




Identification of Maize (*Zea mays* L.) Germplasms for Resistant Sources against Turcicum Leaf Blight Disease

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ABSTRACT

Maize (The present studies were aimed to evaluate 302 maize entries for resistance against turcicum leaf blight (TLB) disease in randomized block design using a check at Agricultural Research Station, Karimnagar, Telangana State, India during *rabi* (November-2019-February-2020 and *kharif* (July-2020-October-2020). During *rabi*, 2019-2020, out of 205 lines, 5 promising entries viz., IB-140, DHM-121, 17×605-1-2, 107×BML-7 and 186×BML-32 were identified with disease score 1 (resistant), 27 lines were recorded as moderately resistant, 2 lines were recorded as moderately susceptible and CM-202 entry was recorded 74.30% diseased leaf area (% DLA). During *kharif*, 2020, out of 98 lines, 41 lines viz., 70531×CML156, 70530×BML45, 70530×11-2-1, 70425×BML6, 72554×50-2-1, 72555×BML7, 72343×50-2-1, 72336×11-2-1, 72336×CML156, 72343×BML45, 72603×66-1-1, 72513×CML156, 72343×66-1-1, 70531×BML45, 722603×CML-156, 72555×66-1-1, 72336×BML6, 70439×CML156, 70576×50-2-1, 72555×605-1-1, 72555×BML6, 72336×50-2-1, 72374×BML7, 72555×CML156, 72555×33-1-4, 70425×BML45, 72520×CML156, 72504×CML156, 70474×50-2-1, 72568×BML-14, 72686×PFSR3, 72260×CML156, 66-1-1, 524-3-2, 31-2-4, 207-1-3, 244-1-2, 540-2-3, 388-2-1, KML225 and 186-4-3 were identified as resistant lines to turcicum leaf blight disease (score 1), three lines were moderately resistant, 1 line CM-202 was noticed with high 72.46% diseased leaf area and severely affected by turcicum leaf blight and rated as susceptible during *kharif*, 2020.

KEYWORDS: Germplasms, maize, screening, resistant, turcicum leaf blight disease

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1. INTRODUCTION

Maize (*Zea mays* L.), a staple food crop in many parts of the World. Maize is monocotyledonous plant that belongs to grass family (Poaceae). Maize (*Zea mays* L.) is the most versatile crop, adapted to different agro-ecological and climatic conditions. Maize the third most important cereal crops in the world's agricultural economy had highest genetic yield potential and is commonly called as queen of cereals. One of the main deterrents to high grain yield in maize is its susceptibility to several diseases (Madhavi et al., 2018). It is the third most important cereal crop next to rice and wheat in India. It is one of the potential crop of Telangana State which has come up on large areas in different districts under rainfed areas and under irrigated command areas of Karimnagar, Nizambad, Siddipeta, Warangal, Khammam, Bhadradi kottagudemamu and Kamareddy etc.. Maize is being affected by many diseases. Diseases in maize decreasing the yield from 28% to 91%. Maize with a notable productive potential among the cereals, is the third most important grain crop after wheat and rice. At global level, maize is cultivated over an area of 197.20 million hectares with an annual production of about 1148.49 million tons with an average productivity of 5.8 tons per hectare (Anonymous, 2019). In Telangana, it is being cultivated on 16.06 lakh acres area with an annual production of 40.78 lakh million tons and productivity of 2,539 kg acre⁻¹ (Anonymous B, 2019–2020). For existing biotic and abiotic stresses, the sustainability of the maize production to meet the future demand is debatable. Maize is affected by more than sixty diseases. Sixteen are major diseases among the sixty. Maize is attacked by many diseases in *kharif* and *rabi* seasons causing severe reduction in yield. Among all the foliar diseases which are affecting the maize, Turcicum leaf blight caused by *Exserohilum turcicum* (syn. *Helminthosporium turcicum* Pass.), is considered a serious disease where climatic conditions are cool with high relative humidity. Maize grain yield loss varies from 25% to 90% in different parts of India depending upon the severity of turcicum leaf blight epiphytotics (Chenulu and Hora, 1962; Jha, 1993). Yield losses approached 50%, when the disease is severe at 2–3 weeks after pollination (Shurtleff, 1980; Dey et al., 2017). Turcicum leaf blight is considered a serious disease under agro ecologies of Telangana. Turcicum leaf blight affects the maize crop from the seedling stage to maturity. The symptoms first appear as grayish green small elliptical spots on the leaves with water soaked lesions parallel to leaf margins, finally attaining a spindle shape with long elliptical grayish or tan lesions. If the disease starts at an early stage, it causes the premature death of blighted leaves. As a result, the crop loses its nutritive value as fodder, have reduced germination capacity, vigor, grain yield and total sugar content (Ferguson and Carson, 2004), has restricted

