

PB-29

QTL Mapping for Rice Gelatinization Reveals *OsSS1q6*, Starch Synthase- Related Gene

Yoon-Hee Jang¹, Kyung-Min Kim^{1*}

¹Department of Applied Biosciences, Graduate School, Kyungpook National University, Daegu, 41566, Korea

[Introduction]

The gelatinization temperature of rice starch is related to the cooking time and texture of rice, the gelatinization temperature of rice is an important factor in determining the quality of rice. The alkali digestion value (ADV) is highly correlated with the gelatinization temperature, and it is a method used to test the quality of the rice grain. In this study, we performed QTL analysis for alkali digestion to search for gene related to palatability of rice.

[Materials and Methods]

120 Cheongcheong/Nagdong double haploid (CNDH) population are used for plant materials. Brown rice and milled rice of each CNDH line were treated 1.4% KOH. After that, ADV was evaluated according to the investigation criteria of the International Rice Research Institute (IRRI). Windows QTL Cartographer 2.5 and the genetic map with an average interval of 10.6 cM between markers created using Mapmaker version 3.0 using 222 DNA markers was used to analyze the QTLs. The threshold LOD score 2.5 or higher was used to perform the QTL analysis.

[Results and Discussion]

In the RM588-RM1163 region of chromosome 6, QTL involved in alkali decay with an LOD value of 4.6 was detected dublicately for 3 years. *LOC_Os06g06560*, named *OsSS1q6*, is involved in the starch synthesis of endosperm amyloplast of rice and plays a role in extending the amylopectin chain. *OsSS1q6* interacts closely with the starch synthesis proteins GBSSII, SBEI, and DPE, and has high homology with the domains of the *starch synthase 1 (SS1)* gene of other *Gramineae*. This result can be used as basic data for the development of high-quality rice cultivars with enhanced palatability of rice. These results suggest that *OsSS1q6* may be involved in starch synthesis, increasing the palatability of rice, and may be helpful in the development of high-quality rice.

[Acknowledgement]

This work was supported by the National Research Foundation of Korea Grant funded by the Korean Government (NRF-2021M3E5E6022715).

*Corresponding author: E-mail, kkm@knu.ac.kr Tel, +82-53-950-5711