

[P4] Crop Genetics and Physiology

Thu. Sep 9, 2021 12:15 PM - 2:00 PM Room 4 (Poster) (Crop Genetics and Physiology)

12:15 PM - 1:00 PM

[P4-03] Histone Acetyltransferase GCN5 Regulates the Expression of *OsRBCS3* and *OsRBCS5*, Rubisco Small Subunit Genes, in Response to Nitrogen Supply in Rice (*Oryza sativa* L.)

*Nominated for Presentation Awards

○Shicheng Feng¹, Fumiya Miyamoto², Sakae Agarie³, Kazuyuki Saitou⁴ (1. Graduate School of Bioresource and Bioenvironmental Sciences, Kyushu University, China, 2. Graduate School of Bioresource and Bioenvironmental Sciences, Kyushu University, Japan, 3. Faculty of Agriculture (Graduate School), Kyushu University, Japan, 4. Faculty of Agriculture (Graduate School), Kyushu University, Japan)

Nitrogen is a primary component of plant substances. Nitrogen deficiency leads to slow and stunted growth and chlorosis. Five Ribulose-1,5-bisphosphate carboxylase/oxygenase small subunit (RBCS) genes identified in the rice genome are designated as *OsRBCS1, 2, 3, 4* and *5*. In this study, we investigated the relationship between the expression of *GCN5*, a GNAT-type histone acetyltransferase gene, and RBCS genes. *OsRBCS1* transcripts were not detectable. The mRNA levels of *OsRBCS2*, *OsRBCS3*, *OsRBCS4*, and *OsRBCS5* in leaf blades were increased by nitrogen supply, but the incremental ratio of *OsRBCS5* was much lower than those of other RBCS multigene family members. The mRNA level of *GCN5* was increased by nitrogen supply. To study whether *GCN5* regulates the expression of RBCS genes, we produced overexpression transformants of *GCN5* under the control of the maize ubiquitin promoter and the CaMV 35S promoter, and knockdown transformants of *GCN5* by RNAi. The expression of *GCN5* doesn't correlate with that of *OsRBCS2* or *OsRBCS4*, but it has a significant positive correlation with that of *OsRBCS3* and *OsRBCS5*. Furthermore, under the same expression level of *GCN5*, the expression level of *OsRBCS3* was higher than that of *OsRBCS5*. These results suggest that *GCN5* regulates the expression of *OsRBCS3* and *OsRBCS5* specifically in response to nitrogen supply.