
H ₈	KR X S	-13.45*	-26.45**	-32.28**	8.81	-3.56	-29.30**	-23.50**	54.61**	1.70	-15.16**	26.90**	-14.67**
H ₉	KR X LL	46.74**	39.96**	-9.85*	44.86**	4.98	-14.10*	-31.91**	37.60**	-6.73	-12.39*	31.04**	-11.89
H ₁₀	KR X BB64	21.20**	21.14**	-21.88**	25.52**	8.34	-2.42	-38.58**	24.13*	1.24	0.50	50.33**	1.08
H ₁₁	KL X KP	-12.66*	-34.54**	-33.69**	6.54	19.76**	-2.35	-1.90	98.26**	7.50	-10.11*	35.47**	-8.92
H ₁₂	KL X SP	29.01**	20.35*	-39.18**	-2.27	14.35*	-3.72	-10.80*	80.28**	-8.24	-10.84*	42.43**	-4.24
H ₁₃	KL X S	-7.97	-28.72**	-34.38**	5.44	7.61	-14.69**	-7.68	86.58**	7.69	-10.42*	35.00**	-9.23
H ₁₄	KL X LL	13.00	5.34	-38.42**	-1.05	20.56**	8.47	-14.02**	73.77**	-2.90	-9.11	36.97**	-7.91
H ₁₅	KL X BB64	-5.03	-15.31*	-45.38**	-12.24	19.97**	19.56*	-24.23**	53.13**	2.24	1.12	52.40**	2.47
	SE±	1.37	1.58	1.58	1.58	0.57	0.66	0.66	0.66	0.23	0.27	0.27	0.27
	CD 5%	2.76	3.18	3.18	3.18	1.15	1.32	1.32	1.32	0.46	0.54	0.54	0.54
	CD 1%	3.68	4.25	4.25	4.25	1.53	1.77	1.77	1.77	0.62	0.71	0.71	0.71
	Min value	-13.45	-34.54	-45.38	-12.24	-7.66	-29.3	-38.58	24.13	-16.16	-24.56	4.99	-29.41
	Max value	46.74	39.96	1.76	63.51	2.56	19.56	13.18	128.74	7.69	1.12	52.4	2.47
	Range	-13.45 to 46.74	-34.54 to 39.96	-45.38 to 1.76	-12.24 to 63.51	-7.66 to 20.56	-29.3 to 19.56	-38.58 to 13.18	24.13 to 128.74	-16.16 to 7.69	-24.56 to 1.12	4.99 to 52.4	-29.41 to 2.47

Table 4: Estimates of heterosis (%) over mid parent, better parent and standard checks (KP, KR) for Fruit weight (g), Fruit yield per plant (kg) and Terminal bacterial wilt incidence (%) grown in naturally bacterial wilt sick plots

	Hybrids	Fruit weight (g)				Fruit yield per plant (kg)				Terminal bacterial wilt incidence (%)			
		MP	BP	SC 1 (Resistant)	SC 2 (Susceptible)	MP	BP	SC 1 (Resistant)	SC 2 (Susceptible)	MP	BP	SC 1 (Resistant)	SC 2 (Susceptible)
H ₁	BDHE X KP	12.35	0.38	33.75**	33.85**	45.23**	32.08**	36.99**	82.77**	-100.00**	-100.00**	-100.00**	-100.00**
H ₂	BDHE X SP	-4.18	-16.80**	50.52**	50.62**	11.59	4.13	2.09	36.21**	-51.52**	-68.00**	33.33	-85.96**
H ₃	BDHE X S	17.04**	7.27	42.94**	43.04**	35.31**	29.47**	20.35*	60.57**	-55.56**	-68.00**	33.33	-85.96**
H ₄	BDHE X LL	-3.01	-7.48	23.29*	23.38*	35.96**	27.19*	8.02	44.13**	30.00**	4.00	333.33**	-54.39**
H ₅	BDHE X BB64	4.42	0.02	45.54**	45.64**	18.34*	12.45	6.07	41.51**	-33.33**	-56.00**	83.33**	-80.70**
H ₆	KR X KP	6.07	5.13	10.22	10.30	8.01	-5.85	-2.35	30.29*	-24.59**	-58.93**	283.33**	-59.65**
H ₇	KR X SP	3.31	-18.94**	46.64**	46.74**	1.68	-9.18	-10.96	18.80	12.50**	-35.71**	500.00**	-36.84**
H ₈	KR X S	8.82	4.89	16.43	16.51	5.41	-3.58	-10.37	19.58	28.36**	-23.21**	616.67**	-24.56**
H ₉	KR X LL	-2.50	-9.75	9.18	9.25	28.76**	26.14*	-2.74	29.77*	54.93**	-1.79	816.67**	-3.51
H ₁₀	KR X BB64	19.57**	2.10	48.55**	48.66**	15.49	4.95	-1.01	32.08*	-3.13	-44.64**	416.67**	-45.61**
H ₁₁	KL X KP	5.43	-16.48**	49.87**	49.97**	34.81**	20.19*	24.66**	66.32**	-100.00**	-100.00**	-100.00**	-100.00**
H ₁₂	KL X SP	-2.56	-2.95	75.56**	75.68**	28.36**	17.34	15.05	53.50**	-51.35**	-68.97**	50.00	-84.21**
H ₁₃	KL X S	15.47**	-6.55	67.69**	67.81**	36.13**	27.53**	18.55*	58.17**	-45.00**	-62.07**	83.33**	-80.70**
H ₁₄	KL X LL	0.99	-15.46**	51.70**	51.80**	30.64**	24.82*	1.37	35.25**	0.00	-24.14**	266.67**	-61.40**
H ₁₅	KL X BB64	1.74	-7.88	65.30**	65.42**	21.74*	13.28	6.85	42.56**	-8.11	-41.38**	183.33**	-70.18**
	SE±	4.38	5.06	5.06	5.06	0.13	0.15	0.15	0.15	2.27	2.62	2.62	2.62
	CD 5%	8.80	10.16	10.16	10.16	0.27	0.31	0.31	0.31	4.57	5.27	5.27	5.27
	CD 1%	11.74	13.56	13.56	13.56	0.36	0.41	0.41	0.41	6.09	7.04	7.04	7.04
	Min value	-16.16	-24.56	4.99	-29.41	1.68	-9.18	-10.96	18.8	-100	-100	-100	-100
	Max value	7.69	1.12	52.4	2.47	45.23	32.08	36.99	82.77	54.93	4	816.67	-3.51
	Range	-16.16 to 7.69	-24.56 to 1.12	4.99 to 52.4	-29.41 to 2.47	1.68 to 45.23	-9.18 to 32.08	-10.96 to 36.99	18.8 to 82.77	-100 to 54.93	-100 to 4	-100 to 816.67	-100 to -3.51

