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Screening of elite genotypes of chilli (Cv. Byadgi Dabbi) against pest complex

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Abstract
In order to explore the possibility of sources of resistance and relative tolerance of the cultivars a total of 70 germplasms consisting of diverse phenotypic and genetic makeup were evaluated against chilli thrips, *Scirtothrips dorsalis* Hood, mites *Polyphagotarsonemus latus* Banks, fruit borer, *Helicoverpa armigera* damages under open field condition. Among these, based on the observation on percent leaf curl index, four genotypes (BDS - 02, BDS - 14, BDS - 32, BDS - 47) were found to be moderately resistant against thrips infestation and four genotypes were categorised under moderately resistant (BDS - 01, BDS - 27, BDS - 41, BDS - 68). Where as, majority of the genotypes belongs to moderately resistant category (24) to susceptible category (33) with fruit borer damage ranging from 6 to 20% and 21 to 40%, respectively. Further, remaining thirteen genotypes exhibited highly susceptibility to fruit borer to an extent of more than 40% incidence.

Keywords: Chilli, insect pests, *Polyphagotarsonemus latus, Scirtothrips dorsalis, Helicoverpa armigera*

1. Introduction
Chilli (*Capsicum annuum* L.) is one of the major vegetable and spice crop grown in the country. It is a important versatile spice as well as vegetable crop. Chilli is mainly used in culinary adding flavour, colour, pungency and rich source of vitamins like A, C and E having medicinal properties. India is the largest consumer and exporter of chilli in the world with a production of 14.92 lakhs tonnes from an area of 7.75 lakh hectares [2]. In Karnataka, chilli occupies an area of 2.74 lakhs ha with a production of 1.44 lakhs tonne with the productivity of 4.85 quintals ha^{-1}. Byadgi chilli cultivars are known for their acceptable pungency and bright red colour value and considered as promising export varieties. India being the largest chilli producer, the number of limiting factors have been identified for the low productivity. A major bottle neck in the production is the pest complex of chilli with more than 293 insects and mite species debilitating the crop in the field as well as in storage [3]. The major insect pests that attack chilli are aphids (*Myzus persicae* Sulzer and *Aphis gossypii* Glover), mites (*Polyphagotarsonemus latus* Banks) and thrips (*Scirtothrips dorsalis* Hood). In Karnataka, thrips, mites and white flies have been identified as key sucking pests of chilli of which leaf curl caused by mite and thrips is serious [9]. In addition to these, pod borers also cause maximum damage to the crop both during vegetative and fruit formation stages. The crop loss by three major pests, where, 30-50% by thrips (*S. dorsalis*), 30-70% by mites (*P. latus*) and 30-40% by fruit borers *Helicoverpa armigera* and *Spodoptera litura* [6]. These pests cause serious damage to the chilli crop by direct feeding and transmitting deadly disease called "leaf curl disease" or "Murda complex". Keeping this in back drop, an attempt was made to evaluate the 70 elite genotypes against chilli insect pests.

2. Materials and Methods
The experiment was laid out during *kharif* 2016 at the Horticulture research and extension centre, Haveri (Devihosur), University of Horticultural Sciences, Bagalkot and screened under field conditions during *kharif* 2016. Seventy genotypes were raised separately in the nursery for one month and then transplanted in main field, during *kharif* season with a spacing of 60 cm x 60 cm. Each genotype was transplanted in a plot size of 6 m x 1.2 m with 10 plants per row and was replicated. A distance of 1.0 m was kept between the two replications. All the agronomic practices were followed except plant protection according to the package of practices [1]. Five plants were randomly selected in each genotype and visually rated for thrips infestation based on upward leaf curl damage.

The rating was used for recording the thrips infestation done at 30 days intervals with symptoms severity on a 0-4 scale as per the standard procedure given below [8]. Similarly for mites, five plants were randomly selected and visually rated for mites infestation based on downward leaf curl damage. The rating was done at 30 days intervals as per the standard procedure [8] from Table 1. Two observations were made during the peak activity of population at 13 and 15 Weeks after transplanting. Adopting one way ANOVA statistical analysis. The data recorded from all the observations was pooled and analyzed with the help of MSTAT-C statistical software, a preliminary classification of the genotypes was made against *S. dorsalis* and *P. latus* incidence and the genotypes were classified as resistant, moderately resistant, susceptible and highly susceptible. The entries falling in each category were represented in the form of histograms.

