

植物诱变育种 · 农业生物技术

EMS诱导小麦易位系YW642突变体的鉴定与分子标记分析

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摘要:

抗黄矮病的小麦-中间偃麦草易位系YW642携带中间偃麦草抗黄矮病基因*Bdv2*。用化学诱变剂甲基磺酸乙酯(EMS)处理抗黄矮病的小麦-中间偃麦草易位系YW642的种子6000粒,从M<sub>2</sub>中筛选出32类不同性状的突变体73株,表型变异率约为7.38%。对感黄矮病突变体的M<sub>3</sub>、M<sub>4</sub>代继续进行鉴定,证明18个感黄矮病突变体的突变性状可以遗传,其黄矮病抗性丧失程度不等。用分子标记对上述感黄矮病突变体及其对照进行分析,结果发现这些突变体分别在1-4个分子标记位点上发生变异,说明这些突变体中*Bdv2*及其附近区域有不同碱基位点发生突变。该研究创造的YW642的突变体,为小麦抗黄矮病基因克隆和功能基因组学研究奠定了坚实的材料基础。

关键词: 小麦 甲基磺酸乙酯(EMS) 突变体 小麦黄矮病抗性

PHENOTYPIC IDENTIFICATION AND MOLECULAR ANALYSIS OF A WHEAT LINE MUTANT YW642 INDUCED BY EMS

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Abstract:

The wheat-*Thinopyrum intermedium* translocation line YW642 carries a *T. intermedium*-derived gene resistant to barley yellow dwarf virus (BYDV), *Bdv2*. The wheat line YW642 was treated by EMS (ethyl methane sulfonate) for the construction of the mutant library. After the selection from M<sub>2</sub> generation, 73 mutant lines with 39 types of traits were obtained with the mutation rate of 7.38%. Among them, 18 mutants with BYDV sensitivity were identified through verifications of M<sub>3</sub> to M<sub>4</sub> generations, but their resistances were reduced to various extent and could be inheritable. Compared with their wild-type donor YW642, these BYDV sensitive mutants showed different amplification results using a number of PCR-based markers in the *Bdv2* region, suggesting that distinct sequence mutations occurred in the region *Bdv2* in these mutants. The mutants are potentially used to clone the *Bdv2* gene and to study effectively functional genomics of wheat.

Keywords: wheat ethyl methane sulfonate(EMS) mutant resistance to barley yellow dwarf virus

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