

[P3] Abiotic Stress for Crop Production

Thu. Sep 9, 2021 12:15 PM - 2:00 PM Room 3 (Poster) (Abiotic Stress for Crop Production)

12:15 PM - 1:00 PM

[P3-11] Differences in Aquaporin Expression and Their Response to Osmotic Stress among Component Roots in a Rice Root System

*Nominated for Presentation Awards

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A rice root system consists of component roots including seminal root, nodal root, and L-type and S-type lateral root. These roots have different morphological and anatomical structures, and show different responses to the environmental stresses such as drought. Our previous studies showed a possibility that S-type lateral root may have the highest contribution to water uptake among the component roots in a whole root system based on the relationship between hydraulic conductivity of the whole root system and surface area of each component root (Watanabe et al., 2020). Additionally, aquaporin genes have been reported to regulate water transport across the cell membrane in the radial direction of a root. However, the differences in aquaporin contribution among those component roots are still unknown. This study, therefore, aimed to compare aquaporin expression levels among component roots. Plants were hydroponically grown with and without osmotic stress. Among the 33 aquaporin gene family, we measured the expression level of PIP2;4 and PIP2;5 which were reported to be involved in water transport in rice root using Real-time PCR. The results showed the expression levels of PIP2;4 and PIP2;5 in lateral roots were higher than nodal roots. In addition, osmotic stress treatment significantly increased the expression level in S-type and L-type lateral roots with branching for PIP2;4. These results indicate that the aquaporin function may differ among component roots, and also with ages.