Development of Low Contents of Easy-to-digest Protein Rice by Marker-assisted Selection[1]

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Abstract

In order to develop low gutelin content and climate adapted rice varieties in Taiwan, we analyzed low levels of easy-to digest protein mutant *Lgc1* by DNA specific marker and protein contents using SDS-PAGE electrophoresis. We used the F8 generation derived from Japanese variety 'Shunyo' with *Lgc1* gene and 'TK16' from Taiwan as materials for analysis. The difference in the total protein content between the *Lgc1* mutant and normal rice varieties was not significant, but the proportion of glutelin contents in *Lgc1* rice was the same as 'Shunyo'. The gutelin content of 'Shunyo' was reduced to 57.5% of 'TK16'. In this study, we analyzed the F8 generations by genotypes using *Lgc1* specific marker and SDS-PAGE electrophoresis. The F8 lines with low gutelin contents also showed homozygosity to 'Shunyo' by genotyping. Both results of genotyping were consistant. In phenotyping, the signals of the *Lgc1* lines and 'Shunyo' were weaker than which of 'TK16' in molecular weight 37-39 kD and 22-23 kD donated as glutelin. It indicated that the *Lgc1* specific marker could be used as an efficient tools for detecting low gultelin content rice in marker-assisted selection. The line 'HKY154' was selected according to favorable agronomic characters and low levels of protein contents. This line has a good potential to be the food for patient with chronic kidney disease.

Key words: rice, glutelin.

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