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EVALUATION OF SESAME GENOTYPES AGAINST LEAF WEBBER AND CAPSULE BORER *ANTIGASTRA CATALAUNALIS* (DUPONCHEL)

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ABSTRACT

Fifty four genotypes of sesame (*Sesamum indicum* L.) of varied geographic and genetic diversity from India were evaluated against the leaf webber and capsule borer *Antigastra catalaunalis* (Duponchel). The % plant, flower and capsule damage was observed to be from 7.94 to 54.43%, 8.67 to 45.45% and 7.73 to 32.15% respectively. During vegetative stage (30 DAS), eight genotypes viz., EC-334990, SP-1144, ES-62, SI-2192, IS-446-1-64, ES-335005, SI-250 and IS-178-C and during flowering stage (45 DAS), SI-250 and IS-178-C were found resistant showing flower damage <10%. At capsule stage (75 DAS) none of the genotype was showing resistance. On the basis of overall performance (damage) at different stages of plant growth the genotypes viz., SI-250 (8.11%), IS-178-C (8.75%) and ES-335005 (9.97%) were found promising, and will be of use in resistance breeding programme as donors for resistance against *A. catalaunalis*.

Key words: Sesame, *Antigastra catalaunalis*, host plant resistance, plant, flower capsule damage, SI-250, IS-178-C, ES 335005, growth stages

Among the oilseeds crops, sesame (*Sesamum indicum* L.) is important (Smith et al., 2000), mainly grown in tropics and subtropics (Anonymous, 2015). In India, the yield potential of sesame has not been fully realized due to a number of biotic and abiotic factors. Among the various biotic factors, the attack of insect pests is the major limiting factor (Egonyu et al., 2005; Ahirwar et al., 2010). The crop is attacked by >67 insect pests at various stages of its growth (Ahirwar et al., 2009), and of these the leaf webber and capsule borer *Antigastra catalaunalis* (Duponchel) is the serious one, as it attacks all the growth stages. It feeds on tender foliage by webbing the top leaves, bores into the pods and shoots (Narayanan and Nadarajan, 2005). This causes 10 to 70% infestation of leaves, 34 to 62% of flower buds or flowers and 10 to 44% of pods resulting up to 72% loss in yield (Ahirwar et al., 2010). If an infestation occurs at a very early stage, the plant dies while at a later stage, infested shoot remains without further growth (Karuppaiah, 2014). It is important to reduce the damage due to this pest. Management using insecticides is effective but is to be discouraged in view of environmental and health considerations (Rai et al., 2002). Host resistance is the most desirable and economic strategy in IPM and as alternative to insecticides, and thus ecofriendly. The present study evaluates some genotypes of sesame against *A. catalaunalis*.

MATERIALS AND METHODS

The experiment was carried out at the Project Coordinating Unit Sesame and Niger farm, College of Agriculture, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur. Randomized Block Design (RBD) was followed with 54 genotypes. The seeds were sown in rows of 3 m length replicated thrice. The spacing between rows to rows and plant to plant was kept 30 cm and 10 cm, respectively. The observations were made at vegetative, flowering and capsule maturity stages- plant damage was observed at vegetative stage (30 DAS) by counting the total number of damage and healthy plants and % worked out. Flower and capsule damage were observed at 45 and 70 DAS, respectively and similarly % was worked out. The resistance/ susceptibility of genotypes was evaluated with the % plant, flower and capsule damage, through the rating system developed by AICRP Sesame and Niger.

RESULTS AND DISCUSSION

The significant differences among the genotypes evaluated with respect to the plant, flower and capsule damage is given as Table 1. The damage was observed to range from 7.94 to 54.43%, maximum being in the genotype Prachi (54.43%) followed by TC-25 (48.27%), EC-334993 (25.51%) and SI-3237 (24.25%); while the

Table 1. Damage by *A. catalaunalis* on sesame genotypes and their categorisation

