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SHORT COMMUNICATION

Evaluation of Rapeseed-Mustard genotypes against Alternaria blight for identification of resistant sources

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Forty one entries with one susceptible check were screened against Alternaria blight of the Rapeseed-Mustard at Pulses and Oilseeds Research Station, Berhampore, Murshidabad, West Bengal, during *Rabi*, 2011-12. None of the entries was found immune or highly resistant or resistant. Only one entry i.e., DRMR-316 was found to be moderately resistant (Disease severity 11% to 25%). Rest eighteen entries were categorized as susceptible (Disease severity 26% to 50%) and twenty two entries were found as highly susceptible (Disease severity > 50%). The moderately resistant entries can be utilized as good donor for evolving resistant varieties against Alternaria blight in Rapeseed-Mustard.

Key words: Alternaria blight, evaluation, rapeseed-mustard, resistance

Rapeseed-Mustard is an important *rabi* oilseed crop of West Bengal cultivated in about 410.793 thousand ha with total production of about 419.58 thousand tones and average productivity of 1021 kg/ha (Anonymous, 2011). Wide gap exists between the potential yield and the realized yield of Rapeseed-Mustard at the farmer's field, which is largely attributed to the number of biotic and abiotic stresses. Among biotic stresses, Alternaria blight has been reported to be most wide spread and destructive fungal diseases of Rapeseed-Mustard throughout the world which causes up to 47% yield losses. Alternaria blight disease [*Alternaria brassicae* (Berk.) Sacc.] has been reported to affect most of the cruciferous crops throughout the world and is one among the important diseases of rapeseed-mustard with no proven source of transferable resistance in any of the hosts. The pathogen is greatly influenced by weather as the highest disease incidence is reported in wet seasons and in areas with relatively high rainfall. *A. brassicae* can affect host species at all stages of growth, including seed. Symptoms of the disease are characterized by formation of spots on leaves, stem and siliqua. Various fungicides control the Alternaria blight disease with dissimilar cost-benefit ratio (Das, 2015). The ideal and most economical mean of managing the Blight disease of Rapeseed-Mustard would be the use of resistant varieties. Under these circumstances there is a need to exploit genetically host resistance in existing varieties and germplasm lines for the identification of resistant sources.

Investigations were carried out in November, 2011 to March, 2012 at an experimental site of the Pulses and Oilseeds Research Station (PORS), Berhampore (Lat. 24°50'N, Lon. 88°13' E, Alt. 66.69 m above msl, Soil type-clay loam and neutral pH), Murshidabad, West Bengal. 41 entries and 1 check (B-9) were screened against Alternaria blight. The entries were sown in single row each of three meter length with spacing of 30x10 cm in

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Table 1 : Groups of Rapeseed-Mustard genotypes on the basis of reactions to Alternaria blight

Reaction grade	Disease severity	Rating Scale	No. of genotypes	Genotypes
Immune (I)	0	0	00	-
Highly Resistant (HR)	<5	1	00	-
Resistant (R)	5-10	3	00	-
Moderately Resistant (MR)	11-25	5	01	DRMR-316
Susceptible (S)	26-50	7	22	DRMR-11-10, NPJ-167, RAUDN-9-32, DRMRIJ-11-275, NPK-127, DRMRIJ-11-287, DRMR-312, EC-399299, RH-0834, NPJ-164, DRMRIJ-11-286, JMT-08-13, EC-414322, DMSC-1, EC-414293, EC-414324, GSL-1, JMT-08-11, DRMR-100, PT-303, RMT-08-2, EC-14299,
Highly Susceptible (HS)	>50	9	18	PAB-2005-16, RAURDM-02-01, JMWR-08-3, PRKS-28, NPJ-121, PAB-2004-4, EC-399299, JMM-07-01, RH-0904, NPJ-166, NPJ-165, DRMR-11-08, RAURD-09-214, NPJ-140, JMM-08-1, JMM-07-2, RMT-08-06, DRMR-11-11

two replications and one row susceptible check was used after two test rows. Nitrogen (N), Phosphate (P_2O_5) and Potash (K_2O) fertilizers were applied at the rate of 100:50:50 kg ha^{-1} in which nitrogen was used in two split doses. Seeds were sown on 24th November, 2013 and grown under prevailing epiphytotic condition for the disease. To maintain the high humidity level in microclimate of the field, time to time irrigation was applied for favouring the development of the disease. Observations were recorded on randomly selected five plants from each varieties/lines. The severity of the disease percent in leaf was assessed at 75 DAS while disease severity percent in pods was assessed at 15 days before harvesting (DBH) using 0-9 scale (Anonymous, 2010). Finally the disease severity on leaf and pod were also calculated. On the basis of disease intensity varieties/lines were classified into different groups viz., near immune/highly resistant, resistant, moderately resistant, moderately susceptible, susceptible, and highly susceptible.

