Construction of Introgression Lines from Wild Rice (*Oryza australiensis* Domin) and Assessment of Yield-Related Traits

Charng-Pei Li2,5, Hsin-Mei Ku3, Tzer-Kuan Hu3, Chyr-Guan Chern4, Ming-Hsing Lai4, Ching-Shan Tseng4, Jen-Ren Chen2, and Tung-Hi Tseng2

**Abstract**


To develop introgression lines (ILs) from wild rice, five Japonica varieties cultivated rice (*Oryza sativa*) were crossed with three accessions of wild rice *O. australiensis*, obtained from International Rice Research Institute (IRRI). The percentage of seed set and germination in embryo rescue culture varied with crosses, ranging from 2.3 to 54.6% for seed sets and 0 to 83.3% for seed germination. Among the three crosses, Tainung 67 (TNG67) × IRGC100882, TNG67 × IRGC101397, and TNG67 × IRGC101410, F1 weakness was observed in TNG67 × IRGC101410, whereas all of the three crosses failed to produce F2 seeds. Backcross was successful only for the hybrid TNG67 × IRGC100882, using TNG67 as the recipient, and the production of seeds from this hybrid was low (< 0.98%) in the first and second generations of backcross but raised to 46% in the third generation of backcross. To evaluate yield-related traits in multiple generations backcross populations, wide ranges of variations in BC2F2 and BC3F1 were observed, suggesting that they are the best generations for selection in the breeding procedure. To assess yield-related traits, 111 lines BC3F7 were selected from BC3F1. Eight lines were showed more than 10% higher grain yield than TNG67. The others trait-enhancing lines best over TNG67 were from 15.7% in 1000-grains weight to 78% in panicle length. These ILs will be useful as a source of valuable traits for the rice improvement and for detecting favorable genes of wild rice *O. australiensis*.

**Key words:** *Oryza sativa*, *Oryza australiensis*, Interspecific hybridization, Backcross, Embryo rescue culture, Introgression lines, Yield related traits.