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Screening of diverse brinjal genotypes against major pests of brinjal

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Abstract
An investigation was carried out in the Department of Entomology, College of Horticulture, Dr. Y.S.R. Horticultural University, V.R. Gudem to screen brinjal genotypes for tolerance/resistant to major pests. Out of 44 brinjal genotypes tested, IC-090050 and IC-090199 showed lowest infestation fruit and shoot borer while Irapaduguda-W showed highest. Based on percent fruit damage, twelve genotypes *viz*., IC-090050, IC-090199, EC-169084, EC-316742, EC-316309, IC-089955, EC-316273, Bhagyamathi, IC-090674, EC-169089, IC-110949 and IC-111392 were found to be moderately resistant to borer damage. The lowest percent fruit damage by *Leucinodes orbonalis* was observed in the genotype IC-090050 (10.26%) followed by IC-090199 (12.75%), EC-169084 (13.03%) and the lowest percent shoot damage was observed in the genotype IC-090050 (4.11%) followed by IC-090199 (4.21%) EC-169084 (4.32%) which were statistically on par with one another. Among 44 genotypes of brinjal tested, none of them were immune to jassid infestation. Nevertheless IC-090050 with 9.90 percent hopper burn intensity was considered as highly resistant to *Amrasca devastans* which recorded 1.41 and 2.74 times lesser than Bhagyamathi and Dommeru local respectively in percent jassid intensity. Least number of whitefly and hadda beetle population per three leaves was noticed in IC-127074.

Keywords: Varietal Screening, brinjal and major pests

Introduction
Brinjal, also known as eggplant or aubergine (*Solanum melongena* L.) is an important vegetable crop grown in India and other parts of the world. Numerous factors are accountable for the short productivity of brinjal, as it is subjected to attack by number of insect pest right from nursery stage till harvesting [1]. Moderate temperature and high humidity favours the population build-up of insect pests due to seasonal changes [2, 3]. Among the integrated pest management practices, chemical control is most widely used and it become the primary source in farmers field level for managing insect pests in brinjal it leads to resistance for insect pests and harmful to eco system. Environmental contamination, bioaccumulation and bio magnification of toxic residues and commotion in ecological balance due to repeated use of broad spectrum synthetic chemicals. Hence, there is an imperative need to look for safer alternative pest management tactics. Use of resistant varieties is recognized as a significant tool in bio intensive pest management system. Attraction, feeding and oviposition of the insect pests coupled with morphological and physical characteristics of plants and fruits. Although host plant resistance alone or in amalgamation with other methods is environmentally safe and companionable with IPM, however this approach is realistic only when resistant varieties of crops subsist and recognized. Number of pesticide applications can be reduced even a moderate level of resistance [4]. However, a colossal scope exists in finding resistant sources to major pests as a sizable share of 4,343 brinjal accessions [5] conserved at the NBPGR still tranquil. In this background, the present investigation was carried out to screen 44 brinjal genotypes for their response to major pests and to expedite their morphological attributes of resistance to the pests. Keeping in view the economic importance of brinjal crop in daily use, where use of insecticides is not desirable, the present studies were undertaken to find out the source of resistance against the major insect pests of brinjal.

Materials and methods
A field experiment was conducted in augumented randomized block design (RABD). The genotypes of 44 brinjal varieties screened against major pests presented in (Table1).

Four weeks old seedlings were transplanted with a spacing of 75 x 60 cm during September to March 2016 in the weather condition of 28 ± 32 C and 85 ± 7 percent RH at College of Horticulture, Dr. Y.S.R. Horticultural University, V.R. Gudem. The cultural practices except plant protection measures were followed as per the crop production guide for horticultural crops. They were planted by maintaining ten plants per treatment/entry. Five plants per treatment were tagged at random and observed for the incidence of major pests in each brinjal genotype at weekly interval starting from transplanting to harvest [6]. The pest population/ damage was recorded at weekly interval commencing from seventh day after transplanting (DAT).

