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## Validation of Brown Planthopper and Blast Resistance Markers in Improved Aromatic Glutinous Rice

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### Abstracts

Brown planthopper (BPH) resistance genes and blast (BL) resistance QTLs were incorporated into an aromatic glutinous rice variety, Hom Xebangfai 4 (HXBF4). This breeding was conducted by a single cross between HXBF4 and a BPH and BL resistance glutinous line, RGD13117-115-52-B. Marker-assisted selection was done in F<sub>2</sub> population. Eleven selected F<sub>3</sub> lines were evaluated for BPH resistance with two populations collected from Singburi (SBR) and Ayutthaya (AYY) by a modified standard seedbox screening method. The results showed that ten lines with *Bph32*, *Bph3* and *TPS* (terpene synthase) were resistant to both BPH populations. The other line carrying only *Bph3* and *TPS* was resistant to AYY but moderately resistant to SBR. For BL validation, 16 F<sub>4</sub> lines derived from one F<sub>3</sub> plant were challenged with seven mixed Thai BL isolates in a greenhouse condition. It was found that all the lines carrying *qBL1* and *qBL11* were resistant to every tested BL isolate suggesting broad-spectrum resistance. They were more effective against blast disease than their parental lines with a single QTL. This study strongly suggests that the genotyping with high-throughput markers developed for BPH and BL resistance selection was very accurate and trustable. *Bph32*, *qBL1* and *qBL11* are recommended for other BPH and BL resistance rice breeding programs.

**Keywords:** Glutinous rice, Breeding, Marker-assisted selection, Brown planthopper resistance, Blast resistance

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