Table 1: Scoring procedure for thrips and mites

Scoring	Category	Symptoms
0	1	No leaf curling (healthy plant)
1	< 25%	(1-25%) low curling
2	26-50%	(26-50%) moderate curling
3	51- 75%	(51-75%) heavy curling
4	75%	(>75%) very high curling

(Niles, 1980) Further, to screen against fruit borer in each genotype five plants were randomly selected and tagged for observation. At the time of maturity, percent fruit borer damage was recorded. The percent fruit damage was worked out by counting total number of fruits per plant and number of damaged fruits per plant on five randomly selected plants in genotype by adapting following formula.

$$\text{Percent fruit damage} = \frac{\text{Number of fruits damaged}}{\text{Total number of fruits}} \times 100$$

The genotypes were classified into following scales (Table 2). Genotypes showing 0-5 percent damage were considered as resistant, 6-20 percent as moderately resistant, 21-40 percent as susceptible and above 41 percent as highly susceptible as mentioned below.

Table 2: Grouping of genotypes based on percent fruit borer incidence

Borer damage	Category
0-5%	Resistant
6-20%	Moderately resistant
21-40%	Susceptible
> 41%	Highly susceptible

(Shivaramu, 1999) [11] In addition, fruit yield per plant (g) was recorded. Then converted into fruit yield per hectare. Three pickings were made during the season. The data were subjected to statistical analysis.

3. Results and Discussion

Present investigation on screening of seventy chilli genotypes (Cv. Byadgi dabbi) against thrips, mites and fruit borer were classified in to four categories of resistance based on the LCI (Leaf Curl Index). The findings of the experiments are presented here under.

The reaction of genotypes for thrips, among 70 different genotypes screened, the genotypes *viz*., BDS-02, BDS-14, BDS-32, BDS-47 recorded relatively lowest LCI (Leaf Curl Index) of 0.40, 0.30, 0.43 and 0.48 respectively, hence categorised under moderately resistant group (Table 3). On the other hand 26 were slightly resistant genotypes, 30 were categorized into less susceptible genotypes and 10 were registered consistantly higher leaf curl damage hence were grouped into highly susceptible genotypes (Table 4 and Fig.1). This may be attributed to a phytophagous insect faces purely mechanical problem such as gaining a firm attachment on the plant surface and penetrating the hard tissue. The problem of obtaining secured anchorage on the smooth surface of plant organ exposed to wind and rain presents formidable difficulties. A smooth cuticle which was hard in nature was quite resistant to sucking pests. The plant height has positive association with thrips damage, the increase in plant height results in more young flesh which attracts the thrips population. Further, hybrid Tejaswini performed better with respect to yield and showed resistance to murda complex due to its rough leaf and higher phenol with moderate potassium content might have repelled the thrips population and resulted less thrips infestation [13]. Similarly, Guntur-4, Pusa Jwala and hybrid Tejaswini recorded less population of mites, thrips and the lowest leaf curl index and proved tolerant to pest damage which has thick leaf, low sugar content, high chlorophyll and phenol content might have favoured the tolerance [5]. Any leaf character that interferes with the thrips life-cycle is a potential resistance factor which may contribute to the mechanism of defence against thrips.

