

研究论文

# 利用DH群体分析水稻产量与蒸煮品质的遗传相关性

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**摘要** 以粳稻农垦57和武运粳8号杂交衍生的DH群体为材, 分析了各株系产量和蒸煮品质之间的关系。结果表明, 在DH群体中有效穗数、每穗粒数、着粒密度、单株产量与PKV、HPV、BDV、CPV、SBV、CSV显著或极显著相关, 而其他产量性状与品质指标间没有显著的相关关系。利用在亲本间表现多态性的60个SSR标记分析了DH群体各株系的基因型, 单标记分析和复合区间作图结果显示, 第7染色体上RM234~RM505区间内存在同时控制单株产量、PKV、HPV和CPV的QTL, 在第6染色体的RM454~RM162同时存在控制着粒密度、BDV、SBV的QTL。没有发现共同控制单株产量和最能反映蒸煮品质的BDV和SBV的相关QTL。总之, 水稻产量和蒸煮品质性状确实存在一定程度的相关性, 但通过优化产量构成因子的结构, 选择合适的品质性状相关基因可以实现优质与高产的重组, 从而培育优质、高产水稻新品种。

**关键词** [水稻](#) [产量](#) [蒸煮品质](#) [相关分析](#)

分类号

## Genetic Correlation Analysis between Yield and Its Components and Cooking Quality by using a Rice DH Population

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**Abstract** Many high-yield varieties usually exhibit inferior grain quality in rice. The understanding of the relationship between rice yield and its components, cooking and eating qualities is beneficial for successfully breeding the high-yield variety with good quality. A DH population, consisting of 130 lines, derived from the cross between japonica cultivar Nongken 57 and Wuyunjing 8, was employed to explore the genetic correlation between yield traits and cooking quality. In the DH population, the productive panicles per plant, grains per panicle, grain density, and yield per panicle significantly correlated with PKV, HPV, BDV, CPV, SBV, and CSV positively or negatively, while no significant correlations between other yield traits and cooking quality indices were detected, preliminarily indicating the certain correlation between yield and grain quality. Furthermore, to fully understand these correlation relationships, 60 SSR markers distributed on the entire rice genome, being polymorphic between two parents, were used to detect the genotypes of each line; composite interval mapping and marker-based analysis of variance were employed to analyze the genetic basis for yield traits and cooking quality indices. The results showed that there were a QTL in the interval of RM234 - RM505 on chromosome 7 conferring yield per plant, PKV, HPV, and CPV simultaneously, and another QTL at RM454 - RM162 on chromosome 6, with effects on grain density, BDV, and SBV. But it also should be pointed out that no QTLs were found contributing to yield per plant, BDV, and SBV, simultaneously, the latter two indices were related to cooking quality. Taken together, it is possible that high yield variety with good quality can be achieved through optimizing the structure of yield components, together with selection of favorable alleles on the gene loci conferring rice grain quality.

**Key words** [Rice](#) [Yield](#) [Cooking quality](#) [Correlation analysis](#)

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