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Evaluation of resistant sources of barnyard millet varieties against banded blight disease

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Abstract

A total of 9 barnyard millet varieties including check were evaluated for resistance to banded blight at Agricultural Research Station, Vizianagaram during *kharif*, 2017-18. The experiment was conducted under field condition. The screening revealed that none of the test lines or varieties was immune or highly resistant. However, TNEf 204 (49.33) and VL 172 (45.33) was recorded as moderately susceptible and DHBM 99-6, DHBM 19-7 and RBM 36 (73.33) were recorded as susceptible, VMBC 331 (local) as highly susceptible, it was 90.67% in susceptible check. Mean of all five locations has revealed that VL 172 (132.52) as resistant and three varieties were moderately susceptible. However, highest disease was recorded in DHBM 19-7 (77.85).

Keywords: barnyard millet, screening, banded blight, resistant, susceptible

Introduction

Small millet crops have a long history of cultivation of more than 5000 years and grown in many states (Gowda *et al.*, 2006)^[3] due to their unique adaptation properties for poor degraded lands and ability to tolerate abiotic stress. They belong to family Poaceae (Graminae) and are mostly cultivated as rainfed crops on marginal soils. Six small millets *viz.*, finger millet, barnyard millet, foxtail millet, proso millet, kodo millet and little millet are the most important small millet crops of India. Among these, barnyard millet (*Echinochloa frumentacea* (Roxb.) also called as Oдалу, Jhangora, Sawan, Kuthiravali, Kavdapullu has emerged as very important dual purpose feed and fodder crop. Barnyard millet is grown in many countries like India, China, Japan, Malaysia, East Indies, Africa and United States of America. In India, it is grown in Andhra Pradesh, Madhya Pradesh, Uttar Pradesh, Uttarakhand, Tamil Nadu, Karnataka, Maharashtra and Bihar.

It has 6 times high fiber content when compared with wheat. It is high in phosphorous, calcium and fiber. It is high in carbohydrates and fat too. It helps to maintain the body temperature. It acts as a good anti oxidant too. Barnyard millets are. Barnyard has low glycemic index and thus helps in type 2 diabetes, cardiovascular disease with regular intake of this millet. Its straw provides a good quality fodder for cattle, which is an important component of sustainable hill farming system, as fodder becomes scarce during winter. It is also used as feed for caged birds. Incidentally, barnyard millet is known to be affected by several diseases (Pall *et al.* 1980)^[7]. During 2007, in a routine survey for diseases of small millets first report of naturally occurred symptoms of banded sheath blight disease on barnyard millet caused by *Rhizoctonia solani* was recorded (Nagaraja *et al.*, 2007)^[5]. During *kharif* 2007, fast spreading symptoms of banded leaf and sheath blight (BLSB) were observed on barnyard millet (*Echinochloa frumentacea*) at late tillering stage in the experimental fields of Madhya Pradesh (Kumar and Prasad, 2009)^[4]. As it is a low value crop doesn't offer much scope for additional cash inputs like fungicides and chemical methods of control are generally not advisable, hence growing resistant varieties is the best option. Very little efforts have been made to identify the resistant sources of barnyard millet against banded leaf blight disease. So an attempt was made to identify the sheath blight resistant lines.

Material and Methods

Nine barnyard advanced varieties were evaluated at three locations *viz.*, Athiyandal, Mandhya and Vizianagaram falling under different agro climatic situations. These entries were evaluated in two rows of 3 m length sown at 22.5 × 10 cm spacing in infector row method using VBMC-331 as a susceptible check so as to ensure the availability of sufficient inoculum during *kharif*.

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2017-18. Banded blight (BB) was recorded by using 0 to 9 scale (Anon, 1996)^[1].

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
3	Vertical spread of the lesions up to 21-30% of plant height	MR
5	Vertical spread of the lesions up to 31-45% of plant height	MS
7	Vertical spread of the lesions up to 46-65% of plant height	S
9	Vertical spread of the lesions up to 66-100% of plant height	HS

Data was taken and expressed in percentage. The Percent Disease Index (PDI) was calculated by using the following formula:

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

Results and Discussion

Nine entries were evaluated during *kharif* 2017-18 in barnyard millet initial advanced variety trial (BIAVT). The screening revealed that none of the test lines or varieties was immune or highly resistant. However, TNEf 204 (49.33) and VL 172 (45.33) was recorded as moderately susceptible and DHBM 99-6, DHBM 19-7 and RBM 36 (73.33) were recorded as susceptible, VMBC 331 (local) as highly susceptible. Percent disease severity ranged from 45.33% (VL 172) to 77.33% (DHBM 99-6, DHBM 19-7 and RBM 36) whereas it was 90.67% in susceptible check (Table 2). Mean of all three locations has revealed that VL 172 (132.52) as resistant, TNEf 204 (46.82) and VL 204 (48.40) as moderately susceptible. However, highest disease was

recorded in DHBM 19-7 (77.85) followed by DHBM 99-6 (71.98).

