[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

[P4-23]A Metabolite Profiling to Seek the Molecular Determinant of Spikelet Number in Rice

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The number of spikelets is a key determinant of the grain yield of rice. Generally, the number of spikelets is determined by the nitrogen accumulation up to 2-weeks before heading and carbon supply during 2-week period preceding heading. However, the metabolic pathway involved in the determination of spikelet number is not fully understood. In this study, to clarify the relationship between the number of spikelets and metabolism of rice, we conducted the field experiment using the two rice cultivars "Nipponbare", "Koshihikari", and the *taw1-D2* mutant lines for each cultivar, which exhibits increased spikelet number per panicle in the two sites in Japan. From 40 days before heading to the heading stage, a basal part of stem including the shoot apical meristem of rice was sampled to analyze the metabolite contents an ion chromatography and a high-performance liquid chromatography. As reported in previous studies, the number of spikelets was highly proportional to the shoot nitrogen content. Among measurable 50 metabolites, the iso-citrate contents were positively while the shikimate contents at 28 days before heading were negatively correlated with the number of spikelets. The number of spikelets is divided into two components, i.e., the panicle number and the spikelet number per panicle. The inorganic phosphate content and fructose-6-phoshate content were highly correlated with the panicle number and the spikelet number per panicle, respectively. Based on the results, the key metabolites determining the number of spikelets will be discussed.