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Varietal screening of Niger against Alternaria blight

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Abstract

The study was conducted to evaluate the effects of different Niger varieties against Alternaria blight disease. The pot experimental was conducted under net house under artificial inoculation condition at the Plant Pathology Department, RCA, MPUAT, Udaipur during 2013 – 2015. Ten varieties of niger seed received from All India Coordinated Research Project on Sesame and Niger, Jabalpur (MP). The pooled data of 2013 and 2015, the results revealed that among ten varieties Utkal Niger- 150, IGPN-2004-1 and Gujarat Niger-1 were moderately resistant to Alternaria blight disease. However, the IGPN-2004-showed significantly less PDI- 17.60 per cent, followed by Utkal Niger- 150 (PDI- 18.10 per cent) and Gujarat Niger-1 (PDI- 22.88 per cent). Further, the variety RCR-18 and JNC-1 were at par with each other with PDI- 25.64 per cent. Varieties JNS-9, PDI- 26.14 per cent; Gujarat Niger-2, PDI- 26.65 per cent; JNC-6, 34.44; Birsa Niger-2, PDI 39.21 and local land race, PDI 40.72 per cent were moderately susceptible. However none of the varieties was found highly resistant.

Keywords: Varietal screening, Niger, Alternaria blight

Introduction

Alternaria blight is the most serious and devastating diseases of niger caused by *Alternaria porri* (Ell.) (Rajpurohit, 2011) [6]. Diseases cause heavy damage upto 35-40 per cent to this crop and reduce its seed yields upto 25-30 per cent, which harm the status of the farmers. The disease appears as concentric rings on the leaves, which later on turns brown with grey centre. As the disease advances, the spots become oval or circular and become irregular in shape. The infected leaves become dry and fall off prematurely. The pathogen also spreads to other plant parts like stem, bud, seeds and results in to complete drying of the whole plant. The disease is favoured by warm and humid climate (Getinet and Sharma 1996) [2]. Host plant resistance is an ultimate tool to keep away the diseases, a simple and low cost method to know the source of resistance.

Material and Method

Screening of niger germplasm / cultivars against Alternaria blight: The pot experiment was conducted under artificial inoculation conditions using 1-5 scale using ten varieties of niger seed received from All India Coordinated Research Project on Sesame and Niger, Jabalpur (MP). Seeds were sown in earthen pots 60 –Days- old plant will be inoculated with moderate inoculum density (1×10^3 conidia /ml) of *A. porri* and blight severity on 1-5 Scale, and number of plants in each score, 7 days after inoculation and then weekly intervals, starting from 60 days old plants till maturity and observation were recorded- Latent period and Diseases severity. Observations for disease severity were recorded by visual scoring as per the standard continuous rating 0-5 scale (Kolte, 1985) [3]. The details of the scale are as follows; 0= free from disease, 1= trace 1 - 10 per cent area of leaf and umbel blighted; 2 = 11-20 per cent area of leaf, stem and umbel blighted, 3 = 21-35 per cent area of leaf, stem and umbel blighted; 4 =36-60 per cent area of leaf, stem and infection on umbel and 5= more than 60 per cent of leaf, stem and umbel blighted. The disease reaction was qualitatively expressed as resistant (score 1 to 2), moderately resistant (score 2.1-3.0), or susceptible (score 3.1-5.0). Ten niger varieties were screened to find out the source of resistant against *A. porri* in the year 2013 and 2015. Observations on disease severity were recorded on the basis of symptoms developed on leaves after infection (Kong, *et al.*, 1995) [4].

Results and Discussion

In the year 2013, the results presented in Table 2 reveal that among ten varieties Utkal Niger-150, IGPN-2004-1 and Gujarat Niger-1 were moderately resistant to Alternaria blight disease. However, the IGPN-2004-showed significantly less PDI *i.e.* - 17.50 per cent, followed by

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Utkal Niger- 150 (PDI- 18.00 per cent) and Gujarat Niger-1 (PDI- 22.75 per cent). Further, the variety RCR-18 and JNC-1 were at par with each other with PDI- 25.50 per cent. Further JNS-9, PDI- 26.00 per cent; Gujarat Niger-2, PDI- 26.50 per cent; JNC-6, 34.25 per cent; Birsa Niger-2, PDI 39.00 and Birsa niger-1, PDI -40.50 were moderately susceptible. However none of varieties was found highly resistant.

In the year 2015, the results presented in Table 2 reveal that among ten varieties Utkal Niger- 150, IGPN-2004-1 and Gujarat Niger-1 were moderately resistant to *Alternaria* blight disease. However, the IGPN-2004-1 showed significantly less PDI- 17.69 per cent followed by Utkal Niger-150 (PDI- 18.20 per cent) and Gujarat Niger-1 (PDI- 23.00 per cent). Further, the variety RCR-18 and JNC-1 were at par with each other with PDI- 25.78 per cent. Further JNS-9, PDI- 26.29 per cent; Gujarat Niger-2, PDI- 26.79 per cent; JNC-6, 34.63 per cent; Birsa Niger-2, PDI 39.43 and local land variety, PDI - 40.95 were moderately susceptible. However, none of the varieties was found highly resistant.

