



# Major quality trait analysis and QTL detection in hexaploid wheat in humid rain-fed agriculture

H.M. Li, Z.X. Tang, H.Q. Zhang, B.J. Yan and Z.L. Ren

State Key Laboratory of Plant Genetics and Breeding,  
Sichuan Agricultural University, Chengdu, Sichuan, China

Corresponding authors: B.J. Yan / Z.L. Ren  
E-mail: yanbenju@sicau.edu.cn / renzllab@sicau.edu.cn

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**ABSTRACT.** Humid rain-fed agriculture is a special environment for wheat (*Triticum aestivum*) culture that tends to negatively affect wheat yield and quality. To identify quality characters of wheat in a humid environment, we conducted quality analysis and quantitative trait loci (QTL) detection in a recombinant inbred line whose parent had a high level of quality for several years. We found that high-quality wheat had less gluten content and lower protein content. Apparently, wheat quality and associated quantity traits were in a dynamic state of equilibrium. We detected 83 QTL for 10 wheat quality traits in this recombinant inbred line population. Nine QTL were detected in both evaluation years; Q.DT.scau-2A, linked to Xwmc522-2A, was detected at the same genetic location in both years. Other QTL for different traits were detected simultaneously in more than one location. Consequently, there appeared to be pleiotropic genes that control wheat quality. Based on previous studies and our research on QTL analysis of grain protein content, we conclude that there must be one or more genes for grain protein content on chromosome 6B, whose expression was little affected by environment. We constructed a consensus map and

projected the QTL on it. It was useful for choosing optimal markers for marker-assisted breeding and map-based cloning.

**Key words:** Wheat; Quality; Humid; Rain-fed agriculture; QTL; Consensus map