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OsDHHC21, a Zinc Finger DHHC Domain Mutates Improve Salt Resistance in Rice MutantDonghyun Lee¹, Hyoenung Seo¹, Cheol Seong Jang^{1*}¹Plant Genomics Laboratory, interdisciplinary Program in Smart Agriculture, Kangwon National University, Chuncheon 200–713, Republic of Korea**[Introduction]**

Rice is the world's major food crop along with wheat and maize and improving the yield of rice has high value. Rice requires a very high amount of water, and according to these characteristics, it is characterized by being vulnerable to salinity stress. Therefore, we induced a core group (M10) using gamma irradiation to breed salt stress-resistant rice and selected a line 300-1059 (81) insensitive to salt.

[Materials and Methods]

Growth condition: The germinated seeds of WT and 300-1059(81) mutant were transferred to plastic box for hydroponic cultivation and grown for 7days with kimura B nutrient solution (pH=5.7).

Salt stress resistance measurement: 7day-olds WT and 300-1059(81) mutant were treated with 100mM NaCl for 7days. Measure length, weight, hydrogen peroxide(H₂O₂).

Subcellular localization: OsDHHC21 were cloned in the binary vector(pGWB406) containing the C-terminal synthetic green fluorescent protein (sGFP) The recombinant plasmids 35S::OsDHHC21 -sGFP, 35S::OsDHHC21p.His440fs-sGFP, 35S::sGFP (empty vector control), nucleus marker of the 35S::OsMeCP-GFP and endoplasmic reticulum marker of the 35S::CD3-959-mCherry were transiently expressed in rice protoplasts. Protoplasts were isolated from the leaves of 2-week-old plants.

[Results and Discussion]

under saline condition the 300-1059 (81) mutant had greater fresh weight, and lower H₂O₂ levels than the wild type (WT). Using the whole-genome re-sequencing of 300-1059(81) mutant, it was observed that a single base cytosine deletion occurred in the LOC_Os08g44230 gene, which adds a palmitoyl chemical group to proteins in order to anchor them to cell membranes. The original gene was named OsDHHC21, and the mutant gene was named OsDHHC21p.His440fs, which means that the frameshift occurred at the 440rd amino acid, histidine. Subcellular localization of OsDHHC21 and the mutant form (OsDHHC21p.His440fs) GFP-tagged protein was found in the cytoplasm and endoplasmic reticulum of rice protoplasts, respectively. Mutant OsDHHC21p.His440fs caused a change in subcellular localization.

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