SHORT COMMUNICATION

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Identification of sources of leaf blast resistance in rice in the mid hills of Himachal Pradesh

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ABSTRACT

Sixty one rice genotypes included in coordinated trials were screened for leaf blast resistance under natural epiphytotic conditions adopting uniform blast nursery (UBN) pattern during wet season 2009 and 2010 at CSK HPKV Rice and Wheat Research Centre, Malan, Himachal Pradesh. Of these, twenty six genotypes were rated as resistant; twenty one as moderately susceptible while rest of the genotypes were found susceptible to leaf blast as per scoring procedures of standard evaluation system for rice on 0-9 scale. Twelve genotypes namely, SKAU 353, HPR 2555, HPR 2557, HPR 2143, HPR 2625 (DH(D)24), VL 30569, VL 7852, VL 31339, RCPL 1-116, VL 31452, VL 31451 and Sukaradhan consistently showed resistant reaction to leaf blast during both the years which may be included as donors in breeding programme for leaf blast resistance.

Key words: *rice, genotypes, screening, leaf blast, Himachal Pradesh*

Rice is grown in 44 million hectares under different ecosystems with a production of about 95 mt (Prasad *et. al*., 2011). In Himachal Pradesh also rice is one of the major cereal crops of wet season which is grown over an area of 79.5 thousand hectares with total production of 109.13 thousand metric tonnes (Anonymous, 2007). Of the twelve districts of the state, rice is cultivated in ten districts of which Kangra and Mandi account for 71.2% of the area and 69.7% of the total production of the state. There is a great scope of increasing rice production in the state; but some biotic constraints like diseases hamper the successful rice cultivation besides other factors. The most serious menace to rice production is 'leaf blast' especially in mid hills of district Kangra where it appears in moderate to severe forms in most of the conventional cultivars in early phase of growth. Though more than 400 high yielding commercial cultivars having blast resistance have been released in India (Shobha Rani *et al.*, 2008), these varieties have become susceptible over a period of time as the pathogen is highly variable. Regular monitoring should be undertaken to check the status of blast among the cultivars. Hence, the present study was undertaken to evaluate some genotypes against leaf blast under natural epiphytotic conditions to identify resistant sources which can be the potential sources for blast resistance breeding programme.

Sixty one rice genotypes included in coordinated trials were screened for leaf blast resistance under natural epiphytotic conditions adopting uniform blast nursery (UBN) pattern during wet season 2009 and 2010 at Malan, Himachal Pradesh. Each test entry was sown 10 cm apart in a single row of 50 cm with a highly susceptible variety, 'T 23' after every twenty test entries. The entire nursery was surrounded on all sides by 'T 23'. Nursery was sown late during first week of August followed by application of excessive nitrogen fertilizer (100-120 Kg ha^{-1}) to ensure maximum disease development. However, other fertilizers were applied as per the package of practices of the university. Observations were recorded on 0-9 scale following standard evaluation system for rice (Anonymous, 1996) during the second fortnight of September when the susceptible check T 23 had completely succumbed to blast. The genotypes were designated as resistant, moderately susceptible and susceptible showing diseases ratings of 0-3, 3.1-5, 5.1-9 (Singh *et. al*., 2010).

Rice genotypes were evaluated for the leaf blast resistance at moderate disease pressures during 2009-2010 on 0-9 scale. On the basis of performance of the genotypes in UBN during wet season 2009 and 2010, twenty six cultivars namely, VL 7620, HPR 2625 (DH(D)24), VL 31284, VL 31452, SKAU 353, VL 31451, IET 21446, RCPL 1-115, RCPL 1-116, VL 31449, Sukaradhan 1, IR 64, VL 31296, VL 31320, VL 30569, VL 7852, VL 31339, VL 7852, HPR 2557, HPR 2555, VL 7954, HPR 2143, IR 50, CB 06-135, IET 21449, SKAU 353 were found resistant with disease rating of 0-3, twenty one genotypes viz., RCPL 1-115, VL 7849, HPR 2529-4, VL 31290, Vivekdhan 62, Ajaya, CB 05-022, CB 06-137, VLPR 8, CB 06-651, VL 7742, VL 31450, HPR 2598, Vivekdhan 154, VLPR 4, VLPR 7, VLPR 1, VL 7849, VL 7702, HPR 2589, SKAU 389 were found moderately susceptible with disease rating of 3.1-5 and rest of the genotypes i.e. VL 7820, UPR 2919-14-1-1, HPR 2559, Vivekdhan 82, RP 2421, IR 50, Swarnadhan, Vikramarya, TN1, Rasi, HR 12, Nidhi, Benibhog, CH 45, Improved Sambha Mahsuri were susceptible to leaf blast with disease rating of 5.1-9. The disease rating of these genotypes, however, slightly varied depending upon the disease pressure prevailing in both the years. Twelve genotypes namely, SKAU 353, HPR 2555, HPR 2557, HPR 2143, HPR 2625 (DH(D)24), VL 30569, VL 7852, VL 31339, RCPL 1-116, VL 31452, VL 31451 and Sukaradhan (Table 1) were found consistently resistant to leaf blast during wet season 2009-2010 which may be included as donors in breeding programme for leaf blast resistance. Singh *et al.* (2010) also observed variable reaction of scented rice genotypes to leaf and neck blast in Haryana. Muralidharan *et al.* (2004) observed that the resistance genes *Pi-1*, *Pi-2* and *Pi-4* imparted a high degree of blast resistance in rice genotypes in multi-environmental tests in India. However, Rathour *et al.* (2006) suggested that blast resistance genes *Pi-z*, *Pi-k*^{h}, *Pi-1* and *Pi-2* represent the potential sources of blast resistance for rice breeding programmes in Himachal Pradesh.

Table 1. Screening of rice genotypes for leaf blast resistance

Reaction Type	Genotypes screened against leaf blast during wet season 2009 and 2010
Resistant (SES Score 0-3)	VL 7620, HPR 2625 (DH(D)24), VL 31284, VL 31452, SKAU 353, VL 31451, IET 21446, RCPL 1-115, RCPL 1-116, VL 31449, Sukaradhan 1, IR 64, VL 31296, VL 31320, VL 30569, VL 7852, VL 31339, VL 7852, HPR 2557, HPR 2555, VL 7954, HPR 2143, IR 50, CB 06-135, IET 21449, SKAU 353
Moderately Susceptible (SES Score = 3.1-5)	RCPL 1-115, VL 7849, HPR 2529-4, VL 31290, Vivekdhan 62, Ajaya, CB 05-022, CB 06-137, VLPR 8, CB 06-651, VL 7742, VL 31450, HPR 2598, Vivekdhan 154, VLPR 4, VLPR 7, VLPR 1, VL 7849, VL 7702, HPR 2589, SKAU 389
Susceptible (SES Score = 5.1-9)	VL 7820, UPR 2919-14-1-1, HPR 2559, Vivekdhan 82, RP 2421, IR 50, Swarnadhan, Vikramarya, TN1, Rasi, HR 12, Nidhi, Benibhog, CH 45, Improved Sambha Mahsuri

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