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Evaluation of different genotypes, varieties and hybrids against Sesamum Phyllody disease

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Abstract

Sesamum (*Sesamum indicum* L.) is one of the oldest oilseed crops grown in the tropical and subtropical region of the world. Sesamum is oldest oilseed indigenous oilseed crop, which has largest history in India. Sesame is also called as “Queen of oil seeds”. Phyllody of Sesamum is phytoplasmal disease which is transmitted by a insect vector leaf hopper, side grafting and through dodder. In present investigation total 32 varieties of Sesamum were screened for resistance to phyllody disease under natural field condition. Out of all the varieties under natural epiphytotic condition none of varieties was found immune for disease. Varieties TBS-05, TBS-09, TBS-02, Sweta, KMR-69, TKG-22, Pragati were resistant, TBS-06, TBS-07, GT-10, GT-01, IVT-17-03, IVT-1705, IVT-17-18, AVT-06, TBS-08, AKT-101, Prachi, Latur local were moderately resistant and IVT-17-07, AVT-17-12 was susceptible to Sesamum Phyllody disease.

Keywords: Sesamum, phyllody, screening, varieties, genotypes

Introduction

Sesamum (*Sesamum indicum* L.) is one of the most ancient and oldest oilseed crop growing all over the world. Sesamum seeds are rich source of oil and protein. Its oil content generally varies from 46 to 52 per cent and protein about 20 per cent (Moazzami *et al.* 2006) [4]. Sesamum oil is considered superior because of its high quality and stability. High quality of oil is due to the presence of well balanced properties of saturated and unsaturated fatty acid. Sesamum seed contains two phenolic antioxidants, sesamol and sesaminol have been shown to possess cholesterol lowering effect in human and to prevent high blood pressure and increase vitamin E supplies in animals. Lignins also found in sesamum seed have remarkable antioxidants effect on human body. “Til se dil” or “Til dil” are the ancient Hindi probes in India signifying the importance of sesamum for hearts. Sesamum phytoplasma exhibits a range of symptoms such as phyllody, witches broom, virescence, cracking of seed capsules, shoot tip fasciation, reduction of internode as well as leaf size and distance flattening of the shoot apex (Vamshi, *et al.* 2018) [8]. The phytoplasma phyllody disease is transmitted by insect vector leaf hopper (*Orosius albicinctus* D), grafting and dodder (Akhtar *et al.* 2009) [1]. For the effective management of sesamum phyllody disease transmitting vector management is key consideration by spraying insecticide Imidacloprid (Thangjam and Vastrad, 2015) [7]. Sesamum phyllody disease symptoms also reappear by spraying antibiotics (Kumhar and Meena, 2016) [3]. The best way for management of sesamum phyllody disease is use of resistance varieties, keeping view in mind the present investigation on field screening of sesamum varieties against Sesamum phyllody was undertaken.

Material and Methods

Experimental Details

Available 32 sesamum cultivars was screened against phytoplasma phyllody disease under natural field condition, during the year *Kharif*- 2017, on research farm of Department of Plant Pathology, College of Agriculture, Latur. Total 30 numbers of plant of each varieties were sown. All recommended cultural practices were followed.

Observations

Observations on leaf hopper population and disease development were carried out 15 days interval. The yield per plant was calculated and converted into kg/ha. The variety were later grouped into different categories by using 0 – 4 rating scale given by (Vanishree *et al.*, 2013) [9].

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Table 1: Disease rating scale used for scoring sesamum phyllody

Scale	Symptoms	Reaction
0	0	Immune
1	1-10	Resistant
2	10.1-25	Moderately Resistant
3	25.1-50	Moderately Susceptible
4	More than 50	Susceptible

Results

To find out natural source of resistance 32 prominent varieties of sesamum were screened under natural epiphytotic for their reaction to leaf hopper and phyllody disease incidence and result obtained were presented in Table 2. Result revealed that, leaf hopper population varies from 0.59 to 1.72 leaf hopper per leaf. Lowest leaf hopper population was reported

in TBS-05, 0.59 leaf hopper / leaf followed by TBS-09, TKG-22 and Sweta reported leaf hopper population 0.72, 0.75 and 0.75 leaf hopper / leaf, respectively. Highest leaf hopper population 1.72 leaf hopper/ leaf and 1.56 leaf hopper / leaf was reported in AVT-17-12 and IVT-17-07, respectively.

