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Screening for identification of resistant sources of little millet varieties against banded blight disease incited by *Rhizoctonia solani* Kuhn

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Abstract

A field experiment was conducted during *kharif*, 2019 at the Agricultural Research Station, Vizianagaram, Acharya N. G. Ranga Agricultural University, to identify the resistant sources for *Rhizoctonia solani* which causes banded blight disease in little millet. Among them none of the variety could exhibit the immune reaction, whereas RLM 223 (check) recorded as highly susceptible to banded blight. The percent disease incidence of Banded blight (Sheath blight) ranged from 51.3% (GPUL 6) to 87.9% (TNPSU 186) where it was 98.3% in susceptible check RLM 223.

Keywords: Little millet, banded blight, *Rhizoctonia solani*, resistant, susceptible

Introduction

Little millet (*Panicum sumatrense* Roth ex Roemer and Schultes), locally known as kutki, mejhari, medois one of the hardiest minor cereal crop belonging to the family Poaceae (Gramineae) and is indigenous to Indian sub-continent. The crop is cultivated by tribal and poor farmers in low fertile soils with low or no cash input for food and feed. It has an excellent rejuvenating capacity compared to other cereal crops. In India, the crop is cultivated in an area of 291 thousand hectares with annual production of 102 thousand tones and productivity of 349 kg per hectare which is very less as compared to other cereal crops. Andhra Pradesh, Chhattisgarh, Madhya Pradesh, Odisha, Tamil Nadu, Karnataka, Jharkhand and Gujarat are major little millet growing states in the country.

Studies on management of sheath blight in little millet is meager in the literature, however few studies on identification of resistant sources and management through seed treatment with carbendazim has been reported. Although, disease can be controlled by application of different chemicals but this is not the right way to control diseases in the present context because chemical application has its many disadvantages like soil pollution, water pollution and environment hazardous. Now a day people are very conscious to health and they are moving to organic production and consumption. The growing of resistant genotypes of crops is one of the best ways to manage many biotic and abiotic stresses in organic crop production system. So the present study was focused on status of the disease in the farmers' field and identification of resistant sources.

Materials and Methods

A field experiment was conducted against sheath blight caused by *Rhizoctonia solani* during *kharif*, 2019 at Agricultural Research Station, Vizianagaram. The experiment was laid on a plot in Randomized Block Design, with 17 varieties, replicated three times which was sown in two rows of 3 m length with a spacing of 22.5 x 10 m. The recommended agronomic practices and other standard packages of practices were adopted at the time of crop growth period. Five randomly selected plants were selected from each genotype/replication for recording the observations. The genotypes of little millet were screened under natural epiphytotic conditions and no artificial inoculation was made. Infected plants were examined for lesion development and disease severity was assessed on the basis of lesion length by using 0 to 5 scale (Anon, 1996)^[1].

Table 1: Standard Evaluation System (SES) scale for sheath blight disease

Score	Description	Reaction
0	No incidence	Immune
1	Vertical spread of the lesions upto 20% of the plant height	HR
2	Vertical spread of the lesions upto 21-30% of the plant height	R
3	Vertical spread of the lesions upto 31-45% of the plant height	MR/MS
4	Vertical spread of the lesions upto 46-65% of the plant height	S
5	Vertical spread of the lesions upto 66-100% of the plant height	HS

Percent Disease Index (PDI) was calculated by using the formula

$$\text{PDI for severity} = \frac{\text{Sum of all disease ratings}}{\text{Total no. of ratings} \times \text{Maximum disease grade}} \times 100$$

Results and Discussion

Seventeen little millet varieties were screened for banded blight reaction. Among those, no variety was found to be immune to *R. solani* also none found to be resistant. Among them none of the variety could exhibit the immune reaction, whereas RLM 223 (check) recorded as highly susceptible to banded blight. The percent disease incidence of Banded blight (Sheath blight) ranged from 51.3% (GPUL 6) to 87.9% (TNPSU 186) where it was 98.3% in susceptible check RLM 223 (Table 2).

Patro and Madhuri (2014) [5] screened 19 little millet genotypes of different maturity groups and reported that RLM 43 as resistant genotype and JK 8 as susceptible genotype. Patro *et al.* (2014) [5] and Nagaraja *et al.* (2016) [2] reported that all the small millet crops were found infected with *R. solani*, whereas in the screening of little millet LAVT 19 and LAVT 14 were found as resistant genotypes. Similar research was also done in other small millet crops by Neeraja *et al.*, 2016, Patro *et al.*, 2013 and Patro *et al.*, 2016. Patro *et al.*, 2019 [3, 4, 7, 8] reported that IIMRLM-8437-7 (4.4) is found to be resistant when screened 24 varieties. These genotypes would be of immense value to the breeders involved in developing high yielding resistant genotypes of little millet.

Table 2: Evaluation of little millet genotypes against sheath blight

S. No.	Entry	Banded blight (%)
1	OLM 217	69.0
2	IIMR LM 7162	69.7
3	TNPSU 186	87.9
4	WV 125	61.7
5	OLM 18	52.0
6	GPUL 6	51.3
7	GPUL 7	73.3
8	IIMR LM 8400-17	72.7
9	IIMR LM-8437-17	68.7
10	TNPSU 203	73.3
11	TNPSU 177	77.7
12	DHLM 36-6	82.3
13	JK 8	60.0
14	OLM 203	55.7
15	BL 6	74.3
16	R(RLM 208)	18.7
17	S(RLM 223)	98.3
	Mean	67.4
	C.D. (5%)	11.1
	C.D. (1%)	14.9
	C.V. (%)	11.9

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