

## QTL Detection to Blast Resistance in Korean Japonica Rice Germplasm Based on GWAS Analysis

Young-Chan Cho<sup>1\*</sup>, Man-Kee Baek<sup>1</sup>, Jong-Min Jeong<sup>1</sup>, Hyun-Su Park<sup>1</sup>, Jeong-Kwon Nam<sup>1</sup>, Soon-Wook Kwon<sup>2</sup>, Gun-Mi Lee<sup>1</sup>, Seul-Ki Park<sup>1</sup>, Hyo-Jeong Lee<sup>1</sup>, Choon-Song Kim<sup>1</sup>, You-Chun Song<sup>1</sup>, Bo-Kyeong Kim<sup>1</sup>

<sup>1</sup>National Institute of Crop Science, RDA, 181 Hyeuksin-Ro, Iseo-myeon, Wanju 55365, Republic of Korea

<sup>2</sup>Department of Plant Bioscience, College of Natural Resources and Life Science, Pusan National University, Milyang 627-706, Republic of Korea

The eating-quality is the most important objective trait in *japonica* rice breeding program as the staple food in Korea. The Korean *japonica* rice germplasm like landrace and weedy rice were used to widen the genetic diversity of breeding materials for high eating-quality. We tried to analyze the information for gene/QTL related to blast resistance in a total of 96 Korean *japonica* germplasm population including 24 Korean varieties, 26 landraces, 22 weedy rices, 19 breeding lines and five Japanese *japonica* varieties. These germplasm population was genotyped by Illumina array analysis 768 SNP of *japonica* rice genetic background (Nagasaki et al. 2010). The data of 622 SNPs except for SNPs of false data, monomorphic and less 5% of minor allele frequency were calling. The GWAS analysis was done using weighted mixed liner model (PCA+K, MLM). The Q-Q plot for correlation analysis among phenotype data and SNP marker was obtained from the relationship among theoretical LOD value and observed LOD value in each trait. The Manhattan plot and Q-Q plot graphic were constructed by R package qqman (Turner 2014). A total of 24 QTLs for blast resistance were detected in chromosomes 1, 2, 3, 4, 6, 7, 8, 9 and 12. These QTLs were explained 6.8-14.9% of phenotypic variation. Some QTLs were identified in the previously reported chromosome regions like qGbn1.3 in Pi35, qGnb2.1 in Pi14, qGnb4.1 in pi21 and qLB4.1, qGnb4.2 in Pi39. qGnb6.1 in Piz, Piz-t, Piz-5, Pi9 and Pi40, qGnb8.1 in Pi33, qGnb12.1 in Pi62, and qGnb12.2 in Pita, Pita-2, Pi20 and Pi25.

\*Corresponding author: Tel. +82-63-238-5211, E-mail, yccho@korea.kr