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Evaluation of Sesame Genotypes for their Resistance against Leaf Webber, *Antigastra catalaunalis* Duponchel

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ABSTRACT: Leaf webber, *Antigastra catalaunalis* Duponchel is a serious pest of sesame causes 72 per cent yield loss. The bio-chemical constituents of genotypes/varieties can suppress the insect pest damage and increases the tolerance level of host plant. Decreasing the usage of chemical insecticides also an important advantage of resistant varieties. Therefore, these biochemical parameters can be utilized as a marker for identification of source of resistance against targeted pest. Thus, experiment was carried out to evaluate total ten genotypes/varieties for their resistance against leaf webber, *A. catalaunalis* based on morphological, biochemical and damage percentages at Instructional farm, Department of Agronomy, College of Agriculture, Junagadh Agricultural University, Junagadh during *Kharif*, 2021. Morphological characters and biochemical characters of sesame *viz.*, number of leaves per plant (r = -0.928) and total phenol (r = -0.857**) showed a negative highly significant correlation with per cent leaf damage. While, total sugar (r = 0.776**) and total protein (r = 0.683**) showed positive highly significant association with leaf damage. However, trichomes/cm^2 (r = -0.259) showed non-significant negative correlation with per cent leaf damage. The number of capsules per plant (r = -0.876**) showed a highly significant negative correlation with the mean per cent of flower and capsule damage. Consideration of leaf, flower and capsule damage, none of the genotypes/varieties were found highly resistant (HS) and highly susceptible (HS). However, variety G. Til-10 and genotype AT-457 were found resistant (R) while varieties G. Til-4 and G. Til-6 were found susceptible (S) against leaf webber damage. Among all genotypes/varieties, the highest yield (520.13 kg/ha) was recorded from G. Til-10 followed by AT-457 (514.15 kg/ha).**

Keywords: Sesame, leaf webber, *Antigastra catalaunali*, genotypes, screening.

INTRODUCTION

Sesame is an herbaceous annual plant belonging to the Pedaliaceae family and the genus *Sesamum* (Das and Bhattacharjee 2015). Sesame is commonly known as til, gingelly, beniseed, til, safedtil, kalatil and tillie. (Vishwanath and Lal 1995). It is also known as “Queen of oil seeds” because of protein-rich seed and its edible oil, which is a rich source of UFAs. Sesamum is used for its nutritional, medicinal and industrial purposes (Elleuch *et al.*, 2007). Its oil is high in unsaturated fatty acids, particularly linoleic acid (37-47%), oleic acid (35-43%), palmitic acid (9-11%) and stearic acid (5-10%) (Pathak *et al*. 2014). Sesamol and sesaminol has both antioxidant and synergistic properties, it also has been proved to decrease cholesterol in people and enhance vitamin E levels in animals (Haller *et al*. 1942; Chakraborthy *et al*., 2008). In India sesame is cultivated in an area of 15.8 lakh ha with production of 7.92 lakh tones (Patel *et al.*, 2022). Among several factors, insect pests proved to be one of the vital factor in sesame crop and it is attacked by 29 insect pests at different stages of the plant growth and causing direct damage both quantitatively and qualitatively (Biswas, 2011). This insect pest causes 10-70 per cent infestation of leaves, 34-62 per cent of flower buds/flowers, 10-44 per cent infestation of pods resulting in about 72 per cent loss in yield (Ahirwar *et al.*, 2010) and heavy seed yield loss upto 90 per cent (Ahuja and Kalyan 2001). The leaf webber, *A. catalaunalis* occurs regularly and infests crop during seedling, flowering and maturity stages of crop growth and causes up to 90 per cent yield losses (Cheema and Singh 1987). In India, the production of sesame is very much low already and therefore the damage due to leaf webber is undesirable and unwelcomed, so it is very important to reduce the extent of damage by this pest. As pesticides are biological poison means these are designed to kill pests, its injudicious use may lead to health problems in consumers. To overcome these problems, use of resistant varieties has been identified as the most desirable, cost-effective, safest and economic measures for managing *A. catalaunalis* in sesame. Development of resistant cultivars/genotypes in sesame is one of the ecofriendly tactic to alleviate the yield loss caused by leaf webber. Therefore, the present research work was conducted to know the resistance in different genotypes/varieties for leaf webber, as screening within local varieties is highly significant in selecting lines resistant to local pests.

