

SHORT COMMUNICATION

Identification of Resistant Sources Against *Alternaria* Blight Disease of *Rabi* Pigeon pea (*Cajanus cajan* (L.) Millsp)

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Pigeon pea (*Cajanus cajan* (L.) Millsp.) is an important pulse crop grown extensively throughout the country under varied cropping systems. When the crop is sown in *rabi* season under high plant density, it remains short in height and exhibits very high yield potential, which is 2 to 3 times more than the *kharif* sown crop. However, prevalence of *Alternaria* blight caused by *Alternaria tenuissima* (Fr.) Wiltsh poses serious threat to wide spread adoption of *rabi* pigeon pea in potential areas particularly in Bihar, Uttar Pradesh and West Bengal. *Alternaria* blight is of little or no importance in the main pigeon pea crop planted during *kharif* season.

Alternaria blight of pigeon pea in epiphytotic form was first reported in 1971 from North India (Patwardhan and Singh, 1971). Due to change in the cropping system severe outbreak of *Alternaria* blight was seen in September planted pigeon pea especially in the cultivars Bahar and Basant in the states of Uttar Pradesh and Bihar (Venkateshwaralu *et al.*, 1981, Narula, 1983, Mahmood *et al.*, 1984). The symptoms of this disease first appear in the second fortnight of November and attain maximum inoculum build up in the late maturing genotypes. The disease caused extensive damage to the aerial parts of plants resulting in complete brightening and great reduction in yield. Under severe condition of infection, 80 to 100 per cent yield losses have been reported in *rabi* pigeon pea (Lal, 1997). Genetic amelioration for disease resistance is considered to be the most effective and economic method of protecting the crops to ensure their productivity.

Considering the limited information available on the sources of resistance and the genetic control of resistance to *Alternaria* blight in pigeon pea grown under *rabi* cropping system, identification of sources of resistance is the first and most important task.

A total of 109 germplasm collections comprising released varieties, local collections, advanced lines and

germplasm accessions received from International Crop Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, India were planted in three replications of 3 m length at 30 cm distance between rows. The crop was artificially inoculated by spraying spore suspension obtained from 7-days old culture at 2 days intervals at flowering stage. To maintain a high humidity to create favourable conditions for maximum disease development, water was sprayed twice a day for seven days. A susceptible check entry, Bahar, was planted on borders all around the screening plots.

Observations were recorded on randomly selected ten plants from each genotype. Screening was rigorously carried out at modified 0-5 point scale (Singh *et al.*, 1986). Each plant was critically observed for the presence of concentric rings and water soaked translucent areas. Thereafter numerical rating grade was given on the basis of percentage area covered by the pathogen on the plant. Pathogen reaction was categorized considering rating scale and disease intensity as follows:

Rating scale	Disease intensity	Pathogen reaction
0	0	Near immune/highly resistant (I)
1	1-10	Resistant (R)
2	11-25	Moderately resistant (MR)
3	26-50	Moderately susceptible (MS)
4	51-75	Susceptible (S)
5	76-100	Highly susceptible (HS)

On the basis of disease intensity, genotypes were classified into different groups i.e. near immune (I), Resistant (R), moderately resistant (MR), Moderately susceptible (MS), Susceptible (S) and highly susceptible (HS).

None of the genotype was found to be completely free from visible symptoms of the disease. Two entries namely RAUP-32 (DA 11 x Bahar) and RAUP-34 (ICP-5455 x Bahar) were found to be resistant (1-10% intensity)

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Table.1. Reaction of Pigeon pea germplasm to *Alternaria* blight disease in Rabi 2002-2003

Reaction	Scale	No. of entries	Name of entries
Highly resistant	0	0	Nil
Resistant reaction	1	2	RAUP-32, RAUP-34
Moderately resistant	2	65	7-14, 7-16, BS-3, IC-285558, IC-315861, IC-315862, IC-315863, ICP-10900, ICP-10901, ICP-10909, ICP-10926, ICP-10928, ICP-11298, ICP-11892, ICP-13253, ICP-14282, ICP-15027, ICP-3679, ICP-5124, ICP-6344, ICP-6917, ICP-7182, ICP-7185, ICP-7186, ICP-7234, ICP-7239, ICP-7252, Muzaffarpur Local, Pant-A-3, Pusa-9, RAUP-12, RAUP-1, RAUP-13, RAUP-14, RAUP-19, RAUP-2, RAUP-20, RAUP-22, RAUP-26, RAUP-27, RAUP-3, RAUP-30, RAUP-31, RAUP-4, RAUP-5, RAUP-8, RAUP-9, VKS/JKH-3/10, VKS/SCC-10/19, VKS/SCC-10/26, VKS/SCC-10/34, VKS/SCC-10/42, VKS/SCC-10/46, VKS/SCC-10/49, VKS/SCC-10/52, VKS/SCC-11/41, VKS/SCC-11/49, VKS/SCC-11/65, VKS/SCC-11/83A, VKS/SCC-9/83, VKS-12/12, VKS-12/13, VKS-12/2, VKS-12/45, VKS-12/25
Moderately susceptible	3	34	Bahar, IC-272038, IC-273154, IC-273158, IC-274730, IC-311466, ICP-10905, ICP-10913, ICP-10915, ICP-10918, ICP-10920, ICP-10921, ICP-1097, ICP-10977, ICP-11040, ICP-7119, ICP-7194, ICP-8117, ICP-8125, RAUP-15, RAUP-17, RAUP-18, RAUP-7, UPAS-120, VKS/SCC-10/1, VKS/SCC-10/25, VKS/SCC-10/38, VKS/SCC-10/41, VKS/SCC-10/54, VKS/SCC-10/57, VKS/SCC-10/59, VKS/SCC-10/6, VKS/SCC-11/71, VKS/SCC-12/53.
Susceptible	4	8	IC-273155, IC-273156, IC-273159, IC-273162, VKS/SCC-10/21, VKS/SCC-11/18, VKS/SCC-11/24, VKS-12/40
Highly susceptible	5	0	
Total number of entries		109	

reaction. Thirty-four entries showed moderately susceptible reaction (26-50% intensity) and eight entries were susceptible (51-75% intensity). None of the entries showed highly susceptible reaction (Table 1).

Entries in the second group (1-10% intensity) can be used as an effective source of resistance against *Alternaria* blight disease in genetic enhancement programme of pigeonpea for rabi cropping system.

References

- Lal HC 1997. Studies on management of *Alternaria* blight of pigeon pea (*Cajanus cajan* (L.) Millsp.), M.Sc. (Ag.) Plant Pathology thesis, RAU, Pusa, 68 pp.
- Mahmood M, BK Sinha, SC Kumar, SK Choudhary, CP Singh and M Murtuza (1984) Leaf blight disease of pigeon pea in Bihar. *RAU Jour. Res.* 4: 89-90.
- Narula PN (1983) Short duration pigeonpea escape leaf blight disease in late seedlings in Bihar. *Int. Pigeonpea Newsl.* 2: 50-51.
- Patwardhan PG and RH Singh (1971) Parasitic fungi from North India VIII. *Mycopath, Mycol. Appl.* 43: 117-125.
- Singh US, VB Chauhan and PR Reddy (1988) Field screening of pigeon pea and *Atylosia* for resistance to *Alternaria tenuissima*. *Int. Pigeonpea Newsl.* 3: 38-39.
- Venkateshwaralu S, AR Reddy, ON Singh and VB Chauhan (1981) *Int. Pigeonpea Newsl.* 1: 28-29.