Similarly the reaction of genotypes for mites, the mean data clearly indicated that, the same 70 chilli germplasm lines exhibited wide differences in causing damage indices of yellow mite, however, none of them was found immune to this pest (Table 3). On the basis of symptoms caused by mite, four genotypes were identified as moderately resistant such as BDS - 01, BDS - 27, BDS - 41, BDS - 68 showing leaf curl indices of 0.97, 0.87, 0.93, 0.67, respectively. Data on LCI showed no statistical difference among many genotypes. However, based on the percentage of plants infested, 57 genotypes were categorized into slightly resistant. The 9 genotypes showed 2.01 - 3.0 grading index and were grouped under less susceptible category *viz*., BDS - 08, BDS - 22, BDS - 23, BDS - 30, BDS - 35, BDS - 40, BDS - 45, BDS - 64, BDS - 28 registered damaging indices of 2.77, 2.00, 2.10, 2.30, 2.54, 2.33, 2.74, 2.07, 2.30, respectively and no genotypes were found highly susceptible to this pest from (Table 5) and (Fig.1). The resistant nature of the genotypes can be attributed to higher leaf thickness. Similar opinion was expressed by screening of 58 genotypes against *P. latus* and found IHR- that 243-1-1-15 and *Musalwadi* selection were promising against the mite infestation [4]. Total sugars and proteins content was high in susceptible entries which might supported mite infestation compared to the resistant entries. Five resistant accessions to *P. latus* were identified [10]. The negative non significant correlation with plant height and population may be due to lack of dispersal behaviour through wind in mite perhaps led to a failure in interception by the taller genotypes as was noticed. The present study also resulted in identification of good number of moderately resistant genotypes for the broad mite infestation in chilli. Likewise, A field investigation was undertaken to screen seventy genotypes under natural epiphytotic condition, where no control measures were taken against chilli fruit borer infestation and their grouping is presented in the Table 3 and 6 respectively.

Among the seventy genotypes none of them were resistant to fruit borer. The 24 genotypes recorded less than 20 percent fruit damage indicating moderately resistant to chilli fruit borer 33 genotypes recorded as susceptible (Fig. 2). The 13 genotypes showed >41% grading index and were grouped under highly susceptible category *viz*., BDS - 07, BDS - 08, BDS - 09, BDS - 10, BDS - 11, BDS - 13, BDS - 14, BDS - 18, BDS - 20, BDS - 25, BDS - 29, BDS - 31, BDS - 39. This may be attributed to thickness of leaf lamina was a major factor for resistance than the number of hair on veins or lamina and pubescent genotypes were found to be tolerant to fruit borer as the trichome interlock the bracts and protect the buds, hence only few genotype showed tolerance to pest infestation. Thirty three genotypes were screened against fruit borer, *H. armigera* [12]. Percent fruit borer damage ranged from 3.25 on SL-37 to 70.19 in PAU-101. As per the scattered diagram, the seven selected genotypes of chilli and capsicum grouped as resistant and six genotypes which recorded more than 48.7 percent fruit borer damage were grouped as highly susceptible With respect to the yield performance, highest dry chilli of 14.3 q ha^{-1} was harvested from BDS - 65 followed by BDS - 01 (13.8 q ha^{-1}), BDS - 67 (12.1 q ha^{-1}), which is on par with BDS - 28 (12 q ha^{-1}), BDS - 03 (12 q ha^{-1}) from (Table 7). The higher dry chilli yield was recorded (17.69 q ha^{-1}) from commercial hybrids *viz.*, Bejosheetal Savitri followed by Bejosheetal Garima (15.12 q ha^{-1}) and Ujala (16.47 q ha^{-1}) [7].

Table 3: *Per se* performance of elite genotypes of chilli (Cv. Byadgi dabbi) for entomological and yield parameters