Healthy and damaged shoots by *L. orbonalis* were recorded on five randomly selected plants and percent damage was worked out. After each observation, the damaged shoots were removed. In case of fruit infestation, number and weight of healthy and damaged fruits were recorded and percent damage was calculated.

Grades (1- Immune - 0% fruit infestation; 2- Highly resistant - 1-10% fruit infestation; 3-Moderately resistant - 11-20; 4-Tolerant- 21-30; 5-Susceptible - 31-40; 6-Highly susceptible – above 40) were also assigned for the fruit damage based on the rating [7].

The number of nymphs and adults of leafhopper, *Amrasca devastans* were assessed on three leaves (one from bottom, middle and top) in five selected plants by examining each leaf carefully during early morning hours, when the pest was less active. To begin with, leafhoppers on upper surface of the leaves were counted and then the leaf was tilted carefully to count population on the lower surface. The population was expressed as number per three leaves [8]. Based on the intensity of hopper burn symptoms on leaves, brinjal genotypes were categorized into different resistant/susceptibility classes the visual assessment of hopper burn intensity was converted into numerical values by calculating the percent intensity of infestation. Percent intensity grades (1-Immune 0%; 2-Highly resistant 1-10%; 3-Moderately resistant 10.1-25%; 4-Moderately susceptible 25.1-50%; 5-Highly susceptible Above 50% were also assigned for the percent intensity of hopper burn based on the rating [9].

The number of grubs and adults of *H. vigintioctopunctata* were recorded from three leaves, one each from top, middle and bottom part of five randomly selected plants. Mean was worked out and expressed as number per three leaves [10]. Similarly whitefly, *Bemisia tabaci* and the population was expressed as number per three leaves.

Results and Discussions

A. Screening of brinjal genotypes against *L. orbonalis*

Shoot and fruit of all the brinjal genotypes screened, were prone to the attack by *L. orbonalis*. Among 44 genotypes of brinjal tested, none of them was immune or highly resistant to shoot and fruit borer (Table-2). However, based on percent fruit damage, twelve genotypes *viz*., IC-090050, IC-090199, EC-169084, EC-316742, EC-316309, IC-089955, EC-316273, Bhagyamathi (C1), IC-090674, EC-169089, IC-110949 and IC-111392 were found to be moderately resistant with 10.26, 12.75, 13.03, 13.06, 13.07, 16.14, 17.63, 17.84, 18.03, 18.10, 19.0 and 19.49 percent fruit damage respectively. Whereas, eight genotypes *viz*., IC-090177, IC-090273, IC-111346, IC-111322, EC-373524, Tuni local, IC-111448, EC-316315 were found tolerant with fruit damage of 21.76, 21.90, 22.16, 23.65, 24.00, 25.63, 27.32 and 27.80 percent respectively and remaining were either susceptible or highly susceptible (Table-3).

B. Fruit damage [%] by *L. orbonalis* in different brinjal genotypes

Among the different brinjal genotypes assessed against the fruit and shoot borer, the percent fruit damage ranged between 10.26 to 71.69 percent (Table 2). The lowest percent fruit damage by *L. orbonalis* was observed in the genotype IC-090050 (10.26%), followed by IC-090199 (12.75%), EC-169084 (13.03%), EC-316742 (13.06%), EC-316309 (13.07%) Amongst the indigenous collections, IC-090050 (19.00%) is statistically far superior than the other genotypes which was 1.73 times much lesser in fruit damage than the resistant check Bhagyamathi (17.84%) and moreover, 2.30 and 2.27 times far lesser than the susceptible checks *viz.*, Dommeru local (43.88%) and West Godavari local (43.29%) respectively. Nonetheless, among the exotic collections EC-169084 (13.03%) showed 1.36 times lesser fruit damage than Bhagyamathi. Nevertheless, the Tuni local showed fruit damage of 25.63% which showed 1.71 and 1.63 times lesser fruit damage than the susceptible check Dommeru local (43.88%) and West Godavari local (43.29%) respectively.