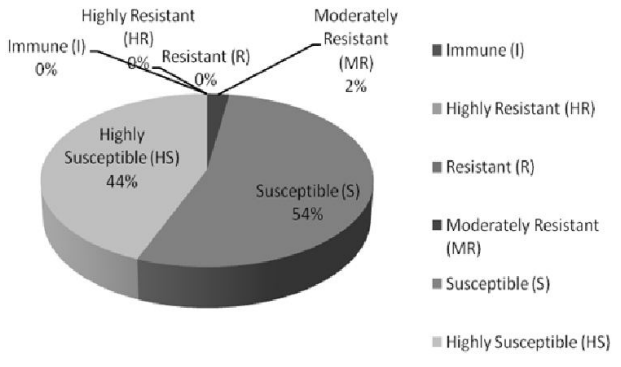

Fig. 1 : Screening of rapeseed-mustard entries against Alternaria blight

Screening of rapeseed-mustard varieties/lines done at PORS, Berhampore, West Bengal revealed that among 41 entries, none was found immune or highly resistant or resistant against Alternaria blight of Rapeseed-Mustard (Table 1 and 2). Only one entry i.e., DRMR-316 was found to be moderately resistant (Disease severity 11% to 25%). Rest eighteen entries were categorized as susceptible (Disease severity 26% to 50%) and twenty two entries were found as highly susceptible (Disease severity > 50%). It could be noticed that the vulnerability level was relatively quite high as compared to resistance status (Figure 1). Different workers evaluated the Rapeseed-Mustard entries and our results are in accordance with those in many cases. Where there is some deviation that

Table 2: Disease severity percentage of Alternaria blight in Rapeseed-Mustard under natural condition

Entry	Disease severity (%) of Alternaria blight				Entry				
	Leaf (75 DAS)		Pod (15 DBH)			Leaf (75 DAS)		Pod (15 DBH)	
	Mean		Mean			Mean		Mean	
DRMR-11-10	42.22	(40.5)	13.33	(21.4)	NPJ-167	40.00	(39.2)	28.89	(32.5)
RAUDN-9-32	42.22	(40.5)	11.11	(19.5)	DRMRIJ-11-275	46.67	(43.1)	20.00	(26.6)
NPK-127	46.67	(43.1)	11.11	(19.5)	DRMRIJ-11-287	46.67	(43.1)	26.67	(31.1)
PAB-2005-16	55.56	(48.2)	11.11	(19.5)	DRMR-312	46.67	(43.1)	20.00	(26.6)
DRMR-316	24.44	(29.6)	11.11	(19.5)	EC-399299	57.78	(49.5)	11.11	(19.5)
RAURDM-02-01	60.00	(50.8)	11.11	(19.5)	JMM-07-01	55.56	(48.2)	11.11	(19.5)
JMWR-08-3	57.78	(49.5)	11.11	(19.5)	RH-0904	57.78	(49.5)	11.11	(19.5)
NPJ-166	35.56	(36.6)	28.89	(32.5)	NPJ-165	57.78	(49.5)	11.11	(19.5)
RH-0834	51.11	(45.6)	15.94	(23.5)	NPJ-164	53.33	(46.9)	17.78	(24.9)
DRMRIJ-11-286	40.00	(39.2)	11.11	(19.5)	DRMR-11-08	57.78	(49.5)	11.11	(19.5)
JMT-08-13	44.44	(41.8)	31.11	(33.9)	EC-414322	42.22	(40.5)	11.11	(19.5)
DMSC-1	35.56	(36.6)	11.11	(19.5)	RAURD-09-214	55.56	(48.2)	11.11	(19.5)
PRKS-28	62.22	(52.1)	11.11	(19.5)	NPJ-140	55.56	(48.2)	28.89	(32.5)
NPJ-121	60.00	(50.8)	11.11	(19.5)	EC-414293	28.89	(32.5)	26.67	(31.1)
PAB-2004-4	62.22	(52.1)	11.11	(19.5)	JMM-08-1	55.56	(48.2)	11.11	(19.5)
EC-414324	44.44	(41.8)	20.00	(26.6)	GSL-1	44.44	(41.8)	11.11	(19.5)
EC-399299	44.44	(41.8)	11.11	(19.5)	JMM-07-2	57.78	(49.5)	28.89	(32.5)
JMT-08-11	44.44	(41.8)	42.22	(40.5)	RMT-08-06	51.11	(45.6)	35.56	(36.6)
DRMR-100	48.89	(44.4)	20.00	(26.6)	DRMR-11-11	55.56	(48.2)	20.00	(26.6)
PT-303	42.22	(40.5)	33.33	(35.3)	RMT-08-2	46.67	(43.1)	33.33	(35.3)
EC-14299	33.33	(35.3)	35.56	(36.6)	B-9 (SC)	64.44	(53.4)	42.22	(40.5)
SEm(±)	3.37		4.18		SEm(±)	3.37		4.18	
CV (%)	10.8%		23.4%		CV (%)	10.8%		23.4%	
CD (0.05)	9.39		11.63		CD (0.05)	9.39		11.63	

Figures in parentheses are angular transformed values

may be due to environmental factors and differences among genotypes and races of pathogens. At N.D. University of Agriculture & Technology, Faizabad, 81 lines/varieties of Indian Mustard were screened against Blight under natural epiphytotic conditions and reported that none of the genotype was found to be completely free from visible symptoms of disease. Only one YET-25 was fairly resistant against Leaf blight, however, 10 and 61 lines were reported moderately resistant and moderately susceptible, respectively (Singh *et al*, 2009). Rahman *et al,* (2010) found varying degree of disease severity while evaluating 26 varieties/lines of Rapeseed-Mustard during their extensive research on Blight at RARS, Jamalpur. On the basis of disease severity index, none was found highly resis-

tant or resistant. While six among them appeared to be moderately resistant against the Alternaria blight. On the basis of disease severity index DRMR-316 was found to be moderately resistant against the Alternaria blight on leaf and pod. These entries can be used as good donor for evolving resistant varieties against Alternaria blight in Rapeseed-Mustard.

Among total 41 screened germplasms 2%, 54% and 44% were showed moderately resistant, susceptible and highly susceptible category respectively. It could be noticed that the vulnerability level was relatively quite high as compared to resistance status (Figure 1).

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