SL. No.	Genotypes	LCI due to thrips		LCI due to mites		Fruit damage (%)		Mean			Fruit yield per plant (Kg)	Yield per ha (q)
		13 WAT	15 WAT	13 WAT	15 WAT	13 WAT	15 WAT	LCI due to thrips	LCI due to mites	Fruit damage (%)		
1	BDS-01	1.85	2.30	0.67	1.27	13.25	14.30	2.08	0.97	13.78	50.75	13.80
2	BDS-02	0.80	0.00	0.93	1.33	12.12	15.48	0.40	1.13	13.80	24.36	6.60
3	BDS-03	1.27	1.73	1.53	1.60	11.60	10.25	1.50	1.57	10.93	43.65	12.00
4	BDS-04	1.95	2.25	1.13	1.87	17.65	15.00	2.10	1.50	16.33	24.36	6.50
5	BDS-05	1.00	1.53	1.13	1.13	17.45	15.00	1.27	1.13	16.23	34.51	9.40
6	BDS-06	1.40	1.67	1.27	1.47	14.00	18.56	1.54	1.37	16.38	34.51	9.40
7	BDS-07	2.45	2.85	0.87	1.13	43.00	41.00	2.65	1.00	42.00	33.50	9.20
8	BDS-08	1.87	2.07	2.67	2.87	51.00	43.00	1.97	2.77	47.00	33.50	9.20
9	BDS-09	1.53	1.93	1.53	1.80	56.00	48.00	1.73	1.67	52.00	32.48	8.90
10	BDS-10	2.81	1.87	1.33	1.67	46.35	41.00	2.34	1.50	43.68	31.47	8.50
11	BDS-11	2.93	2.67	1.13	1.80	42.25	56.00	2.80	1.47	49.13	38.57	10.40
12	BDS-12	1.13	1.40	1.40	1.53	18.10	14.35	1.27	1.47	16.23	25.38	7.00
13	BDS-13	2.54	2.84	1.33	1.60	52.00	55.00	2.69	1.47	53.50	32.48	8.80
14	BDS-14	0.40	0.20	1.27	1.60	57.00	51.00	0.30	1.44	54.00	38.57	10.50
15	BDS-15	1.53	1.87	1.07	1.47	14.55	16.23	1.70	1.27	15.39	37.56	10.30
16	BDS-16	2.24	2.65	1.00	1.27	10.65	10.72	2.45	1.14	10.69	36.54	10.10
17	BDS-17	2.45	2.73	1.00	1.60	27.45	37.13	2.59	1.30	32.29	34.51	9.50
18	BDS-18	1.40	1.93	1.53	1.33	49.00	53.00	1.67	1.43	51.00	40.60	11.10
19	BDS-19	1.53	1.93	1.33	1.47	22.65	38.42	1.73	1.40	30.54	26.39	7.10
20	BDS-20	2.35	2.50	1.13	1.07	53.50	58.00	2.43	1.10	55.75	28.42	7.80
21	BDS-21	2.65	2.85	1.20	1.20	23.40	34.56	2.75	1.20	28.98	32.48	8.90
22	BDS-22	2.95	2.35	2.27	1.73	15.50	17.50	2.65	2.00	16.50	31.47	8.60
23	BDS-23	1.53	2.00	2.00	2.20	24.46	36.23	1.77	2.10	30.35	26.39	7.40
24	BDS-24	2.75	2.21	1.87	1.93	26.50	37.00	2.48	1.90	31.75	40.60	11.00
25	BDS-25	1.73	2.00	1.33	1.33	59.00	61.00	1.87	1.33	60.00	27.41	7.50
26	BDS-26	1.67	2.07	1.47	1.47	28.45	36.40	1.87	1.47	32.43	27.41	7.50
27	BDS-27	2.12	2.60	0.80	0.93	20.50	9.45	2.36	0.87	14.98	33.50	9.10
28	BDS-28	1.60	2.07	2.27	2.33	15.85	14.55	1.84	2.30	15.20	43.65	12.00
29	BDS-29	1.33	1.27	1.13	1.40	62.50	55.00	1.30	1.27	58.75	36.54	10.10
30	BDS-30	2.25	2.75	2.33	2.27	18.00	14.00	2.50	2.30	16.00	39.59	10.90
31	BDS-31	2.15	2.85	1.27	1.73	53.00	62.00	2.50	1.50	57.50	38.57	10.50
32	BDS-32	0.30	0.55	1.47	1.73	35.00	19.75	0.43	1.60	27.38	31.47	8.50
33	BDS-33	1.53	1.33	1.33	2.00	29.50	39.00	1.43	1.67	34.25	25.38	7.00
34	BDS-34	2.70	2.30	1.40	1.60	32.15	17.50	2.50	1.50	24.83	34.51	9.30
35	BDS-35	1.47	1.33	2.20	2.87	28.75	33.75	1.40	2.54	31.25	25.38	6.80
36	BDS-36	1.47	1.13	1.07	1.53	12.50	16.15	1.30	1.30	14.33	28.42	7.90
37	BDS-37	1.33	1.33	1.53	1.93	31.20	35.65	1.33	1.73	33.43	32.48	8.70
38	BDS-38	1.73	1.93	1.80	1.87	12.35	17.65	1.83	1.84	15.00	28.42	7.90
39	BDS-39	2.05	2.45	1.20	1.20	50.00	64.50	2.25	1.20	57.25	39.59	10.70
40	BDS-40	1.40	1.73	2.33	2.33	18.50	22.50	1.57	2.33	20.50	30.45	8.40
41	BDS-41	0.93	1.20	0.73	1.13	26.55	17.35	1.07	0.93	21.95	40.60	11.10
42	BDS-42	2.93	2.41	1.13	1.53	26.35	15.50	2.67	1.33	20.93	27.41	7.50
43	BDS-43	1.00	1.07	0.93	1.27	31.75	22.65	1.04	1.10	27.20	36.54	10.00
44	BDS-44	2.35	2.85	0.87	1.20	24.50	12.75	2.60	1.04	18.63	26.39	7.20
45	BDS-45	2.75	2.80	2.80	2.67	19.50	17.50	2.78	2.74	18.50	22.33	6.00
46	BDS-46	2.85	2.25	1.00	1.40	22.00	26.00	2.55	1.20	24.00	29.44	8.10
47	BDS-47	0.50	0.45	1.60	1.93	15.00	12.75	0.48	1.77	13.88	28.42	7.90
48	BDS-48	2.30	2.56	1.40	1.47	13.50	15.00	2.43	1.44	14.25	26.39	7.10
49	BDS-49	1.27	1.60	1.67	2.13	26.50	32.50	1.44	1.90	29.50	43.65	11.90
50	BDS-50	1.33	2.07	1.27	1.13	30.75	32.50	1.70	1.20	31.63	26.39	7.10
51	BDS-51	1.20	1.47	1.13	1.40	15.00	17.25	1.34	1.27	16.13	24.36	6.70