starch formation, chaffy kernels and infected plants are liable to infection with stalk rots (Cuq et al., 1993).

Genetic resistance of crop plants against pathogen is economical and eco-friendly disease management strategy. The resistant varieties are not only environmental friendly but also suitable to adopt at farmers level. There is a need to identify new sources of resistance through artificial epiphytotics to cater the resistance breeding programs. The objective of this study was to assess the maize inbred lines and their hybrids for resistance to turcicum leaf blight disease under field conditions. Keeping in view the above points, the present study was carried out to screen the three hundred and two maize entries for identification of resistant sources against turcicum leaf blight disease.

2. MATERIALS AND METHODS

2.1. Collection of diseased samples

Evaluate three hundred two maize entries for resistance against turcicum leaf blight (TLB) disease in Telangana State. The diseased leaf samples of affected maize plants showing typical symptoms of turcicum leaf blight having necrotic lesions were collected in paper poly bags from different maize growing areas of research station, Karimnagar and Telangana districts in *rabi*, 2019–2020 (12 lakh acres) and *kharif* season, 2020 (20 lakh acres). The Agricultural Research Station, Karimnagar is situated at 18° 30'N latitude, 79° 15'E longitude and 259.15 m above mean sea level. Two hundred five entries for *rabi* season, 2019–2020 and ninety eight entries for *kharif* season, 2020. The pathogen *Exserohilum turcicum* was isolated from infected leaves using single spore isolation technique (Tuite, 1969).

2.2. Layout of maize trial for field screening

For the identification of source of resistance to *Exserohilum turcicum*, a set of three hundred and two maize entries were evaluated in a randomized block design (RBD) along with a check CM-202 at Agricultural Research Station, Karimnagar field conditions using 1 to 9 disease rating scale (Mitiku et al., 2014). The test genotypes were planted in 2 rows of 3m length each with a plant spacing of 60×20 cm².

2.3. Inoculum preparation and inoculation

Spore suspension of the *Exserohilum turcicum* from twenty days old cultures was prepared by washing the conidia with distilled water. Equal volume of spore suspension was mixed and sprayed in evening hours by using atomizer at three to four leaf stages of maize plants and humidity was maintained by spraying water. Check plants were also treated similarly with spore suspension.

2.4. Disease assessment

Disease reaction was recorded by using 1 to 9 scale (Mitiku



et al., 2014 and Indian Institute of Maize Research, Ludhiana (Anonymous A, 2014) at 35 to 45 days after inoculation and assessed % diseased leaf area of TLB disease. The genotypes showing disease score /scale from 1.0 to

3.0 were considered as resistant (R), 4–5 as moderately resistant (MR), 6–7 as moderately susceptible (MS) and 8–9 as susceptible (S) (Table 1).

Table 1: Rating scale for maize turicum leaf blight Disease (Mitiku et al., 2014 and Anonymous A. Indian Institute of Maize Research. Annexure A. 2014)

Rating scale	Description (Diseased leaf area)	Reaction
1.0	Nil to very slight infection ($\leq 10\%$).	Resistant (R) (Score: ≤ 3.0)
2.0	Slight infection, a few lesions scattered on two lower leaves (10.1-20%)	
3.0	Light infection, moderate number of lesions scattered on four lower leaves (20.1-30%).	
4.0	Light infection, moderate number of lesions scattered on lower leaves, a few lesions scattered on middle leaves below the cob (30.1-40%).	Moderately resistant (MR) (Score: 3.1–5.0)
5.0	Moderate infection, abundant number of lesions scattered on lower leaves, moderate number of lesions scattered on middle leaves below the cob (40.1-50%).	
6.0	Heavy infection, abundant number of lesions scattered on lower leaves, moderate infection on middle leaves and a few lesions on two leaves above the cob (50.1-60%)	Moderately susceptible (MS) (Score: 5.1–7.0)
7.0	Heavy infection, abundant number of lesions scattered on lower and middle leaves and moderate number of lesions on two to four leaves above the cob (60.1-70%).	
8.0	Very heavy infection, lesions abundant scattered on lower and middle leaves and spreading up to the flag leaf (70.1-80%).	Susceptible (S) (Score: >7.0)
9.0	Very heavy infection, lesions abundant scattered on almost all the leaves, plant prematurely dried and killed ($>80\%$).	

