

BROWN PLANTHOPPER RESISTANT GENETIC ARSENAL OF I.G.K.V. RICE GERMPLASM RAIPUR

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In recent times, brown planthopper (*Nilaparvata lugens*) has assumed importance in Chhattisgarh region, a eastern part of Madhya Pradesh, where in 1975, its outbreak resulted to reduce the rice yield to the extent of 34.4 per cent (Gangrade *et al.* 1978). Since 1973, it had caused extensive damage to rice crop in various parts of India (Nalini Kumari *et al.*, 1975). Emergence of insect biotypes is a constraint for the use of resistant varieties in IPM programme. Therefore, to stay ahead of the problem improved resistant cultivars must be developed with more genetic diversity. A large collection of about 20,000 rice accessions are available at IGKV, Raipur of which 78.8 per cent belongs to this Chhattisgarh region only. This material was collected during 1971 to 1981 by Dr. R.H. Richharia (Sharma *et al.*, 1987). The importance of this germplasm needs no introduction. This has been stressed many times both at national and international level particularly in the context of fast spread of high yielding varieties resulting in large scale erosion of useful genes.

Nilaparvata lugens insect is being mass reared throughout the year in a air cooled glass house at $30^{\circ}\text{C} \pm 5^{\circ}\text{C}$ on potted TN₁ variety to get the steady supply of insect for various studies. A total 2500 rice accessions were screened against this insect in glass house by adopting the technique described by Kalode *et al.* (1975). Promising lines identified in seedling bulk test were retested several times and on confirmation, few of these cultivars were considered for insect feeding test.

Of the 2,500 rice accessions evaluated so far, 84 varieties were confirmed as a resistant and 32 varieties indicated moderate degree of resistance to *Nilaparvata lugens* population at Raipur. All these 84 resistant varieties exhibited

plant damage score below 3 and few of these varieties (Table 1) were free from apparent plant damage symptoms. Most of these resistant varieties belong to Bastar, Raipur, Raigarh and Balaghat districts of this region denoting possibility of ecogenetic diversity.

Table 1. Brown planthopper resistant genetic arsenal of rice germplasm

Av. Plant damage score (0-9)	Rating	IGKV Acc. No.
0 — 1	R	H 218, J 432, F 16, H 435, B 2682, D 1043, W 91, A 719
1.1 — 2	R	K 2531, D 1015, PTB 33, B 2876, D 1164, D 279, D 455II, D 455 III, K 556 II, K 1173, K 60, G 976, J 287II, B 1862, B 611, K 2478, K 430, K 446II, D 1167, B 1651, K 1832, C 738, B 57II, L 289I, A 2631, P 879, L 289II, B 2712, C 62III, G 809,
2.1 — 3	R	H 56, J 55II, C 758, K 2167, K 1167I, K 1163, D 8011, B 803II, K 2312, K 2388, K 2413 K 1592, B 2655, K 1699, D 1163, D 1771, K 224, K 711 III, B 409, K 544, B 1261, D 475, B 432II, B 846I
3.1 — 4	MR	K 2154, K 2520II, K 1751, K 1836, R 289II, K 1338IV, D 470I, G 544, G 619, G 842, K 2586, K 1272, K 86, K 197, K 2158
4.1 — 5	MR	K 2140, K 1811, K 2012, K 1831, K 2071
9	S	TN-1

R = resistant, MR = Moderately resistant, S = Susceptible

This result thus symbolises the presence of vast potential in this germplasm with respect to BPH resistant genetic material. Now these paramount BPH resistant genetic arsenal needs further evaluation with respect to establish relatedness amongst these 84 BPH resistant accession identified. Most authentically RFLP and RAPDS analysis of rice DNA will throw more light on this aspect to disclose the new BPH resistant genes from these lines.

Feeding rate of insect on some selected varieties ranged between 0.96 mm² per female in **Chapdo** to 0.65 mm² per female in **Hinga** variety which exhibited 0.65 plant damage score. The results are crystal clear to note genetic variability amongst these identified varieties. Reaction of differential donors were also tested. The standard seedling test showed **Mudgo** (Bph1), **ASD7** (bph2), and **Babawee** (bph4) to be highly susceptible. **Rathu Heenati** (Bph3) and **Balamawee** (Bph9), moderately resistant and **swarnalata** (bph6) and **ARC 10550** (bph5) resistant (Table 2) BPH honeydew excretion test confirmed these results. Donors received from Directorate of Rice Research, Hyderabad were also resistant at Raipur, thus indicated similar virulency patterns at both locations. But comparison with donors received from Pattambi, showed BPH populations is more virulent than Pattambi.

Table 2. Resistance of selected donors to the BPH Population in Raipur, M.P.

Donor	BPH gene	Damage		Honeydew in 24 h (mm ² /female)
		Score	Rating	
Balamawee	Bph 9	4.1	MR	12.61
Swarnalata	bph 6	0.5	R	18.66
Rathu Heenati	Bph 3	5.0	MR	31.51
Mudgo	Bph 1	9.0	S	78.89
ASD 7	bph 2	9.0	S	132.37
PTB 33	R check	1.6	R	6.80
TN-1	S check	9.0	S	66.34
ARC 10550	bph 5	0.8	R	10.10
Babawee	bph 4	7.7	S	19.20
TN1		9.0	S	32.37

R = Resident

MR = moderately resistant,

S = susceptible

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