C. Shoot damage [%] by *L. orbonalis* in different brinjal genotypes

The percent shoot damage by *L. orbonalis* ranged between 4.11 to 32.76 percent in different brinjal genotypes screened The lowest percent shoot damage was observed in the genotype IC-090050 (4.11%), followed by IC-090199 (4.21%) EC-169084 (4.32%) EC-316742 (4.98%) which are statistically on par (Table 2). Among the exotic collections, EC-169084 with 4.32% shoot damage showed 1.38 and 2.29 times lesser damage than the resistant checks *viz.*, Bhagyamathi (5.98%) and Gulabi (9.91%). Amongst, the land races evaluated, the lowest shoot damage was observed in the Tuni local (10.78%) local genotype which was 2.20 and 2.10 times lesser that the susceptible checks Dommeru local (23.78%) and West Godavari local (22.67%). Among the indigenous collections, the lowest shoot damage was found with IC-090050 (4.11%) which was 1.45 times lesser in shoot damage than the resistant check Bhagyamathi.

Immunity to *L. orbonalis* was reported only either in wild species of brinjal like *Solanum khasianum* [11] and *S. anomalum* and *S. incanum* [12] or in the derivatives of wild species like Arka Mahima and Arka Sanjivans [13]. However, in the present study, none of the genotypes tested was immune to *L.orbonalis*. The resistant reaction of above genotypes to *L. orbonalis* might be due to the presence of tough fruit skin, narrow pericarp, extra longish fruits with light purple colour, less seedless area and less peripheral ring, as reported [14]. Pusa Purple Cluster and Black Beauty were reported as resistant [15], as they had purple coloured leaves [16], the presence of heavily lignified sclerenchymous hypodermis and closely packed vascular bundles in the hybrids of brinjal might be responsible for the moderately resistant /tolerant reactions.

The tolerance nature of brinjal genotypes might be attributed to hardness of the fruit skin and flesh [17] and hard to semi-hard shoot and medium to dense pubescence [18]. Tolerant entries of brinjal are highly useful in IPM to augment the natural enemies rather than resistant and fairly resistant entries. These moderately resistant and tolerant genotypes of

brinjal can be utilized as a resistance source in the breeding programmes to develop resistant/ tolerant varieties of brinjal to *L. orbonalis.*

Eight genotypes *viz.,* Gottivada local, Andra local, Hiramandalam-1, EC-144145, IC-090696, IC-112309A, IC-127021 and IC-316291 screened in the present study were susceptible to shoot and fruit borer which might be due to the softness of the shoot, sparse pubescence and spherical and oblong fruit with soft rind and loosely arranged seeds. Highly susceptible reaction was exhibited by 13 genotypes namely, Irapaduguda-B, Irapaduguda-W, Babajipeta-1, Babajipeta-2, Hiramandalam-2, AU-1, EC-169061, IC-111427, IC-126918, IC-127071, IC-127074, IC-336474, IC-34467 which was in conformity with [19]. The possible reasons for high susceptibility of genotypes may be due to the round shaped fruit with less number of seeds and soft and smooth surface, as reported by [20, 11].

D. Leaf hopper intensity in different brinjal genotypes

Based on the intensity of hopper burn symptoms, the brinjal accessions were categorized into resistant /susceptibility classes. The percent hopper burn intensity ranged between 9.90 to 62.50 percent. Among 44 genotypes of brinjal tested, none of them was immune to jassid infestation. Nevertheless, one genotypes *viz*., IC-090050 with 9.90 percent hopper burn intensity was considered as highly resistant to *A. devastans* which was 1.41 and 2.74 times lesser than Bhagyamathi and Dommeru local in percent jassid intensity (Table 5).

