

Screening of Maize Germplasm Lines Against *Helminthosporium maydis* Nisicado and Miyake in Bihar

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SUMMARY

Altogether 185 maize entries screened against *Helminthosporium maydis* Nisicado and Miyake under artificial inoculated conditions, none were found free from the disease. Twenty entries namely, C-555, C.P.818, G.K-3050, PRO-311, BH-4070, PRO-371, 22 K 40, PAC 740, BH-40703, K.D.M.H-1001, C.P-828, BISCO-111, BIO-9637, EH-1561, BH-4068, BH-3438, JH-31172, QPM-3, QPM-4 and QPM-13 showed resistant reaction against maydis leaf blight.

Key words :

Helminthosporium maydis, Maize, Resistance, Screening.

Maize occupies fifth position in area and third in production in India as it is cultivated in 8.0 million ha with a production of 16.78 million tonnes having an average productivity of more than 2 tonnes/ha and contributing 7 per cent in food basket of the country. Annual loss of grain due to disease in maize has been estimated to the tune of 13.2 per cent. Maydis leaf blight caused by *Helminthosporium maydis* Nisicado and Miyake is one of the most important yield limiting factors particularly in Bihar. The disease is widely distributed in India during *kharif* season. The yield losses under experimental conditions in susceptible cultivar due to maydis leaf blight has been observed up to 30.3 per cent (Sangam Lal, 1999). Although effective chemical control measures are available to the disease, however, development of resistant varieties is the most economical and eco-friendly means to control the disease. Evaluation of germplasm and advanced breeding lines are essential to identify the donors for their utilization in resistance breeding programme. The present study was undertaken to search out the level of resistance against maydis leaf blight.

MATERIALS AND METHODS

An experiment was conducted during *kharif* 2007, in the experimental field of Tirhut College of Agriculture Dholi, Muzaffarpur. One hundred eighty five germplasm of different maturity group were planted in 2 rows of 5 m length with a spacing of 75 and 20 cm row to row and plant to plant, respectively. The experiment was laid in Randomized Block

Design with 2 replications. Germplasm of different maturity groups were sown in separate block along with one check row of a susceptible CML 186 at beginning and end of the test entries to facilitate recording of comparative disease reactions and also to provide sufficient inoculum pressure with the help of susceptible infector rows.

After 30 days of sowing, all the germplasm including susceptible infector rows were inoculated in the afternoon with the mass culture of pathogen grown on sorghum dextrose medium and immediately by water spraying sufficient humidity was provided. Inoculation was repeated thrice at weekly interval. Disease intensities were recorded according to the 1-5 rating scale (Sharma, 1983).

RESULTS AND DISCUSSION

Altogether 185 entries of different maturity group were screened against *Helminthosporium maydis* under artificially inoculated conditions and the resistant source obtained from different maturity group are presented in Table 1.

Out of 185 entries only 20 sources were rated as the resistant materials against *Helminthosporium maydis*. The close observations of recorded data indicate that maturity group had negative response with the disease development indicating 11 resistant sources from the full maturity group including QPM sources where as, medium and early maturity group indicated only 7 and 2 resistant sources. In case of extra early maturity groups none of the tested entries indicated resistant reaction.

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Table 1: Screening of resistant entries against *Helminthosporium maydis* under artificially inoculated conditions

Maturity groups	No. of tested entries	No. of resistance source	Name of resistance source
Full maturity group	57	Resistant- 8	C-555, C.P.818, G.K-3050, PRO-311, BH-4070, PRO-371, 22 K 40 and PAC 740
		Moderate resistant- 14	JH-11433, X 6B 271, SINDHU-333, AMAR-555, JH-11117, BH 4064, BH-4065, BH-4066, SMH-3904, 30-R-77, PRO 365, JH-10704, PARBHAT and SEEDTEC-2324
Medium maturity group	51	Resistant- 7	BH-40703, K.D.M.H-1001, C.P-828, BISCO-111, BIO-9637, EH-1561 and BH-4068
		Moderate resistant- 2	KMH-22168, KDM-438, NAVJOT, BIO-9637
Early maturity group	38	Resistant- 2	BH-3438 and JH-31172
		Moderate resistant- 6	BH-4070, JC-3284, UMH-8, L-201, COMP-R-3005-2, X-3342
Extra early maturity group	18	Resistant - 0	Nil
		Moderate resistant- 5	FH—3414, FH-3433, FH-3440, FQH-38 and AH-502
QPM (Quality protein maize)	11	Resistant- 3	QPM-3, QPM-4, and QPM-13
		Moderate resistant- 8	QPM-1, QPM-2, QPM-6, QPM-7, QPM-8, QPM-9, QPM-11 and QPM-12
Total	185	Resistant -20 Moderated resistant-37	

Out of these only 20 entries namely, C-555, C.P.818, G.K-3050, PRO-311, BH-4070, PRO-371, 22 K 40, PAC 740, BH-40703, K.D.M.H-1001, C.P-828, BISCO-111, BIO-9637, EH-1561, BH-4068, BH-3438, JH-31172, QPM-3, QPM-4 and QPM-13 showed resistant reaction. The resistant reaction in these entries might be either by the dominant resistant against the disease gene from the parental lines or presence of certain physiological as well as the chemical barriers against the pathogen or combination of all above features in these entries. Cunha *et al.*, 1972, Sharma, 1983 and Jha, 1996 also reported similar possibilities for resistant factor in different entries.

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