

研究论文

1Dx5亚基特异PCR标记在小麦品质性状群体改良中的应用

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摘要 利用1Dx5亚基特异PCR标记对改良品质性状的Ta1小麦轮回选择群体C4进行了分子检测, 并通过SDS-PAGE电泳对其结果的验证, 以探讨群体5亚基基因型的组成及其特异PCR标记用于轮回选择的可行性。结果表明:

(1) 1Dx5亚基特异PCR标记在具有1Dx5亚基的单株中均扩增出450 bp的基因片段, 生化标记检测也证明所有能扩增出450 bp片段的单株均含有5亚基的条带, 分子标记与生化标记结果一致, 而且PCR扩增结果的重复性好。说明1Dx5亚基特异PCR标记的选择准确率高, 完全可用于Ta1小麦群体改良中1Dx5亚基基因型的检测; (2) 构建的轮回选择群体C4中携带1Dx5亚基的优质基因型比例高, 达56.81%, 且大都伴随与之连锁的10亚基出现。生化检测表明群体中同时产生5+12稀有亚基和14+15与5+10的聚合体。

关键词 [太谷核不育小麦](#) [群体改良](#) [分子标记](#) [HMW-GS](#) [SDS-PAGE](#)

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The Application of Specific PCR Marker of 1Dx5 Subunit in Population Improvement for Wheat Quality Characters

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Abstract Ta1 wheat C4 recurrent selection population with improved quality characters were detected by specific PCR marker of 1Dx5 subunit, and retested by SDS-PAGE technique. The objectives of this study were is to study the genotype composition of 1Dx5 subunit and the feasibility of its specific PCR marker used in recurrent selection, furthermore, to provide the scientific evidence of molecule marker assisted recurrent selection breeding of Ta1 wheat. The results indicated that: (1) 450 bp special fragment was amplified using 1Dx5 specific PCR technique in all the plants with 1Dx5 subunit, and the result of biochemical marker indicated that all the plants with 450 bp special fragment also had 1Dx5 belt, the results of molecular marker and biochemical marker were the same. And the high repeatability of PCR amplification indicated that specific PCR marker had high accuracy on selection, which were suitable for detecting genotype of 1Dx5 in Ta1 wheat improving population(Fig.2 and Fig.3). (2) The percentage of high quality genotype of 1Dx5 in the C4 recurrent selection population was high, which was 56.81%, and almost associated with 1Dy10. The result of biochemical detection showed that the rare subunits of 5+12 and the polymer of 14+15 and 5+10 were also found in the population(Fig.5). (3) Stability of specific PCR marker of 1Dx5 subunit was high, duplications of the same sample were with no exception, 450 bp special fragment was produced in all of them (Fig.4), so the availability of molecule marker assistant recurrent selection of Ta1 wheat which can improve the composition of high molecular weight-glutenin subunits(HMW-GS) was proved. Using the above-mentioned method and technique, wheat quality characters can be improved. According to the principle of recurrent selection, good genes were introduced into the population via controlled pollination, the bad quality genotypes were eliminated before flowering by molecular marker assisted selection, high quality genes were recombined, accumulated and polymerized by inter-crossing male-sterile plants with fertile ones, thus the frequency of high quality genes were increased.

Key words [Taigu genic male-sterile wheat](#); [Population improvement](#); [Molecular marker](#); [HMW-GS](#); [SDS-PAGE](#)

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