Whereas, twenty genotypes recorded as moderately resistant to Jassid including the land races Gottivada local (10.20%), Tuni local (14.02%), Andra local (18.45%). Among the exotic collections, EC-169089 (18.18%), EC-373524 (18.33%), EC-316273 (18.45%), EC-316309 (19.89%) were found to be moderately resistant to jassid. Further among the indigenous collections, IC-127021 (15.22%), IC-090696 (15.00%), IC-112309-A (16.51%), IC-090674 (17.55%), IC-111448 (17.86%), IC-090177 (17.98%), IC-111346 (18.18%),IC-344674 (20.83%), IC-111322 (21.67%), IC-110949 (21.98%), IC-090177 (22.00%) respectively were reported as moderately resistant to jassid infestation. 14 genotypes were reported as moderately susceptible ranging from 25 - 50 percent intensity and while 6 genotypes were regarded as highly susceptible with over 50 percent intensity of jassid infestation (Table 4).

The mean jassid population per three leaves ranged from 3.28 to 8.39 the lowest was recorded in EC-316309 and IC-111448 (3.28), followed by IC-090050 (3.48), IC-112309A (3.59).Whereas, the maximum population of jassid per three leaves were found in IC-090273 (8.39). In contrary the population count was lower in land races like Gottivada local (3.91), Andra local (4.06), Tuni local (4.62).

The aggregation of more number of jassid population on susceptible varieties and a lower jassid number on resistant plants can be attributed to antixenosis and antibiosis mechanism [21]. Pubescence of leaf is a function of both hair length and hair density. More number of lengthy hairs will result in higher pubescence and consequently a better resistance towards jassid. Brinjal cultivars with smooth textured leaves were preferred more by the jassid compared to the cultivars with leaves having leathery texture or leathery texture with spines [22]. The hair density and length of hair on lamina, midrib, and veins of brinjal had highly significant and negative correlation with the jassid population with the findings of [23]. The influence of hairiness on the resistance of bhendi to the leaf hopper was reported by [24].

E. Whitefly population in different brinjal genotypes:

Among the different brinjal genotypes screened against the whitefly, the least number of whitefly population per three leaves / plant (2.03) was noticed in genotype IC-127074 and the highest population (5.22 /plant) was recorded in IC-090050 (Table 6). Amongst the other indigenous collections, IC-090273, IC-316291, IC-336474, IC-344674 were recorded with 2.07, 2.11, 2.27, 2.56 whiteflies per plant which are statistically different than the other genotypes. Nonetheless, among the exotic collections EC-169061 was recorded with least whitefly population of 2.72/plant and on the land race Irapaduguda-B only 2.47 whiteflies were found per plant.

Out of fourteen genotypes of brinjal screened, the genotype AB-8/6 (5.93 whitefly/three leaves) recorded lowest population of whiteflies which was at par with the genotype JBR-8/8, JBG-8/6, JBJL-10/203, AB-8/5, AB-9/1, AB-8/4 and AB-10/14 as they recorded (7.66, 8.20, 9.68, 9.95, 10.28, 10.38 and 11.15 whiteflies/three leaves, respectively) [25].The low infestation of whitefly in the resistant genotypes could be due to the biochemical compounds on the leaves, which could repel insects or affect host selection, indicating the existence of a possible chemical resistance factor in the variety. On the other hand, physical factors such as leaf area, pubescence and lamina thickness must also be taken into consideration regarding host selection and might play a role in imparting resistance to *B.tabaci* which is in accordance with the findings of [26].

As per the findings of [27] the tannins and flavonols are negatively correlated with the whitefly population. The increased tannin content in resistant genotypes may be due to the inbuilt defense mechanism of the plant which increased after the attack of the whitefly in tomato. Higher concentrations of tannins have also been reported to impart resistance to *B. tabaci* in cotton [28- 31].

F. Hadda beetle population in different brinjal genotypes

Among the different brinjal genotypes screened against hadda beetle, the least number of hadda beetle population per three leaves / plant (5.59) was noticed in genotype IC-127074 and the highest population (15.12/plant) was recorded in IC-112309-A (Table 6). Amongst the other indigenous collections, IC-127074, IC-316291, IC-090273 was recorded with 5.62, 5.77 and 7.28 per plant which are statistically superior to the other genotypes. Nonetheless, among the exotic collections EC-169061 was recorded with least population of 7.37 per plant and on the land race Irapaduguda-B only 6.71 hadda beetle was found per plant.

