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Genotype and Phenotype Interaction between *OsWKRYq6* and BLB after *Xanthomonas oryzae* pv. *Oryzae* Inoculation in the Field

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[Introduction]

Bacterial leaf blight (BLB) is an important and devastating rice disease caused by the pathogen *Xanthomonas oryzae* pv. *Oryzae (Xoo)*. In particular, the occurrence of abnormal climate and warming phenomena has produced a good environment for the occurrence of BLB, and the rice yield due to the occurrence of BLB continues to decrease. Currently, molecular breeding is applied by searching for resistant genes to development of BLB resistance cultivar. In addition, phenotype analysis in the field and applied research is rarely conducted. Due to recent rapid climate change, BLB is a major problem that has a more serious negative effect on rice yield. Therefore, we suggest *OsWRKYq6* to be effectively used for breeding BLB-resistant cultivars by screening BLB-resistant genes.

[Materials and Methods]

In this study, the BLB-resistant gene was screened using the lesion length, which most definitely changes to the phenotype when *Xoo* is infected. *OsWRKYq6* was finally selected as a BLB resistance gene by analyzing the phenotype and genotype after inoculating *Xoo* in 120 Cheongcheong/Nagdong double haploid (CNDH) lines in the field. After *Xoo* inoculation, lesion length and yield were investigated, and 120 CNDH lines were divided from BLB-resistant and susceptible lines. Moreover, when the transcription level of *OsWRKYq6* was analyzed in the resistant and susceptible lines after *Xoo* inoculation in the field, the expression level was regulated to a high level in the resistant line.

[Results and Discussions]

In this study, we propose *OsWRKYq6* as a transcription factor involved in BLB resistance. Currently, the differentiation of various races is proceeding rapidly due to rapid climate change. In addition, screening of transcription factor genes involved in BLB resistance in the field can be effectively applied to molecular breeding to develop resistant cultivars in preparation for rapid climate change.

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