

SHORT COMMUNICATION

## Screening of Rapeseed-Mustard entries for resistance against *Alternaria* blight

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## Screening of Rapeseed-Mustard entries for resistance against *Alternaria* blight

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The study was conducted with the objective to assess the resistance source against *Alternaria* blight in rapeseed-mustard at Pulses and Oilseeds Research Station, Berhampore, Murshidabad, West Bengal, during *Rabi*, 2013-14. None of the 42 entries screened against *Alternaria* blight of the rapeseed-mustard was found immune or highly resistant or resistant. Only seven varieties i.e., DRMR-312, DRMR-316, PR-2009-11, DRMRAB-13-1, RTM-314, DLSC-1 and GSL-1 were found to be moderately resistant (Disease severity 11% to 25%). Rest thirty five entries were categorized as susceptible (Disease severity 26% to 50%).

**Key words** : Rapeseed mustard, *Alternaria* Blight, Disease Severity, resistance

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Rapeseed-mustard (*Brassica* sp.), a major group of oilseed crop of the world being grown in 53 countries across the six continents with India, is one of the largest rapeseed-mustard growing country, occupying the third position in acreage (21.01%) and production (12.58%) after Canada and China during 2011-12. Rapeseed-mustard oil in India contributes 26.5% to the total domestic edible oil production (DRMR, 2013). It is also 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 attack host species at all stages of growth, including seed. Symptoms of the disease are characterized by formation of spots on leaves, stem and siliqua. This blight also reduces seed size and impairs seed colour and oil content. 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

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**Table 1** : 0-9 scale for rating disease severity of *Alternaria* blight in rapeseed-mustard

Rating	Scale	Disease Intensity (%)	Pathogen Reaction
0	0	Immune (I)	
1	<5	Highly Resistant (HR)	
3	5-10	Resistant (R)	
5	11-25	Moderately Resistant (MR)	
7	26-50	Susceptible (S)	
9	>50	Highly Susceptible (HS)	

genetically host resistance in existing varieties and germplasm lines for the identification of resistant sources.

Investigations were carried out in November, 2013 to March, 2014 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. Forty two entries rapeseed-mustard and 3 checks were screened against *Alternaria* blight. The varieties/lines were sown in single row each of three meter length with spacing of 30x10 cm in two replications and one row susceptible check was used after two test rows. Nitrogen (N), phosphate (P<sub>2</sub>O<sub>5</sub>) and potash (K<sub>2</sub>O) fertilizers were applied at the rate of 100:50:50 kg ha<sup>-1</sup> in which nitrogen was used in two split doses. Seeds were sown on 26th 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 per cent 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.

Screening of rapeseed-mustard varieties/lines done at PORS, Berhampore (WB) revealed that among 42 varieties/lines, none was found immune or highly resistant or resistant against *Alternaria* blight of rapeseed-mustard (Table 1.) Only seven entries i.e. DRMR-312, DRMR-316, PR-2009-11, DRMRAB-13-1, RTM-314, DLSC-1 and GSL-1 were found to be moderately resistant (Disease severity 11% to 25%). Rest thirty five entries were categorized as susceptible (Disease severity 26% to 50%) (Table 3). Different workers evaluated the rapeseed-mustard varieties/lines and our results are in accordance with those in many cases. Where there is some deviation that may be due to environmental factors and differences among genotypes and races of pathogens. At N.D. University of Agriculture and 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 resistant or resistant. While six among them appeared to be moderately resistant against the *Alternaria* blight.