MATERIALS AND METHODS

Field screening of ten genotypes/varieties of sesame *viz*., AT- 467, AT- 470, AT- 457, AT- 482, AT- 483, G. Til-2, G. Til-4, G. Til-6, G. Til-10 and G. Til-3 were taken as treatment to know their relative resistance/susceptibility against leaf webber. All the genotypes/varieties were sown at a spacing of 45 cm × 15 cm, in a randomized block design with three replications at Instructional farm, Department of Agronomy, College of Agriculture, Junagadh Agricultural University, Junagadh during *Kharif*, 2021. The sesame genotypes/varieties were grouped into six categories of susceptibility to leaf webber *viz.*, Highly Resistant (HR), Resistant (R), Moderately Resistant (MR), Moderately Susceptible (MS), Susceptible (S) and Highly Susceptible (HS) based on leaf, flower and capsule damage. The leaves, flowers and capsules damage were estimated on 30 & 50, 50 & 60 and 60 & 70 days after sowing, respectively.

Number of leaves per plant: The total number of leaves per plant was counted from five randomly selected plants per plot.

Number of capsules per plant: The total number of capsules per plant was counted from five randomly selected plants per plot.

Number of trichomes/cm^2: The observations of number of trichomes were carried out in the P. G. Laboratory, Department of Entomology, College of Agriculture, Junagadh Agricultural University, Junagadh. The trichomes were counted from ten different genotypes/varieties of sesame after 50 days of sowing. In each replication of genotypes/varieties five plants were randomly selected and tagged. Then ten leaves per genotype/variety from each replication were collected. Graph sheet was used to measure an area of 1 cm^2 on the leaf and it was cut into leaf bit by using cutter knife. These bits were observed under the stereozoomtrinocular microscope to count the number of trichomes present on the leaf bit.

Biochemical characters: The estimation of biochemical parameters such as total phenol, total sugar and total protein were carried out in the Department of Biotechnology, College of Agriculture, Junagadh Agricultural University, Junagadh.

Preparation of aliquot: All polywares were thoroughly cleaned and air dried before use. From each replication, 10 leaves of each genotype were collected at 70 days after sowing and to make an aliquot, weighed the leaf bits and crushed them. Then added 10 ml of 80% methanol and kept overnight. Suitable aliquot (0.1 ml) was taken from methanol extract and evaporated to dryness in water bath. One ml of millipore water in each test tube and 0.5 ml of Folin Ciocalteu's phenol reagent (1:1 with water) was added and kept for 3 min. After this 2 ml of 20% sodium carbonate was added and mixed thoroughly. The tubes were placed in boiling water for exactly one minute and cooled in ice water. The absorbance was read at 650 nm against a reagent blank (Bray and Thorpe, 1954).

$$\text{Total protein/sugar/phenol} = \text{Graph factor} \times \frac{\text{Sample reading}}{\text{Weight of sample}} \times \frac{\text{Total volume}}{\text{Aliquot taken}} = 10^{-3}$$

Field screening methodology of leaf webber. The score chart was formulated based on intensity of damage. The per cent damage on different plant parts at various stages was converted to 1 to 9 score chart (Kavitha and Reddy 2012) (Table 1). The data on per cent damage were subjected to arcsine transformation and statistically analyzed for interpretation by following standard statistical technique (Steel and Torrie 1980).

