

[P4] Crop Genetics and Physiology

Thu. Sep 9, 2021 12:15 PM - 2:00 PM Room 4 (Poster) (Crop Genetics and Physiology)

1:15 PM - 2:00 PM

[P4-28] Morphological Characteristics of Mealy and Translucent Endosperm Cells of Hulless Barley (*Hordeum vulgare* var. *nudum*) During the Ripening Stage

*Nominated for Presentation Awards

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Glassiness rate is one of the important indices for grain quality of hulless barley (*Hordeum vulgare* var. *nudum*), and the high glassiness rate declines the processing efficiency and market value of the grain. The glassiness represents the ratio of the mealy and translucent areas in the endosperm of the grain. Although it was reported that the glassiness was involved in the protein matrix (protein bodies) and structure of starch granules in the endosperm cell, the differences in the development process of these organelles between putative mealy and translucent cells during the ripening stage remain unclear. In this study, using a light microscope and transmission electron microscope, the endosperm cells of two hulless barley cultivars, Haruhimeboshi and Mannenboshi, at the eight ripening stages were observed. At maturation, the percentage of glassy grain which translucent endosperm area occupied more than 70 % of the whole cross-section area of grain was less than 20 % in Haruhimeboshi, whereas that was more than 80 % in Mannenboshi. The protein bodies and amyloplasts developed especially after 20 days after flowering, and the area of protein bodies at maturation became larger in Mannenboshi than Haruhimeboshi. Moreover, the area of protein bodies in the outer endosperm where the glassy cell was observed with high frequency was larger than that in the middle and inner endosperm. These results suggested that the development of protein bodies at the later ripening stage could be involved in the glassy formation of hulless barley grains.