S. No.	Genotypes	% damage		
		Plant (%)	Flower (%)	Capsule (%)
1.	T_{1} - SI-3237	24.25	32.38	21.20
2.	T_{2} - IC-131607	19.38	22.36	17.29
3.	T_{3} - SI-3179	21.65	24.73	18.61
4.	T_{4} - SI-3231	11.70	15.81	11.94
5.	T_{5} - EC-33507	12.70	18.03	12.32
6.	T_{6} - IS-321	15.08	20.50	17.09
7.	T_{7} - SI-1156	13.05	13.51	11.81
8.	T_{8} - EC-335011-A	18.99	18.09	18.69
9.	T_{9} - EC-334990	9.84	13.74	9.16
10.	T_{10} - EC-334989	12.94	13.95	12.68
11.	T_{11} - ICA-14146-A	13.53	18.33	13.37
12.	T_{12} - BC-303427	21.54	17.47	21.49
13.	T_{13} - IS-665	16.95	25.70	16.18
14.	T_{14} - SI-3234	18.64	12.08	19.31
15.	T_{15} - EC-334280	12.61	18.66	13.80
16.	T_{16} - S-0182-I	15.84	19.74	16.22
17.	T_{17} - IS-475	16.00	18.07	16.10
18.	T_{18} - EC-334983	15.17	25.62	15.75
19.	T_{19} - KIS-375	13.41	19.37	14.51
20.	T_{20} - Agra-balik	13.61	16.11	14.24
21.	T_{21} - IS-100-8	13.51	20.23	12.65
22.	T_{22} - SI-1679	16.39	20.57	16.13
23.	T_{23} - SI-76-1	10.80	13.95	9.90
24.	T_{24} - EC-334984	10.61	14.08	9.57
25.	T_{25} - SP-1144	9.94	13.83	9.88
26.	T_{26} – IS-723	14.67	24.96	15.65
27.	T_{27} - IS-253	12.92	21.97	12.81
28.	T_{28} – S-0388	17.12	21.66	17.08
29.	T_{29} – ES-75-2-84	15.19	25.89	15.40
30.	T_{30} – ES-334966	13.22	22.56	13.44
31.	T_{31} – ES-81	13.90	19.71	11.10
32.	T_{32} - IC-199443	12.31	18.26	12.38
33.	T_{33} - EC-334995	11.32	21.40	10.17
34.	T_{34} – EC-3349997	22.01	21.85	19.07
35.	T_{35} – KMR-1	14.03	12.93	13.04
36.	T_{36} – ES-62	9.56	13.08	9.72
37.	T_{37} – SI-2192	9.95	13.54	9.82
38.	T_{38} – IS-17	10.93	14.44	10.05
39.	T_{39} – IS-722-2-84	20.28	23.54	18.41
40.	T_{40} – IS-3179	14.99	18.16	13.98
41.	T_{41} - IS-446-1-64	9.19	13.67	8.87
42.	T_{42} - IS-391	11.09	17.16	11.32
43.	T_{43} - EC-303440-B	10.91	11.47	9.99
44.	T_{44} - IS-461-1-84-I	16.47	20.76	16.20
45.	T_{45} - ES-335005	9.34	12.00	8.56
46.	T_{46} - NIC-163-88	17.48	22.05	18.41
47.	T_{47} - SI-995	10.83	14.83	9.90
48.	T_{48} - SI-1345	12.59	17.50	11.84
49.	T_{49} - SI-63	18.38	21.30	18.89
50.	T_{50} – EC-334993	25. 51	34.49	28.02
51.	T_{51} - SI-250	7.94	8.67	7.73
52.	T_{52} - IS-178-C	8.56	9.44	8.24
53.	T_{53} – Prachi	54.43	45.45	32.15
54.	T_{54} - TC-25	48.27	42.17	29.20
SEm ±		0.48	4.93	4.01
CD (P= 0.05%)		1.17	13.81	12.09

least damage (7.94%) was in SI-250 (7.94%) followed by IS-178-C (8.56%). Other genotypes which showed less damage were IS-446-1-64 (9.19%), ES-335005 (9.34%), ES-62 (9.56%), EC-334990 (9.84%), SP-1144 (9.94%) and SI-2192 (9.95%). The genotypes SI-250 and IS-178-C were found at par with the least plant damage. The present results are in conformity with those of Karuppaiah and Nadarajan (2011) on TKG-309 and CST- 2001-3, at the vegetative stage. The genotypes were grouped into categories based on % plant damage, and none was observed to be free. Eight genotypes viz., EC-334990, SP-1144, ES-62, SI-2192, IS-446-1-64, ES-335005, SI-250 and IS-178-C were found resistant (<10% damage). The moderately resistant ones include 38 genotypes (10-20%), and six genotypes were found moderately susceptible and one genotype each under susceptible and highly susceptible category viz., TC-25 and Prachi, respectively (Table 2). Present findings are also supported by those of Balaji and Selvanarayanan (2016) with NIC-7875 showing high resistance to leaf, flower and capsule damages.