RESULTS AND DISCUSSION

Incidence of *Antigastra catalaunalis* related to morphological characters

Number of capsules: The number of capsules per plant in all genotypes/varieties recorded between 28.62 (G. Til-6) and 53.93 (AT-457) had negative and significant correlation with pooled flower and capsule damage (r = -0.876**). (Table 2).

Number of leaves: The number of leaves per plant ranged between 56.47 (G. Til-6) and 99.17 (G. Til-10) in all genotypes/varieties. Considering the correlation coefficient results revealed that number of leaves had highly significant association (r = -0.928**) with leaf damage caused by *A. catalaunalis* (Table 3 and Fig. 1).

Number of trichomes/cm^2: The trichomes on plant ultimately influence the locomotion of *A. catalaunalis* in sesame. The less susceptible sesame genotypes/varieties, G. Til-10, AT-457 and G. Til-3 had 89.7, 84.29 and 80.27 trichomes/cm^2, respectively. The genotypes/varieties AT-470, G. Til-2, AT-482, AT-467 and AT-483 recorded 70.57 to 78.16 trichomes/cm^2. Comparatively lesser number of trichomes (67.34 and 69.38/cm^2) were observed in G. Til-6 and G. Til-4, respectively.

The correlation coefficient analysis showed that there was non-significant negative relationship (r = -0.259) between trichome density and leaf damage. It indicated that trichome density increases, the pest incidence decreases (Table 3 & Fig. 1). These results are in agreement with the findings of Singh *et al*. (1990); Halder *et al*. (2006) who revealed that genotypes that had a higher density of trichomes on the leaf surface exhibited relatively less damage to the other genotypes. Similar results were recorded by Choudhary *et al.* (2018) that the morphological characters of varieties *viz*., no. of leaves, no. of branches, no. of capsules and trichome density had negative correlation with the population of *A. catalaunalis*.

Correlation between biochemical characters of sesame genotypes/ varieties and leaf damage caused by *A. catalaunalis*

Total phenol: Total phenol content measured from leaf was ranged from 5.49 mg/g (G. Til-6) to 13.18 mg/g (G. Til-10) in screened genotypes/varieties. The correlation coefficient between total phenol and leaf damage had highly significant negative (r = -0.857**) relationship. This relation indicated that when phenol content in leaf is increased, the leaf damage due to *A. catalaunalis* decreased and *vice versa* (Table 3 & Fig. 1). Comparable results are found by Jyothi *et al*. (2018) who reported that the higher amount of total phenols in leaves showed a significant negative correlation with per cent leaf damage (r = -0.94) caused by *A. catalaunalis*. Similar results were found by Karuppaiah *et al*. (2009) *i.e*., the phenol content in the leaves found to be negatively correlated with damage caused by *A. catalaunalis.*

Total soluble sugar: Total soluble sugar content measured from leaf was ranged from 7.59 mg/g (G. Til-10) to 37.22 mg/g (G. Til-6) in tested ten genotypes/varieties. In respect to correlation coefficient study, the results showed that soluble sugar had highly significant positive (r = 0.776**) relationship with leaf damage (Table 3 & Fig. 1). These results are in conformity with the findings of Jyothi *et al*. (2018) who reported that the higher amount of total phenols total sugars (r = 0.89) showed a significant positive relationship with per cent leaf damage.

Total protein: Total protein content among different tested genotypes/varieties had range between 10.08 mg/g (G. Til-10) and 22.5mg/g (G. Til-6). The results of correlation coefficient analysis were revealed that total protein had significantly positive (r = 0.683**) with leaf damage (Table 3 & Fig. 1).

Field screening of leaf webber, *A. catalaunalis* on the basis of damage

Leaf damage at 30 DAS and 50 DAS: Based on pooled of leaf damage over period recorded at 30 DAS and 50 DAS showed that the significant differences in leaf damage done by *A. catalaunalis* in different genotypes/varieties. The variety G. Til-10 recorded the lowest leaf damage (9.16%) and it was at par with AT-457, AT-470, G. Til-2 and AT-482. The highest damage was found in G. Til-4 and G. Til-6 which was statistically at par with each other (Table 4).

