Sources of Resistance Against Sclerotinia Rot in Repeseed-Mustard

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SUMMARY

Thirty five genotypes of rapeseed-mustard were screened against Sclerotinia rot caused by *Sclerotinia sclerotiorum* under field conditions. Out of these entries, twelve *viz*., DHR 9405, RSM 9801, RN 488, SKM 9640, JMWR 92-01, NDR 9503, BLO 929-97, PK 9801, JGM 98-21, PR 9627, BLO 341-92 and HUM 9712 were observed immune whereas seven entries such as VLSLO, PCR 15-1, NGN 6008, RH 9615, JMWR 93-38, PRO 9801 and NM 9621 showed resistant and four entries namely, PCR 9301, RH 9512, PBR 179 and PBR 146 gave moderatel resistant reaction.

Key words : Resistance, Sclerotinia rot, Rapeseed-mustard, *Sclerotinia sclerotiorum*.

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Rapeseed-mustard are important group of oilseed crops constituting almost 13.2% of the world's edible oil requirement. Although, cultural, agronomic and environmental factors are responsible for low productivity but occurrence of pests and diseases is an important established yield destabilizing factor in these crops. Sclerotinia rot caused by *Sclerotinia sclerotiorum* (Lib.) de Bary is one of the more severe yield destabilizing factors causing serious yield losses each year depending upon the severity of the disease under favourable environmental conditions. The pathogen attacks the stem of the plant at post flowering stage and causes heavy yield losses in Indian mustard. (Roy and Saikia,1976). It has assumed a serious proportion in major rapeseed and mustard growing areas in the country (Ghasolia *et al.*,2004). The pathogen is reported to have a wide host range, known to infect about 400 plant species (Kolte, 1985) with no proven sources of resistance. Little efforts have been made so far to find out the source of resistance against Sclerotinia rot in species of rapeseed mustard. So, the present studies were conducted to find out the sources of resistance against Sclerotinia rot disease in rapeseed-mustard.

MATERIALS AND METHODS

A field trial was conducted at Tirhut College of Agriculture (RAU), Dholi, Muzaffarpur, during *rabi* seasons 1999-2000 and 2000-2001 in a sick plot. Thirty five promising entries of rapeseed mustard were screened against Sclerotinia rot. These 35 lines alongwith susceptible check, Varuna were in order to generate information about potential donor/tolerance sources.

All these genotypes were grown in a single row of 3 m length in augmented design in 3 replications with row to row spacing 30 cm keeping 10 cm plant to plant distance. The two rows susceptible check of Varuna was used repeatedly after every 5th test entries. The recommended agronomical practices were followed to raise good crop except the application of any fungitoxicant as a control measure against the pathogen. Disease observations started from the appearance of first symptoms of the disease which continued at weekly interval till pod stage (*i.e.* 15 days before harvest). The disease observations were calculated by using the following formula and reactions were graded in the categories as given in Table 1:

$$\text{Disease incidence} = \frac{\text{Number of individual showing infection}}{\text{Total number of individual examined}} \times 100$$

$$\text{Disease incidence} = \frac{\text{Sum of total of numerical ratings}}{\text{Number of plant examined} \times \text{maximum grade}} \times 100$$

Table 1: Depending upon the intensity of the infection, disease was categorized into different grade of infection

Score	Grade	Disease intensity (%)
0	Immune (I)	0
1	Resistant (R)	1-4
2	Moderately resistant(MR)	5-9
3	Moderate susceptible(MS)	10-24
4	Susceptible (S)	25-49
5	Highly susceptible (HS)	50 and above

RESULTS AND DISCUSSION

Out of thirty five entries ,twelve entries namely, DHR 9405, RSM 9801, RN 488, SKM 9640, JMWR 92-01, NDR 9503, BLO 929-97, PK 9801, JGM 98-21, PR 9627, BLO 341-92 and HUM 9712 proved as highly resistant (Immune) whereas 7 entries *i.e.* VLSLO, PCR 15-01, RGN6008, RH 9615, JMWR 93-38, PRO 9801 and NM9621 showed resistant (R) reaction with level of disease incidence ranging from 1.17 - 4.50 per cent (Table 2). Four genotype *viz.*, PCR 9301, RH9512, PBR 179 and PBR 146 recorded moderately resistant (MR) reaction and disease incidence ranged 5.83 to 8.66 per cent. Eleven entries namely, RAURPT-1, RAURD 9602, VA-5, KRANRI, NDYR 9808, PBCM 320, PK9802, PR 9720, HUM 341-92, HUM 9720 and HQ 30 were graded as moderately susceptible (MS) and disease incidence ranged from 10.10 to 21.50 per cent. Maximum severity of the disease (27.16%) was observed in Varuna which was graded as susceptible (S) to sclerotinia rot. None of the variety was highly susceptible (HS) to the disease. Similar observations regarding screening of entries of rapeseed-mustard and other crops against Sclerotinia rot disease have also been made by earlier workers (Kolte *et al.*, 1977; Shivpuri *et al.*, 1997; Singh *et al.*, 1997; Shivpuri *et al.*, 2000 and Pathak *et al.*,2002).

Table 1: Reaction of different genotypes of repeseed-mustard against Sclerotinia rot

Genotypes	Disease incidence (%)			
	1990 – 2000	2000 – 2001	Mean	Reaction
DHR 9405	0.00	0.00	0.00	HR
RSM 9801	0.00	0.00	0.00	HR
RN 488	0.00	0.00	0.00	HR
JMWR 92-01	0.00	0.00	0.00	HR
NDR 9503	0.00	0.00	0.00	HR
BLO 929-97	0.00	0.00	0.00	HR
PK 9801	0.00	0.00	0.00	HR
JGM 98 -21	0.00	0.00	0.00	HR
PR 9627	0.00	0.00	0.00	HR
BLO 341-92	0.00	0.00	0.00	HR
HUM 9712	0.00	0.00	0.00	HR
SKM 9640	0.00	0.00	0.00	HR
PCR 15-01	1.00	1.33	1.17	R
RGN 6008	3.33	2.66	3.00	R
RH 9615	3.66	4.33	3.99	R
KRANTI	22.33	20.66	21.50	MS
JMWR 93-38	3.44	0.00	1.72	R
PRO 9801	5.33	3.66	4.50	R
NM 9621	3.33	3.66	3.50	R
VLSLO	1.66	1.83	1.49	R
PCR 9301	6.66	7.33	6.70	MR
RH 9512	4.99	6.66	5.83	MR
PBCM-320	10.66	9.99	10.33	MS
PBR 179	8.33	8.99	8.66	MR
PBR 146	6.66	8.33	7.50	MR
RAURPT-1	9.33	12.66	10.10	MS
RAURD-9602	15.67	18.66	17.17	MS
VA-5	18.33	20.11	19.22	MS
NDYR 9808	9.33	11.22	10.28	MS
PK 9802	13.44	12.32	12.89	MS
HQ 30	12.33	15.33	13.83	MS
PR 9720	13.99	10.44	12.22	MS
HUM 341-92	15.33	16.66	16.00	MS
HUM 9720	11.66	10.33	11.00	MS
VARUNA	25.66	28.66	27.16	S

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