Patro *et al.*, (2017)^[5] evaluated ten varieties where the disease intensity ranges from 85.33% (VL 207) to 97.33% (DHBM 18-6, VL 249 and DHBM 99-6) while it was 98.67% in the local check. Divya *et al.*, (2016)^[2] evaluated thirteen varieties the percentage disease intensity ranged from 27.9% (ACM 10-082) to 92.5% (RBM 7-2) whereas it was 93.7% in susceptible check. Mean of all five locations revealed that ACM 10-082 as highly resistant, VL 172 and DHB 23-3 as resistant and remaining varieties as moderately resistant. Patro *et al.* (2014)^[9] and Nagaraja *et al.* (2016)^[5] 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^[10, 11]. These genotypes would be of immense value to the breeders involved in developing high yielding resistant genotypes of little millet.

Table 2: Reaction of Barnyard millet varieties to banded blight

S. No.	Entry	Vizianagaram	Entry	Mean over three centers
1	VL 249	61.33	VL 249	56.62
2	DHBM 99-6	73.33	DHBM 99-6	71.98
3	TNEf 204	49.33	TNEf 204	46.82
4	DHBM 19-7	73.33	DHBM 19-7	77.85
5	RBM 36	73.33	RBM 36	65.90
6	DHBM 33	72.00	DHBM 33	71.35
7	VL 172	45.33	VL 172	32.52
8	VL 207	60.00	VL 207	48.40
9	VMBC 331	90.67	VMBC 331	
	Mean	66.52	Mean	58.93
	CD (5%)	8.23	CD (5%)	19.51
	CV	8.61	CV	14.00

References

- Anonymous. Standard evaluation system for rice. International Rice Testing programme. International Rice Research Institute Report, Philippines, 1996.
- Divya M, Patro TSSK, Ashok S. Evaluation of resistant sources of Barnyard millet varieties against banded blight (BB) disease incited by *Rhizoctonia solani* Khun. *Frontiers in Cxrop Improvement*. 2016; 4(2):99-100.
- Gowda KTK, Gowda J, Ashok EG, Nagaraja A, Jagadish, PS, Sashidhar VR *et al.* Technology for increasing finger millet and other small millets production in India. Project Coordinating Cell, ICAR, UAS, GKVK Campus, Bangalore. 2006, 41.
- Kumar B, Prasad D. First record of banded sheath blight disease of barnyard millet caused by *Rhizoctonia solani*. *J Mycol PI Pathol*. 2009; 39(2):352-354.
- Nagaraja A, Bijendra Kumar, Jain AK, Patro TSSK, Nageswar Rao TG. Diseases of small millets. Diseases of field crops and their management. *Indian Phytopathological Society*. New Delhi. 2016, 295-371.
- Nagaraja A, Kumar J, Jain AK, Narasimhudu Y, Raghuchander T, Kumar B, Gowda HB. Compendium of Small Millets Diseases. Project Coordination Cell, All India Coordinated Small Millets Improvement Project, UAS, GKVK Campus, Bangalore. 2007, 80.
- Pall BS, Jain AC, Singh SP. Diseases of lesser millets. *Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jawalpur (Madhya Pradesh), India*. 1980, 55-57.
- Patro TSSK, Anuradha N, Madhuri J, Suma Y, Soujanya A. Identification of resistant sources for blast disease in finger millet (*Eleusine coracana* Gaertn.). *Varietal Improvement of Small Millets*. National seminar on

“Recent Advances of Varietal Improvement in Small Millets. 2013, 5-6.

9. Patro TSSK, Divya M, Sandhya Rani Y, Triveni U, Anuradha N. Identification of resistant sources against *Rhizoctonia solani* Khun, the incitant of sheath blight of *Echinochloa frumentacea*. Progressive Research- An International Journal. 2017; 12(1):125-126.
10. Patro TSSK, Neeraja B, Rani SY, Keerthi S, Jyothsna S. Banded blight – An emerging malady in small millets. National conference on emerging challenges and opportunities in biotic and abiotic management. Society for scientific development in agriculture and technology, Meerut, India. 2014, 120.
11. Patro TSSK, Neeraja B, Sandhya Rani Y, Jyothsna S, Keerthi S, Bansal A. Reaction of elite finger millet varieties against blast disease incited by *Magnaporthe grisea* in vivo. Progressive Research- An International Journal. 2016; 11(2):209-212.