

[P3] Abiotic Stress for Crop Production

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

12:15 PM - 1:00 PM

[P3-45] Root Anatomical Traits Related to Root Oxygen Consumption and Transportation between Upland Rice and Lowland Rice Varieties

*Nominated for Presentation Awards

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Root oxygen transportation is important traits to maintain the oxygen consumption to roots under hypoxia. Many studies focused on the aerenchyma formation, in these days anatomical study of root tissue such as narrower stele and larger cortex is revealed to benefit for waterlogging adaptation (Sundgren et al. 2018, Yamauchi et al. 2019). We aimed to investigate the difference of adaptive strategy for waterlogging in upland and lowland rice on physiological and anatomical aspects. We evaluated the anatomical traits in seminal root to seedlings of 6 rice varieties, then we evaluated the physiological and anatomical traits among 4 varieties include Sensho showing lowest CSR (Cortex to stele ratio) in seminal root. Our analysis observed narrower stele and higher CSR in IR42 and Koshihikari. It was considered to benefit adaptation to continuous hypoxia condition such as paddy field because of lower root oxygen consumption per plant. On the other hand, Sensho showed the lowest CSR and porosity, larger stele compared to lowland varieties, but this variety had highest oxygen transportation ability. It may relate the shoot activity because Sensho had highest estimated stomatal contribution to roots. As a result of comparing lowland and upland rice variety, oxygen consumption per plant and stele area were significant higher in upland rice variety than in lowland rice variety. It was considered that this higher oxygen demand was compensated by high CSR and porosity in Black Gora, and by high oxygen transportation in Sensho.