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Screening of mungbean [*Vigna radiata* (L.) Wilczek] genotypes for resistance against *Cercospora* leaf spot under field conditions

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Abstract

Mungbean (*Vigna radiata* L.) is also known as mung, moong, mungo. In India it is third most important pulse crop after chickpea and pigeonpea. Mungbean is an important short duration grain legume which is grown in different parts of the country, for grain and green manuring. It is an outstanding source of easily digestible proteins with low flatulence, which balances the staple rice diet in Asia. The mungbean crop is infected by a large number of pathogens such as fungi, bacteria, virus and nematodes in which mungbean *Cercospora* leaf spot causes significantly losses. Use of resistant genotypes is the best method of avoiding the occurrence of the disease. Keeping this point in view, one hundred genotypes of mungbean were tested for the resistance against *Cercospora* leaf spot during *Kharif* 2019 in field condition. Out of total test entries screened 2 genotypes viz., SKNM 1502, COGG 13-39 were found highly resistant.

Keywords: leaf spot, cercospora, mungbean, *Vigna radiata* (L.) Wilczek

Introduction

The mungbean (*Vigna radiata* L., Wilczek), alternatively known as the green gram, maash or mungbean, Sanskrit mudga, is a plant species in the legume family. Mungbeans are one of many species recently moved from the genus *Phaseolus* to *Vigna*. The disease starts appearing about 30 days after sowing, depending upon day and night temperature and relative humidity. The main symptom of this disease is formation of angular lesions, on leaves which are grey to brown with radish brown margin. Similar spots also occur on branches and pods. The numbers of leaves spots are more but smaller in case *Cercospora canescens* than *Cercospora cruenta*. In severe case the spots are coalesce and leave are looks like burn. The fungus causes severe leaf spotting and defoliation at the flowering and pod formation. Disease also causes reduction in pod size and grain yield.

Methods and Materials

Seeds of mungbean genotypes were obtained from Indian Institute of Pulses Research, Kanpur and Pulse Section. The field experiment was conducted at Department of Genetics and Plant Breeding, A.N.D. University of Agriculture and Technology, Kumarganj, Ayodhya. Total one hundred genotypes (Table 1) were evaluated in R.B.D. with three replications during *Kharif* season of 2019. Two rows of 4m length spaced 30 cm apart with plant to plant distance of 15 cm., After every genotypes, one row of Kopergoan (*Cercospora* leaf spot susceptible variety of mungbean) was planted and the experimental plot was also surrounded by two rows of Kopergoan to ensure uniform spread of the disease. Observations on disease severity were recorded at 15 days interval, starting with first appearance of symptoms till the maturity of crop using 1-9 rating scale of Mayee and Datar (1986). After germination, observations were recorded regularly up to 30 days for the first appearances of the disease i.e. *Cercospora* leaf spot. The disease was recorded by using 1-9 scale as described in.

Table 1: Disease rating scale for CLS (Mayee and Datar, 1986).

Sl. No.	Grade	% Foliage affected	Reaction
1.	1	No infection	Free
2.	2	0.1-5	Highly Resistant
3.	3	5-10	Resistant
4.	4	11-15	Moderately Resistant
5.	5	15-20	Moderately Susceptible
6.	6	21-30	Susceptible
7.	7	31-50	Susceptible
8.	8	51-75	Highly Susceptible
9.	9	Above 75	Highly Resistant

Result and Discussion

Total 100 genotypes of mungbean were screened against the *Cercospora* leaf spot disease. Out of One hundred genotypes were screened for their reaction to *Cercospora canescens* in the field that out of total test entries screened 2 genotypes viz., SKNM 1502, COGG 13-39 were found highly resistant, while 6 genotypes viz., AKM 12-24, IPM 02-3, IPM 04-1, PM 14-11, IGKM 2016-1, MDGGV 18, were found resistant, 20 genotypes were found moderately resistant, 34 genotypes were found moderately susceptible, 13 genotypes were found

susceptible, 2 genotypes viz., PM 1522, Pusa 0672 were highly susceptible, and rest of 2 genotypes viz., PM 1511, Type 44, Kopergaon were found highly susceptible to *Cercospora* leaf spot caused by *C. canescens*.

Different genotypes were also reported resistant to *Cercospora* leaf spot disease from different paces of country by different workers. Mew *et al.* (1975) had also found resistance in ML-5, ML-15 and ML-3. Sandhu *et al.* (1988) 4 genotypes namely. ML-231, ML-5, ML-267 and ML-337, found resistance with high seed yield Sidhan *et al.* (1999) [2] screened 260 genotypes of mungbean and they found 9 genotypes were resistant and 28 genotypes were found moderately resistant to this disease.

Out of one hundred eighteen mungbean germplasms screened against *Cercospora* leaf spot, 5 varieties viz., Co-4, CO-5, ML-515, BM-4 and TM-98-50 were resistant and 9 genotypes viz., LM-1, LM-319, LNM-729, HUM-6, SG-1, AAU-34, TM-98-37, V-461 and VC-3944 were moderately resistant (Anonymous, 2005-06) [6]. The similar results were also reported by Gupta *et al.* (2007) [5], Singh and Gurha (2007) [3], Iqbal *et al.* (2008 & 2009) [4].

Table 2: Reaction of mungbean genotypes against *C. canescens*.

Rating scale	Name of Reaction	No. of germplasm	Name of germplasm
1.	Free from infection	0	Nil
2.	Highly resistant	2	SKNM 1502, COGG 13-39
3.	Resistant	6	AKM 12-24, IPM 02-3, IPM 04-1, PM 14-11, IGKM 2016-1, MDGGV 18
4.	Moderately resistant	20	IGKM 5-6-27, IPM 02-14, IPM 410-9, JLM 707-5, K 851, KM 2241, KM 2355, LGG 450, LGG 630, MGG 399, MH 2-15, ML 818, OBG 101, Pusa 171, VGG – 17009, VGG 16-055, SVM 6133, NMK 15-08, JAUM 0936, IPM 14-7
5.	Moderately susceptible	34	COGG 912, DGGV 59, IPM 512-1, JAUM 936, Kopergaon, LGG 450, MH 1323, MH 1344, ML 2479, ML 2483, NDMK 16-324, NVL 855, OBG 56, OBG 58, Pant M-6, PKVAKM 4, Pusa M1871, Pusa 1872, SKAU M-365, SKNM 1504, SML 1808, SML 1901, SVM 6262, TRCM 171-B-12-6, VG 17002, VGG 16-036, LGG 607, PM 14-3, AKM 12-28, VGG 16-036, Pusa 171, Pusa 172, RMG 1092, RMG 1097, JLM 302-46, IPM 312-19, IPM 312-20, MGG 387, Barabanki Local
6.	Susceptible	13	AKM 1604, AKM 8802, IGKM 06-18-3, MH 1142, OBG 102, Pant M-4, RMB 12-07, SKNM 1514, SKNM 1516, T 44, TMB 126, LBG 450, DGG 7
7.	Susceptible	1	RMG 1087,
8.	Highly susceptible	2	PM 1522, Pusa 0672
9.	Highly Resistant	2	PM 1511, Type 44

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