

研究论文

# 利用CSSL群体研究稻米AC和PC相关QTL表达稳定性

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**摘要** 利用以Asominori为遗传背景具IR24染色体片段的置换系(CSSL)群体,在“2年4点”8个环境对稻米直链淀粉含量(AC)和蛋白质含量(PC)进行QTL定位和表达稳定性分析。结果共检测到8个AC和PC相关QTL,其中2个QTL在8个环境中都能重复出现,即影响AC的qAC-8和控制PC的qPC-8,平均贡献率分别为21.0%和26.9%。qAC-8和qPC-8对应置换系与背景亲本Asominori在8个环境中相应性状的表现型都达到极显著差异( $P < 0.01$ );都仅与8个环境中的2个环境之间存在显著的互作效应;说明qAC-8和qPC-8的效应显著且稳定性较高。此外,qAC-8和qPC-8都被定位在第8染色体R727~G1149区间,IR24的等位基因可同时提高AC和PC,这为研究水稻籽粒直链淀粉和蛋白质形成途径之间的相互关系以及碳氮代谢协同调控的遗传机制提供了新的信息。

**关键词** [水稻](#), [直链淀粉含量](#) [蛋白质含量](#) [染色体片段置换系\(CSSL\)](#) [QTL稳定性](#)

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## Stable Expression of QTL for AC and PC of Milled Rice (*Oryza sativa* L.) Using a CSSL Population

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**Abstract** A chromosome segment substitution lines population, derived from Asominori/IR24 with Asominori as the recurrent parent, was planted and phenotyped for amylose content (AC) and protein content (PC) of milled rice in two successive years and four sites. QTL for AC and PC were characterized and stability of their expression was investigated. The phenotypic value for AC and PC showed a continuous distribution and some transgressive lines were also observed. Additionally, a total of 8 QTL for two quality traits were identified, and two of them were consistently detected in the eight different environments. Phenotypic values were different significantly ( $P < 0.01$ ) between Asominori and the CSSLs harboring any of the two QTL alleles. Otherwise, the significant QTL by environment interactions were observed for qAC-8 and qPC-8 in two of the eight environments. Therefore, these results indicated that the two QTL, qAC-8 for AC and qPC-8 for PC, were stably expressed in different environments. Since QTL qAC-8 and qPC-8 were both mapped in the G1149 - R727 interval, the two RFLP markers, namely G1149 and R727, would be useful markers for further fine mapping of QTL and marker-assisted selection (MAS) through marker conversion in rice quality improvement.

**Key words** [Rice \(\*Oryza sativa\* L.\)](#) [Amylose content](#) [Protein content](#) [Chromosome Segment Substitution Lines \(CSSLs\)](#) [QTL expression stability](#) [Marker-assisted selection \(MAS\)](#)

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