

论文

籼稻与粳稻恢复系C堡籽粒灌浆速率的特征及遗传分析

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摘要:

籼稻是一种分蘖力强、灌浆期短的较原始的亚洲栽培稻类型。大穗型杂交粳稻F<sub>1</sub>单株有效穗数偏少、部分籽粒充实度欠佳,为克服该缺点,本研究调查了籼稻(P<sub>1</sub>)与粳稻恢复系C堡(P<sub>2</sub>)及其正反交F<sub>1</sub>、B<sub>1</sub>、B<sub>2</sub>和F<sub>2</sub> 6个世代各6个灌浆时段的灌浆速率,并运用世代平均数分析方法和主基因+多基因混合遗传模型6个世代联合分析的方法,对平均灌浆速率进行了遗传分析。结果表明:(1)以正反交没有发现平均灌浆速率的细胞质效应。(2)P<sub>1</sub>、P<sub>2</sub>及其F<sub>1</sub>灌浆速率最大的时段都是开花后8~14 d。(3)籼稻全灌浆期28 d,比C堡短14 d;平均灌浆速率比C堡快50%。(4)世代平均数分析显示平均灌浆速率遗传符合加性-显性-上位性模型。主基因+多基因混合遗传模型分析显示平均灌浆速率受2对加性-显性-上位性主基因+加性-显性-上位性多基因共同控制,以主基因遗传为主。

关键词: 籼稻 粳稻恢复系 籽粒灌浆速率 主基因+多基因混合遗传模型 遗传分析

Characterization and Genetic Analysis of Grain Filling Rate of Ludao and Restorer Line C-Bao in *Japonica* Rice(*Oryza sativa* L.)

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Abstract:

Plants of hybrid *japonica* rice with large panicles usually possess fewer productive panicles per plant and have poor plumpness for a number of fertilized grains. "Ludao" is a kind of primitive *japonica* rice of *O. sativa* L., which expressed strong tillering ability and short grain filling duration. In order to overcome the barrier of poor plumpness of *japonica* hybrid rice with large panicles, grain filling rate of 6 filling stages (1-7 d, 8-14 d, 15-21 d, 22-28 d, 29-35 d, and 36-42 d after flowering) were investigated using 6 generations (P<sub>1</sub>, P<sub>2</sub>, F<sub>1</sub>, F<sub>2</sub>, B<sub>1</sub> and B<sub>2</sub>) in the reciprocal crosses derived from "Ludao" and C Bao, a restorer line of *japonica* rice. And genetic analysis for average grain filling rate over whole filling duration was conducted by using the methods of components of means and the mixed major gene plus polygene inheritance models. Research results were as follows: (1) No cytoplasmic effect was found for average grain filling rate based on reciprocal analysis. (2) The largest filling rate appeared in the second stage (8-14 d after flowing) in P<sub>1</sub>, P<sub>2</sub> and their F<sub>1</sub>. (3) The whole filling duration of Ludao was 28 days, 14 days shorter than that of C Bao, and average filling rate in Ludao was fast by 50% as compared with that in C Bao. (4) The inheritance of average grain filling rate fitted additive-dominance-epistasis model based on the analysis of components of means. The average filling rate was controlled by two major genes with additive-dominance-epistatic effects plus polygene with additive-dominance-epistatic effects based on the mixed major gene plus polygene inheritance models, and was mainly governed by major genes.

Keywords: Ludao Restorer line in japonica rice Grain filling rate Mixed major genes plus polygene inheritance models Genetic analysis

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