References

- Ajjappalavara PS, Dharmatti PR, Salimath PM. Heterosis for yield and bacterial wilt resistance in brinjal (*Solanum melongena* L.). Asian J Hort. 2013;8(1):12-20.
- Balwani AK, Patel JN, Acharya RR, Gohil DP, Dhruve JJ. Heterosis for fruit yield and its component traits in brinjal (*Solanum melongena* L.). Journal of Pharmacognosy and Phytochemistry. 2017;6(5):187-190.
- Chadha, Sidhu. Heterosis breeding in vegetable crops. 1982:38-41.
- Chintan RM, Keshubhai BK, Srikanth S, Sushil K. Heterosis and inbreeding depression for fruit yield attributing traits in eggplant. Current Plant Biology. 2018;16:27-31.
- Dhankar BS, Mehrotra N, Singh K. Heterosis in relation to yield components and shoot/fruit borer in eggplant. 1980.
- FAOSTAT. 2022.

7. Kalaiyarasi G, Ranjith RRS, Saravanan KR. Studies on heterosis for yield in brinjal (*Solanum melongena* L.). Horticultural Biotechnology Research. 2018;4:35-38.
8. Khapte PS, Singh TH, Sadashiva AT. Heterosis in Manjari gota type of brinjal (*Solanum melongena* L.). Res Environ Life Sci. 2017;10(5):421-424.
9. Kurhade GM. Heterosis and combining ability for yield and its traits with genetics of bacterial wilt resistance in brinjal (*Solanum melongena* L.). PhD Thesis. Dr Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli; 2017.
10. Meyer RS, Karol KG, Little DP, Nee MH, Litt A. Phylogeographic relationships among Asian eggplants and new perspectives on eggplant domestication. Mol Phylogenet Evol. 2012;63:685-701.
11. Mishra SL, Tripathy P, Sahu GS, Lenka D, Mishra MK, Tripathy SK, *et al.* Study of heterosis, combining ability and gene action in brinjal (*Solanum melongena* L.) landraces of Odisha. 2023;14(2):572-583.
12. Mishra GM. Investigation on hybrid vigour in brinjal (*Solanum melongena* L.). Indian J Hort. 1961;19:305-317.
13. NHB. First advance estimates. 2021-22.
14. Nikhila J, Jirankali JP, Gowda TH, Dushyanthkumar B. Heterosis studies for yield and yield attributing traits in brinjal (*Solanum melongena* L.). The Pharma Innovation Journal. 2022;11(5):738-741.
15. Pal BP, Singh HB. Hybrid brinjal gives increased yields. Indian Farming. 1949;10:378-380.
16. Ramani PS, Vaddoria MA, Jivani LL, Patel NB. Heterosis for fruit borer resistance. 2015.
17. Ramireddy SRKM, Lingiah HB, Naresh P, Reddy PVK, Kuchi VS. Heterosis studies for yield and yield attributing characters in brinjal (*Solanum melongena* L.). Plant Archives. 2011;11(2):649-653.
18. Rani M, Kumar S, Kumar M. Estimation of heterosis for yield and its contributing traits in brinjal. Journal of Environmental Biology. 2018;39:710-718.
19. Reddy EEP, Patel AI. Heterosis studies for yield and yield attributing characters in brinjal (*Solanum melongena* L.). Journal of Recent Advances in Agriculture. 2014;2:175-180.
20. Samandam CN. Natural cross pollination in eggplant. Economic Botany. 1962;18:128-131.
21. Samatha T, Saidaiiah P, Sivaraj N, Geetha A, Ravinder Reddy K. Estimation of heterosis for yield, yield attributes and quality parameters in brinjal (*Solanum melongena* L.). International Journal of Chemical Studies. 2021;9(1):1891-1901.
22. Sivakumar V, Jyothi KU, Venkataramana C, Rajyalakshmi R. Estimation of heterosis for yield and yield components in brinjal (*Solanum melongena* L.) over locations. International Journal of Current Microbiology and Applied Sciences. 2017;6(7):1074-1081.
23. Susmitha J, Eswaran R, Senthil Kumar N. Heterosis breeding for yield and its attributes in brinjal (*Solanum melongena* L.). Electronic Journal of Plant Breeding. 2023;14(1):114-120.
24. Zeven AC, Zhukovsky PM. Dictionary of cultivated plants and their centres of diversity. Wageningen, Netherlands; 1975. p. 219.