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Identification and Functional Analysis of a Major QTL and Related Genes for Tiller Angle in Rice Using QTL Analysis

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[Abstract]

Tiller angle, defined as the angle between the main stem and its side tillers, is one of the main target traits selected inbreeding to achieve the ideal plant type and increase rice yield. Therefore, the discovery and identification of tiller angle-related genes can provide architecture and yield. In the present work, using QTL analysis hence a total of 8 quantitative trait loci (QTLs) were detected based on the phenotype data of tiller angle and tiller crown width in two years. Among them, four QTLs (*qTA9*, *qCW9*, *qTA9-1*, *qCW9-1*) were overlapped at marker interval RM6235-RM24288 on chromosome 9 with a large effect value regarded as stable major QTL. Twenty tiller angle-related genes were selected from the target region and the relative gene expression levels were checked in five compact type lines, five spreading type lines, and their parental lines. Finally, *OsSAURq9* which belongs auxin-responsive SMALL AUXIN UP RNA (SAUR) protein family was selected as a target gene. Overall, this work will help broaden our understanding of the genetic control of tiller angle and tiller crown width, and this study provides both a good theoretical basis and a new genetic resource for the breeding of ideal-type rice.

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