Hadda beetle causes considerable economic losses to many crops including brinjal depending on place and season for variations of prevailing environmental conditions [32-34]. It is highly destructive at both, adult and larval stages which feed on the epidermal tissues of leaves, flowers, and fruits by scrapping the chlorophyll content and cause a big yield loss [35,4].The affected leaves gradually gets skeletonized, dry and drop down. The larvae confine their attack to the lower surface while adult beetles usually feed on the upper surface of the leaves [36, 37]

Screened the six commercial cultivars of brinjal (*Solanum melongena*), namely Pusa Purple Long, Pusa Purple Round, Pusa Hybrid-6, Pusa Kranti, Supriya and Nisha, for their susceptibility to the spotted leaf-eating beetle and reported that the maximum average population (19.33 grubs and

adults/5 plants) was recorded in Pusa Purple Long [33]. Based on the seasonal incidence of the pest, Pusa Purple Long was categorized as the most susceptible while all others *viz.*, Pusa Purple Round, Pusa Hybrid-6, Pusa Kranti, Supriya and Nisha, were categorized as susceptible cultivars.

Table 1: Brinjal genotypes used in screening against major pests of brinjal

Sl	Genotype	Source	Sl	Genotype	Source
1	Gottivada Local	Gottivada	23	IC-090199	NBPGR
2	Andra Local	Saluru	24	IC-090273	NBPGR
3	Irapaduguda- (B)	Hiramandalam	25	IC-090674	NBPGR
4	Irapaduguda -(W)	Hiramandalam	26	IC-090696	NBPGR
5	Tuni Local	Tuni	27	IC-110949	NBPGR
6	Babajipeta - 1	Rottavalasa	28	IC-111322	NBPGR
7	Babajipeta - 2	Rottavalasa	29	IC-111346	NBPGR
8	Hiramandalam - 1	Hiramandalam	30	IC-111392	NBPGR
9	Hiramandalam -2	Hiramandalam	31	IC-111427	NBPGR
10	AU-1	Annamalai	32	IC-111448	NBPGR
11	EC-144145	NBPGR	33	IC-112309-A	NBPGR
12	EC-169061	NBPGR	34	IC-126918	NBPGR
13	EC-169084	NBPGR	35	IC-127021	NBPGR
14	EC-169089	NBPGR	36	IC-127071	NBPGR
15	EC-316273	NBPGR	37	IC-127074	NBPGR
16	EC-316309	NBPGR	38	IC-316291	NBPGR
17	EC-316315	NBPGR	39	IC-336474	NBPGR
18	EC-316742	NBPGR	40	IC-344674	NBPGR
19	EC-373524	NBPGR	41	Bhagymathi (C1)	Dr YSRHU
20	IC-089955	NBPGR	42	Dommeru local (C2)	Dommeru
21	IC-090050	NBPGR	43	Gulabi (C3)	Dr YSRHU
22	IC-090177	NBPGR	44	West Godavari Local (C4)	Telikacharla

