

RESEARCH NOTE

# Reaction of *Brassica* genotypes against *Alternaria* blight caused by *Alternaria brassicae* (Berk) Sacc.

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ABSTRACT

Thirty two germplasm lines of rapeseed-mustard belonging to *Brassica rapa* L.(Syn. *B. campestris* L.), *B. napus* L., *B. juncea* (L.) Czern. and Coss. and *B. carinata* Braun. were artificial screened against *Alternaria* blight under field conditions. Significant variability in the severity of the disease was observed among genotypes. The per cent disease severity ranged from 37.50–72.50 at leaf stage and 7.50 -15.00 at pod stage. Genotypes MHO-173 and GSL-1 showed lower severity of *Alternaria* blight at leaf as well siliqua stage.

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Rapeseed-mustard is the second most important edible oilseed crop of India, next only to groundnut. It accounts for more than 25 per cent of the total oilseeds produced in the country. The estimated area, production and productivity during 2011-12 of rapeseed-mustard in the world were 33.1 m ha, 60.7 million tonnes (mt) and 1832 kg/ha, respectively (Agricultural Statistics Division, GOI, 2012). Globally, India accounts for 20.2 per cent and 10.7 per cent of the total acreage and production (USDA, 2012). Although, rapeseed-mustard acreage and production fluctuate from year to year, the all time high production of 8.17 mt from 6.69 mha were recorded in 2010-11.

The crop suffers much due to biotic and abiotic factors. Among them, most important disease, *Alternaria* blight caused by *Alternaria brassicae* (Berk.) Sacc. causing yield losses may vary from 10 -70 per cent depending on the type of crop species grown and prevailing environmental conditions; (>70%) being in yellow sarson and toria and low to moderately high (35-40%) in mustard (Kolte, 1996). Little efforts have been made so far to find out the sources of resistance against this important disease in different species of rapeseed-mustard except fungicidal treatment.

Thirty two *Brassica* genotypes received from NRCRM, Bharatpur were evaluated for their reaction to *Alternaria* blight

during *Rabi* 2007 – 08 at Tirhut College of Agriculture, Dholi Muzaffarpur, Bihar under artificial inoculated conditions. Each line was sown in three meter length in two replications with row to row spacing 30 cm and plant to plant 10 cm. The susceptible check RAUTS-17 was sown after two test rows after proper thinning at 21 days after sowing. The recommended agronomical practices were followed to raise good crop except application of any control measure. To maintain a high humidity level in micro-climate of the field, time to time light irrigation was applied for favouring the development of disease.

Pure culture of *A. brassicae* was obtained on V-8 medium (200 ml tomato juice, 40 mg Rose Bengal, 0.75g CaCO<sub>3</sub>, 20 g Agar agar and final volume made to one litre by adding sterilized distilled water). The crop was inoculated on 45 days after sowing with conidial suspension (5×10<sup>5</sup> spores/ml) of *A. brassicae* obtained from 10 day old pure culture of the pathogen for successful infection on leaves. For infection on pods, the plants were again inoculated at siliqua formation stage.

**Score of disease :**

The scoring of *Alternaria* blight was done using 0-6 scale at two stages *i.e.* leaf and siliqua phase as suggested by

(Conn *et al.*, 1990). *Alternaria* blight was recorded on leaves and 15 days before harvesting on pod as per scale. The disease was scored on per cent area of leaf as well as pod affected.

The findings of the present study as well as relevant discussion have been presented under following heads :

#### Indian colza (*B.rapa*) :

The severity of *Alternaria* blight at the leaf stage in different genotypes of Indian colza (*B.rapa*) ranged from 53-72 per cent (Table 1). Although, all the genotypes showed susceptibility to the disease, but lowest disease was observed in NPJ-53, JMT04-03 EJ-17 and TL-15. The higher disease in different genotypes of *B.rapa* at the leaf as well as

