

植物遗传学

籼米淀粉粘滞性的基因型与环境互作研究

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摘要

水稻精米中大约含有90%的淀粉, 因此淀粉的特性对水稻的食味品质有很大的影响。淀粉粘滞性是预测稻米食用、蒸煮和加工品质的重要指标。本研究利用4个细胞质雄性不育系和8个恢复系配置的不完全双列杂交组合来分析淀粉粘滞性指标(崩解值、回复值和消减值)的胚乳、细胞质和母体基因效应及环境互作效应。结果表明: 在崩解值、回复值和消减值的遗传变异中, 遗传主效应方差分量占了64%以上, 表明它们主要受遗传主效应控制, 同时也受到基因型与环境互作效应的影响。崩解值、回复值和消减值的总遗传率分别为67.8%、79.5%、79.5%, 而且普通遗传率占了总遗传率的75%以上, 表明对这些性状的早世代选择有效, 且在不同环境中选择效果相对稳定。

关键词 [水稻; 淀粉粘滞性; RVA; 基因型与环境互作](#)

分类号

Analysis of Genotype × Environment Interaction Effects for Starch Pasting Viscosity Characteristics in Indica Rice

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Abstract

Milled rice (*Oryza sativa* L.) is composed of approximately 90% starch. The properties of starch have considerable effects on cooked rice palatability and consumer acceptability. Starch pasting viscosity parameters serve as important indices in the estimation of eating, cooking, and processing qualities of rice. In the present study, four cytoplasmic male-sterile (CMS) lines and eight restorer (R) lines have been used in an incomplete diallel cross to analyze seed effects, cytoplasmic effects, maternal gene effects, and their genotype × environment (GE) effects on the following starch pasting viscosity parameters: breakdown (BD), consistency (CS), and setback (SB). The results demonstrated that the total main genetic variances (VG) accounted for over 64% of the total genetic variance (VG + VGE) for the three traits, indicating that these traits were mainly controlled by the main genetic effects in addition to the GE interaction effects. The estimated total narrow-sense heritability were 67.8%, 79.5%, and 79.5% for BD, CS, and SB, respectively. The general heritability (h^2_G) accounted for over 75% of the total heritability ($h^2_G + h^2_{GE}$), indicating that early selection would be effective for those traits and the selection efficiencies were relatively stable in different environments.

Key words [rice; starch; RVA; pasting viscosity; genotype*environment effect](#)

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