Table 2: Screening of brinjal genotypes against *L.orbonalis*

Sl.no	Genotype	Shoot damage (%)*	Fruit damage (%)**	Grade
1	Gottivada	15.87 (23.80)	33.65 (35.78)	S
2	Andra	15.01 (23.11)	31.89 (34.70)	S
3	Irapaduguda-B	26.98 (31.61)	45.81 (42.92)	HS
4	Irapaduguda-W	32.76 (35.24)	71.69 (58.17)	HS
5	Tuni	10.78 (19.49)	25.63 (30.74)	T
6	Babajipeta-1	27.34 (31.85)	47.03 (43.62)	HS
7	Babajipeta-2	29.12 (32.98)	49.81 (45.21)	HS
8	Hiramandal-1	14.96 (23.07)	31.73 (34.60)	S
9	Hiramandal-2	20.98 (27.58)	41.97 (40.70)	HS
10	AU-1	30.01 (33.54)	52.64 (46.83)	HS
11	EC-144145	17.92 (24.71)	36.81 (37.02)	S
12	EC-169061	25.80 (30.20)	44.95 (41.77)	HS
13	EC-169084	4.32 (11.67)	13.03 (20.83)	MR
14	EC-169089	6.53 (14.48)	18.10 (24.85)	MR
15	EC-316273	5.71 (13.49)	17.63 (24.50)	MR
16	EC-316309	5.32 (13.01)	13.07 (20.86)	MR
17	EC-316315	13.3 (21.06)	27.80 (31.49)	T
18	EC-316742	4.98 (12.56)	13.06 (20.86)	MR
19	EC-373524	9.34 (17.47)	24.00 (29.00)	T
20	IC-089955	5.37 (13.07)	16.14 (23.36)	MR
21	IC-090050	4.11 (12.02)	10.26 (19.00)	MR
22	IC-090177	7.94 (16.69)	21.78 (28.14)	T
23	IC-090199	4.21 (12.16)	12.75 (21.24)	MR
24	IC-090273	8.01 (16.76)	21.90 (28.22)	T
25	IC-090674	6.11 (14.63)	18.03 (25.45)	MR
26	IC-090696	16.78 (24.50)	33.96 (35.96)	S
27	IC-110949	6.87 (15.52)	19.00 (26.16)	MR
28	IC-111322	8.89 (17.67)	23.65 (29.42)	T
29	IC-111346	8.45 (17.22)	22.16 (28.40)	T
30	IC-111392	7.11 (15.78)	19.49 (26.52)	MR
31	IC-111427	21.45 (27.26)	42.78 (40.52)	HS
32	IC-111448	11.79 (19.75)	27.32 (31.18)	T

33	IC-112309-A	17.56 (24.44)	34.7 (35.76)	S
34	IC-126918	19.12 (25.60)	41.07 (39.53)	HS
35	IC-127021	14.67 (22.19)	30.90 (33.44)	S
36	IC-127071	32.18 (34.23)	54.99 (47.53)	HS
37	IC-127074	28.88 (32.18)	48.59 (43.86)	HS
38	IC-316291	18.44 (25.10)	37.11 (37.20)	S
39	IC-336474	31.34 (33.71)	54.03 (46.98)	HS
40	IC-344674	24.78 (29.52)	44.51 (41.52)	HS
41	Bhagyamathi (C1)	5.98 (13.52)	17.84 (24.60)	MR
42	Dommeru (C2)	23.78 (28.85)	43.88 (41.19)	HS
43	Gulabi (C3)	9.91 (18.35)	24.59 (29.39)	T
44	W.Godavari (C4)	22.67 (28.08)	43.29 (40.85)	HS
	Mean	22.27	33.86	
	Std Error	1.11	1.36	
	Ci - Cj	0.476	0.079	
	BiVi - BiVj	0.952	0.159	
	Ci - VI	0.842	0.140	

*Mean of seven observations; ** Mean of four harvests; Figures in parentheses are arcsine transformed values in a column. MR-Moderately Resistant, T-Tolerant, S- Susceptible, HS- Highly Susceptible. Ci – Cj (Critical diference between check and check), BiVi – BiVj (Critical diference between the blocks), Ci – VI (Critical diference between the variety and variety).

Table 3: Categorization of brinjal genotypes based on mean percent fruit damage by *L. orbonalis*

Fruit damage (%)	No.	Genotype	Grade
0	0	Nil	I-Immune
1 to 10	0	Nil	HR-Highly Resistance
11 to 20	12	IC-090050, IC-090199, EC-169084, EC-316742, EC-316309, IC-089955, EC-316273, Bhagyamathi (C1), IC-090674, EC-169089, IC-110949, IC-111392.	MR-Moderately Resistant
21 to 30	9	IC090177, IC-090273, IC-111346, IC-111322, EC-373524, Gulabi (C3), Tuni, IC-111448, EC-316315.	T-Tolerant
31 to 40	8	IC-127021, Hiramandal-1, Andra, Gottivada, IC-090696, IC-112309-A, EC144145, IC-316291.	S-Susceptible
> 41	15	IC-126918, Hiramandal-2, IC-111427, West Godavari Local (C4), Dommeru (C2), IC-344674, EC-169061, Irapaduguda-B, Babajipeta-1, IC-127074, Babajipeta-2, A.U-1 IC-336474, IC-127071, Irapaduguda-W.	HS-Highly Susceptible

