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TSSK Patro
Acharya N.G. Ranga Agricultural University, Agricultural Research Station, Vizianagaram, Andhra Pradesh, India

S Raj Kumar
Acharya N.G. Ranga Agricultural University, Agricultural Research Station, Vizianagaram, Andhra Pradesh, India

A Meena
Acharya N.G. Ranga Agricultural University, Agricultural Research Station, Vizianagaram, Andhra Pradesh, India

N Anuradha
Acharya N.G. Ranga Agricultural University, Agricultural Research Station, Vizianagaram, Andhra Pradesh, India

U Triveni
Acharya N.G. Ranga Agricultural University, Agricultural Research Station, Vizianagaram, Andhra Pradesh, India

P Joga Rao
Acharya N.G. Ranga Agricultural University, Agricultural Research Station, Vizianagaram, Andhra Pradesh, India

Corresponding Author:
TSSK Patro
Acharya N.G. Ranga Agricultural University, Agricultural Research Station, Vizianagaram, Andhra Pradesh, India

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

TSSK Patro, S Raj Kumar, A Meena, N Anuradha, U Triveni and P Joga Rao

Abstract
A field experiment was conducted during *kharif*, 2018 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, in which one variety is found to be resistant and three varieties are found to be moderately resistant whereas RLM 223 (check) recorded as highly susceptible to banded blight. The percent disease incidence of Banded blight (Sheath blight) ranged from 4.4% (IIMRLM-8437-17) to 92.0% (JK 8 and TNPSu 202) where it was 95.3% 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*, 2018 at Agricultural Research Station, Vizianagaram. The experiment was laid on a plot in Randomized Block Design, with 24 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

Twenty four 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. However, one variety IIMRLM-8437-7 (4.4) is found to be resistant, IIMRLM-8400-17 (43.2), WV 126 (44.4), and BL-6 (35.2) as moderately resistant. TNPSu 202 (92.0) and JK 8 (92.0) was found to be as susceptible. Whereas, RLM 208 (resistant check) was recorded 9.5% and RLM 223 (susceptible check) was recorded 95.3% (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 [3, 7], Patro *et al*., 2013 [4] and Patro *et al*., 2016 [7]. 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 (%)	Reaction
1	WV 164	62.2	S
2	VS 13	59.7	S
3	GPUL 7	70.2	HS
4	DHLT 28-4	79.2	HS
5	IIMRLM-8400-17	43.2	MR
6	IIMR LM 7162	47.2	S
7	TNPSu 177	51.2	S
8	GPUL 6	87.2	HS
9	TNPSu 203	90.9	HS
10	OLM 203	87.2	HS
11	TNPSu 186	50.9	S
12	WV 126	44.4	MR
13	WV 125	49.2	S
14	BL 6	35.2	MR
15	IIMRLM-8437-17	4.4	R
16	LMNDL-1	91.3	HS
17	OLM 217	90.7	HS
18	JK 8	92.0	HS
19	GLM 368	85.2	HS
20	OLM 18	87.2	HS
21	TNPSu 202	92.0	HS
22	TNPSu 176	50.1	S
23	R(RLM 208)	9.5	R
24	S(RLM 223)	95.3	HS
	Mean	64.8	
	C.D. (5%)	13.3	
	C.D. (1%)	17.8	
	C.V. (%)	12.5	

*R=Resistant, S=Susceptible, MR= Moderately Resistant, HS= Highly Susceptible

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