52	BDS-52	2.89	3.25	1.33	1.73	13.55	14.25	3.07	1.53	13.90	33.50	9.20
53	BDS-53	2.95	2.15	1.33	1.20	12.75	11.58	2.55	1.27	12.17	28.42	7.60
54	BDS-54	1.80	1.93	1.47	1.73	19.75	17.75	1.87	1.60	18.75	27.41	7.40
55	BDS-55	2.35	2.55	1.40	2.27	18.35	13.00	2.45	1.84	15.68	29.44	8.10
56	BDS-56	3.51	3.20	1.07	1.27	24.75	21.75	3.36	1.17	23.25	27.41	7.40
57	BDS-57	2.40	2.68	1.13	1.27	37.75	21.75	2.54	1.20	29.75	33.50	9.20
58	BDS-58	2.84	2.65	1.33	1.47	21.00	25.00	2.75	1.40	23.00	34.51	9.60
59	BDS-59	2.85	3.54	1.07	1.00	22.75	21.40	3.20	1.04	22.08	31.47	8.70
60	BDS-60	2.35	2.74	0.93	1.20	26.00	23.45	2.55	1.07	24.73	41.62	11.40
61	BDS-61	2.85	2.35	1.33	1.07	31.50	28.60	2.60	1.20	30.05	40.60	11.20
62	BDS-62	3.45	3.30	1.47	1.47	27.35	31.00	3.38	1.47	29.18	32.48	8.80
63	BDS-63	2.75	2.45	1.73	1.60	28.00	23.00	2.60	1.67	25.50	32.48	8.80
64	BDS-64	3.10	3.75	2.07	2.07	24.61	33.50	3.43	2.07	29.06	36.54	9.90
65	BDS-65	2.25	2.84	1.80	1.93	28.00	27.00	2.55	1.87	27.50	52.78	14.30
66	BDS-66	2.85	3.15	1.00	1.07	22.56	29.35	3.00	1.04	25.96	34.51	9.30
67	BDS-67	3.45	2.75	1.13	1.20	23.50	27.00	3.10	1.17	25.25	44.66	12.10
68	BDS-68	3.20	3.45	0.47	0.87	24.00	27.00	3.33	0.67	25.50	36.54	9.90
69	BDS-69	3.55	3.20	1.20	1.20	28.00	21.00	3.38	1.20	24.50	36.54	9.90
70	BDS-70	3.80	3.45	1.33	1.33	23.00	28.70	3.63	1.33	25.85	29.44	8.00
Mean	2.10	2.21	1.38	1.58	27.65	28.05	2.15	1.48	27.85	33.30	9.08	
S.Em ±	0.41	0.15	0.10	0.08	7.14	8.01	0.14	0.09	4.28	2.33	0.63	
C.D. at 5%	1.13	0.43	0.29	0.24	20.1	21.41	0.42	0.26	11.89	6.47	1.76	

