Investigation of Brown Plant Hopper resistance in *Oryza nivara* and *Oryza eichinigeri* derived lines

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Abstract

The Brown Plant Hopper (BPH), *Nilaparvata lugens* is one of the most serious rice pests in Sri Lanka. About 5-10% of cultivated rice lands are affected due to BPH damage. Due to several drawbacks associated with chemical control, host plant resistance is the most effective way of BPH management. Some of the wild relatives of rice have provided new sources of resistance to pests like BPH. Two accessions of Sri Lankan *O. nivara* and some *O. eichinigeri* derived lines were identified as BPH resistant. But up to now no experiments were conducted to evaluate resistance of above lines. Therefore, this study was carried out to identify the nature of the resistance by bioassay and molecular techniques for the use of rice improvement programs in Sri Lanka.

Bioassay was conducted at RRDI, Bathalagoda. Five different BPH populations maintained for three months period in screen house were used to screen selected rice lines and varieties. Then the reaction of BPH & plant resistance was measured by using standard honey dew test. During bioassay, resistant accessions were screened at molecular level to get some evidences to support the results obtained from the standard honey dew test. Availability of 3 BPH resistant genes (*Bph10*, *bph2*, *Bph13*) was checked by using Gene specific 3 STS primers RG 457, KAM 4 and AJ 096 respectively at PGRC.

Molecular screening results revealed that all the tested *O.nivara* accessions and *O. eichinigeri* derived lines haven't *Bph 10* gene in their genome while *O.nivara* (WRAC 04) accession may have *bph 2* and *Bph 13* genes and no any checked gene was found in *O.nivara* (9864) accession. *O. eichinigeri* derived lines (TC 01 and TC 02) may have *Bph 13* gene in their genome. The honey dew screening results showed that Virulence of PTB 33, Bg 379/2 and Kegalle populations was not significantly different from each other. But virulence of Bg 379/2 and Kegalle populations was significantly different from populations reared in IR 54751-2-34-10-6-2 line and Bg 380. Among selected rice

lines and varieties Bg 380 is the most susceptible. PTB 33, *O.nivara* accessions (WRAC 04, 9864) and *O. eichinigeri* derived lines (TC 01 and TC 02) are not significantly different from each other considering resistance to BPH and also comparatively resistant to all the populations. Therefore, these lines can be used to avoid genetic uniformity of cultivated rice in future.

Further experiments should be carried out with more markers for already identified BPH resistant genes to detect their resistance is due to existing genes or new genes.

Keywords: Rice, Brown Plant Hopper, Honey Dew Test, *O. nivara*, *O. eichinigeri*