

[P1] Field Crop Production

Thu. Sep 9, 2021 12:15 PM - 2:00 PM Room 1 (Poster) (Field Crop Production)

1:15 PM - 2:00 PM

[P1-12] Cultivar Difference of Iron Toxicity Tolerance in Rice (*Oryza sativa* L.) during Germination and Seedling Stages

*Nominated for Presentation Awards

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Iron (Fe) toxicity is a major constraint for rice production on acid sulfate soils in tropical deltas, where development of Fe toxicity-tolerant cultivars is prerequisite. In this study, genotype screening systems for Fe toxicity tolerance during germination and seedling stages were examined. For the screening during the germination stage, hydroponic and soil cultures and the use of agar medium were evaluated. Hydroponic and soil cultures proved suitable for large scale screening due to their simplicity and rapidity, while uniform seeding and water depth was critical in soil culture. In the screening during the seedling stage with hydroponic culture, varying Fe levels (0-400 mg L⁻¹) were compared, and we found that significant shoot biomass reduction occurs with more than 300 mg L⁻¹ Fe. Our results also showed that the effect of pH was small in the range of pH 4-5, compared to that of Fe level in the range of 0-800 mg L⁻¹. Among seven cultivars (Cilamaya Muncul, DV85, INPARA2, INPARA5, IR64, Mahsuri and Taichung 65) grown at 500 mg L⁻¹ Fe, Taichung 65 showed least shoot biomass reduction and the lowest shoot Fe concentration. This result suggested that Taichung 65 has root-based tolerant mechanism, possibly by preventing Fe from permeating the root or inhibiting the Fe transport from the root to the shoot. In conclusion, genotype screening systems for Fe toxicity during germination and seedling stages were established and Taichung 65 showed tolerance in the seedling stage, possibly by operating its root-based tolerant mechanism.