

STUDIES ON FIELD EVALUATION OF *BRASSICA* GERMPLASM/VARIETIES AGAINST *SCLEROTINIA SCLEROTIUM* UNDER INOCULATED CONDITION

*PRAMOD KUMAR FATEHPURIA, RAJNI S. SASODE, DEVASHISH R. CHOBE, VEERENDRA GUPTA AND REETI SINGH

Department of Plant Pathology,
Rajmata Vijayeraje Scindia Krishi Viswavidyalaya,
GWALIOR - 474002 (M.P.) INDIA

*Corresponding Author

E-mail: pramodfatehpuria@gmail.com

Received : 21.02.2017; **Revision** : 11.03.2017; **Accepted** : 19.04.2017

ABSTRACT

Indian mustard, *Brassica juncea* belong to Brassicaceae and Centre of origin Mideterian. Sclerotinia stem rot/blight caused by *Sclerotinia sclerotiorum* is one of the most important fungal diseases in rapeseed and other crops in the world. The present study was undertaken to access the forty seven germplasm/varieties to find out the resistance against *S. sclerotiorum* under inoculated condition. The reaction of forty-seven germplasm was evaluated in randomized complete block design with thrice replications at the experimental field, Department of Plant Pathology, College of Agriculture, Gwalior during Rabi season 2014-15 and laboratory work was done in the Department of Plant Pathology, College of Agriculture, Gwalior (M.P.). Observations for severity of stem rot on main stem were recorded after 120 days of sowing using 0 - 4 scale. (Assessment scale 0-4 where 0 = no disease (resistance), 1 = less than half stem girdled (moderate resistance), 2 = more than half stem girdled (susceptible), 3 = whole stem girdled (moderate susceptible), 4 = plant dead (highly susceptible). Forty-seven germplasm/varieties were evaluated for their reaction against Sclerotinia blight (*Sclerotinia sclerotiorum*). Out of forty seven germplasm / varieties, tested two Cultivar SBG-14-5 and SBG-14-6 gave highly resistance reactions, while twenty six varieties are found resistant SBG-14-2, SBG-14-3, SBG-14-4, SBG-14-7, SBG-14-8, SBG-14-9, SBG-14-10, SBG-14-11, SBG-14-13, SBG-14-15, SBG-14-17, SBG-14-18, SBG-14-23, SBG-14-27, SBG-14-28, SBG-14-30, SBG-14-31, SBG-14-32, SBG-14-33, SBG-14-34, SBG-14-35, SBG-14-36, SBG-14-41, SBG-14-42, NDNSR-14-76, NDNSR-14-77, twelve varieties are found susceptible SBG-14-1, SBG-14-12, SBG-14-14, SBG-14-16, SBG-14-21, SBG-14-22, SBG-14-24, SBG-14-26, SBG-14-29, SBG-14-37, SBG-14-39, SBG-14-40 and seven varieties SBG-14-19, SBG-14-20, SBG-14-25, SBG-14-38, Varuna, Rohini and BIOYSR were found highly susceptible against *Sclerotinia* blight (*Sclerotinia sclerotiorum*).

Figure : 00

References : 05

Table : 01

KEY WORDS : Cultivar, Germplasm, Resistant, *Sclerotinia sclerotiorum*, Susceptible

Introduction

Indian mustard, *Brassica juncea* is also known as Rai or Laha belong to Brassicaceae and Centre of origin Mideterian. Oilseed Brassicas, Rapeseed- Mustard are the world's third most important sources of vegetable edible oil. Rape seed and Mustard crops are being cultivated in 53 countries spreading over the six continents across

the globe covered area. Sclerotinia rot (SR) caused by *Sclerotinia sclerotiorum* is one of the most important fungal diseases in rapeseed and other crops in the world⁵. The pathogen has wide host range and infects over 400 host plants in 287 genera of 75 families¹. There are several ways of controlling this disease, but use of resistance cultivars in combination with other cultural and

ACKNOWLEDGEMENTS : The authors express thanks to Head, Department of Plant Pathology, College of Agriculture, Rajmata Vijayeraje Scandia Krishi Viswavidyalaya, Gwalior and Zonal Agriculture Research Station Morena (M.P.) for providing all the facilities.

88 *PRAMOD KUMAR FATEHPURIA, RAJNI S. SASODE, DEVASHISH R. CHOBE, VEERENDRA GUPTA AND REETI SINGH

TABLE- 1 : Reaction of *Brassica* germplasm against Sclerotinia blight under artificial inoculation

S.No	Entries	PDI	Transferred value	Sr. No	Entries	PDI	Transferred value
1	SBG-14-1	72.5	58.35	25	SBG-14-25	92.5	74.32
2	SBG-14-2	27.5	31.10	26	SBG-14-26	72.5	58.39
3	SBG-14-3	40.0	39.23	27	SBG-14-27	37.5	37.75
4	SBG-14-4	32.5	34.61	28	SBG-14-28	27.5	30.10
5.	SBG-14-5	25.0	30.00	29	SBG-14-29	52.5	46.43
6.	SBG-14-6	00.0	00.00	30	SBG-14-30	35.0	36.27
7.	SBG-14-7	27.5	31.16	31	SBG-14-31	32.5	34.74
8.	SBG-14-8	37.5	37.75	32	SBG-14-32	45.0	42.13
9.	SBG-14-9	47.5	43.56	33	SBG-14-33	30.0	33.21
10.	SBG-14-10	35.0	36.27	34	SBG-14-34	27.5	31.60
11	SBG-14-11	27.5	31.60	35	SBG-14-35	32.5	34.74
12	SBG-14-12	62.5	54.75	36	SBG-14-36	30.0	33.21
13.	SBG-14-13	37.5	37.75	37	SBG-14-37	75.0	60.11
14.	SBG-14-14	65.0	53.73	38	SBG-14-38	77.5	61.72
15	SBG-14-15	27.5	31.60	39	SBG-14-39	55.0	47.87
16	SBG-14-16	62.5	52.25	40	SBG-14-40	57.5	49.32
17	SBG-14-17	40.0	39.23	41	SBG-14-41	27.5	31.60
18	SBG-14-18	32.5	34.24	42	SBG-14-42	37.5	37.75
19	SBG-14-19	100	90.00	43	VARUNA	92.5	74.32
20	SBG-14-20	100	90.00	44	ROHINI	90.0	72.14
21	SBG-14-21	75.0	60.11	45	BIOYSR	82.5	65.32
22	SBG-14-22	52.5	46.43	46	NDNSR-14-76	33.5	35.70
23	SBG-14-23	32.5	34.74	47	NDNSR-14-77	42.00	40.90
24	SBG-14-24	67.5	55.26				