LCI - Leaf Curl Index WAT- Weeks after Transplanting

Table 4: Indexing of chilli genotypes into different grades on the basis of leaf curling due to thrips damage

Leaf Curl Index (LCI)	Reaction	No. of genotypes	Genotype
0	Resistant	0	-
0.01 - 1.0	Moderately resistant	4	BDS - 02, BDS - 14, BDS - 32, BDS - 47.
1.01 - 2.0	Slightly resistant	26	BDS - 03, BDS - 05, BDS - 06, BDS - 08, BDS - 09, BDS - 12, BDS - 15, BDS - 18, BDS - 19, BDS - 23, BDS - 25, BDS - 26, BDS - 28, BDS - 29, BDS - 33, BDS - 35, BDS - 36, BDS - 37, BDS - 38, BDS - 40, BDS - 41, BDS - 43, BDS - 49, BDS - 50, BDS - 51, BDS - 54.
2.01 - 3.0	Less Susceptible	30	BDS - 01, BDS - 04, BDS - 07, BDS - 10, BDS - 11, BDS - 13, BDS - 16, BDS - 17, BDS - 20, BDS - 21, BDS - 22, BDS - 24, BDS - 27, BDS - 30, BDS - 31, BDS - 34, BDS - 39, BDS - 42, BDS - 44, BDS - 45, BDS - 46, BDS - 48, BDS - 53, BDS - 55, BDS - 57, BDS - 58, BDS - 60, BDS - 61, BDS - 63, BDS - 65.
3.01 - 4.0	Highly susceptible	10	BDS - 52, BDS - 56, BDS - 59, BDS - 62, BDS - 64, BDS - 66, BDS - 67, BDS - 68, BDS - 69, BDS - 70.

Table 5: Indexing of chilli genotypes into different grades on the basis of leaf curling due to mites damage

Leaf Curl Index (LCI)	Reaction	No. of genotypes	Genotype
0	Resistant	-	-
0.01 - 1.0	Moderately resistant	4	BDS - 01, BDS - 27, BDS - 41, BDS - 68.
1.01 - 2.0	Slightly resistant	57	BDS - 02, BDS - 03, BDS - 04, BDS - 05, BDS - 06, BDS - 07, BDS - 09, BDS - 10, BDS - 11, BDS - 12, BDS - 13, BDS - 14, BDS - 15, BDS - 16, BDS - 17, BDS - 18, BDS - 19, BDS - 20, BDS - 21, BDS - 24, BDS - 25, BDS - 26, BDS - 29, BDS - 31, BDS - 32, BDS - 33, BDS - 34, BDS - 36, BDS - 37, BDS - 38, BDS - 39, BDS - 42, BDS - 43, BDS - 44, BDS - 46, BDS - 47, BDS - 48, BDS - 49, BDS - 50, BDS - 51, BDS - 52, BDS - 53, BDS - 54, BDS - 55, BDS - 56, BDS - 57, BDS - 58, BDS - 59, BDS - 60, BDS - 61, BDS - 62, BDS - 63, BDS - 65, BDS - 66, BDS - 67, BDS - 69, BDS - 70.
2.01 - 3.0	Less Susceptible	9	BDS - 08, BDS - 22, BDS - 23, BDS - 30, BDS - 35, BDS - 40, BDS - 45, BDS - 64, BDS - 28.
3.01 - 4.0	Highly susceptible	0	-

