

植物遗传学

盛花期抗虫杂交棉及其亲本叶片基因表达差异与杂种优势

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摘要

采用DDRT-PCR技术, 以棉花盛花期顶尖叶片cDNA为材料, 对上海生物工程公司合成的专用于基因差异显示分析的3个锚定引物和全套26个随机引物进行筛选, 最后选择了15个扩增差异带丰富的随机引物。采用3个锚定引物和这15个随机引物组成的45对引物组合对24个抗虫棉杂交组合及其10亲本盛花期叶片cDNA进行扩增和差显, 2次扩增重复率达70.1%, 表明在扩增过程中存在较高的假阳性, 通过重复PCR扩增, 统计稳定扩增的条带, 可减少假阳性干扰。根据基因表达方式, 将其划分5种模式: M1为双亲表达沉默, 双亲出现条带而杂种没有条带; M2为单亲表达沉默, 带仅出现在亲本之一, 包括仅母本有带而父本和杂种无带和仅父本有带而母本和杂种无带2种表达方式; M3为杂种特异表达, 带仅出现在杂种, 双亲无带; M4为单亲表达一致, 带在双亲之一和杂种中出现, 而在另一亲本中不出现, 包括母本、杂种中有带而父本无带和父本、杂种中有带而母本无带2种方式; M5为基因表达一致, 带在双亲和杂种中均出现。差显表达模式比例与产量性状和杂种优势分析表明: M4与所有产量性状均呈正相关, 并且与单位面积铃数相关达显著水平, 其他各种模式与杂种产量性状表型值均未达到显著水平; M2与单位面积铃数杂种优势呈显著负相关, M3与皮棉产量杂种优势呈显著正相关。上述结果表明, 盛花期叶片中的基因显性表达和杂种特异表达有利于产量形成和杂种优势发挥。

关键词 [抗虫棉](#); [基因差异表达](#); [杂种优势](#); [盛花期](#)

分类号

Relationship Between Gene Differential Expression of Leaves in Full Opening Flower Stages of Hybrids & Their Parents and Heterosis in Pest-resistant Cotton

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Abstract

<P>cDNAs of leaves of 24 pest-resistant cotton (authorization) crosses and their parents in full opening flower stages were amplified and different bands were displayed by DDRT-PCR, with 45 primer combinations. The mean percentage of bands duplicated was 70.1%, which implied that there was a high proportion of pseudopositive fragments in the amplified cDNA. These pseudopositive bands can be reduced using duplicate PCR. Correlation analysis between differential gene expression and hybrid performance and heterosis showed that M4 (bands detected in one parent and F1) was positively correlated with all yield traits, and significantly correlated with boll number; M2 (bands observed in one parent but not in F1 and another parent) was negatively correlated with heterosis of boll number; and M3 (bands observed only in F1) was positively correlated with heterosis of lint yield. These results showed that genes that had dominant and specific expression in top leaves of full opening flower stages were beneficial to yield formation and heterosis occurrence. </P>

Key words [differential gene expression](#); [pest-resistant cotton](#); [heterosis](#); [full opening flower stages](#)

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