3. RESULTS AND DISCUSSION

Disease score of maize entries to turicum leaf blight disease and artificially inoculated under field conditions during *rabi*, 2019–2020 and *kharif*, 2020 was observed. The performance of three hundred two germplasms along with susceptible check on the basis of disease reaction and 1-9 disease scale was classified into four groups (Table 2, 3 and 4).

3.1. Disease reaction during *rabi*, 2019–2020

Out of the two hundred five entries, five lines viz., IB-140, DHM-121, 17×605-1-2, 107×BML-7 and 186×BML-32 were identified with disease score 1, one hundred and nine lines with a score 2 and sixty one lines with a score 3. Entries with disease scores 1, 2 and 3 were categorized as resistant. The % DLA for IB-140 and IB-78 was 7.5 and 30 respectively. Twenty eight with disease score 4 are moderately resistant. Two lines viz., IB-154-1 and IB-59 were moderately susceptible with a disease score 6. The % diseased leaf area for IB-154-1 and IB-59 was 55.20 and 55.60 respectively. CM-202 recorded 74.30% diseased leaf area, severely affected by turicum leaf blight and rated as susceptible (Tables 2 and 3).

3.2. Disease reaction during *kharif*-2020

Ninety eight genotypes were screened against turicum

leaf blight disease. Out of them, forty one genotypes viz., 70531×CML156, 70530×BML45, 70530×11-2-1, 70425×BML6, 72554×50-2-1, 72555×BML7, 72343×50-2-1, 2336×11-2-1, 72336×CML156, 72343×BML45, 72603×66-1-1, 72513×CML156, 72343×66-1-1, 70531×BML45, 722603×CML-156, 72555×66-1-1, 72336×BML6, 70439×CML156, 70576×50-2-1, 72555×605-1-1, 72555×BML6, 72336×50-2-1, 72374×BML7, 72555×CML156, 72555×33-1-4, 70425×BML45, 72520×CML156, 72504×CML156, 70474×50-2-1, 72568×BML14, 72686×PFSR3, 72660×CML156, 66-1-1, 524-3-2, 31-2-4, 207-1-3, 244-1-2, 540-2-3, 388-2-1, KML225 and 186-4-3 were identified as disease score 1, fifty lines with a disease score 2 and three lines with a score 3, which were categorized as resistant. Two lines with disease score 4 and one line with disease score 5 were moderately resistant. In CM-202, the % diseased leaf area was 72.46%, which was also severely affected by turicum leaf blight and rated as susceptible (Tables 4 and 5).

Similar results were reported by scientists: Shikari and Zafar (2009) reported that inbred NAI-147 and composite Girija expressed resistance to Turicum leaf blight. Kumar et al. (2011) identified twenty inbred lines as sources of resistance