Table 6: Grouping of genotypes based on percent fruit borer incidence

Borer damage	Category	No. of genotypes	Genotypes
0-5%	Resistant	0	-
6-20%	Moderately resistant	24	BDS - 01, BDS - 04, BDS - 15, BDS - 06, BDS - 02, BDS - 12, BDS - 05, BDS - 16, BDS -3, BDS - 54, BDS - 44, BDS - 45, BDS - 30, BDS - 51, BDS - 55, BDS - 28, BDS - 38, BDS - 27, BDS - 36, BDS - 48, BDS - 52, BDS - 47, BDS -22, BDS -53.
21-40%	Susceptible	33	BDS - 37, BDS - 21, BDS - 24, BDS - 61, BDS - 19, BDS - 23, BDS - 64, BDS - 17, BDS - 26, BDS - 57, BDS - 62, BDS - 66, BDS - 70, BDS - 68, BDS - 63, BDS - 65, BDS - 67, BDS - 60, BDS - 69, BDS - 56, BDS - 58, BDS - 59, BDS - 41, BDS - 42, BDS - 40, BDS - 46, BDS - 49, BDS - 43, BDS - 50, BDS - 32, BDS - 34, BDS - 35, BDS - 33.
> 41%	Highly susceptible	13	BDS - 07, BDS - 08, BDS - 09, BDS - 10, BDS - 11, BDS - 13, BDS - 14, BDS - 18, BDS - 20, BDS - 25, BDS - 29, BDS - 31, BDS - 39.

Table 7: High yielding genotypes of chilli (Cv. Byadgi dabbi)

Sl. No.	Genotypes	LCI due to thrips	LCI due to mites	Fruit borer damage (%)	Total yield per ha (q)
1.	BDS - 65	2.55 d	1.87 c	27.5 (31.63)	14.30 a
2.	BDS - 01	2.08 c	0.97 a	13.78 (21.79)	13.80 b
3.	BDS -67	3.10 d	1.17 b	25.25 (30.17)	12.10 c
4.	BDS - 03	1.50 b	1.57 c	10.93 (19.31)	12.00 c
5.	BDS - 28	1.84 c	2.30 d	15.20 (22.95)	12.00 c
6.	BDS - 49	1.44 b	1.90 c	29.50 (32.90)	11.90 c
7.	BDS - 60	2.55 d	1.07 b	24.73 (29.82)	11.40 d
8.	BDS - 61	2.60 d	1.20 b	30.05 (33.24)	11.20 d
9.	BDS - 41	1.07 a	0.93 a	21.95 (27.94)	11.10 d
10.	BDS - 18	1.67 b	1.43 c	51.00 (45.57)	11.10 d
Mean		2.04	1.44	24.99	12.09
S.Em ±		0.05	0.04	1.34	0.13
C.D at 5%		0.15	0.12	3.96	0.39

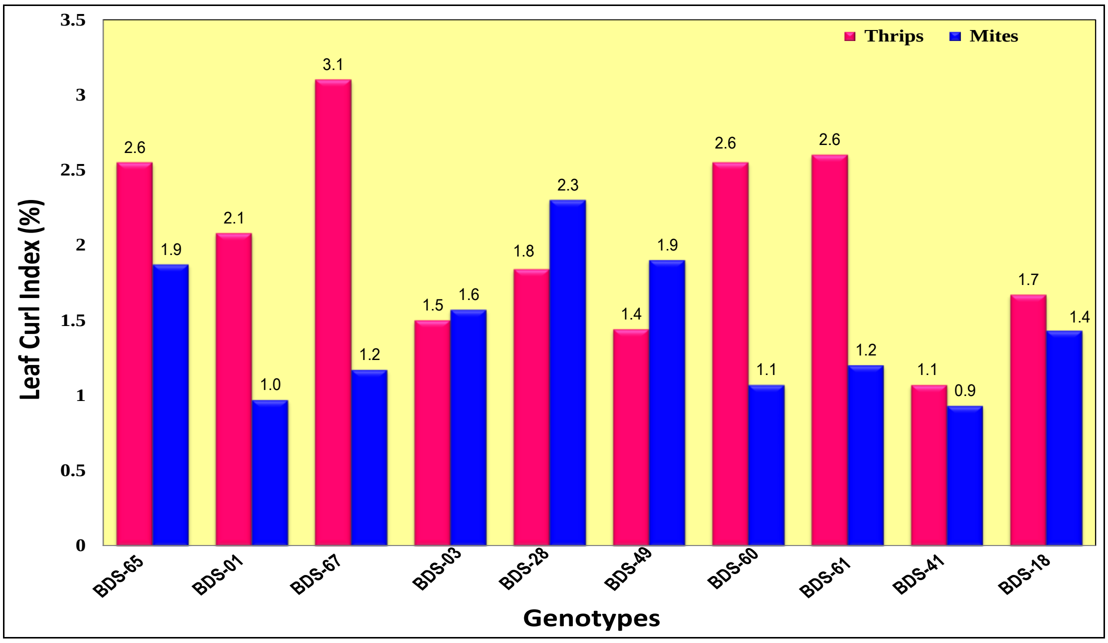

Fig 1: Indexing of chilli genotypes into different grades on the basis of leaf curling due to thrips, *Scirtothrips dorsalis* and mites, *Polyphagotarsonemus latus*