Name of entry	Disease severity on leaves				Disease severity of AB on pods 15 days before harvesting	
	70 DAS		90 DAS		AB	T
	AB	T	AB	T		
NPJ 112	16.00	23.57	53.00	46.72	12.50	20.61
JMT-04-03	16.00	23.57	54.00	47.29	11.00	19.35
TL 15	32.00	34.44	57.50	49.32	12.50	20.61
EJ 17	30.00	33.21	56.50	48.74	10.00	18.43
RH 0304	32.00	34.45	60.00	50.77	8.50	16.89
TL 2013	33.50	35.36	61.00	51.36	12.50	20.61
TK 06 – 1	35.00	36.27	60.00	50.77	11.00	19.35
PT 303	34.00	35.67	72.50	58.39	13.50	21.53
JD 6	32.00	34.45	60.00	50.77	11.00	19.35
RYSK 05- 01	35.00	36.27	70.00	56.79	15.00	22.79
RYSK 05-02	32.00	34.44	63.50	52.84	13.50	21.53
NRCYS 05- 02	36.00	36.87	64.00	53.13	13.50	21.53
YSH 401	33.50	35.36	62.00	51.95	15.00	22.79
YSK 06- 02	32.50	34.74	60.00	50.77	13.50	21.53
YST 151	32.00	34.44	64.00	53.13	15.00	22.79
BINOY (b-9)	30.00	33.21	66.50	54.64	11.50	19.61
MHO 173	16.00	23.27	37.50	37.75	7.50	15.68
GSL 1	18.00	25.07	37.50	37.75	8.50	16.89
NPJ 113	35.00	36.27	61.00	51.36	13.50	21.53
RGN 145	29.00	32.55	52.50	46.43	9.00	17.43
NRCHB 101	23.00	28.66	53.50	47.01	13.50	21.53
NRCDR 509	23.00	28.61	54.00	47.30	7.50	15.68
HUJM 05 -01	18.00	25.1	51.00	45.57	7.50	15.68
RB 50	17.50	24.68	51.00	45.57	7.50	15.68
DMH-1	17.00	24.34	54.00	47.3	10.00	17.85
NRCHB 603	18.00	25.07	50.00	45.00	7.50	15.68
PAC 437	21.00	27.27	53.50	47.01	8.50	16.89
PHR-2	27.50	31.61	42.50	40.68	10.00	18.43
JM-1	28.00	31.95	52.50	46.43	12.50	20.61
BIOYSR	26.00	30.65	42.50	40.68	7.50	15.68
VARUNA	33.50	35.36	61.00	51.36	8.50	16.89
ROHINI	31.00	33.83	62.50	52.25	10.00	18.35
S. Em. ±		0.736		0.946		1.53
C.D. (P=0.05)		2.123		2.729		4.414

AB = *Alternaria* blight

T = Transformed values (arc sin angular transformation)

siliquae stage has been reported by Kumar and Saharan (2002).

#### Indian mustard (*B. juncea*):

Disease severity of Alternaria blight on leaves on different varieties of mustard ranged from 42.5 – 54 per cent. Least severity of disease on leaves was observed in case of PHR-2(42.5) followed by NRCHB603(50%). Similar a significance variation with respect to Alternaria blight was also observed at the siliquae stage. Present studies confirm the findings of Vishwanath and Kolte (1999) regarding their tolerance of genotypes of *B. juncea* namely PHR-1 and PHR-2 to Alternaria blight.

#### Swedrape (*B. napus*):

Higher per cent disease severity of Alternaria blight was recorded on MHO 173 (37.5) followed by GSL-1. Similarly lowest infection of Alternaria blight on siliquae was observed in MHO173 (7.5) followed by GSL-1 (8.5). Earlier, *B. napus* genotypes like GS-7027, Midas and Tower have been reported to have resistance to this disease (Dang *et al.*, 2000).

These findings are in close conformity of reports of Rai and Kumar (1995), Kumar *et al.* (2008) Saharan *et al.* (1981) and Sudhir and Saharan (2002). It can be concluded from the above observations that as MHO-173 and GSL-1 of the sources exhibited disease tolerance. There are tolerance sources identified against Alternaria blight which could be further utilized in *Brassica* improvement programme.

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