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Screen Maize Inbred Lines and Commercially Released Hybrids for Resistance to Turcicum Leaf Blight

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ABSTRACT

Screenings were carried out on, Ten inbred lines and twelve commercially released hybrids. The reactions of maize inbred lines against turcicum leaf blight disease used inbreds are 117(JCY-7-1-2-1-b-2-1-3-1), 24 (LM 13), 190 (WCP16), 184 (WCP10), 28 (HVZM371), 69 (DMSC 20), 88 (WINPOP-47), 146 (CML 421' CML 170), 31 (LM6) and DMSC 19 and inbred lines collected from Maize Research Station, ARI, Rajendranagar, Hyderabad was screened for identifying sources of resistance against Exserohilum turcicum by artificial inoculated conditions in glasshouse.

Twelve commercially released hybrids collected from diiferent companies, were screened and results presented DHM-117, 30V92, GHM 145, PAC 74O, GK 3060, KMH 225(Delux), FMH 8899 (Bhuvana), KMH 218, SCORPIO, RMH 4(Tip top), RMH 7 (New top star) and RMH 25(Gold star).

Key words: *Maize, Turcicum leaf blight, Exserohilum turcicum, inbred lines, Hybrids.*

INTRODUCTION

Maize is one of the most important cereal crops next to rice and wheat in Indian food grains. Among the foliar diseases, Turcicum leaf blight (TLB) of maize caused by Exserohilum turcicum (Pass.) Leonard and Suggs is a major constraint in large scale cultivation and production of maize both in kharif and rabi, causing grain yield losses up to 16 - 98%. Recently, this disease has occurred in alarming proportions reducing grain and straw yield. Hence, an attempt was made to evaluate different fungicides and bio agents against the Exserohilum turcicum and identify the effective treatment against TLB of maize.

MATERIALS AND METHODS

Screening in glasshouse by artificial inoculation:

The inbred lines and commercially released hybrids were evaluated in the seedling stage in the greenhouse.

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Preparation of spore suspension and inoculation

Conidia of the fungus were collected from actively growing seven days old culture. The spores were harvested by adding sterilized distilled water into petriplates and scraped gently with camel hair brush. Water loaded with spore mass in petriplates were collected in to a beaker and the concentration of spore suspension was adjusted to $50x10^3$ spores/ml.

The spore suspension was sprayed on 20-25 days old plants or 5^{th} leaf stage of maize plants. Plants were covered with the polythene sheet for 12 hours to maintain the humidity and were left for the development of symptoms. On 15^{th} day after inoculation the percent disease index (PDI) was calculated using the 0-9 scale given by Mayee and Datar. Two replications were maintained for each treatment.

RESULTS AND DISCUSSION

Inbred Lines screening:

Ten inbred lines were screened and results presented in table 1, in respect of the reactions of maize inbred lines against turcicum leaf blight disease imply that, among ten inbred lines, three were showed Highly Resistance (PDI rating scale was 0) 117(JCY-7-1-2-1-b-2-1-3-1), 24(LM 13) and 190(WCP16), two were showed Resistance (PDI rating scale was 0.5 to 1) 184(WCP10) and 28(HVZM371), one was showed Moderate Resistance (PDI rating scale was 1 to 3) 69(DMSC 20), two were showed Moderately Susceptible (PDI rating scale was 3 to 5) 88(WINPOP-47) and 146(CML 421' CML 170), one was showed Susceptible (PDI rating scale was 5 to 7) 31(LM6) and one was Showed Highly Susceptible (PDI rating scale was 7 to 9) DMSC 19.

Table 1: Evaluation of inbred lines for resistance against Turcicum leaf blight In vitro:

S.No.	Per cent disease index (PDI)	Reaction group	Inbred lines (Pedigree)	Source of inbred lines
1.	0	Highly resistant	117(JCY-7-1-2-1-b-2-1-3-1) 24(LM13) 190(WCP16)	Maize Research Station, ARI, Rajendranagar
2.	0.5 to 1	Resistant	184(WCP10) 28((HVZM371)	Maize Research Station, ARI, Rajendranagar
3.	1 to 3	Moderately resistant	69(DMSC20)	Maize Research Station, ARI, Rajendranagar
4.	3 to 5	Moderately susceptible	88(WINPOP-47) 146(CML421' CML170)	Maize Research Station, ARI, Rajendranagar
5.	5 to 7	Susceptible	31(LM6)	Maize Research Station, ARI, Rajendranagar
6.	7 to 9	Highly susceptible	DMSC 19	Maize Research Station, ARI, Rajendranagar

Commercially released hybrids:

Twelve commercially released hybrids were screened and results presented in table 2. Out of twelve hybrids, three were showed Highly Resistance (PDI rating scale was 0) DHM-117,30V92 and GHM 145, three were showed Resistance (PDI rating scale was 0.5 to 1) PAC 74O, GK 3060 and KMH 225 (Delux) , two were showed Moderate Resistance (PDI rating scale was 1 to 3) FMH 8899 (Bhuvana) and KMH 218, one was showed Moderately Susceptible (PDI rating scale was 3 to 5) SCORPIO, two were showed Susceptible (PDI rating scale was 5 to 7) RMH 4(Tip top)and RMH 7 (New top star) one was Showed Highly Susceptible (PDI rating was scale 7 to 9) RMH 25(Gold star).

Table 2: Evaluation of commercially released hybrids for resistance against Turcicum leaf blight *In vitro*

S.No.	Per cent disease index (PDI)	Reaction group	Hybrids	Source of seeds
1.	0	Highly resistant	DHM-117 30V92 GHM 145	ANGRAU, Rajendranagar , Hyderabad Pioneer Hybrid Seeds Pvt. Ltd. GHM Hybrid Seeds Pvt. Ltd.
2.	0.5 to 1	Resistant	PAC 740 GK3060 KMH 225(Deluxe)	Advanta India Pvt. Ltd. Ganga Kaveri Hybrid Seeds Pvt. Ltd. Kaveri Hybrid Seeds Pvt. Ltd.
3.	1 to 3	Moderately resistant	FMH 8899 (Bhuvana) KMH 218	Fortune Hybrid seeds Pvt. Ltd. Kaveri Hybrid Seeds Pvt. Ltd.
4.	3 to 5	Moderately susceptible	SCORPIO	Advanta India Pvt. Ltd.
5.	5 to 7	Susceptible	RMH-4(Tip Top) RMH-7(New top star)	Rasi Hybrid Seeds Pvt. Ltd. Rasi Hybrid Seeds Pvt.Ltd.
6.	7 to 9	Highly susceptible	RMH-25(Gold star)	Rasi Hybrid Seeds Pvt. Ltd.

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