

**PB-03**

## Screening for *OsF3H*, Whitebacked Planthopper Resistance Gene in Rice through QTL Mapping

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### [Introduction]

Whitebacked planthopper (WBPH) is a pest that causes serious damage to rice in Asian countries with a mild climate. WBPH severely negative affects rice yield and grain quality. Plants resist stress by expressed various genes such as kinase, phytohormones, transcript factors, especially secondary metabolites.

### [Materials and Methods]

The Cheongcheong/Nagdong double haploid (CNDH) line was breeding in the field at Kyungpook National University from 2010. For quantitative trait locus (QTL) mapping, CNDH 120 lines used. The WBPH resistance gene was screening by measuring the resistance score using the phenotype that appeared after WBPH inoculation in the CNDH line. QTL mapping was performed. To identify candidate genes through QTL mapping, RiceXPro and Rapdb were used.

### [Results and Discussion]

The WBPH resistant score of the CNDH lines showed a normal distribution, and WBPH resistance is a quantitative trait that expression is regulated by one or more genes. The RM280-RM6909 region of chromosome 4 was detected through QTL mapping in 2018 and 2019. This region includes 27 ORFs that cell function, kinase, signaling, transcription factors, and secondary metabolites that protect plants from the stress of WBPH. The region on chromosome 4 contained a sequence similar to the flavanone 3-hydroxylase (*OsF3H*) of rice. The sequence has been found not only in *Oryza sativa* but also in *Zea mays*, *Prunus avium*, *Vitis vinifera*. The *OsF3H* is homology genes, which play an important role in biosynthesis defending against biotic stress in plants. After inoculation of WBPH, the relative expression level of *OsF3H* was higher in resistant line than a susceptible line to WBPH. The newly identified WBPH resistance gene *OsF3H* can be used for the development of rice cultivars that are resistant to WBPH.

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