Flower damage at 50 and 60DAS: Based on pooled of flower damage over period recorded at 50 and 60 DAS described that the varieties G. Til-6 and G. Til-4 were found to be more susceptible damage done by *A. catalaunalis* and were statistically at par with each other. In contrast, AT-457 recorded the lowest flower damage and it was at par with G. Til-10, AT-482 and AT-470.

Capsule damage at 60 and 70 DAS: Based on pooled of capsule damage over period recorded at 60 DAS and 70 DAS revealed that the capsule damage caused by leaf webber significantly differed among different genotype/varieties. The varieties G. Til-6, G. Til-4 and AT-467 were found to be more susceptible and were statistically at par to each other. In contrast, G. Til-10 recorded the lowest capsule damage and it is at par with AT-457, AT-483 and G. Til-2. (Table 6 & Plate B). According to Mishra *et al*. (2016) capsule damage ranged from 0.25 to 15.0per cent in a pooled analysis, compared to 9.0 and 2.0 per cent in susceptible and resistant checks further Choudhary *et al.* (2018) recorded none of the variety was immune among 15 varieties of sesame screened against *A. catalaunalis*. The varieties, RT-358 (4.63%), RT-370 (4.38%) and RT-371 (4.18%) were ranked as least susceptible based on capsule damage, while LT-8 (7.93%), TC-25 (6.78%) and RT-46 (7.88%) as highly susceptible. The results are in close conformity with Kumar *et al.* (2018) who revealed that leaf, flower and pod damage varied between 9.76 to 14.20 per cent, 3.58 to 5.88 per cent, and 1.42 to 1.65 per cent, respectively and were rated as resistant (R) with a cumulative score of 1.66. Swapna *et al.* (2021) also found similar results for screening of genotypes/varieties against *A. catalaunalis i.e.,* the intensity of leaf damage at 30 DAS ranged from 5.00 to 25.00 per cent, the mean per cent flower damage at 50 DAS was recorded between 5.50 to 22.50 per cent. The average per cent capsule damage at 70 DAS is ranged from 2.75 to 9.00 per cent.

Categories of genotypes/varieties: Based on score of damage pooled over period, none of the genotypes/varieties were observed under highly resistant (HR) and highly susceptible (HS) categories. However, the genotype AT-457 (1.97) was found to be resistant (R). The genotypes/varieties G. Til-10 (2.02), AT-470 (2.49), AT-482 (2.69), AT-483 (2.71), G. Til-2 (2.80) and G. Til-3 (3.20) were grouped under moderate resistant (MR) categories. The genotype AT-467 (4.53) was recorded under the categories of moderately susceptible. While, G. Til-4 (5.47) and G. Til-6 (5.73) were recorded under susceptible (S) categories (Table 7). Similar results were recorded by Saravanaraman *et al*. (2017) who revealed that sesame accessions *viz*., IVTS 2001-7 and TMV-3 were rated as resistant and plants of SVPR-1 were highly susceptible based on leaf, flower and capsule damage caused by leaf webber infestation.

Yield: As far as the yield of different genotypes/varieties are concerned, highest yield (520.13 kg/ha) was recorded from G. Til-10 than the rest of the genotypes/varieties which was followed by AT-457 (514.15 kg/ha) and AT-470 (477.5 kg/ha). The significantly lowest yield performance was recorded in AT-467, G. Til-4 and G. Til-6 *i.e.,* 207.6, 195.27 and 103.2 kg/ha, respectively (Table 8 and Fig. 2). The present results are in agreement with Selvanarayan and Baskaran (1996) who recorded the infestation of *A. catalaunalis* on the variety TSS 6 which recorded the lowest yield, whereas variety TMV 3 had the highest yield and the lowest infestation.

