

Short Communication

Field Evaluation of Mustard Genotypes Against White Rust, Powdery Mildew and Stem Rot

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White rust caused by *Albugo candida* (Pers. ex Lev.) Kuntze, is an important disease of rapeseed-mustard (Saharan and Verma, 1992). In recent years, there is an increase in the incidence of white rust, powdery mildew (*Erysiphe cruciferarum* Opiz. ex. Junell) and stem rot (*Sclerotinia sclerotiorum* de Bary) in the state of Rajasthan. In this state, powdery mildew appears on mustard crop from the first week of February. This disease generally does not cause much damage to the crop except during occasional outbreaks.

Stem rot is an upcoming problem in rapeseed-mustard (*Brassica juncea*) growing areas of the state. The disease appears in field during pod formation, i.e., in 70-75 day-old crop. Sudden drooping of leaves, followed by drying of plants, are characteristic features of the disease. Cultivation of disease-resistant varieties seems to be the most practical and economic means to overcome these problems. However, most of the released cultivars are susceptible to these diseases. The present investigation was undertaken to search for the source of multiple resistance against these diseases.

Durgapura, Jaipur. The seeds of 34 *Brassica* genotypes belonging to 4 species, *B. juncea*, *B. carinata*, *B. campestris* and *B. napus* were sown on November 10th in both the years. All the genotypes were grown in single plot of 5 m row. Fresh sporangial inoculum was collected from infected crop and sprayed (2×10^4 zoospores ml^{-1}) thrice at an interval of 5 days in experimental crop area, starting from third week of December. Inoculum was sprayed in the evening to ensure high infection in the test genotypes. The disease first appeared on lower leaves, 8-10 days after inoculation. Data on disease severity on leaves were recorded using 0-9 rating scale (Bharadwaj and Sud, 1995) 40 days before harvest. Per cent disease intensity (PDI) was calculated as: $\text{PDI} = (\text{sum of all numerical values} / \text{total number of leaves observed}) \times (100 / \text{maximum rating})$. Staghead infection was noted as per cent disease incidence by counting number of plants showing staghead formation and total number of plants in a plot.

Stem Rot

For sclerotinia stem rot, ten 50 to 55-day-old plants were randomly selected from 5 m row and inoculated with mycelium of 10-day-old culture of *S. sclerotiorum*.

White Rust

Field trials were carried out for two years (1993-94 and 1994-95) at A.R.S.,

Table 1. Evaluation of different Brassica genotypes against white rust, powdery mildew and stem rot during 1993-94 and 1994-95 (average of two years data)

Genotype	White rust		Stem rot incidence (%)	Powdery mildew incidence (%)
	PDI on foliage (%)	Staghead incidence (%)		
CSR-102	53.32	26.00	100.00	100.00
CSR-429	63.43	26.00	100.00	100.00
CSR-450	54.54	34.00	100.00	100.00
CSR-703	77.65	30.00	100.00	100.00
CSR-911	55.65	28.00	100.00	100.00
CSR-955	63.37	28.00	100.00	100.00
JMG-1206	72.83	34.00	100.00	100.00
JMG-27	57.44	30.00	100.00	100.00
JMG-256	68.65	32.00	100.00	100.00
JMG-200	72.72	28.00	100.00	100.00
JMG-256	56.36	30.00	100.00	100.00
RC-154	67.47	26.00	100.00	100.00
B-443	74.64	22.00	100.00	100.00
BIO-902	59.43	32.00	100.00	100.00
PCR-7	63.32	24.00	100.00	100.00
PRG-920	74.43	26.00	100.00	100.00
RH-30	56.34	32.00	100.00	100.00
T-59	65.76	22.00	100.00	100.00
Rn-356	67.87	32.00	100.00	100.00
Vaibhav	73.25	32.00	100.00	100.00
PBM-16	56.25	28.00	100.00	100.00
PBM-17	67.48	24.00	100.00	100.00
PBM-18	70.67	20.00	100.00	100.00
PBM-19	55.36	32.00	100.00	100.00
PBM-20	60.44	28.00	100.00	100.00

Slight injury with surface sterilized knife was made at collar region and mycelium was placed there and covered with a swab of wet cotton. Disease symptoms appeared within 10-12 days after inoculation.

Powdery Mildew

Screening against powdery mildew was done under field conditions. Data on per cent disease incidence of powdery mildew

and stem rot were recorded 20 days before harvesting by counting diseased and total number of plants in a plot. However, observations on 10 inoculated plants were recorded for stem rot.

Of the 34 genotypes, nine, viz., cutlass, ZYR-6 (*B. juncea*), PSM-169, PDM-169 (*B. carinata*); Wester (*B. napus*), PYM-7, Parkland, Tobin and Candle (*B. campestris*)

showed complete resistance to white rust, powdery mildew and stem rot diseases. All these genotypes showing multiple resistance are of long duration (160-165 days). These genotypes can be used for breeding of disease resistance, whereas the remaining 25 genotypes belonging to *B. juncea* were susceptible to all the diseases (Table 1). The staghead phase of the white rust developed in all genotypes which showed infection on foliage. During studies, it was found that infection of white rust up to middle leaves is responsible for more stagheads. However, direct correlation between foliage infection and staghead formation was not found.

It is concluded that 9 accessions of *Brassica* having diverse genomes were found resistant to white rust, powdery mildew and stem rot diseases concomitantly. Earlier, several genotypes of *B. juncea*, *B. campestris*, *B. carinata* and *B. napus* were reported resistant to *Albugo candida* (Parui and Bandopadhyay, 1973; Kolte and Tewari, 1980; Saharan *et al.*, 1988; Srivastava and Verma, 1987; Verma and Bhowmik, 1989) and *A. candida* and powdery mildew (Gupta and Singh, 1994).

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