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Characterization of panicle architecture and vascular bundle number at panicle neck on *Oryza glaberrima* introgression lines

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Abstract

Oryza sativa and *Oryza glaberrima* are rice cultivars distributed in Asia and Africa. There are several differences between these cultivars in morphological characteristics such as panicle structure and especially the secondary branch number of *O. glaberrima* is less than that of *O. sativa*. Generally, branch number of panicle related to a large vascular bundle number (VBN) among *O. sativa* and there is a wide variation of the VBN of the peduncle from where the bundles enter into the rachis branches. However, there is less information about VBN in *O. glaberrima* and also the relationship between VBN and branch numbers, the primary branch number (PBN) and secondary branch number (SBN). Additionally, the genetic factor for VBN and branch number in *O. glaberrima* is not completely exploited. In this study, phenotypic variation for VBN and panicle structure were investigated using a set of 40 BC_3 -derived from IRGC 104038 (*O. glaberrima* from Senegal) and 35 BC_4 –derived from IRGC103777 (*O. glaberrima* from Mali) introgression lines with a genetic background of *japonica* rice Taichung 65. Taichung 65 had 11.8 PBN, 16.0 SBN and 11.5 VBN, while IRGC 103777 had 12.0 PBN, 15.0 SBN and 15.3 VBN. The introgression lines derived from IRGC 104038 had range from 9.0 to 14.4 in the PBN, range from 9.6 to 33.5 in the SBN and range from 9.8 to 14.8 in the VBN. Additionally, the introgression lines derived from IRGC 103777 had range from 9.0 to 18.5 in the PBN, range from 10.3 to 39.0 in the SBN and range from 9.0 to 15.3 in the VBN. Among two set of introgression lines, there are significant correlation between VBN and PBN. Multiple introgression lines indicated higher PBN, SBN and VBN than Taichung 65 and these examined characteristics are supposedly controlled by quantitative traits loci. The genetic factor related to VBN and panicle architecture can be revealed using segregating population in future study.

Keywords: *Oryza glaberrima*, rice, introgression lines, panicle architecture, vascular bundle

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