



陆地棉遗传距离与纤维品质性状中亲优势及 F_1 、 F_2 表现的相关性研究

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The Relationship of Genetic Distance to Mid-parent Heterosis and Manifestations of F_1 & F_2 of Fiber Quality Traits in Upland Cotton

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摘要

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摘要 通过29个陆地棉品种(系)表型性状及SSR标记遗传距离聚类分析,依据遗传距离大小在不同类群中选择了8个遗传背景差异不同的陆地棉亲本,进行不完全双列杂交,共配制了28个组合,开展了陆地棉纤维品质性状 F_1 、 F_2 表现及其中亲优势与遗传距离之间的相关、回归分析研究。结果发现杂种 F_1 、 F_2 纤维上半部平均长度、整齐度指数、断裂比强度及其中亲优势均与表型及SSR标记遗传距离正相关,其中杂种 F_1 纤维上半部平均长度与2种遗传距离均达到了显著水平,断裂比强度与SSR标记遗传距离达显著水平;伸长率的杂种 F_1 、 F_2 表现及其中亲优势均与表型及SSR标记遗传距离负相关,其中杂种 F_1 伸长率与SSR标记遗传距离显著负相关。回归分析发现与遗传距离达到显著或极显著相关的纤维品质性状,均与对应遗传距离具有显著或极显著拟合的曲线模型。这些显著或极显著的纤维品质性状,可在育种实践中为利用杂种优势改良棉纤维品质提供参考信息。

关键词: 棉花 遗传距离 中亲优势 SSR标记

Abstract: 29 cotton cultivars or lines were researched by clustering analysis with genetic distance determined by SSR markers and cultivar phenotype data. 28 hybridized combinations, which from 8 upland cotton parents classified by different genetic distance, were tested in the incomplete parallel cross design. The test was designed for the correlation and regression analysis of genetic distance with the mid-parent heterosis and the manifestations of F_1 & F_2 in upland cotton. The results showed that the manifestations and genetic distance marked by SSR in F_1 & F_2 were positive correlation with the fiber length, uniformity index, strength and their mid-parent heterosis, and also, the fiber length was at very significant level with the both, but the strength was at significant level with the genetic distance marked by SSR. The manifestation and their mid-parent heterosis of the elongation were both negative correlated with phenotype and genetic distance, especially, and the correlation of manifestation of elongation with the genetic distance was at significant level. The result of regression analysis showed the curve model of the fiber traits, which were at very significant level or significant level with their genetic distance, were all at very significant level or significant level with their corresponding genetic distance too. The traits, which were at significant or very significant level, could provide reference information for fiber quality improvement and heterosis utilization in cotton.

Keywords: cotton genetic distance mid-parent heterosis SSR markers

Received 2012-07-20;

Fund:

新疆农垦科学院青年基金项目(YQJ2009-06); 新疆农垦科学院引导计划项目(YYD2010-06); 新疆兵团博士资金专项(2010JC01); 新疆兵团育种专项(2011BA001)

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引用本文:

宿俊吉,陈红,余渝,林海,宁新柱,李吉莲,刘萍,刘丽,相吉山,邓福军.陆地棉遗传距离与纤维品质性状中亲优势及 F_1 、 F_2 表现的相关性研究[J] 棉花学报, 2013,V25(2): 142-147

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