Table 1: Score chart of damage intensity in different plant parts.

Damage (%)			
Leaf	**Flower buds**	**Pod**	**Score**
0-10	0-5	>0-2	1
>10-20	>5-10	>2-4	3
>20-30	>10-15	>4-6	5
>30-40	>15-20	>6-8	7
>40	>20	>8	9

Table 2: Correlation between number of capsule per plant and pooled flower and capsule damage caused by *A. catalaunalis* in sesame.

Genotypes/ varieties	No. of capsule per plant	Pooled flower and capsule damage (%)
AT-467	38.05	16.70 (8.48)
AT-470	47.92	12.02 (4.50)
AT-457	53.93	10.72 (3.61)
AT-482	44.45	12.10 (4.48)
AT-483	43.65	12.28 (4.86)
G. Til-2	43.95	12.74 (5.18)
G. Til-4	38.02	18.10 (10.07)
G. Til-6	28.62	18.52 (10.44)
G. Til-10	49.99	10.92 (3.78)
G. Til-3	39.69	13.82 (5.97)
S. Em. ±	2.06	0.52
C. D. at 5%	6.13	1.49
C.V.%	8.43	9.19
Correlation	-0.876**	

Note: 1. Figures in parentheses are retransformed values; those outside are arcsine transformed value
2. **Significant at 1% (r = ± 0.641), n = 15

Table 3: Morphological and biochemical parameters of sesame genotypes/varieties and their relation with leaf damage caused by *A. catalaunalis.*

Genotypes/ varieties	Morphological characters		Biochemical characters			Leaf damage (%)
	No. of leaves/plant	No. of trichomes/ cm^2	Total phenol (mg/g)	Total soluble sugar (mg/g)	Total protein (mg/g)	
AT-467	72	75.89	7.24	34.75	21.09	24.46^{d} (17.14)
AT-470	84.3	70.57	11.14	28.30	20.82	18.64^{ab} (10.22)
AT-457	88.43	84.29	12.75	10.65	15.60	17.92^{ab} (9.48)
AT-482	82.77	77.81	10.23	11.89	15.61	19.69^{abc} (11.36)
AT-483	81.53	78.15	9.90	28.30	15.61	20.32^{bc} (12.06)
G. Til-2	80.46	74.97	8.46	23.78	19.40	19.61^{abc} (11.28)
G. Til-4	60.6	69.38	6.32	36.35	21.96	30.79^{e} (26.22)
G. Til-6	56.47	67.34	5.49	37.22	22.50	29.87^{e} (24.81)
G. Til-10	99.17	89.7	13.18	7.59	10.08	17.61^{a} (9.16)
G. Til-3	73.5	80.27	7.81	23.65	20.08	21.87^{c} (13.87)
S. Em. ±	3.43	3.00	0.33	0.95	0.59	0.84
C. D. at 5%	10.20	8.91	0.98	2.82	1.76	2.42
C.V.%	7.54	6.77	6.15	6.78	5.63	9.36
Correlation	-0.928**	-0.259	-0.857**	0.776**	0.683**	-

Note: 1. Figures in parentheses are retransformed values; those outside are arcsine transformed value.
2. **Significant at 1% (r = ± 0.463), n = 30

Table 4: Leaf damage in different genotypes/varieties of sesame due to leaf webber, *A. catalaunalis.*