Table 2: Per cent diseased leaf area of maize entries to turicum leaf blight disease during <i>rabi</i> , 2019-2020									
Sl. no.	Entries	% diseased leaf area	Score	Reaction	Sl. no.	Entries	% diseased leaf area	Score	Reaction
1.	IB-4	25.40	3	R	39.	IB-113	27.5	3	R
2.	IB-7	35.60	4	MR	40.	IB-120	30.20	4	MR
3.	IB-8	35.00	4	MR	41.	IB-127	25.10	3	R
4.	IB-11	30.20	4	MR	42.	IB-133	25	3	R
5.	IB-14	26	3	R	43.	IB-135	27.54	3	R
6.	IB-15	22.5	3	R	44.	IB-139	27.5	3	R
7.	IB-16	32.5	4	MR	45.	IB-140	7.5	1	R
8.	IB-17	22.5	3	R	46.	IB-141	20	2	R
9.	IB-18	20	2	R	47.	IB-144	25.30	3	R
10.	IB-20	17.5	2	R	48.	IB-146	35.20	4	MR
11.	IB-22	27.5	3	R	49.	IB-146-1	42.5	5	MR
12.	IB-27	22.5	3	R	50.	IB-152	30	3	R
13.	IB-28	15	2	R	51.	IB-154-1	55.20	6	MS
14.	IB-32	27.5	3	R	52.	IB-305	12.5	2	R
15.	IB-36	32.5	4	MR	53.	IB-322	37.5	4	MR
16.	IB-37	25.30	3	R	54.	WNC-6	27.5	3	R
17.	IB-42	20.10	3	R	55.	WNC-35	20	2	R
18.	IB-43	22.5	3	R	56.	WNC-42	42.5	5	MR
19.	IB-51	20	2	R	57.	WNC-52	25	3	R
20.	IB-59	55.60	6	MS	58.	WNC-52-1	27.5	3	R
21.	IB-60	27.5	3	R	59.	WNC-54	32.5	4	MR
22.	IB-63	20	2	R	60.	WNC-55	45.0	5	MR
23.	IB-66	17.5	2	R	61.	WNC-105	37.5	4	MR
24.	IB-68	27.5	3	R	62.	WNC-150	32.5	4	MR
25.	IB-70	22.5	3	R	63.	WNC-226	32.5	4	MR
26.	IB-73	17.5	2	R	64.	WNC-233	25.10	3	R
27.	IB-74	30.40	4	MR	65.	WNC-239	30.30	4	MR
28.	IB-75	30.80	4	MR	66.	WNC-416	25.30	3	R
29.	IB-78	30	3	R	67.	WNC-494	25	3	R
30.	IB-83	27.50	3	R	68.	WLS-F -73	37.5	4	MR
31.	IB-84	27.52	3	R	69.	WLS-F -191	27.5	3	R
32.	IB-85	32.5	4	MR	70.	4845	30	3	R
33.	IB-86	27.5	3	R	71.	52007	27.5	3	R
34.	IB-86-1	30	3	R	72.	52014	22.5	3	R
35.	IB-95	35.30	4	MR	73.	52075	37.5	4	MR
36.	IB-99	22.5	3	R	74.	52082	20	2	R
37.	IB-101	22.58	3	R	75.	52089	15.90	2	R
38.	IB-102	40	4	MR	76.	52161	12.5	2	R

Table 2: Continue...

Sl. no.	Entries	% diseased leaf area	Score	Reaction	Sl. no.	Entries	% diseased leaf area	Score	Reaction
77.	52193	20.40	3	R	91.	BGS-337	32.5	4	MR
78.	52256	20.45	3	R	92.	E15 98438	25.30	3	R
79.	52265	12.5	2	R	93.	E15 98462	25	3	R
80.	52284	20.30	3	R	94.	ACC5204093	22.5	3	R
81.	52299	20	2	R	95.	BLS-42050	15	2	R
82.	52300	12.5	2	R	96.	PFSR-16	20	2	R
83.	52306	32.5	4	MR	97.	KML-225	22.5	3	R
84.	52323	37.5	4	MR	98.	PFSR-3	12.5	2	R
85.	52333	35	4	MR	99.	DHM-117	15	2	R
86.	SHDIER-6-1	22.5	3	R	100.	DHM-121	10	1	R
87.	SEPARATELY	27.5	3	R	101.	KNMH-131	20.40	3	R
88.	EC-619098	30.15	4	MR	102.	KNMH-141	15.80	2	R
89.	CLQ-PCY	25.30	3	R	103.	KAVERI-50	12.5	2	R
90.	CML-165	30	3	R	104.	CM-202 (Check)	72.20	8	S

Table 3: Per cent diseased leaf area of maize entries (hybrids) to turicum leaf blight disease during *rabi*, 2019-2020

