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论文

川麦42的1BS染色体臂对小麦主要农艺性状的遗传效应

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摘要：

川麦42的1BS染色体臂来源于人工合成小麦亲本Syn769。利用川麦42与含1BL/1RS易位系的四川小麦品种川农16构建的127个重组自交系(RIL, F_8)，经3年4个环境的遗传评价，比较了川麦42的1BS和川农16的1RS染色体臂对小麦产量构成因子和产量的遗传效应。结果表明，RIL群体中川麦42的1BS染色体臂株系和川农16的1RS染色体臂株系在分蘖力、成穗率、全生育期、小穗数、收获指数和籽粒产量6个性状上存在显著差异; 1BS染色体臂有利于提高成穗率和收获指数，而1RS染色体臂有利于提高分蘖能力和增加小穗数，1BS株系的籽粒平均产量比1RS株系增加2.91%。鉴于1RS染色体臂上的抗条锈病基因丧失抗性，其携带的黑麦碱基因对加工品质有明显的负向作用，而川麦42的1BS染色体臂携带高抗条锈病基因*YrCH42*, 并对小麦籽粒产量有正向作用，因此建议在小麦遗传改良中利用川麦42的1BS替换1RS染色体臂。

关键词： 1BS 1RS 人工合成小麦 川麦42 遗传效应

Genetic Effects of 1BS Chromosome Arm on the Main Agrionomic Traits in Chuanmai 42

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Abstract:

Chuanmai 42 (Syn769/Sw3243//Chuan6415) is a non-1BL/1RS wheat (*Triticum aestivum* L.) cultivar with high-yield potential and good resistance to strip rust (*Puccinia striiformis* f. sp. *tritici*), which has been developed from an elite synthetic hexaploid wheat Syn769 (Decoy 1/*Aegilops tauschii* 188, 1BS/1BL). The 1BS chromosome arm of Chuanmai 42 is originated from Syn769 and carries a stripe rust resistance gene *YrCH42*. In purpose of understanding the genetic effects of 1BS and 1RS chromosome arm on yield-related traits in wheat, 127 recombinant inbred lines (RILs, F_8) derived from Chuanmai 42 and Chuannong 16 (1BL/1RS translocation cultivar) were evaluated in three years across four environments in Sichuan province from 2005 to 2008. A total of 16 traits of the two parents (Chuanmai 42 and Chuannong 16) and the RIL population, such as spike number, grain number per spike, thousand-grain weight, and grain yield, were investigated. 1BS chromosome arm lines derived from Chuanmai 42 and 1RS chromosome arm lines derived from Chuannong 16 were significantly different on six traits. The 1BS chromosome arm positively increased the ratio of spikes to summit population and harvest index, whereas the 1RS chromosome arm only had positive effect on tiller number per plant and spikelet number per spike. The average grain yield of RILs with 1BS chromosome arm was 2.91% higher than that of RILs with 1RS chromosome arm. Because the 1RS chromosome arm with *Sec-1* gene significantly degrades the processing quality of wheat and the rust resistance genes are invalidated to rust races in China, it is suggested to replace the 1RS with the 1BS chromosome arm of Chuanmai 42.

Keywords: 1BS 1RS Synthetic hexaploid wheat Chuanmai 42 Genetic effection

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