In all the sesamum lines the maximum disease incidence was observed in AVT17-12 (68%) followed by IVT-17-07 (54%), IVT-17-04 (50%) and IVT-17-10 (48%) with the other hand minimum disease incidence was observed in TBS-05, Pragati, Sweta and TKG-22 which recorded 7 per cent, 8 per cent, 9 per cent and 9 per cent disease incidence, respectively. The data on screened prominent lines and varieties of sesamum revealed that highest yield was observed in TKG-22 (925 kg/ha) followed by KMR-69 (910 kg/ha). Lowest yield was recorded in TBS-01 (629 kg/ha).

Table 2: Screening of sesamum genotypes/varieties/hybrids evaluated against leaf hopper population, sesamum phyllody disease incidence and yield of sesamum

Sr. No.	Name of Cultivar	No. of Leaf hopper /leaf*	Disease Incidence (%)	Reaction	Yield (Kg/ha)
1	TBS-05	0.59	07	R	847
2	TBS-06	1.22	25	MR	820
3	TBS-07	1.11	18	MR	825
4	TBS-09	0.72	09	R	870
5	TBS-10	1.28	33	MS	740
6	GT-10	1.03	13	MR	860
7	GT-01	1.14	22	MR	830
8	IVT-17-01	1.26	29	MS	715
9	IVT-17-03	1.20	25	MR	820
10	IVT-17-04	1.50	50	MS	700
11	IVT-17-05	1.03	12	MR	832
12	IVT-17-07	1.56	54	S	660
13	IVT-17-09	1.33	40	MS	710
14	IVT-17-10	1.45	48	MS	733
15	IVT-17-11	1.26	30	MS	695
16	IVT-17-18	1.13	20	MR	872
17	AVT-17-12	1.72	68	S	680
18	AVT-17-05	1.28	33	MS	755
19	AVT-06	1.07	14	MR	890
20	TBS-01	1.43	47	MS	629
21	TBS-02	1.00	10	R	870
22	TBS-05	1.32	39	MS	719
23	TBS-08	1.19	23	MR	880
24	JLT-07	1.27	29	MS	717
25	AKT-101	1.16	23	MR	815
26	Sweta	0.75	09	R	870
27	G-1	1.29	32	MS	775
28	KMR-69	1.02	10	R	910
29	TKG-22	0.75	09	R	925
30	Pragati	0.82	08	R	850
31	Latur local	1.12	17	MR	790
32	Parbhani local	1.30	32	MS	725

*: Average of five plants

Result on above data, revealed that the varieties/genotypes TKG-22, Sweta and KMR-69 are resistant to disease and

recorded highest yield. These varieties were helpful for sesamum phyllody disease management.

Table 3: Reaction of sesamum genotypes/ varieties/ hybrids to sesamum phyllody disease under field condition

Scale	Reaction	Genotypes/ Varieties/ Hybrids
0	Immune	-----
1	Resistant	TBS-05, TBS-09, TBS-02, Sweta, KMR-69, TKG-22 and Pragati
2	Moderately Resistant	TBS-06, TBS-07, GT-10, GT-01, IVT-17-03, IVT-17-05, IVT-17-18, AVT-06, TBS-08, AKT-101, Prachi and Latur local
3	Moderately Susceptible	TBS-10, IVT-17-01, IVT-17-04, IVT-17-09, IVT-17-10, IVT-17-11, AVT-17-05, TBS-01, TBS-05, JLT-408, JLT-07, G-1 and Parbhani local
4	Susceptible	IVT-17-07 and AVT-17-12

Further the sesamum entries were characterized on the basis of their reactions to sesamum phyllody and presented in Table 3. The data from table 3 highlighted that, the tested genotype / varieties / hybrids none was free from sesamum phyllody disease. Among all the lines TBS-05, TBS-09, TBS-02, Sweta, KMR-69, TKG-22 and Pragati were found resistance to sesamum phyllody. TBS-06, TBS-07, GT-10, GT-01, IVT-17-03, IVT-17-05, IVT-17-18, AVT-06, TBS-08, AKT-101, Prachi, Latur local were moderately resistance to sesamum phyllody and IVT-17-07, AVT-17-12 were found most susceptible to sesamum phyllody disease.

Discussion

Similar results regarding the sesamum phyllody lines was reported by Dandnaik *et al.*, (2002) ^[2] they reported that, three line like Sweta, RT-127 and No-171 were resistance and nine line namely Local-1, Local-3, TKG-21, Rajeshri, RT-125, T-4, T-12, No-6 and Tapi have recorded moderately resistant reaction to disease. Similar result was also reported by Singh *et al.*, (2007) ^[5] they reported that sesamum variety pragati were resistance to phyllody disease. Tan (2010) ^[6] reported that, use of resistance/tolerant varieties which may help to reduce the phyllody disease incidence.

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