Sr. No.	Genotypes/ varieties	Leaf damage (%)		Pooled
		30 DAS	50 DAS	
1.	AT-467	24.16^{c}(16.76)	24.75^{c}(17.53)	24.46^{d}(17.14)
2.	AT-470	18.32^{ab}(9.88)	18.96^{ab} (10.56)	18.64^{ab}(10.22)
3.	AT-457	17.35^{a}(8.89)	18.49^{ab}(10.06)	17.92^{ab}(9.48)
4.	AT-482	19.17^{ab}(10.77)	20.22^{ab}(11.94)	19.69^{abc}(11.36)
5.	AT-483	19.96^{ab}(11.65)	20.68^{ab} (12.47)	20.32^{bc}(12.06)
6.	G. Til-2	19.06^{ab}(10.66)	20.17^{ab}(11.89)	19.61^{abc} (11.28)
7.	G. Til-4	30.42^{d}(25.64)	31.18^{d} (26.79)	30.79^{e}(26.22)
8.	G. Til-6	29.47^{d} (24.19)	30.28^{d}(25.43)	29.87^{e}(24.81)
9.	G. Til-10	17.03^{a}(8.58)	18.19^{a}(9.75)	17.61^{a}(9.16)
10.	G. Til-3	21.61^{bc}(13.56)	22.13^{bc}(14.19)	21.87^{c}(13.87)
S. Em.± (T)		1.14	1.25	0.84
P		-	-	0.38
T×P		-	-	1.19
C. D. at 5% (T)		3.39	3.71	2.42
P		-	-	NS
T×P		-	-	NS
C. V. %		9.09	9.60	9.36

Note: Figures in parentheses are retransformed values; those outside are arcsine transformed value

Table 5: Flower damage in different genotypes/varieties of sesame due to leaf webber, *A. catalaunalis.*

Sr. No.	Genotypes/ varieties	Flower damage (%)		Pooled
		50 DAS	60 DAS	
1.	AT-467	18.59^{c}(10.17)	20.39^{de}(12.14)	19.49^{d}(11.15)
2.	AT-470	12.88^{a}(4.97)	15.27^{abc}(6.94)	14.08^{ab}(5.96)
3.	AT-457	11.29^{a}(3.83)	13.88^{a}(5.75)	12.58^{a}(4.79)
4.	AT-482	11.86^{a}(4.22)	14.81^{ab}(6.53)	13.33^{a}(5.38)
5.	AT-483	14.39^{b}(6.17)	16.72^{bc}(8.28)	15.56^{bc}(7.23)
6.	G. Til-2	14.70^{b}(6.44)	17.07^{bc}(8.62)	15.89^{c}(7.53)
7.	G. Til-4	21.32^{d}(13.22)	22.94^{e}(15.19)	22.13^{e}(14.20)
8.	G. Til-6	21.34^{d}(13.25)	23.03^{e}(15.31)	22.19^{e}(14.28)
9.	G. Til-10	11.85^{a}(4.22)	14.45^{ab}(6.23)	13.15^{a}(5.22)
10.	G. Til-3	15.7^{b}(7.33)	17.77^{cd}(9.32)	16.74^{c}(8.33)
S. Em.± T		0.78	0.94	0.61
P		-	-	0.27
T×P		-	-	0.87
C. D. at 5% T		2.32	2.81	1.76
P		-		1.79
T×P		-	-	NS
C. V.%		8.80	9.27	9.09

Note: Figures in parentheses are retransformed values; those outside are arcsine transformed value

Table 6: Capsule damage in different genotypes/varieties of sesame due to leaf webber, *A. catalaunalis.*

