

Identification of blast resistant landraces of North-East India

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ABSTRACT

Result of testing 110 rice landraces from North-east region of India for blast resistance over 2 screenings in the foot-hills of Medziphema, Nagaland, showed 67 resistant, 10 moderately resistant/tolerant and the rest susceptible. The resistant entries in the second test exhibited high level (93.1%) consistent resistant reaction. The resistant landraces identified in this study could be utilized in the breeding programme for blast resistant high yielding varieties. Evaluation of resistance to blast disease should be continuously done over location and cropping season.

Key words: rice blast, *Pyricularia grisea*, screening

The blast disease of rice caused by *Pyricularia grisea* is a very common disease in North-East India. The Sub-tropical climatic condition and intensive rice cropping in the region makes this disease more severe. In India a very narrow germplasm base is available with regard to resistance for blast. Therefore, the search for

additional source of donors with high degrees of resistance for use as parental materials in the breeding programme for blast resistance has to continue. North East Hill region of India has a wealth of indigenous upland rice genotypes. Very little work has been conducted to identify blast resistant varieties from this region.

Table 1. Reaction of rice land races to blast disease during the first screening

Land races Group	Range of Score (0-9)	Number of Land races	% of total Land races	Typical Land races
Resistant	0 - 3	72	65.5	ic-series 280975-76, 280978-80, 326126, 326137-38, 326202326226, 326229,326270, 326284, 326309-10, 319525, 319555324213, 324216, 324219, 324221, 324249-50, 324282-83, 324285-86, 324301-02,324307, 324314, 334374, 334377, 334380, 334349, 330278-79, 330315-16, 330319, 330404, 330421 330422-23,330430,340058-59,340061,340066,330429-A363867-68,360761-62,360765-67,Kemenya, KezieChorkheo,SAW-GA-40,SAW-GA-42, SAW-NAZ-TA-61, DPRR-85DPRR-167,VV-21,Bhalum-1,Bhalum-2GA-14,SAW-NAZ-TA-61,DPRR-85, DPRR-167, VV-21EX-FD-RS-DR83/11,EX-AP-7, Bhalum-1, Bhalum-2
Moderately Resistant/Tolerant	3.4 - 4.4	7	6.4	ic-series 280975,326267,330416,SAW-GA-44, EX-AP-12330416, SAW-GA-44,EX-FD-RS-DR83/9EX-AP-12
Susceptible	5.2 - 7	23	20.9	ic-series 280977, 360760, 326218, 326226, 326268, 326273, 324188, 324282,324284, 330307, 330428-429, 340060 Nagali, Semadhan, Gumdhan, DBC-1, SAW-GA-45, DPRR-117,DPRR-168,VP-15, EX-AP-15, Ex-AP-18
Highly Susceptible	7.1 - 8	8	7.3	ic- series 326223, 319634, 330317, 363869, Lekhumo, Lekhumo(big), Lekhumo (black), SAW-NAZ-TA-62

Score of Susceptible Check* 'Mahsuri= 6.9 (0-9 SES scale)

The study was carried out at School of Agricultural Sciences and Rural Development, Medziphema, Nagaland during the wet season. All together 110 landraces of rice, (100 entries collected from NBPGR, Shillong, 2 improved varieties from ICAR, NEH region, Meghalaya including 8 local collections) were screened against blast disease using International uniform blast nursery (IUBN) method (Ahn, 1994) with variety Mahsuri as susceptible check. Seeds were sown on 1st week of July when the disease pressure was high. In order to initiate blast infection, a

were found tolerant and only 1(one) each came under susceptible and highly susceptible category (Table 2). The susceptible check Mahsuri scored 9 (0-9 SES scale) and were all dead due to severe blast. Both the improved varieties Bhalum 1 and Bhalum 2 showed resistant reaction in both the screening.

It was noted that the resistant entries maintained high level of consistency (93.1%) during the second screening even when the susceptible check Mahsuri exhibited score 9 (0-9 SES scale). This

Table 2. Reaction of rice land races to blast disease during the first screening

Land races Group	Range of Score (0-9)	Number of Land races	% of total Land races	Typical Land races
Resistant	0.3 - 3	66	91.7	ic- series 280975-76, 280978-79, 326126, 326137-38, 326202, 326229, 326270, 326309-10, 319525, 319555, 324213, 324216, 324219, 324221, 324249-50, 324282-83, 324285-86, 324301, 324307, 324314, 334374, 334377, 334380, 334349, 330278-79, 330315-16, 330319, 330404, 330421, 330422-23, 330430, 340058-59, 340061, 340066, 330429-A 363867-68, 360761-62, 360765-67 Chorkheo, SAW-GA-40, SAW-GA-42, SAW-NAZ-TA-61, DPRR-85, DPRR-167, VV-21, Bhalum-1, Bhalum-2, GA-14, SAW-NAZ-TA-61, DPRR-85, DPRR-167, VV-21 EX-FD-RS-DR83/11, EX-AP-7, Bhalum-1, Bhalum-2
Moderately resistant/tolerant	3.4 - 4.8	3	4.2	ic- series 280980, 326284, Kezie
Susceptible	5.4	2	2.7	ic-series 326226, Kemenya
Highly Susceptible	9	1	1.4	ic-series 324302

Score of Susceptible Check* 'Mahsuri= 9.0 (0-9 SES scale)

high dose of fertilizer (urea @ 120kg ha⁻¹ and MOP@90 Kg ha⁻¹) was applied in the experimental plot with two equal split applications. Disease scoring was done at 25-30 days after sowing using standard evaluation system (SES) scale (IRRI, 2003) on leaf -3 of 10 randomly selected plants. All the resistant entries were subjected to second screening in the month of August during the same calendar year.

During the first screening, 72 entries of landraces were found to be resistant, 7 tolerant, 23 susceptible and only 8 entries were found to be highly susceptible (Table 1). The susceptible check Mahsuri scored only 7 (0-9 SES scale).

In the second screening, out of 72 resistant entries of the first test 67 showed resistant reaction, 2

indicated that these landraces can be exploited by breeders for development of high yielding resistant cultivars. Ali *et al.* (1994) found that out of 100 traditional *Ahu* (summer) and *Sali* (winter) varieties grown in Assam, 30 IET cultivars and 20 new varieties and cultivars developed at the research station, only 15 were resistant to blast (*Pyricularia grisea*) and 20 were moderately resistant.

North- Eastern region of India has a vast pool of rice genetic resource. This gene pool can be exploited for wide range of scientific studies. The resistant varieties identified in this study could be utilized in the breeding programme for development of high yielding resistant varieties. The farmers in the region still continue to use varieties/ landraces with unstable resistance or susceptibility to blast disease. These

varieties / landraces should be used only with high caution in pest management. Due to high variability of the fungus races, the evaluation of rice varieties for blast resistance should be done over time and place in North-Eastern region.

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