

RESPONSE OF SOME ACCESSIONS OF RAPE-SEED 'TORIA AND LAHIA AGAINST ALTERNARIA BLIGHT

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Under natural conditions in the field, 129 accessions of 'toria' *Brassica campestris* L. var. *toria* and 44 accessions of 'lahia' *B. campestris* L. var. *lahia* were screened for their response against *Alternaria* blight in the cropping season of 1985-86. The accessions which showed moderate resistance in the field were again screened in artificial inoculations in glasshouse. In general the accessions lacked resistance against *Alternaria brassicae*. In the field trials 16 accessions of 'toria' and 7 of 'lahia' were rated as moderately resistant. Rest of the accessions were rated as moderately susceptible, susceptible or highly susceptible. The accessions with moderate resistance response in the field trials showed either susceptible or highly susceptible reaction in artificial inoculation tests.

Key words : Response, accessions, rape-seeds, *Alternaria* blight.

Rapeseed (*Brassica campestris* L.) is an important oilseed crop of India and its varieties 'toria' (*Brassica campestris* L. var. *toria*) and 'lahia' (*Brassica campestris* L. var. *lahia*) are grown on a large scale in the Indo-gangetic plains. *Alternaria* blight of rapeseed is a serious disease, causing substantial yield loss annually (Ansari, 1987) and seeds of infected plants become poor in oil content (Ansari *et al.*, 1988). The production of oilseed in the current perspective has assumed great significance in the agriculture economy of India. Host-resistance being economical and effective measure for the management of the disease can be important for the successful cultivation of the oilseed crops. Therefore, in this study for locating resistance, a number of accessions of 'toria' and 'lahia' which are under trial for crop performance in relation to other aspects of their cultivation were screened against *Alternaria brassicae* (Berk.) Sacc. which causes *Alternaria* blight of the crops.

MATERIALS AND METHODS

Response of 129 accessions of *Brassica campestris* var. *toria* 'toria' and 44 accessions of *B. campestris* var. *lahia* 'lahia' were examined in 1985-86 under natural conditions in the fields. The seeds of the accessions of 'toria' and 'lahia' under trials were sown at a rate of 5 kg/ha in field plots of 5 x 3 m size at the C.S.A. University of Agriculture & Technology Farm,

Kanpur. The plots were arranged in complete randomized blocks with four replicates of each accession.

The intensity of the naturally appearing *Alternaria* blight disease was assessed on each accession by comparison with a score chart prepared beforehand spanning the range of disease levels. Rapeseed leaves were collected from heavily infected plants in the field. The leaves were pressed, dried and the total leaf area and diseased areas on each were measured with a planimeter. The leaves were then arranged into six groups representing upto 0, 3, 10, 25, 40 or more than 40% disease intensity and a score chart was constructed accordingly.

The % intensity of the disease on each accession was determined by collecting leaf samples randomly from each experimental plot and comparing them with the chart to assign scores. The mean % disease intensity was calculated as the sum of the products of the scores for each accession, n_0, n_3, \dots, n_4 being the number of leaves in each category, thus: $(n_0 \cdot 0 + n_3 \cdot 3 + n_6 \cdot 10 + n_9 \cdot 25 + n_{12} \cdot 40 + n_{15} \cdot > 40) / (\text{sum of } n_0, \dots, n_{15})$.

The degree of resistance was allocated to the score categories as:

Infection-free (F) = zero infection; resistant (R) = 1-3%; moderately resistant (MR) = 4-10%; moderately susceptible (MS) = 11-25%; susceptible (S) = 26-40% and highly susceptible (HS) = more than 40%.

The accessions found moderately resistant in the field trials were subsequently tested under artificial inoculations in glasshouse. For this, plants of each accession were raised from surface sterilized seeds in autoclaved soils filled in clay pot of 30 cm size. One-month-old plants were inoculated by spraying spore suspension (10,000 spores/litre) of pure culture of *A. brassicae*. The intensity of the infection was determined a week after inoculation.

RESULTS AND DISCUSSION

The results presented in Table 1 show that all the accessions of the 'toria' became infected and leaves showed characteristic symptoms. Sixteen accessions were moderately resistant, 38 moderately susceptible, 47 susceptible and 28 highly susceptible. No accession was resistant. Two recommended varieties viz., T-9 and Bhawani were also found highly susceptible.

Table 1: Assessments of the Resistance of Accessions of *Brassica campestris* var. *toria* to *Alternaria brassicae*.

