

## [P3] Abiotic Stress for Crop Production

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

1:15 PM - 2:00 PM

### [P3-38]Introgression of Dormant Gene *Sdr4-k* Improves Grain Quality of Sake Rice

\*Nominated for Presentation Awards

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Rice is one of the most important factors in determining the quality of sake. The grain kernel of sake rice cultivars is characterized by the possession of a white cloudy tissue at the center, termed 'white core'. The white core is a critical trait that affects, among others, water absorbability for sake production, yet the mechanism of controlling the tissue formation of the white-core remains not fully understood.

In this study, we focused on *Seed dormancy 4* (*Sdr4-k*) — derived from *indica* rice "kasalth"— as a potential regulator of seed dormancy as well as high temperature (HT)-induced grain chalkiness reduction at the ripening stage. Using a biotron speed-breeding system — with controlled light, temperature, tiller removal, and embryo rescue—, we precisely introgressed the *Sdr4-k* gene into the sake rice varieties "Koshitanrei" and "Gohyakumangoku", and we developed a BC<sub>3</sub> population, named "Koshitanrei *Sdr4-k*" and "Gohyakumangoku *Sdr4-k*" in six generations and 17 months.

Field assessment, gene expression, and brewing characteristics data indicated that plants carrying the *Sdr4-k* gene had similar brewing traits to the WT. Koshitanrei *Sdr4-k* subjected to HT had significantly higher grain quality and seed dormancy than the WT. Our data revealed that HT induced alteration of starch-related gene expression in Koshitanrei *Sdr4-k* and Gohyakumangoku *Sdr4-k* ripe seeds than WT.