

研究论文

# 水稻品种IR24抗条纹叶枯病相关QTL的检测

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**摘要** 为探明籼稻品种IR24是否携有新的抗条纹叶枯病基因, 利用衍生于Asominori/IR24的重组自交系(RIL)群体和以Asominori为遗传背景IR24插入片段的染色体片段置换系(CSSL)群体, 进行抗条纹叶枯病相关QTL的检测。利用疫区田间自然条件鉴定的方法, 在RIL群体中共检测到4个控制条纹叶枯病的QTL, 分别位于第3、5、7、11染色体上(qSTV3、qSTV5、qSTV7、qSTV11), 其中qSTV3、qSTV7和qSTV11增强抗性的等位基因来自抗性亲本IR24。采用图示基因型比较法, 在CSSL群体中将4个抗条纹叶枯病相关基因位点分别定位在染色体片段置换系CSSL4、L17、L39、L61、L62的IR24插入片段上。对比分析RIL群体和CSSL群体的分子连锁图谱, 发现qSTV3所在的标记区间与CSSL17的IR24片段相吻合, qSTV7所在的标记区间与CSSL4的杂合片段、CSSL39的IR24片段相吻合, qSTV11所在的标记区间与CSSL61的IR24片段以及CSSL62的杂合片段相吻合, 表明确实存在这3个位点。与前人的研究结果相比较, 发现位于第3染色体上的qSTV3区域存在抗刺吸性害虫的基因簇, 是一个表达稳定的抗灰飞虱基因座; 位于第7染色体上的qSTV7不同于已报道的抗性基因座, 表明IR24携有新的抗性基因, 这些基因不同于主基因Stvb-i, 为防止广泛使用单一基因而造成的遗传脆弱性提供了新的抗性基因源, 并且为利用分子标记辅助选择, 聚合不同抗性基因培育抗性稳定的条纹叶枯病抗性品种创造了条件。

**关键词** [水稻条纹叶枯病](#) [灰飞虱](#) [抗性](#) [数量性状基因座](#)

分类号

## Detection of QTL Associated with Rice Stripe Resistance in Cultivar IR24

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**Abstract** In order to verify the quantitative trait loci for rice stripe in rice cultivar IR24, QTL mapping of resistance to rice stripe was studied using both recombinant inbred lines (RIL) and a series of IR24 chromosome segment substitution lines (CSSLs) with Asominori genetic background. Four QTL were detected and located on chromosome 3, 5, 7, 11, respectively, (qSTV3, qSTV5, qSTV7, qSTV11) using RIL population by natural condition test in the infected rice field. The positive resistance effects at qSTV3, qSTV7 and qSTV11 were from IR24. A graphical genotype analysis of the CSSL population indicated that the IR24-derived segments presented in five lines with QTL conferring rice stripe resistance. Comparing RIL with CSSL linkage maps, we found that the marker regions of qSTV3, qSTV7 and qSTV11 coincided with IR24 segment in CSSL 17, heterozygous segment in CSSL4 and IR24 segment in CSSL39, and IR24 segment in CSSL61 and heterozygous segment in CSSL62, respectively. Additionally, qSTV3 was arranged on a gene cluster of chromosome 3 associated with sucking insect resistance, suggesting it be a new and stable expression locus, and qSTV7 be another new QTL detected in this research, after comparing with previous reports. These results indicated that IR24 carried several new resistance genes controlling rice stripe. This will provide a new resistance resource for avoiding genetic vulnerability from single resistance gene, Stvb-i, and provide a foundation for breeding rice varieties with stable resistance to rice stripe by diversifying rice stripe virus and small brown planthopper resistance genes in MAS.

**Key words** [Rice stripe](#) [Laodelphax striatellus](#) [Fallen](#) [Resistance](#) [Quantitative trait locus \(QTL\)](#)

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