Degree of resistance	Accessions
F	Nil
R	Nil
MR	TCS. 4-1, TCS. 4-2, TH-4, TH-11, PT-303, T-7, 5605, UP-70MSC-1, PT-390, PT-530, TL-84, TL-85, TK-8402, (TK-5-79), TK-8403, TH-72, TH-83.
MS	PT-2, PT-30, TL-15, Ldh.Comp-1, ITSA, TCS. 4-3, TCS-4-4, TCS. 4-5, TCS. 4-6, TCS. 4-7, PT-1, PT-507B, PT-9, PT-101, PT-600, Ldh.Comp-3, T-1/16, T-1/14, T-2/8, T-4/10, Baradari, TH-42, 5606, 5607, T-24, UP-70, MSC-3, UP-70MSC-3, UP-70, MSC-6, TH-43, Gurd.Comp-18, TK-8481, TH-68, TH-84, TW-1-9-13, TW-54-9-5, TWS-1, RAUT-6, RAUT-7.
S	TH-44, 6823, 6235, 6306, 6307, T-8, 5624, T-19, T-14, T-10, T-33, 4104, 5904, 5905, 5928, T-20, 6204, 6206, 6215, 6217, 6219, 6200, 6236, M-3, WB.No.6/30, 680, T-1, T-Karmaha, T-3, T-15, T-16, T-17, T-22, 5631, T-29, WB.No.40, WB.No.54, WB.No.58, WB.No.107, 5503, 5506, Comp-1, Toria, Sel-96, Syn.No.1, T.T.-128, T.T.54-40.
HS	Ldh.Comp-2, Gurdas.Comp-1, T.1/15, WB.No.106, Syn.65, Toria-A, S.T.1, 5824, BR-23, 6809, TH-6, TH-5, TH-8, TH-7, 146-1, H-26, IB-133, IB-126, IB-225, IB-230, IB-290, I-275, UP-70MSC-7, UP-70 MSC-9, UP-70 MSC-13, Toria-Etawah, T-9, Bhawani.

F = Infection free; R = Resistant; MR = Moderately resistant; MS = Moderately susceptible; S = Susceptible; HS = Highly susceptible.

The results given in Table 2 indicate that seven accessions of 'lahia' were moderately resistant, 19 moderately susceptible, 14 susceptible and the rest four were highly susceptible. None of the accessions were resistant. A recommended variety, T-36 was also found susceptible.

Table 2: Assessments of the Resistance of Accessions of *Brassica campestris* var. *lahia* to *Alternaria brassicae*.

Degree of resistance	Accessions
F	Nil
R	Nil
MR	T-14, T-16, T-29, T-30, 5610, C.6-1-2, BSYS-2-2.
MS	T-2, T-8, T-15, T-18, T-20, 5615, 5614, 5604, 5603, 5602, 5601, T-39, T-37, T-37, T-35, 5620, 5621, 5622, YSB-5, B-2-3.
S	5623, 5624, 5625, 5626, 5627, 5629, 5631, 1314, T-4-1, Maghi, C.10-2-2, C-10-9, C-11-1, T-36.
MS	C.11-5-1, T.17, BSYS-5, B.7-1.

F = Infection free; R = Resistant; MR = Moderately resistant; MS = Moderately susceptible; S = Susceptible; HS = Highly susceptible.

In the glasshouse inoculations of the accessions which showed moderately resistant response in the field trials, seven accessions of 'toria' viz., PT-203, T-7, 5605, UP-70MSC-1, PT-390, PT-530 and TL-84 became susceptible and nine accessions viz., TCS.4-1, TCS. 4-2, TH-4, TH-11, TH-83, TH-72, TL-85, TK-8402 (TK-5-79) and TK-8403 became highly susceptible. Two accessions of 'lahia' viz., 5610 and C.6.1-2 were rated as susceptible and five accessions viz., T-14, T-16, T-30, BSYS.2-3 and T-29 as highly susceptible in the artificial inoculations in glasshouse.

The use of resistant varieties is most economical method of plant disease control. Performance of various accessions of 'toria' and 'lahia' observed under field conditions against *Alternaria* blight showed that most of the accessions were variously susceptible. Some of the accessions of 'toria' and 'lahia' which are moderately resistant in the field trials, became susceptible to highly susceptible to the pathogen in artificial inoculations. The field resistance shown by them was thus not stable. This observation is of great significance for cultivation of rapeseed, particularly 'lahia' and 'toria' in the Indo-Gangetic Plains. In view

of general lack of resistance observed in the accessions of 'lahia' and 'toria' there is immediate need to call attention towards breeding of cultivars making blight-resistant genotypes as a basis. For long term management strategy for this disease, breeding resistant cultivars, demands greater attention than at present.

REFERENCES

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