Sr. No.	Genotypes/ varieties	Capsule damage (%)		Pooled
		60 DAS	70 DAS	
1.	AT-467	13^{d}(5.06)	14.82^{c}(6.54)	13.91^{d}(5.80)
2.	AT-470	8.72^{bc}(2.30)	11.22^{ab}(3.78)	9.97^{bc}(3.04)
3.	AT-457	7.45^{ab}(1.68)	10.25^{ab}(3.16)	8.85^{ab}(2.42)
4.	AT-482	9.7^{c}(2.85)	12.02^{b}(4.33)	10.86^{c}(3.59)
5.	AT-483	7.62^{ab}(1.76)	10.37^{ab}(3.24)	8.99^{ab}(2.49)
6.	G. Til-2	8.29^{ab}(2.08)	10.89^{ab}(3.57)	9.59^{ab}(2.82)
7.	G. Til-4	13.17^{d}(5.19)	14.97^{c}(6.67)	14.07^{d}(5.93)
8.	G. Til-6	14.00^{d}(5.85)	15.71^{c}(7.33)	14.86^{d}(6.59)
9.	G. Til-10	7.26^{a}(1.59)	10.11^{a}(3.08)	8.68^{a}(2.34)
10.	G. Til-3	9.74^{c}(2.86)	12.04^{b}(4.35)	10.89^{c}(3.60)
S. Em.± T		0.47	0.64	0.40
P		-	-	0.18
T×P		-	-	0.56
C. D. at 5% T		1.41	1.90	1.14
P		-	-	0.51
T×P		-	-	NS
C. V.%		8.31	9.06	8.83

Note: Figures in parentheses are retransformed values; those outside are arcsine transformed value

Table 7: Categorization of sesame genotypes/varieties based on pooled score data.

Based on pooled data	SD = 1.379, $\bar{X}$ = 3.363, $\bar{X}$ - 2SD = 0.606, $\bar{X}$ - SD = 1.985, $\bar{X}$ + SD = 4.742, $\bar{X}$ + 2SD = 6.121	
Highly Resistant (HR)	$\bar{X}$ i ≤ 0.606	-
Resistant (R)	1.985 ≥ $\bar{X}$ i> 0.606	AT-457 (1.97)
Moderately Resistant (MR)	3.363 ≥ $\bar{X}$ i>1.985	G. Til-10 (2.02), AT-470 (2.49), AT-482 (2.69), AT-483 (2.71), G. Til-2 (2.80), G. Til-3 (3.20)
Moderately Susceptible (MS)	3.363 < $\bar{X}$ i ≤ 4.742	AT-467 (4.53)
Susceptible (S)	4.742 < $\bar{X}$ i ≤ 6.121	G. Til-4 (5.47), G. Til-6 (5.73)
Highly Susceptible (HS)	$\bar{X}$ i>6.121	-

Note: $\bar{X}$ = Mean value of all genotypes/varieties and SD = Standard deviation

Table 8: Relative susceptibility of different genotypes/varieties of sesame against leaf webber, *A. catalaunalis* during *Kharif*, 2021

Sr. No.	Genotypes/ varieties	Damage (%)			Yield (kg/ha)
		Leaf	Flower	Capsule	
1.	AT-467	24.46^{d} (17.14)	19.49^{d} (11.15)	13.91^{d} (5.80)	207.6^{d}
2.	AT-470	18.64^{ab} (10.22)	14.08^{ab} (5.96)	9.97^{bc} (3.04)	477.5^{a}
3.	AT-457	17.92^{ab} (9.48)	12.58^{a} (4.79)	8.85^{ab} (2.42)	514.15^{a}
4.	AT-482	19.69^{abc} (11.36)	13.33^{a} (5.38)	10.86^{c} (3.59)	408.33^{b}
5.	AT-483	20.32^{bc} (12.06)	15.56^{bc} (7.23)	8.99^{ab} (2.49)	373.5^{bc}
6.	G. Til-2	19.61^{abc} (11.28)	15.89^{c} (7.53)	9.59^{ab} (2.82)	334.2^{c}
7.	G. Til-4	30.79^{e} (26.22)	22.13^{e} (14.20)	14.07^{d} (5.93)	195.67^{d}
8.	G. Til-6	29.87^{e} (24.81)	22.19^{e} (14.28)	14.86^{d} (6.59)	106.33^{e}
9.	G. Til-10	17.61^{a} (9.16)	13.15^{a} (5.22)	8.68^{a} (2.34)	520.13^{a}
10.	G. Til-3	21.87^{c} (13.87)	16.74^{c} (8.33)	10.89^{c} (5.8)	330.5^{c}
S. Em.±		0.84	0.61	0.40	17.27
C. D. at 5%		2.42	1.76	1.14	51.30
C. V. %		9.36	9.09	8.83	8.62

Note: Figures in parentheses are retransformed values; those outside are arcsine transformed value

Plate A. Flower damage caused by *Antigastra catalaunalis* infesting sesame

Plate B. Capsule damage caused by *Antigastra catalaunalis* infesting sesame.