In case of pooled data of 2013 and 2015, the results presented in Table 2 reveal that among ten varieties Utkal Niger- 150, IGPN-2004-1 and Gujarat Niger-1 were moderately resistant to *Alternaria* blight disease. However, the IGPN-2004-1 showed significantly less PDI- 17.60 per cent, followed by Utkal

Niger- 150 (PDI- 18.10 per cent) and Gujarat Niger-1 (PDI- 22.88 per cent). Further, the variety RCR-18 and JNC-1 were at par with each other with PDI- 25.64 per cent. Varieties JNS-9, PDI- 26.14 per cent; Gujarat Niger-2, PDI- 26.65 per cent; JNC-6, 34.44; Birsa Niger-2, PDI 39.21 and local land race, PDI 40.72 per cent were moderately susceptible. However none of the varieties was found highly resistant. Results are found similar to Mangala, *et al.* 2006 [5] and Chethana, *et al.* 2011 [1].

Table 1: Category based on Percent Disease Intensity

S. No.	Category based on PDI	Variety
1.	Immune	NIL
2.	Resistant	NIL
3.	Moderately resistant	IGPN-2004-1 (Phule Karala-1), Utkal Niger-150 and Guj. Niger-1
4.	Moderately susceptible	Variety – JNC-6, JNC-1, JNS-9, Guj. Niger-2, RCR-18, Birsa Niger-2 and local land race
5.	Susceptible	NIL
6.	Highly susceptible	NIL

Table 2: Screening of Niger cultivars against *Alternaria* blight (*Alternaria porri*) under pot conditions during Kharif 2013 and 2015

S. No.	Variety	Per cent Disease Index (PDI)			Disease Reaction
		2013	2015	Pooled	
1	JNC-6	34.25 (35.81)	34.63 (36.04)	34.44 (35.95)	MS
2	JNC-1	25.50 (30.26)	25.78 (30.44)	25.64 (30.35)	MS
3	JNS-9	26.00 (30.63)	26.29 (30.81)	26.14 (30.72)	MS
4	Utkal Niger-150	18.00 (25.07)	18.20 (25.22)	18.10 (25.15)	MR
5	IGPN-2004-1, (Phule Karala-1)	17.50 (24.71)	17.69 (24.86)	17.60 (24.78)	MR
6	Guj. Niger-1	22.75 (28.48)	23.00 (28.65)	22.88 (28.56)	MR
7	Guj. Niger-2	26.50 (30.98)	26.79 (31.17)	26.65 (31.07)	MS
8	RCR-18	25.50 (30.26)	25.78 (30.44)	25.64 (30.35)	MS
9	Birsa Niger-2 (BNS-8)	39.00 (38.63)	39.43 (38.88)	39.21 (38.75)	MS
10	Local land race	40.50 (39.52)	40.95 (39.78)	40.72 (39.65)	MS
	SEM±	1.42	0.785	0.639	
	CD at 5%	4.38	2.269	1.808	
	CV%	7.8	4.97	4.97	

* Figures in parentheses are arcsine√ per cent angular transformed values

Category based on PDI:-

0 = Free from disease (I = Immune),

1 = 1 to 10 PDI (R= Resistant),

2 = 10.1 to 25 PDI (MR= Moderately resistant),

3 = 25.1 to 50 PDI (MS= Moderately susceptible),

4 = 50.1 to 75 PDI (S = Susceptible),

5 = >75 PDI (HS= Highly susceptible)

Reference

- Chethana BS, Ganeshan G, Manjunath B. Screening of genotypes and effect of fungicides against purple blotch of onion. *International Journal of Agricultural Technology*. 2011; 7(5):1369-1374
- Getinet A, Sharma SM. Niger *Guizotia abyssinica* (L. f.) Cass. Promoting the conservation and use of underutilized and neglected crops. Institute of Plant Genetics and Crop Plant Research, Gatersleben / International Plant Genetic Resources Institute, Rome, 1996.
- Kolte SR. Niger seed diseases In: Diseases of Annual Edible Oilseed Crops. Vol. III. CRC Press, Inc. 1985, 139.
- Kong GA, Kochman JK, Brown JF. A greenhouse assay to screen sunflower for resistance to *Alternaria helianthi*. *Annals of Applied Biology*. 1995; 127:463-478.

- Mangala UN, Subbarao M, Ravindrababu R. Host range and resistance to *Alternaria alternata* leaf blight on chilli. *Journal of Mycology and Plant Pathology*. 2006; 36(1):84-85.
- Rajpurohit TJ. Diseases of Niger and their management. *Plant Science Feed*. 2011; 1(2):19-20.