

[P4] Crop Genetics and Physiology

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

12:15 PM - 1:00 PM

[P4-35] Marker-Assisted Selection to Develop the High Nutrition Rice, Giant-Golden-Purple Rice, PFR32, and Giant-Golden-Red Rice, RFR13

○Yu-Chia Hsu¹, Yu-Chien Tseng¹, Yu-Chi Cheng², Bing-Nan Lin¹, Yong-Pei Wu² (1.Department of Agronomy, National Chiayi University, Taiwan, 2.Department of Agronomy, Chiayi Agricultural Experiment Station, Taiwan Agricultural Research Institute, Taiwan)

Rice (*Oryza sativa* L.) is one of the most important crops in the world. Functional rice can help people quickly gain nutrition and improve the health condition. CNY103108 and CNY103107, are two rice lines with purple waxy, golden endosperm and giant embryo. They were utilized as the donor parents in this study. In Taiwan, CNY922401, an elite purple waxy rice line and TNGSW26, a *indica* red waxy rice variety with high yield, which were used as the recurrent parents. The progenies were foreground selected by OsALDH7 (rice aldehyde dehydrogenase 7) and ge2 (giant embryo gene 2) functional markers and consequently background selected by molecular markers to recover their recurrent parent's background genome. The MAS results showed on purple rice population (CNY922401 / CNY103108), the recovery of recurrent parental genome was 91.3% and on red rice population (TNGSW26 / CNY103107), the recovery of recurrent parental genome was 89.8%. Through observing the grain appearance of brown rice from two populations, the progenies showed that they have the same color of pericarp with the recurrent parents, and have the larger embryo than the recurrent parents. After three-year yield trials in the field, PFR32 and RFR13 were selected from purple rice and red rice population, respectively. They have similar yield as the recurrent parents with golden endosperm and giant embryo. These results indicated that these lines can be grown in the fields for cultivation, and have been successful introgressed two genes, OsALDH7 and ge2 to the recurrent parents using marker-assisted selection. The new functional rice varieties will be developed and suitable for rice production in Taiwan and the world.