The flower damage was ranging from 8.67 to 45.45%, maximum being with genotype Prachi (45.45%) followed by TC-25 (42.17%), EC-334993 (34.49%) and SI-3237 (32.38%); while the least flower damage (8.67%) was in SI-250 followed by IS-178-C (9.44%), and only two genotypes SI-250 and IS-178-C were found resistant (<10% damage). The capsule damage ranged from 7.73 to 32.15%, maximum was with genotype Prachi (32.15%) and the least (7.73%) with SI-250 followed by IS-178-C (8.24%), and none was resistant. Present findings corroborate with those of Karuppaiah et al. (2009). A differential response of the genotypes was noticed at the various crop growth stages. The genotypes, SI-250, ES-22 and UMA showed resistance at all the three stages, i.e. vegetative, flowering and pod maturity. However, TKG-309 and CST-2001-3 showed resistance only at the vegetative stage; KMR-14 and VRI-1 exhibited resistance only at the pod maturity stage. Based on the overall grading, SI-250 and UMA genotypes were found resistant, and ES-22 was highly resistant. Similarly, Murli Baskaran et al. (1990) also reported resistance in terms of capsule damage. Five entries viz., SI-241 (6.16%), NIC-8262 (6.42%), NIC-16359 (6.51%), JLT-8 (6.55%) and KMR-4 (6.83), were found promising with least susceptibility at capsule stage. Thus, on the basis of overall (mean) damage at different stages of plant growth the genotypes SI-250 (8.11%), IS-178-C (8.75%) and ES-335005 (9.97%) provide promising results.

Table 2. Categorisation of sesame genotypes (based on damage)

S. No.	Plant/ flower damage (%)	Reactions	Genotypes		Capsule damage (%)	Genotypes
1.	No Damage	Immune	-		No damage	
2.	<10	Resistant	EC-334990, SP-1144, ES-62, SI-2192, IS-446-1-64, ES-335005, SI-250 (RC) and IS-178-C.	SI-250 (RC) and IS-178-C.	<5	
3.	10-20	Moderately resistant	IC-131607, SI-3231,EC-33507,IS-321, SI-1156, EC-335011-A, EC-334989, ICA-14146-A, IS-665, SI-3234, EC-334280, S-0182-I, IS-475, EC-334983, KIS-375, Agra-balik, IS-100-8, SI-1679, SI-76-1, EC-334984, IS-723, IS-253, S-0388, ES-75-2-84, ES-334966, ES-81, IC-199443, EC-334995, KMR-1, IS-17, IS-3179, IS-391, EC-303440-B, IS-461-1-84-I, NIC-163-88,SI-995, SI-1345 and SI-63.	SI-3231, EC-33507, SI-1156, EC-335011-A, EC-334990, EC-334989, ICA-14146-A, BC-303427, SI-3234, EC-334280, S-0182-I, IS-475, KIS-375, Agra-balik, SI-76-1, EC-334984, SP-1144, ES-81, IC-199443, KMR-1, ES-62, SI-2192, IS-17, IS-3179, IS-446-1-64, IS-391, EC-303440-B, ES-335005, SI-995 and SI-1345.	5-10	EC-334990, SI-76-1, EC-334984, SP-1144, ES-62, SI-2192, IS-446-1-64, EC-303440-B, ES-335005, SI-995, SI-250 (RC) and IS-178-C.
4.	21-30	Moderately susceptible	SI-3237, SI-3179, BC-303427, EC-3349997, IS-722-2-84 and EC-334993.	IC-131607, SI-3179, IS-321, IS-665, EC-334983, IS-100-8, SI-1679, IS-723, IS-253, S-0388, ES-75-2-84, ES-334966, EC-334995, EC-3349997, IS-722-2-84, IS-461-1-84-I, NIC-163-88 and SI-63.	11-15	SI-3231, EC-33507, SI-1156, EC-334989, ICA-14146-A, EC-334280, KIS-375, Agra-balik, IS-100-8, IS-253, ES-334966, ES-81, IC-199443, EC-334995, KMR-1, IS-17, IS-3179, IS-391 and SI-1345.
5.	31-50	Susceptible	TC-25 (SC).	SI-3237, EC-334993, Prachi and TC-25 (SC).	16-25	SI-3237, IC-131607, SI-3179, IS-321, EC-335011-A, BC-303427, IS-665, SI-3234, S-0182-I, IS-475, EC-334983, SI-1679, IS-723, S-0388, ES-75-2-84, EC-3349997, IS-722-2-84, IS-461-1-84-I, NIC-163-88 and SI-63.
6.	>50	Highly susceptible	Prachi	-	>25	EC-334993, Prachi and TC-25 (SC).

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