

대학원생 연구 발표-01

Oryza Sativa C3HC4-type E3 Ligase, OsRFPHC-13 is a Positive Role in Salt Stress

Kim Jong Ho¹, Jang Cheol Seong^{1*}

¹Plant Genomics Laboratory, Interdisciplinary Program in Smart Agriculture, Kangwon National University, Chuncheon 24341, Republic of Korea

[Introduction]

Environment stress has affected rice growth and productivity. Significantly, salinity stress negatively affects rice, such as plant growth, cell homeosis, and metabolism. E3 ligase is a positive regulator via the Ubiquitin proteasome system (UPS), which degrades ubiquitin-substrate by 26S proteasome, this mechanism was related to enhancing salt stress tolerance. We studied OsRFPHC-13, which functions as an E3 ligase, and confirmed salt resistance performance by overexpression of OsRFPHC-13, T-DNA knock-out mutant plants.

[Materials and Methods]

rice seeds (*Oryza sativa* L. cv Dongjin byeo) were germinated and grown in 0.5 X Kimura B solution in growth chamber (16/8-h light, dark at 30/28°C with 70% humidity) for 8days.

Plant material: Wild-type (Dongjin-byeo), two independent OsRFPHC-13 overexpression plant, and one T-DNA knock-out plant were measured salt resistance test.

ICP analysis: WT, overexpression plants, and T-DNA plants were measured with the content of Na⁺ and K⁺.

Enzyme assay: plants were extracted by extraction buffer with PBS, and measured with SOD, CAT and POD.

Gene expression analysis: Total RNA of overexpression line and knock-out line were extracted induced 100 mM NaCl for 0,1,6 and 12h. total RNA were synthesized cDNA using reverse-transcriptase cDNA Kit.

[Results and Discussion]

In phenotype analysis, overexpression plants of OsRFPHC-13 were identified to enhance salt tolerance compared to WT plants. However, T-DNA mutant was shown a salt-sensitive phenotype more than WT. Also, It was confirmed that the overexpressing plants were measured a lower Na⁺ uptake compared to WT, whereas the T-DNA plants were measured to a high Na⁺ uptake by ICP analysis. And, in enzyme assay, leaf and root of overexpression plants were shown high activity in SOD, CAT, and POD compared to WT. however, T-DNA mutants were shown the opposite pattern. Also, gene relative expression was shown at different levels in overexpression plants compared to WT. collectedly, these results suggest that OsRFPHC-13 was identified to enhancing salt tolerance. interestingly, in the ABA germination assay, OsRFPHC-13 was might related to ABA-dependent pathway, it suggest that OsRFPHC-13 may hance additional functions.

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*Corresponding author: E-mail, csjang@kangwon.ac.kr Tel. +82-33-250-6416 Fax, +82-33-244-6410