Table 4: Screening of Brinjal genotypes against *A. devastans*

SL.No	Genotypes	Percent intensity	Grade	Population/ 3 Leaf
1	Gottivada	10.20 (18.96)	MR	3.91
2	Andra	18.45 (25.77)	MR	4.06
3	Irapaduguda-B	50.61 (45.68)	HS	8.39
4	Irapaduguda-W	26.09 (31.05)	MS	5.85
5	Tuni	14.02 (22.32)	MR	4.62
6	Babajipeta-1	26.88 (31.56)	MS	6.28
7	Babajipeta-2	28.64 (32.68)	MS	6.39
8	Hiramandal-1	50.00 (45.33)	MS	8.15
9	Hiramandal-2	26.63 (31.40)	MS	7.21
10	AU-1	25.66 (30.76)	MS	6.28
11	EC-144145	24.93 (29.62)	MS	4.82
12	EC-169061	57.58 (49.03)	HS	7.95
13	EC-169084	18.40 (25.07)	MR	3.62
14	EC-169089	18.18 (24.91)	MR	3.82
15	EC-316273	18.45 (25.11)	MR	3.81
16	EC-316309	19.89 (26.16)	MR	3.28
17	EC-316315	41.13 (39.56)	MS	5.17
18	EC-316742	29.09 (32.31)	MS	6.28
19	EC-373524	18.33 (25.02)	MR	4.06
20	IC-089955	26.89 (30.91)	MS	6.28
21	IC-090050	9.90 (18.67)	HR	3.48
22	IC-090177	17.98 (25.42)	MR	4.17
23	IC-090199	22.00 (28.30)	MR	4.61
24	IC-090273	62.50 (52.57)	HS	8.39
25	IC-090674	17.55 (25.10)	MR	4.06

26	IC-090696	15.00 (23.12)	MR	4.62
27	IC-110949	21.98 (28.29)	MR	4.59
28	IC-111322	21.67 (28.07)	MR	4.73
29	IC-111346	18.18 (25.57)	MR	4.82
30	IC-111392	25.35 (30.56)	MS	6.17
31	IC-111427	27.86 (31.53)	MS	5.17
32	IC-111448	17.86 (24.67)	MR	3.28
33	IC-112309-A	16.51 (23.64)	MR	3.59
34	IC-126918	26.13 (30.41)	MS	5.28
35	IC-127021	15.22 (22.63)	MR	3.62
36	IC-127071	26.00 (30.33)	MS	4.39
37	IC-127074	51.97 (45.80)	HS	7.60
38	IC-316291	51.04 (45.27)	HS	7.48
39	IC-336474	50.36 (44.88)	HS	7.17
40	IC-344674	20.83 (26.82)	MR	3.73
41	Bhagyamathi(C1)	14.02 (21.57)	MR	3.71
42	Dommeru(C2)	27.18 (31.10)	MS	4.84
43	Gulabi(C3)	46.61 (42.77)	MS	5.62
44	W.Godavari (C4)	36.18 (36.68)	MS	5.77
	Mean	31.06		5.34
	Std Error	1.27		0.23
	BiVi - BiVj	0.110		0.003
	Ci - VI	0.221		0.006
	BiVi - BiVj	0.195		0.006

Figures in parantheses are arcsine transformed values. HR-Highly Resistant, MR-Moderately Resistant, MS-Moderately Susceptible, HS- Highly Susceptible. Ci – Cj (Critical diference between check and check), BiVi – BiVj (Critical diference between the blocks), Ci – VI (Critical diference between the variety and variety).

