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Improving Rice Eating Quality using qTV9 Associated with the Glossiness of Cooked Rice

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[Introduction]

The quality of cooked rice is normally evaluated indirectly, through measurement of key elements driving quality as well as more directly by sensory evaluation, but remains a complex trait conditioned by the genetic complexity of factors driving quality, changes wrought by environment, and the complexity of consumer preferences. Use of DNA marker has advantage on that the effect of gene on the quality is directly measured on the target traits and not estimated from the phenotype. The marker developed in this study would be useful for developing japonica cultivars with improved eating quality based on glossiness.

[Materials and Methods]

The population (F8) composed of 174 lines derived from a cross between Hwayeong and Wandoengmi6, a japonica-type Korean weedy rice was used to access the phenotypic data of rice eating quality as well as to identify the QTLs controlling eating quality. To detect QTLs the phenotypic measurement and the genotypic SNP data were combined and analyzed.

[Results and Discussion]

In this study, we identified QTLs associated with the taste value obtained by glossiness of cooked rice (TV), to explain rice eating quality by statistical methods and identified QTLs associated with TV. From the QTL analysis, the QTL qTV9 delimited within Id9007180 and 9851330 on chromosome 9 was detected in the both years explaining about 17% of R² on average. Among the tested lines, two recombinants (HW085 and HW135) were finally selected. In further narrow down by fine mapping, qTV9 was delimited to an approximately 34-Kbp segment flanked by the DNA marker CTV9_9. To develop new cultivar with eating quality improved three lines including qTV9 were selected. These will apply to functional analysis on the glossiness and then MAS breeding program for improvement of japonica eating quality as donor line.

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