[O33] Salinity

Chair: Yoshihiko Hirai (Okayama University, Japan)
Chair: Sakae Agarie (Kyushu University, Japan)
Chair: Glenn Borja Gregorio (Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA), Phillippines)
Thu. Sep 9, 2021 5:00 PM - 7:00 PM Room 3 (Oral) (Abiotic Stress for Crop Production)

6:25 PM - 6:40 PM

[O33-06]Three-Dimensional Analysis on the Internal Structure of Rice Leaf Tissue and the Intracellular Structure of Mesophyll Cells

*Nominated for Presentation Awards

○Rachana Ouk, Takao Oi, Mitsutaka Taniguchi (Graduate School of Bioagricultural Sciences, Nagoya University, Japan)

Anatomical characteristics of the mesophyll in leaves are essential for understanding the plant photosynthetic ability, potential productivity, and environmental stress adaptation. Mesophyll cells in rice leaf blades have an intricate shape with a large volume of chloroplasts compared to other crops, enhancing the gas exchange between stroma and intercellular airspace. The capacity of the gas diffusion inside the leaf depends on the intracellular structure and intercellular airspace. However, it is hard to characterize their structures on a three-dimensional (3D) level. This study used the 3D reconstruction method based on serial section light microscopy to compare the cell structures and intercellular airspace at three regions (adaxial, middle, abaxial) of rice leaf tissues. The 3D reconstructed models revealed that the sizes of adaxial mesophyll cells appeared to be larger than those of middle and abaxial mesophyll cells. In contrast, the mesophyll cell density in the middle region was higher than those in the adaxial and abaxial regions. The volume of chloroplasts in adaxial mesophyll cells was more significant than those in the middle and abaxial mesophyll cells. The volume of intercellular airspace in leaves showed no difference among the three regions. Based on the 3D anatomical value, we will discuss the surface areas of mesophyll cells (S_{mes}) and chloroplasts (S_c) facing intercellular airspace that are important for photosynthetic ability.