Sl no.	Entries	% diseased leaf area	Score	Reaction	Sl no.	Entries	% diseased leaf area	Score	Reaction
1.	1×BML-32	17.5	2	R	23	14×BML-32	17.5	2	R
2.	2×50-2-1	10.90	2	R	24	14×BML-6	22.5	3	R
3.	2×BML-4	15	2	R	25	15×605-1-1	17.5	2	R
4.	2×BML-45	12.50	2	R	26	15×BML-20	15	2	R
5.	2×BML-7	12.56	2	R	27	15×BML-45	17.5	2	R
6.	4×605-1-2	12.52	2	R	28	CIM15×PFSR-3	12.50	2	R
7.	6×50-2-1	15	2	R	29	16×BML-14	12.54	2	R
8.	6× BML-20	15	2	R	30	16×BML-32	12.58	2	R
9.	6×BML-45	12.5	2	R	31	16×BML-45	11	2	R
10.	6×BML-7	12.54	2	R	32	16×BML-7	12.5	2	R
11.	7×50-2-1	15	2	R	33	17×605-1-2	8.75	1	R
12.	7×BML-14	10.70	2	R	34	17×BML-45	20	2	R
13.	8×605-1-1	15	2	R	35	17×BML-6	25	3	R
14.	8×BML-32	20	2	R	36	17×BML-7	20	2	R
15.	9×605-1-2	20	2	R	37	18×BML-14	17.5	2	R
16.	9×BML-20	22.5	3	R	38	18×BML-32	15	2	R
17.	9×BML-6	22.56	3	R	39	18×BML-45	17.5	2	R
18.	9×BML-7	15	2	R	40	52×605-1-1	15	2	R
19.	10×BML-32	20	2	R	41	52× BML-7	15	2	R
20.	12×BML-32	20	2	R	42	53×605-1-2	17.5	2	R
21.	13×BML-14	27.5	3	R	43	53×BML-14	20	2	R
22.	13×BML-6	27.58	3	R	44	53×BML-45	20.10	3	R

Table 3: Continue...



S l. no.	Entries	% diseased leaf area	Score	Reaction	S l. no.	Entries	% diseased leaf area	Score	Reaction
45.	59×605-1-2	20.40	3	R	74.	116× BML-6	12.5	2	R
46.	62×50-2-1	20	2	R	75.	119× BML-14	15	2	R
47.	62×BML-14	17.5	2	R	76.	131× PFSR-3	17.5	2	R
48.	62×BML-20	20	2	R	77.	145× BML-32	15	2	R
49.	62×BML-45	15	2	R	78.	151× BML-14	15.60	2	R
50.	62×BML-6	20	2	R	79.	151× BML-6	15	2	R
51.	62×BML-7	20.50	3	R	80.	151× BML-7	20	2	R
52.	62×PFSR-3	20	2	R	81.	155× BML-14	17.5	2	R
53.	85×605-1-2	27.5	3	R	82.	155× BML-32	17.52	2	R
54.	85×BML-6	17.5	2	R	83.	184× BML-32	17.5	2	R
55.	CIM101× BML-7	20	2	R	84.	184× BML-6	15	2	R
56.	CIM101×PFSR-3	15	2	R	85.	184× PFSR-3	15	2	R
57.	101× 50-2-1	15.60	2	R	86.	186× BML-32	10	1	R
58.	101× 605-1-1	15	2	R	87.	187× PFSR-3	12.5	2	R
59.	105× PFSR-3	15.40	2	R	88.	188× BML-45	20	2	R
60.	107× BML-20	12.5	2	R	89.	188× BML-7	17.5	2	R
61.	107× BML-32	17.5	2	R	90.	188× PFSR-3	15	2	R
62.	107× BML-45	12.5	2	R	91.	193× 605-1-2	15	2	R
63.	107× BML-7	10	1	R	92.	193× BML-32	17.5	2	R
64.	107× PFSR-3	12.5	2	R	93.	193× BML-6	17.54	2	R
65.	107× BML-20	15	2	R	94.	193× PFSR-3	17.5	2	R
66.	108× BML-32	20	2	R	95.	195× BML-6	17.58	2	R
67.	108× BML-45	17.5	2	R	96.	196× 50-2-1	15	2	R
68.	111× 605-1-1	15	2	R	97.	196× BML-32	15	2	R
69.	111× 605-1-2	12.5	2	R	98.	196× BML-7	17.5	2	R
70.	111× BML-14	12.5	2	R	99.	199× BML-6	15	2	R
71.	111× BML-20	20	2	R	100.	199× PFSR-3	20	2	R
72.	111× BML-45	20	2	R	Check	CM-202	74.30	8	S
73.	111× BML-6	17.5	2	R					