**Table 2** : Varieties/lines in which *Alternaria* blight incidence was recorded at PORS, Berhampore (WB)

Scale	Category	Number	Varieties/lines	Name
0	0	Nil		-
1	<5	Nil		-
3	5-10	Nil		-
5	11-25	08	DRMR-312, DRMR-316, PR-2009-11, DRMRAB-13-1, RTM-314, DLSC-1 and GSL-1	
7	26-50	39		Rest of entries
9	>50	Nil		-

**Table 3:** Disease severity percentage of *Alternaria* blight in rapeseed-mustard under natural condition

Entry	Disease severity (%) of <i>Alternaria</i> blight									
	Leaf (75 DAS)					Pod (15 DBH)				
	Mean		Mean		Mean	Entry	Mean		Mean	
PYS-2010-3	32.78	(34.93)	26.67	(31.1)	PR-2006-14	40.00	(39.23)	12.04	(20.3)	
PR-2009-6	31.11	(33.90)	16.67	(24.1)	DRMR-100	29.63	(32.98)	7.78	(16.2)	
PRL-2009-3	40.00	(39.23)	8.89	(17.3)	PT-2010-10	41.11	(39.88)	16.67	(24.1)	
RMT-10-10	36.11	(36.94)	13.33	(21.4)	PRE-2011-15	44.44	(41.81)	13.33	(21.4)	
AHS-2-2	31.11	(33.90)	7.78	(16.2)	DRMRAB-13-2	26.67	(31.09)	9.07	(17.5)	
DRMRMJA-35	40.00	(39.23)	8.89	(17.3)	PTC-2011-3	33.33	(35.26)	8.89	(17.3)	
PRL-2010-8	37.78	(37.93)	7.78	(16.2)	DRMRWR-13-1	37.78	(37.93)	8.89	(17.3)	
PTC-200-3	42.22	(40.53)	7.78	(16.2)	PYS-2011-1	44.44	(41.81)	18.33	(25.4)	
AHS-2-1	31.11	(33.90)	5.56	(13.6)	PRL-2010-10	35.56	(36.60)	7.78	(16.2)	
DRMRAB-13-4	28.89	(32.51)	16.67	(24.1)	DRMRAB-13-3	31.11	(33.90)	10.00	(18.4)	
PYS-200-10	31.11	(33.90)	17.78	(24.9)	RAURD-09-212	35.56	(36.60)	5.56	(13.6)	
PT-2010-11	35.56	(36.60)	7.78	(16.2)	DRMRWR-13-2	40.00	(39.23)	7.78	(16.2)	
RMT-10-7	37.78	(37.93)	17.78	(24.9)	RAURD-09-32	42.22	(40.53)	7.78	(16.2)	
DRMR-312	18.10	(25.18)	11.11	(19.5)	RAURDL-02-01	35.56	(36.60)	8.89	(17.3)	
PRL-2011-3	28.89	(32.51)	7.78	(16.2)	RTM-314	22.22	(28.13)	22.22	(28.1)	
RTM-1351	27.78	(31.81)	23.89	(29.3)	PT-303	40.00	(39.23)	7.78	(16.2)	
PYS-2008-5	33.70	(35.49)	26.67	(31.1)	EC-399299	26.67	(31.09)	4.44	(12.2)	
PT-2006-4	35.19	(36.38)	28.89	(32.5)	DLSC-1	18.89	(25.76)	7.78	(16.2)	
DRMR-316	13.33	(21.42)	8.89	(17.3)	GSL-1	20.00	(26.57)	8.15	(16.6)	
PR-2009-11	20.00	(26.57)	7.78	(16.2)	PHR-2 (TC)	23.29	(28.86)	6.67	(15.0)	
PRE-2010-8	39.26	(38.80)	21.11	(27.4)	Rohini (SC)	35.56	(36.60)	6.11	(14.3)	
DRMRAB-13-1	24.44	(29.63)	8.89	(17.3)	B-9 (SC)	44.44	(41.81)	38.33	(38.3)	
AHS-2-3	42.22	(40.53)	10.00	(18.4)						
---	2.852		1.769		SEm(±)	2.852		1.769		
CV (%)	11.5%		12.4%		CV (%)	11.5%		12.4%		
CD (0.05)	6.77		4.20		CD (0.05)	6.77		4.20		

Figures in parentheses are angular transformed values, Date of Sowing: 26.11.2013, SC = Susceptible check, TC= Tolerant check, DAS: Days after sowing, DBH: Days before harvesting

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