PB-57

OsMYB16, a Novel MYB-Related Transcription Factor, Response ABA signaling and Salinity Stress Causes Delayed Senescence

Da-Yea Park[1]* and Nam-Chon Paek[1]

[1]Department of Plant Science, Plant Genomics and Breeding Institute, and Research Institute for Agriculture and Life Sciences, Seoul National University, Seoul 151-921, Korea.

[Introduction]

MYB-related transcription factor plays important roles in not only plant growth and developments but also abiotic stress response. Functions of *OsMYB16* do not well identified as a senescence and stress responsive gene. In this study, we figure out the function of *OsMYB16* as a positive regulator for dark induced senescence and an ABA response gene.

[Materials and Methods]

For dark induced senesncence, plants grown for 1 month under LD were transferred to darkness at 28C for 5 days. The changes of detached leaf color with chlorophyll quntification, and ion leakage. Total RNA was isolated from the rice leaves using RNA kit (TaKaRa, Dalian, China) according to the manufacturer's instructions. A five folds dilution of the resultant first strand cDNA was used as template for PCR. Quntitative real-rime PCR (qRT-PCR) was performed according to described previously. The rice *Ubiqutin 5* was used as the endogenous control for data normalization, and each analysis was repeated at three times. For salinity stress test, *OsMYB16* knock out mutant and WT grew in natural long day condition for 2 weeks. The plants were treated high salinity stress with 200mM NaCl for 5 days, and then recovered with fresh water for 5days.

[Results and Discussions]

In natural field, *OsMYB16* expression rises up during vegetative phase, however, the gene expression declined the initiation point of the reproductive phase. Even there is no significant differences in the natural senescence, *OsMYB16* knock out plants shows stay green under dark induced senescence. In various hormone treatments, *OsMYB16* expression is up-regulated by ABA. Moreover, under ABA treatments, ABA signaling genes in *osmyb16* are dropped significantly. As another effect of ABA, stress regulation, *OsMYB16* gene expression level was highly induced by high salinity, dehydration and mannitol, related with osmotic stress. The *OsMYB16* knock out mutant, *osmyb16*, in *Oryza sativa* has salinity stress sensitive phenotype. Transcriptions of ABA signaling genes in *osmyb16* were changed under stress condition. ABA early response genes, such as *OsLEA3*, *OsRAB21*, *OsRAB16C*, *OsRAB16D*, and late response genes, *OsPP2C* and *OsRK1*, decreased under salinity stress. In this regard, these results suggested that *OsMYB16* effects on senescence and salinity stress response mechanism by regulating ABA signaling.

[Acknowledgements]

We appreciate Prof. Gynheung An for donating the *osmyb16* T-DNA insertion mutants in rice. This work was carried out with the support of the Cooperative Research Program for Agriculture & Technology Development (Project No. PJ011079), Rural Development Administration, Republic of Korea.

*Corresponding author: Tel. +82-02-880-4553, E-mail. ncpaek@snu.ac.kr