against Turcicum leaf blight of maize. Babita and Mani (2011) screened the temperate maize lines against northern corn leaf blight and found five inbreds resistant to disease. Shankara and Gowda (2011) identified 56 moderately resistant genotypes and two inbreds (NAI-125, NAI-137) showed moderately resistant reaction. Ishfaq et al. (2014) carried out a disease reaction studies against turcicum leaf blight were done with two crosses viz., 15C (A) x I-318 (R) and I-401(A)×I-318(R) for all six generations with P1, P2, F1, F2, BC1 and BC2 and results revealed significant variability has been exhibited by fungus to infect different generations of a particular cross. In I-15C (A)×I-318(R) cross, F1 was moderately resistant to turcicum leaf

blight but F1 of I-401(A)×I-318(R) cross was moderately susceptible to the disease. Mitiku et al. (2014) results revealed that the variety BH660 was highly resistant with the incidence of 13.7% and variety BH543 was susceptible with the incidence of 52.3%. Out of 26 maize genotypes, 8 genotypes viz., PS 39, CML 451, CML 470, CML 472, VL1030, VL 1018140, VL1018527 and SMI178-1 were found resistant and eight genotypes viz., PS45, CML165, CML459, VL1249, VL0536, SMC-5, SMC-3 and KDL 211 were found moderately resistant against *E. turcicum* with disease grade ranged from 2.1–2.5 (Ahangar et al., 2016). One hundred inbred lines each of early maturing (EM) and extra-early maturing (EEM) were tested against



Table 4: Per cent diseased leaf area of maize entries (hybrids) to turicum leaf blight disease during Kharif-2020

Sl. no.	Entries	% diseased leaf area	Score	Reaction	Sl. no.	Entries	% diseased leaf area	Score	Reaction
1.	70531×CML 156	10	1	R	39.	72336× 33-1-4	11.5	2	R
2.	70576× BML 7	13.3	2	R	40.	72555× CML 156	8.5	1	R
3.	70530 CML 156	12.6	2	R	41.	72343× 11-2-1	12.5	2	R
4.	70531×11-2-1	14.6	2	R	42.	72554× 605-1-2	12	2	R
5.	70531×50-2-1	11	2	R	43.	72555× 33-1-4	9	1	R
6.	70530× BML 45	9.1	1	R	44.	72555× BML 45	12.5	2	R
7.	70537×BML 45	16	2	R	45.	70425× BML 45	6	1	R
8.	70530×11-2-1	9.5	1	R	46.	72520× CML 156	8	1	R
9.	70425× BML 6	6.0	1	R	47.	72504× CML 156	9.5	1	R
10.	72554× 50-2-1	8.5	1	R	48.	72343× 605-1-1	15.5	2	R
11.	72513× KML 225	13.5	2	R	49.	70474× 50-2-1	7	1	R
12.	72555× BML 7	8.5	1	R	50.	72555× 11-2-1	9	1	R
13.	72343× 50-2-1	7.0	1	R	51.	72555× 50-2-1	15	2	R
14.	72336 ×11-2-1	8.5	1	R	52.	70474× BML 7	12.5	2	R
15.	72336 × CML 156	10	1	R	53.	72601× 605-1-2	17.5	2	R
16.	72343 × BML 45	6.5	1	R	54.	72568× CML 156	25	3	R
17.	72336 × 66-1-1	13	2	R	55.	70425× CML 156	16	2	R
18.	72603 × 66-1-1	7.5	1	R	56.	72568× BML 14	7.5	1	R
19.	72513 × CML 156	9.5	1	R	57.	72568× 11-2-1	12	2	R
20.	72343 × 66-1-1	11.0	2	R	58.	72568× 33-1-4	12.5	2	R
21.	732374× 66-1-1	11.5	2	R	59.	72568× BML 45	17.5	2	R
22.	72336× BML 7	15.5	2	R	60.	72601× 605-1-1	11.5	2	R
23.	70404× BML 45	12.5	2	R	61.	72307× CML 156	12.5	2	R
24.	72343× 605-1-2	11.5	2	R	62.	72307× 11-2-1	12.58	2	R
25.	70531× BML 45	6.20	1	R	63.	72686× PFSR 3	10	1	R
26.	72603× CML 156	7.0	1	R	64.	72686× CML 156	12.5	2	R
27.	72555×66-1-1	9.5	1	R	65.	70425× BML 7	22.7	3	R
28.	72374×11-2-1	12	2	R	66.	72686× BML 6	27.5	3	R
29.	72336× BML 6	10	1	R	67.	72260× CML 156	10	1	R
30.	70439× CML 156	6	1	R	68.	72307× BML 45	15	2	R
31.	70576×50-2-1	6.5	1	R	69.	72686× KML 225	12.5	2	R
32.	72555× 605-1-1	6.54	1	R	70.	72686× 11-2-1	12.56	2	R
33.	70474× 11-2-1	12	2	R	71.	KNMH-131	12.50	2	R
34.	72555× BML 6	9.5	1	R	72.	KNMH141	12.58	2	R
35.	72603× BML 45	13	2	R	73.	KNMH-4191	34.26	4	MR
36.	70474× 33-1-4	12	2	R	74.	KNMH-4192	42.60	5	MR
37.	72336× 50-2-1	8.5	1	R	75.	DHM-117	35.40	4	MR
38.	72374× BML- 7	10	1	R					