chemical means is prepared³. Results of several researchers show considerable differences in reaction of rapeseed cultivars and hybrids. Workers² reported partial resistance in different rapeseed genotypes.

Material and Method

The reaction of forty-seven germplasm was evaluated in Randomized Complete Block Design(RCBD) with twice replications at the experimental field of Department of Plant Pathology, College of Agriculture, Gwalior during Rabi season 2014-15 and laboratory work done in the Department of Plant Pathology, College of Agriculture, Gwalior (M.P.). Crop management practices including land preparation, crop rotation, fertilizer, and weed control were followed as recommended for the local area. Observation for severity of stem rot on main stem was recorded after 120 days of sowing using 0-4 scale⁴. (Assessment scale 0-4 where 0 = no disease (resistance), 1 = less than half stem girdled (moderate resistance), 2 = more than half stem girdled (susceptible), 3 = whole stem girdled (moderate susceptible), 4 = plant dead (highly susceptible)).

Results and Discussion

Forty-seven germplasm/varieties were evaluated for their reaction against *Sclerotinia* blight (*Sclerotinia sclerotiorum*). The data are summarized (Table-1). Out of forty seven germplasm / varieties, tested two Cultivar SBG-14-5 and SBG-14-6 gave highly resistance reactions,

while twenty six varieties resistant SBG-14-2, SBG-14-3, SBG-14-4, SBG-14-7, SBG-14-8, SBG-14-9, SBG-14-10, SBG-14-11, SBG-14-13, SBG-14-15, SBG-14-17, SBG-14-18, SBG-14-23, SBG-14-27, SBG-14-28, SBG-14-30, SBG-14-31, SBG-14-32, SBG-14-33, SBG-14-34, SBG-14-35, SBG-14-36, SBG-14-41, SBG-14-42, NDNSR-14-76, NDNSR-14-77, twelve varieties susceptible SBG-14-1, SBG-14-12, SBG-14-14, SBG-14-16, SBG-14-21, SBG-14-22, SBG-14-24, SBG-14-26, SBG-14-29, SBG-14-37, SBG-14-39, SBG-14-40 and seven varieties SBG-14-19, SBG-14-20, SBG-14-25, SBG-14-38, Varuna, Rohini and BIOYSR were found highly susceptible against *Sclerotinia* blight⁴ (*Sclerotinia sclerotiorum*), according to disease score rating scale 0-4. On the basis of source of genetic resistance is limited or none of the tested germplasm lines showed complete resistance, by partial resistance tolerance less was observed and has hampered the development of resistant genotypes and many researchers formerly believed that resistance to *S. sclerotiorum* did not exist. Since oxalic acid play a vital role in the establishment of pathogenicity. Attempts made to degrade oxalic acid will enhance resistance against *S. sclerotiorum* by increasing the production of H₂O₂ mediated through oxidative burst. More recently, however, field resistance was observed in some germplasm against *S. sclerotiorum*. However, none was found with any immune germplasm/varieties against sclerotinia blight (*Sclerotinia sclerotiorum*) because of the resistance was associated with its tolerance to oxalic acid secreted by sclerotinia blight of mustard.

References

1. BOLAND, G.J. AND HALL, R. (1994) Index of plant hosts of *Sclerotinia sclerotiorum*. *Can. J. Plant Pathol.* **16**: 93-100.
2. BRADLEY, C.A., HENSON, R.A., PORTER, P.M., LEGARE, D.G., DEL RIO, L.E. AND KHOT, S.D. (2006) Response of canola cultivars to *Sclerotinia sclerotiorum* in controlled and field environments. *Plant Dis.* **90** : 215-219.
3. GARG, H., SIVASITHAMPARAM, K., BANGA, S.S. AND BARBETTI, M.J. (2008) Cotyledon assay as a rapid and reliable method of screening for resistance against *Sclerotinia sclerotiorum* in *Brassica napus* genotypes. *Austral. Plant Pathol.* **37** : 106–111.
4. SANSFORD, C.E. (1995) Development of stem rot (*Sclerotinia sclerotiorum*) and its effect on yield. In: *Proc. IX Internat. Rapeseed Cong*, Cambridge, UK, 4-7 July, 1995 : 634.
5. ZHAO, J., PELTIER, A.J., MENG, J., OSBORN, T.C. AND GRAU, C.R. (2004) Evaluation of *Sclerotinia* stem rot resistance in oilseed *Brassica napus* using a petiole inoculation technique under greenhouse conditions. *Plant Dis.* **88** :1033-1039.