

[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

[P4-25] Analysis on the Roles of Vacuolar Invertase Isoform, *OsINV3* in Root Development of Rice

*Nominated for Presentation Awards

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Root system is the only organ to absorb water and nutrient from soil, therefore it is an important factor for crop growth and yield. Carbon required for root development is supplied exclusively from shoot, however, the relationship between root development and metabolism of photoassimilates has been yet unknown. Here, we analysed the sugar metabolism in the root of rice *inv3* mutant, in which *OsINV3* a vacuolar invertase gene, is knocked out. The mutant was compared with wild-type (cv. Nipponbare) to clarify the role of sucrose degradation in root development.

Fresh weights of shoot, main roots and lateral roots were significantly smaller in *inv3*, while fresh weight of root tips was almost same level as wild-type. Non-structural carbohydrate (starch and soluble sugars) contents of main roots were not different in both lines. Although the sucrose contents in root tips and lateral roots of the mutant were more than twice that of the wild-type the glucose content in lateral roots of *inv3* was significantly lower in the mutant than in the wild-type. Moreover, the fructose content in root tips and lateral roots of the mutant decreased to approximately one-seventh and one-third, respectively, compared to the wild-type. Whole root length in *inv3* was also shorter than in the wild-type. These results imply that *OsINV3* functions especially in lateral roots and root tips for their elongation.