TLB disease and recorded average disease severity values ranged from 1.9–5.8 and 2.9–5.7 for the EM and EEM inbred lines, respectively (Baffour et al., 2021). Out of 135 genotypes, 34 genotypes expressed moderately resistant reaction, 73 showed moderately susceptible reaction and 29 genotypes exhibited susceptibility reaction to TLB disease (Mallikarjuna et al., 2018). Wani et al., 2018% disease severity was recorded in two inbred lines, viz., NAI-112 and NAI-147 and one hybrid, viz., HQPM-1 was found resistant to turicum leaf blight disease. Out of twenty six maize hybrids were evaluated along with check hybrids against turicum leaf blight disease resistance, two hybrids viz., AH4158 and AH4142 were found to be resistant to turicum leaf blight disease (Meghashri and Motagi, 2020). Out of 237, 41 inbred lines were found resistant (disease incidence <3.0), 181 inbred lines were moderately resistant (disease incidence 3.1–5.0) and 15 inbred lines

were moderately susceptible (disease incidence 5.1–7.0) (Singh et al., 2018).

4. CONCLUSION

In *rabi*, 2019–2020, out of two hundred five lines, 5 entries viz., IB-140, DHM-121, 17×605-1-2, 107×BML-7 and 186×BML-32 were identified with a disease score 1 and CM-202 recorded 74.30% diseased leaf area and in *kharif*, 2020, out of ninety eight entries, forty one entries were noticed with a disease score 1, remaining were recorded with disease score from 2–7 and one line CM-202 was observed with high 72.46% diseased leaf area, severely affected by turicum leaf blight disease and rated as susceptible. Breeders use these identified resistant lines in crossing program to develop high yield turicum leaf blight disease resistant hybrid varieties.

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Table 5: per cent diseased leaf area of maize Inbreds to turicum leaf blight disease during *kharif*, 2020

Sl. no.	Inbreds	% diseased leaf area	Score	Reaction
1.	605-1-1	15	2	R
2.	605-1-2	12.5	2	R
3.	33-1-4	12.56	2	R
4.	50-2-1	12.58	2	R
5.	66-1-1	10	1	R
6.	11 -2- 1	12.5	2	R
7.	524-3-2	10	1	R
8.	31-2-4	10	1	R
9.	207-1-3	10	1	R
10.	207-1-2	12.5	2	R
11.	244-1-2	10	1	R
12.	186-5-3	15	2	R
13.	1- 3- 1	12.9	2	R
14.	4- 2- 1	12.5	2	R
15.	539-3-1	13.5	2	R
16.	540-2-3	10	1	R
17.	524-2-1	12.5	2	R
18.	388-2-1	10	1	R
19.	471-1-3	15	2	R
20.	186-4-3	10	1	R
21.	KML-225	10	1	R
22.	PFSR-3	12.5	2	R
Check	CM-202	72.46	8	S



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