Table 5: Categorization of brinjal genotypes based on mean percent intensity of *A. devastans*

Percent Intensity	No.	Genotype	Grade
0	0	Nil	Immune
0-10	1	IC-090050	Highly resistant
10.1-25	20	Gottivada local, Tuni local, Bhagyamathi(C1), IC- 127021,IC-090696, IC-112309-A, IC-090674, IC-111448, IC-090177, EC-169089, IC-111346, EC-373524,EC-169084, EC-316273, Andra local, EC-316309,IC-344674, IC-111322, IC-110949, IC-090199.	Moderately resistant
25.1-50	17	EC-144145, IC-111392, AU-1, IC-127071, Irapaduguda-W, IC-126918, Hiramandal-2, Babajipeta-1, IC-089955, Dommeru local (C2), IC-111427, Babajipeta-2, EC-316742, West Godavari Local (C4), EC-316315, Gulabi (C3), Hiramandal-1.	Moderately susceptible
Above 50	6	IC-336474, Irapaduguda-B, IC-316291, IC-127074, EC-169061, IC-090273.	Highly susceptible

Table 6: Screening of brinjal genotypes against *B. tabaci* and *H.vigintioctopunctata*

SL.No	Genotypes	Whitefly (No./ 3L/Plant)	Hadda beetle (No./ 3L/Plant)
1	Gottivada	4.43	12.81
2	Andra	4.55	11.18
3	Irapaduguda-B	2.47	6.71
4	Irapaduguda-W	3.91	9.06
5	Tuni	4.55	12.82
6	Babajipeta-1	4.03	9.15
7	Babajipeta-2	3.87	9.58
8	Hiramandal-1	3.51	9.18
9	Hiramandal-2	4.03	10.80
10	AU-1	3.79	9.42
11	EC-144145	3.20	9.05
12	EC-169061	2.72	7.37
13	EC-169084	4.16	11.82
14	EC-169089	4.12	10.73
15	EC-316273	3.96	9.61
16	EC-316309	4.16	10.62
17	EC-316315	3.88	8.28
18	EC-316742	3.40	8.73
19	EC-373524	3.96	11.48

20	IC-089955	3.84	9.61
21	IC-090050	5.22	12.95
22	IC-090177	4.72	12.48
23	IC-090199	4.60	12.26
24	IC-090273	2.56	7.28
25	IC-090674	4.84	11.74
26	IC-090696	4.52	13.48
27	IC-110949	4.48	11.40
28	IC-111322	4.08	11.95
29	IC-111346	4.80	11.82
30	IC-111392	3.20	8.62
31	IC-111427	3.63	7.51
32	IC-111448	4.39	9.61
33	IC-112309-A	4.47	15.12
34	IC-126918	3.39	8.17
35	IC-127021	4.67	9.82
36	IC-127071	3.35	8.01
37	IC-127074	2.03	5.62
38	IC-316291	2.07	5.77
39	IC-336474	2.11	5.59
40	IC-344674	2.27	7.39
41	Bhagyamathi (C1)	4.29	10.06
42	Dommeru (C2)	3.58	8.26
43	Gulabi (C3)	2.73	9.17
44	W.Godavari (C4)	4.24	8.28
	Mean	3.79	9.78
	Std Error	0.12	2.22
	Ci – Cj	0.002	0.004
	BiVi - BiVj	0.005	0.009
	Ci - VI	0.004	0.008

Ci – Cj (Critical diference between check and check), BiVi – BiVj (Critical diference between the blocks), Ci – VI (Critical diference between the variety and variety). No./ 3L/Plant-Number per three leaves per plant.

Conclusion

Studies carried out to screen 44 genotypes against major insect pests of brinjal showed that IC-090050 and IC-090199 resistance to fruit and shoot borer where as the genotypes EC-316309 and IC-111448 resistance to jassid. Moreover the least number of whitefly and hadda beetles were identified in the genotype IC-127074. So, it may be promoted as promising lines for resistance to respective pests for effective management.

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