



## QTLs for rice flag leaf traits in doubled haploid populations in different environments

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Genet. Mol. Res. 14 (2): 6786-6795 (2015)

Received September 4, 2014

Accepted February 13, 2015

Published June 18, 2015

DOI <http://dx.doi.org/10.4238/2015.June.18.21>

**ABSTRACT.** Two rice doubled haploid (DH) populations derived from the crosses of ZYQ8/JX17 and CJ06/TN1 were used to detect quantitative trait loci (QTLs) for flag leaf length (FLL), width (FLW), and angle (FLA) under long-day conditions in Hangzhou (subtropical zone) and short-day conditions in Hainan (tropical zone), China. The four parents differed significantly in all 3 traits. FLL was found to be positively correlated with FLW in the 2 populations. A total of 30 QTLs were identified for flag leaf traits, with a contribution to the phenotypic variation of each QTL from 4.49 to 26.30%. Among these, *qFLL-4b*, *qFLW-12*, and *qFLA-2a* showed larger additive effects on the phenotype and explained more variations compared to the other QTLs. *qFLL-1a* and *qFLL-8* were detected in both environments, while *qFLL-2*, *qFLL-3*, *qFLL-10*, *qFLL-12*, *qFLW11*, *qFLW2*, and *qFLA8* were novel QTLs, which may be beneficial to rice ideal-type breeding.

**Key words:** Doubled haploid population; Quantitative trait loci; Flag leaf; Rice