

[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

[P3-35] Effects of Root Aerenchyma Formation and Photosynthetic Activity of Leaves under Submergence on Post-Submergence Recovery in *Oryza sativa* and *O. glaberrima*

○Chiharu Sone, Yuta Echizenya, Daichi Tozawa, Kyoko Toyofuku, Atushi Ogawa (Faculty of Bioresource Sciences, Akita Prefectural University, Japan)

Rice plants cope with flash floods using either an "escape strategy" involving rapid shoot elongation or a "quiescence strategy" involving survival underwater with minimal activity. In previous studies, leaf elongation and growth in shoot biomass during complete submergence were greater in *O. glaberrima* than in *O. sativa*. To clarify the mechanism of rapid shoot elongation under submergence of *O. glaberrima*, we studied the effects of root aerenchyma formation and photosynthetic activity of leaves under submergence on post-submergence recovery. *O. glaberrima* cv. TOG6876, *O. sativa* cv. REXMONT and *O. sativa* cv. MILYANG23 were used. TOG6876 and REXMONT exhibit shoot elongation in response to submergence. MILYANG23 elongated slowly when submerged. Twenty-day old seedlings were submerged for 7 days. During submergence, the shoot elongation rates were higher in TOG6876 than in REXMONT and the lowest in MILYANG23. In submerged TOG6876 and MILYANG23, the increase of shoot biomass during post-submergence was significantly larger than in REXMONT. During submergence, the maximal quantum yield of photosystem II (F_v/F_m) of the upper developed leaf decreased earlier in REXMONT than in TOG6876 and MILYANG23. At 3 days after submergence, root aerenchyma formation was observed in TOG6876 and REXMONT but not in MILYANG23. The physiological mechanism responsible through the chlorophyll breakdown and photodamage in submerged leaves of *O. glaberrima* might be different from the shoot-elongation cultivar in *O. sativa*.