International Journal
of Pure & Applied
Bioscience

Reaction of Kodo millet Germplasm for Resistance to Leaf Blight under Natural Field Conditions

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ABSTRACT

In the present investigation 26 kodo millet germplasm available at the National Active Germplasm Site (NAGS) of the Project Coordinating Unit (Small Millets), were screened for resistance against natural incidence of leaf blight at the Zonal Agricultural Research Station (ZARS) G.K.V.K Bengaluru during Kharif 15. Among them, only one genotype i.e. JK 41 was found to be moderately resistant, 12 were moderately susceptible and 10 were susceptible with three genotypes showing highly susceptible reaction, but none of the lines were resistant.

Key words: *Leaf blight, Kodo millet, Field conditions.*

INTRODUCTIO

Kodo is the hardiest crop among the millets. The kodo rice contains high amount of fiber with low fat and thus is good for people suffering from diabetes. Although head smut is the most important constraint in the production of this crop, several other fungi attack the crop causing various diseases. Among them, leaf blight reported 2-3 years back in a severe form is one of the emerging diseases [3]. Since the economic returns from the cultivation of kodo are not much, advocating chemicals for the disease management may not be a viable proposition. Hence, cultivation of resistant varieties is a non cash input and can be an important management practice.

Farmers are dependent upon chemicals and cultural measures to manage the disease. Chemical control is expensive, causes environmental pollution, and is a threat to the health of farmers and consumers. Cultural measures, especially use of healthy planting material, destruction of plant debris, wider planting density, and the economic use of fertilizers, do provide protection to the disease but not completely. However, the combination of the cultural measures and the use of resistant cultivars can reduce the disease problem and improve the profitability of crop production to a large extent[4]. This paper focuses on the identification of resistance source under disease endemic field conditions.

MATERIAL AND METHODS

The experimental material consisted of 26 germplasm collected from the Project Coordinating Unit on small millets, GKVK Bengaluru which was screened under natural disease pressure during *kharif* 2015.

Each entry was sown in three rows of three meter length kept at 30 cm apart. The experiment was laid in RBD with three replications. The crop was raised following recommended package of practices.

Observations on leaf blight were recorded when more than 50 per cent of the foliage showed blighting by counting number of infected plants. The disease grading was done as per the scale given by Adipala *et al*[1].

Scale	Description
0	No disease (no lesions identifiable on any of the leaves)
1	0.5 to 1.0 per cent of leaf surface diseased (a few restricted lesions on a few leaves)
2	5 to 10 per cent of leaf area diseased (several small or big lesions on many leaves)
3	10 to 15 per cent of leaf surface diseased (numerous small and large lesions on many leaves)
4	20 - 35 per cent of leaf surface diseased (many large and coalesced lesions on many leaves)
5	45-75 per cent of leaf surface diseased; representing multitudes of coalesced lesions resulting in leaf wilting.

On the basis of disease grade obtained the genotypes were grouped into the following categories.

Disease Grade	Varietal Reaction
0	Highly Resistant (HR)
Up to 1.0	Resistant (R)
1.1 to 2.0	Moderately resistant (MR)
2.1 to 3.0	Moderately susceptible (MS)
3.1 to 4.0	Susceptible (S)
4.1 to 5.0	Highly Susceptible (HS)

RESULTS AND DISCUSSION

Twenty six germplasm lines of kodo millet were screened under disease endemic field for their resistance to leaf blight caused by *A. tenuissima*; among them, only JK-41 was found to be moderately resistant (1.1-2.0 grade). Of the remaining, 12 were moderately susceptible (2.1-3.0 grade) and 10 were susceptible (3.1-4.0 grade) and three genotypes showed highly susceptible reaction (4.1-5.0 grade) while none of the germplasm showed highly resistant (0-1 grade) and resistant reaction against the leaf blight

pathogen (Table 1). The results are in agreement with[2]. This is attributable to the genotypic constitution of each line that may differently react to pathogen attack.

Breeding varieties with in-built resistance to any disease is the most cost effective, and environment, farmers friendly practice. This is especially true in millets as they are mostly grown by resource poor farmers, in marginal soils under minimum management. In low value crops like kodo millet breeding for horizontal or rate reducing resistance is very useful.

Table 1: Reaction of kodo millet germplasm for leaf blight

Grade	Reaction	Number of germplasm	Germplasm
0	Highly resistant	-	-
Up to 1.0	Resistant	-	-
1.1-2.0	Moderately resistant	01	JK-41
2.1-3.0	Moderately susceptible	12	JK-136, CO-2, GPS 9-1, JK-439, Indira kodo-1, GK-2, JK-62, RBK-155, K-1, JK-106, CO-3, APK-1
3.1-4.0	Susceptible	10	Nivas-101, JK-65, JK-13, JK-98, PSC-1, JK-76, JK-48, JNK-364, RK-65-18, JNK-101
4.1-5.0	Highly susceptible	03	GPUK-3, RK-390-25,TNAU-86

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