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Identification of Potent Resistant Varieties of Proso millet against Banded Blight Disease incited by *Rhizoctonia solani* Kuhn.

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ABSTRACT

A total of 11 proso millet varieties including checks were evaluated for identification of resistance source against banded blight disease at Agricultural Research Station, Vizianagaram during *kharif*, 2021 under natural field conditions. Among the screened entries, none of the test lines or varieties were immune or highly resistant. However, TNPm-310 (21.53%), TNPm-311 (21.87%), TNPm-315 (25.53%) were found to be moderately resistant. The disease severity ranged from 21.53% (TNPm-310) to 47.60% (TNPm 318). Whereas, it was 72.27% in (Nilavoor local) susceptible check and 7.93% in (TNPm 230) resistant check.

Keywords: *Banded blight, Proso millet, Resistance and Susceptible.*

Small millet crops belonging to Poaceae have a long history of more than 5000 years of cultivation and grow in many states (Gowda *et al*., 2006). Due to their unique adaptation properties for poor degraded lands and ability to tolerate abiotic stresses they serve as high quality fodder crops with high nutritive value. Small millets are hitherto staple food for millions of people residing in arid and semiarid regions of Asian and African countries and are currently restricted to certain traditional growing areas. Changes in life style has increased health problems and have driven people to rethink their food habits resulting in deliberate shift toward nutritional crops, such as small millets (Anuradha *et al*., 2022). In India, the antiquity of proso millet (*Panicum milliaceum* L.) is not clear. The crop is cultivated in sporadic patches from the Himalayas in the north and to Tamil Nadu in the south (Nagaraja *et al*. 2007). It is grown in Madhya Pradesh, Andhra Pradesh, Karnataka, Tamil Nadu, Maharashtra, Bihar, Uttar Pradesh and Uttarakhand (Sinha and Upadhyay, 1997). Incidentally, proso millet is known to be affected by several diseases.

Being a low value crop, it doesn't offered much scope for additional cash inputs like fungicides and chemical methods of disease control are generally not advisable, hence growing resistant varieties is the best option. Screening of varieties with inbuilt genetic resistance is the best means for management of Banded blight disease, as the crop is predominantly grown by resource poor farmers who can hardly afford using chemicals for its control (Das *et al*., 2021). So an attempt was made to identify the sheath blight resistant lines in Prosomillet germplasm lines.

MATERIAL AND METHODS

Eleven entries of proso millet initial advanced varieties were evaluated at ARS, Vizianagaram. These entries were evaluated in two rows of 3 m length sown at 22.5×10 cm spacing in infector row method using Nilavoor Local as a susceptible check and TNPm 230 as resistant check so as to ensure the availability of sufficient inoculum during *kharif* 2021. Banded blight (BB) severity was recorded by using 0 to 5 scale (Anon, 1996) (Table 1).

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

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

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

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

RESULTS AND DISCUSSION

A total of eleven proso millet entries were evaluated during *kharif* 2021 against banded blight disease incited by *Rhizoctonia solani* Kuhn. The screening revealed that none of the test lines or varieties were immune or highly resistant to banded blight. However, TNPm-310 (21.53%), TNPm-311 (21.87%), TNPm-315 (25.53%) were found to be moderately resistant. The disease severity was ranged from 21.53% (TNPm-310) to 47.60% (TNPm 318). Whereas, 72.27% PDI was observed in susceptible check and 7.93% PDI was recorded in resistant check (Table 2)

Table 2: Evaluation of proso millet genotypes against banded blight

S.No.	Entry	Banded blight (%)	Yield/ plot (g)
1	TNPm-310	21.53	105.43
2	TNPm-311	21.87	91.23
3	TNPm-312	35.07	69.17
4	TNPm-313	29.33	83.33
5	TNPm-314	34.47	67.87
6	TNPm-315	25.53	99.27
7	TNPm-316	36.80	72.27
8	TNPm-317	43.93	53.60
9	TNPm-318	47.60	48.53
10	TNPm 230 (R)	7.93	182.93
11	Nilavoor local (S)	72.27	27.83
	Mean	**34.21**	**81.95**
	C.D. (5%)	**8.3**	**11.5**
	C.D. (1%)	**11.3**	**15.7**
	C.V. (%)	**14.2**	**8.2**

Patro *et al.,* (2015) screened 18 proso millet genotypes and reported DhPrMv 2164 (29.23%) and DhPrMv 2769 (28.90%) as resistant to moderately resistant genotypes. Patro *et al.* (2017) screened eleven varieties and reported minimum disease severity (64.00%) in TNAU 145 whereas it was 90.67 % in check. Patro *et al.,* (2021) reported that the disease intensity was less in TNPm 247 (64.00) followed by GPUP 21 (68.00) and was highest in TNAU 151 (81.33) followed by GPUP (76.00) when screened 8 proso millet entries against *R. solani.* Patro *et al.,* 2020 evaluated 20 proso millet varieties including checks for identification of resistance source to banded blight and revealed that none of the test lines or varieties was immune, highly resistant or resistant to the disease. They reported that these genotypes would be of immense value to the breeders involved in developing high yielding resistant genotypes of little millet.

Patro *et al.,* (2014) and Nagaraja *et al.,* (2016) reported that all the small millet crops were found infected with *R. solani*. Similar research was also done in other small millet crops by Patro *et al*., (2013) and Patro *et al*., (2016).

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