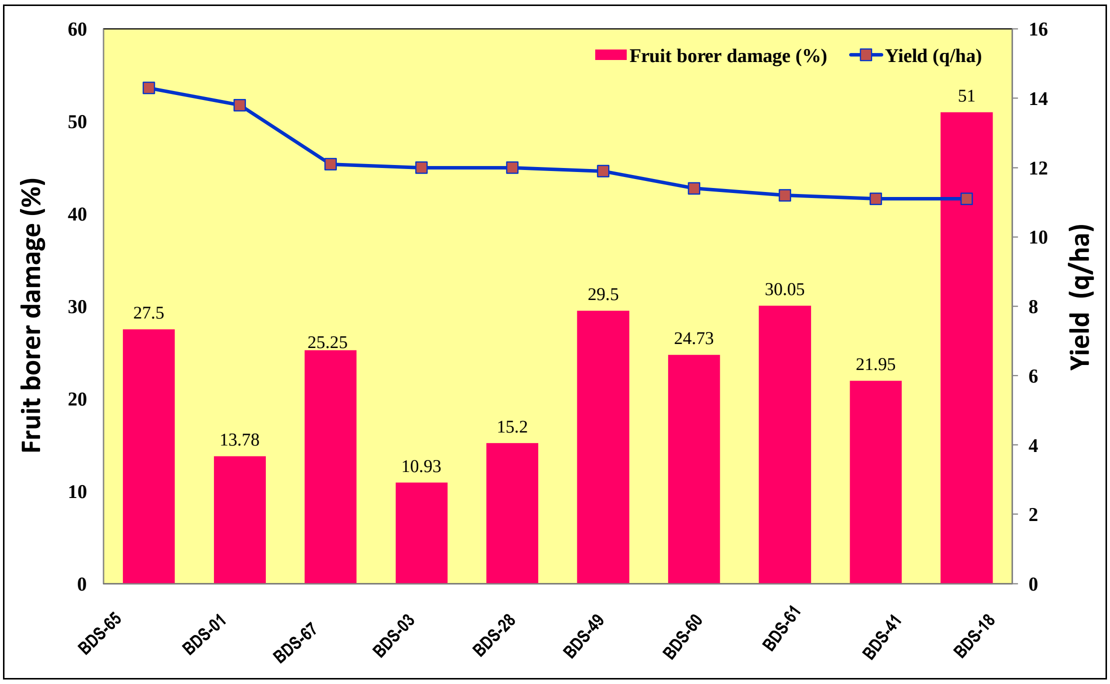

Fig 2: Grouping of genotypes based on percent fruit borer, *Helicoverpa armigera* incidence and yield

4. Conclusion

Among 70 different genotypes screened, the genotypes *viz.*, BDS-02, BDS-14, BDS-32, BDS-47 recorded relatively lowest LCI (Leaf Curl Index) of 0.74, 0.30, 0.43 and 0.48 against thrips, respectively and they were categorised under moderately resistant group. Whereas, four genotypes were identified as moderately resistant such as BDS - 01, BDS - 27, BDS - 41, BDS - 68 showing leaf curl indices of 0.97, 0.87, 0.93, 0.67 against mites, respectively. Further same genotypes were screened against chilli fruit borer, *Helicoverpa armigera* (Hubner) reaction where seven genotypes *viz*., BDS-01, BDS-04, BDS-15, BDS-06, BDS-02, BDS-12, BDS-05, BDS-16, BDS-03 recorded less than 20 percent fruit damage indicating moderately resistant to chilli fruit borer. With respect to the yield performance, highest dry chilli of 14.3 q ha^{-1} was harvested from BDS - 65 followed by BDS - 01 (13.8 q ha^{-1}), BDS - 67 (12.1 q ha^{-1}), which is on par with BDS - 28 (12 q ha^{-1}) and BDS - 03 (12 q ha^{-1}).

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