作物学报 2004 30 (3): 253-257 ISSN: 0496-3490 CN: 11-1809/S

研究论文

利用RIL群体分析HMW-GS对小麦品质性状的量化效应

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收稿日期 2002-9-23 修回日期 2003-3-25 网络版发布日期 接受日期

摘要 利用重组自交系群体——RIL-8群体的131个系及其亲本为材料，分析了高分子量麦谷蛋白亚基及亚基组合对10个小麦品质性状的量化效应及其差异。结果表明，RIL-8群体Glu-A1、Glu-B1、Glu-D1位点编码的亚基分别为 1、N，7+9、7+8和5+10、2+12，主要存在7种亚基组合类型。同一位点不同亚基对面粉吸水率、Zeleny沉淀值、面团形成时间、稳定时间、公差指数、断裂时间等共6个性状均有不同程度的显著影响；而对蛋白质含量、湿面筋含量、干面筋含量、GMP含量等4个性状无显著影响。7种不同位点亚基组合对干面筋含量、蛋白质含量没有显著影响，对湿面筋含量、GMP含量、Zeleny沉淀值、面粉吸水率、面团形成时间、稳定时间、公差指数、断裂时间等8性状均有显著影响。表明同一位点不同亚基、不同位点亚基组合对品质性质均具有重要作用。

关键词 小麦 重组自交系 高分子量麦谷蛋白亚基 品质性状

分类号 S512

Quantitative Effects of High Molecular Weight Glutenin Subunits (HMW-GS) on Wheat Quality Traits Using the Population of Recombinant Inbred Lines (RIL)

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Abstract The quantitative effects of high molecular weight glutenin subunits (HMW-GS) on 11 wheat quality traits were analyzed using a population of recombinant inbred lines (RIL), RIL-8, which included 131 lines obtained from a cross between Chuan 35050 and Shannong 483. The results showed that the HMW-GS of RIL-8 at Glu-A1, Glu-B1 and Glu-D1 loci were 1, N; 7+8, 7+9 and 5+10, 2+12, respectively. The effects were significant differences between different subunits at same loci for water absorption, zeleny sedimentation value, dough development time, dough stability time, mixing tolerance index and breakdown time. On the contrary, no significant differences were detected for wet and dry gluten content, protein content, glutenin macropolymer (GMP) content and GMP/pr. The influences of 7 different subunit combinations at different loci of RIL-8 were significant differences for water absorption, wet glutenin content, GMP content, GMP/pr, zeleny sedimentation value, protein content, dry gluten content, dough development time, dough stability time, mixing tolerance index and breakdown time, but were not significant difference for dry gluten content and protein content. These indicated that the different subunits at same loci and different subunit combinations at different loci have important effects to wheat quality traits.

Key words Common wheat；Recombinant inbred lines；High molecular weigh glutenin subunits；Quality traits

DOI:

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