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Screening of Sorghum Varieties, Cultivars and Hybrids against *Colletotrichum graminicola*

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A B S T R A C T

Fifteen sorghum genotypes obtained from Sorghum Research Station, VNMKV, Parbhani were screened against *Colletotrichum graminicola* during *Kharif*, 2014-15 (flowering stage) at Sorghum Research Station, VNMKV, Parbhani under natural field conditions. Test cultivars were sown during last week of June with a spacing of 45 x 15 cm with three replications. Observations on percent anthracnose disease incidence were recorded 15 days before harvesting of the crop for screening purpose. The result indicated that (8.53%) anthracnose incidence was observed in cv.CSV-8R. E36-1 recorded lowest (2.89%) anthracnose incidence which was at par with SPV 2250, CSV 27, CSV 20, M 35-1 and significantly superior over rest of the entries.

Introduction

Sorghum (*Sorghum bicolor* (L.) Moench), is an important cereal crop in India popularly known as 'Jowar' and large size of among other grain millets is called 'Great millet'. In India the production is concentrated in the four states Maharashtra, Karnataka, Andhra Pradesh and Gujarat; it is next in importance to rice and wheat and is planted on nearly 5.84 million hectares with an annual production of 5.90 million tones (Anonymous, 2013). Maharashtra contributes 23.81 lakh hectares and 8.82 lakh hectares areas with production of 11.19 and 13.25 lakh tonnes in *Rabi* and *Kharif* respectively (Anonymous, 2013). Powell *et al.*, (1977) reported that grain yield was reduced by 70% and more than half the yield loss resulted from incomplete grain fill as verified by 42% decrease in 1000-seed mass and 17.2% decrease in seed density. Uttarakhand has been identified as hot spot for the anthracnose disease (Singh and Singh 2008). Anthracnose of sorghum was first reported from Togo in 1902 (Mughogho, 1988).

Materials and Methods

Fifteen sorghum genotypes obtained from Sorghum Research Station, VNMKV, Parbhani were screened against *Colletotrichum graminicola* during *Kharif*, 2014-15 (flowering stage) at Sorghum Research Station, VNMKV, Parbhani under

natural field conditions. Test cultivars were sown during last week of June with a spacing of 45 x 15 cm with three replications. Observations on percent anthracnose disease incidence were recorded 15 days before harvesting of the crop for screening purpose. Based on the percentage anthracnose incidence the cultivars were graded using 0-9 scale (Mayee and Datar, 1986) and grouped into respective categories as follows.

Results and Discussion

Reactions of sorghum varieties, cultivars and hybrids (Field)

In order to find out the sources of resistance in sorghum for anthracnose, 15 sorghum varieties, cultivars and hybrids were evaluated during *Kharif*, 2014-15 at Sorghum Research station, VNMKV, Parbhani. The result (Table 1, PLATE-I and II) indicated that (8.53%) anthracnose incidence was observed in cv. CSV-8R. E36-1 recorded lowest (2.89%) anthracnose incidence which was at par with SPV 2250, CSV 27, CSV 20, M 35-1 and significantly superior over rest of the entries.

Categorization of sorghum varieties, cultivars and hybrids

A total of 15sorghum varieties, cultivars, and hybrids were screened during *Kharif*, 2014-15 against *C. graminicola* under field conditions.

The observations on per cent anthracnose incidence were recorded before harvesting of the crop and test entries of sorghum were graded and categorized as immune, highly resistant, resistant, moderately susceptible, susceptible and highly susceptible.

Table.1 Reaction of sorghum varieties, cultivar and hybrids against *C. graminicola* (field)

Sr. No	Entry	Per cent Anthracnose	Varietal Reaction
1	SPH 1724	7.28	R
2	SPH 1736	7.97	R
3	SPV 2165	6.62	R
4	SPV 2242	5.99	R
5	SPV 2250	4.55	R
6	CSV-27	4.51	R
7	CSV-20	5.27	R
8	CSV-17	4.55	R
9	M 35-1	4.41	R
10	kekari local	5.89	R
11	CSV 23	6.03	R
12	Parbhani Moti	7.16	R
13	M35-1	4.26	R
14	E 36-1	2.89	R
15	CSV 8 R	8.53	R
	SE $\pm$	0.88	R
	C. D at 5%	**2.55**	-
	C. V. %	**11.19**	-

*Mean of two replications R = Resistance

Table.2 Categorization of sorghum varieties, cultivars and hybrids showing various reactions against *C. graminicola* under field conditions during *Kharif*, 2014-15

Disease Scale	Reaction	Per cent infection	Varieties
0	**Immune**	No symptom	Nil
1	**Highly resistant**	Less than 1 per cent	Nil
3	**Resistant**	1-10per cent	SPH 1724, SPH 1736, SPV 2165, SPV 2242, SPV 2250, CSV 27, CSV 17, M 35-1, Kekari local, CSV 23, Parbhani Moti M35-1, E 36-1 and CSV 8 R
5	**Moderately susceptible**	11-25 per cent	Nil
7	**Susceptible**	26-50per cent	Nil
9	**Highly susceptible**	51-100per cent	Nil

The percentage anthracnose incidence the cultivers were graded using 0-9 scale

Disease Scale	Reaction	Per cent infection
0	Immune.	No symptom
1	Highly resistant	Less than 1 per cent infection
3	Resistant	2-10per cent infection
5	Moderately susceptible	11-25 per cent infection
7	Susceptible	26-50per cent infection
9	Highly susceptible	51-100per cent infection

Plate.1

Plate.2

The results (Table 2) indicated that, the cultivars SPH 1724, SPH 1736, SPV 2165, SPV 2242, SPV 2250, CSV 27, CSV 17, M 35-1, Kekari local, CSV 23, Parbhani Moti M35-1, E 36-1 and CSV 8 R were found resistant to anthracnose disease. None of the sorghum entry was found susceptible to anthracnose disease.

Thus, sorghum varieties, cultivars and hybrids found resistant against *C. graminicola* could be further exploited either for breeding disease resistant varieties of sorghum or encouraged for commercial cultivation on large scale.

These results of the sorghum varieties, cultivars and hybrids reactions against *C. graminicola* under natural epiphytotics are on the same line as to that of reported earlier by several workers (Sharma, 1975; Ravindranath, 1978; Sharma *et al.*, 1982; Gupta *et al.*, 1996 and Mishra, 2008).

During this research work under natural epiphytotic conditions, all the fifteen sorghum entries evaluated, exhibited resistance against *C. graminicola*, with average disease incidence in the range of 2.89 to 8.53 per cent.

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