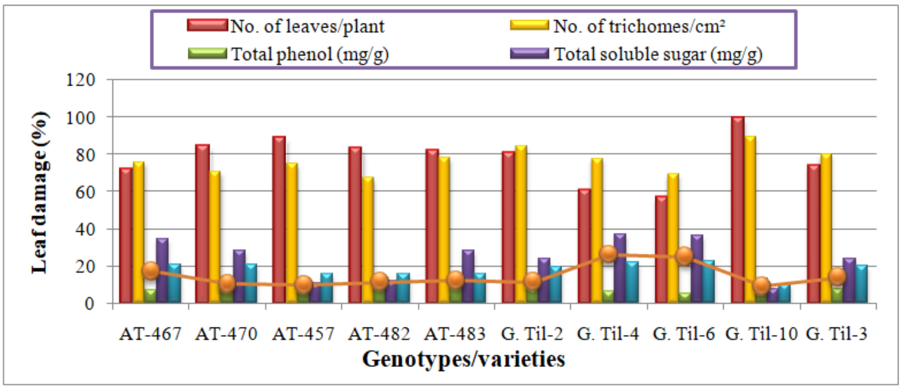

Fig. 1. Correlation between morphological and biochemical parameters of sesame genotypes/varieties with leaf damage caused by *Antigastra catalaunalis.*

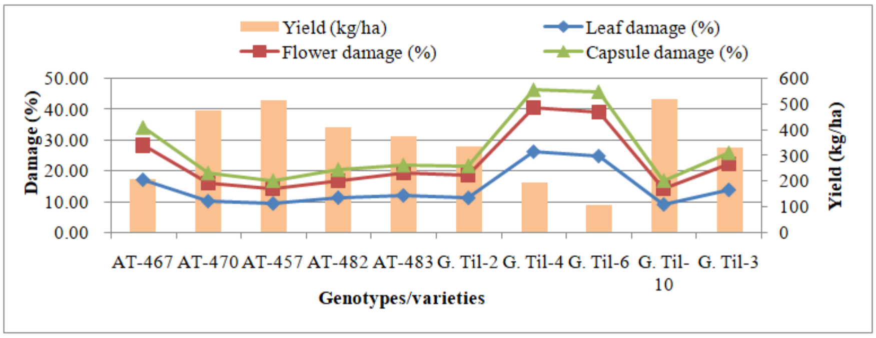

Fig. 2. Yield of different genotypes/varieties along with leaf, flower and capsule damage due to leaf webber, *Antigastra catalaunalis.*

CONCLUSIONS

The varietal screening of sesame against leaf webber during *kharif* season revealed that the genotype AT-457 and variety G. Til-10 has very less amount of leaf, flower and capsule damage and highest yield with highest content of phenol. These genotype/variety also has lowest sugar and protein content which gives resistance character to them against *A. catalaunalis*. Moreover to this, these can be used as resistant source at farmer level.

FUTURE SCOPE

Those genotypes/varieties had low amount of sugar and protein and high amount of phenol were observed more resistant against *A. catalaunalis* damage. So, these chemical ingredients of genotypes/varieties suppress the insect pest damage and elevate the tolerance level of host plant. Reducing the use of insecticides also a key advantage of resistant varieties. Thus, these biochemical parameters can be used as marker for identification of source of resistance against targeted pest. More research works should be carried out on succeeding breeding program of generating new resistant/tolerant varieties.

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