

研究论文

三黄占2号稻瘟病抗性与稻米直链淀粉含量的关系研究

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收稿日期 2004-10-8 修回日期 2005-5-12 网络版发布日期 接受日期

摘要 以高抗稻瘟病、直链淀粉含量(AC)较高的三黄占2号和高感稻瘟病、AC较低的丽江新团黑谷衍生的重组自交系群体为研究材料,从性状的相关性和控制两性状的基因在染色体上的位置关系剖析稻瘟病抗性和稻米AC的内在关系。结果表明,两性状间没有显著的相关性。3个与AC相关的QTL分别被定位在第5、6和7染色体上,其加性效应均来自丽江新团黑谷,起降低AC的作用。比较这些QTL与先前对同一群体鉴定的稻瘟病抗性基因(主效基因和QTL)在染色体上的位置,表明控制这两性状的基因上没有紧密连锁关系,亦没有显著的基因间互作。据此认为,通过亲本的合理选择和分子标记辅助选择可以把三黄占2号稻瘟病持久抗性与理想AC整合到同一品系中,育成优质、抗病的优良品种。

关键词 [稻瘟病抗性](#) [直链淀粉含量](#) [基因定位](#) [相关性](#) [水稻](#)

分类号 [S511](#)

Relationship between Blast Resistance and Amylose Content in a RIL Population Derived from Rice Crossed SHZ-2 × LTH

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Abstract Sanhuangzhan 2 (SHZ-2) has been considered as a promising blast resistance source in rice breeding in South China because of its durable blast resistance and good agronomic traits. Three major genes responsible for qualitative resistance and five defense genes significantly associated with quantitative resistance to blast in SHZ-2 have been identified and mapped using the candidate resistance gene approach in our previous study. However, its eating quality of kernel is relatively poor because of higher amylose content (AC), and most derived resistant cultivars have the similar shortcoming. To have an insight into the relationship between the strong blast resistance and the higher AC in SHZ-2, a RIL population derived from a cross between SHZ-2 and Lijiangxintuanheigu (LTH) was used to identify the blast resistance genes in SHZ-2 and QTLs for AC in the study. Results revealed that no significant ($P < 0.05$) correlation between blast resistance and AC in the RIL population was found (Table 2). t-test also indicated that there was no significant difference for average AC between highly blast-resistant RI lines and the blast-susceptible RI lines (Table 3). Three QTLs for AC were identified when single-factor analysis of variance and interval mapping were performed. They were mapped on chromosome 5, 6 and 7, respectively. All the three QTLs were from LTH and contributed to the reduction of AC. Comparing the locations of QTLs for AC identified in this study with the locations of previously identified genes (major genes and QTLs) conferring blast resistance in SHZ-2, there was no close linkage among these genes for the two traits (Fig.2). These results suggested that the strong blast resistance are not linked with the higher AC in SHZ-2 and it is possible to combine the two traits and develop a elite cultivar with durable blast resistance and ideal AC by proper selection of parents and marker-assisted selection.

Key words [Blast resistance](#) [Amylose content](#) [Gene mapping](#) [Correlation](#) [Oryza sativa L.](#)

DOI:

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