棉花学报
Cotton Science
主管：中国科学技术协会
主办：中国农学会
承办：中国农业科学院棉花研究所

棉花学报 » 2013, Vol. 25 » Issue (6) :496-502 DOI: 1002-7807（2013）06-0496-07

利用海岛棉染色体片段置换系改良新陆早45号纤维品质性状的研究

马 麒[1,2]，宿俊吉[2*]，陈 红[2]，邓福军[2**]

1.石河子大学生命科学学院，新疆 石河子 832000；2.新疆农垦科学院棉花研究所/农业部西北内陆区棉花生物学与遗传育种重点实验室，新疆 石河子 832000

Improving Fiber Quality Traits of Xinluzao 45 Using *Gossypium barbadense* Chromosome Segment Substitution Lines

MA Qi[1,2], SU Jun-ji[2*],CHEN Hong[2], DENG Fu-jun[2**]*

1.*College of Life Science*, *Shihezi University*, *Shihezi*, *Xinjiang* 832000, *China*; 2.*Cotton Research Institute*, *Xinjiang Academy of Agricultural and Reclamation Science/ Northwest Inland Region Key Laboratory of Cotton Biology and Genetic Breeding Ministry of Agriculture*, *Shihezi*, *Xinjiang* 832000, *China*

摘要 海岛棉染色体片段置换系是改良陆地棉纤维品质性状的重要种质资源之一。本研究以TM-1背景的海岛棉染色体片段置换系CSSL-122与新疆陆地棉品种新陆早45号及其杂交、回交BC_2F_1群体的120个单株为实验材料，利用被定位在海岛棉染色体上与纤维长度、强度性状紧密连锁的19对SSR标记，在亲本间进行多态性检测，采用多态性标记对BC_2F_1群体中的单株进行海岛棉染色体片段的跟踪和鉴定；同时结合纤维品质性状指标的检测结果，对含有海岛棉染色体片段的阳性植株与无海岛棉染色体片段的非阳性植株进行纤维品质指标的比较分析。结果表明：2对与长度性状连锁的SSR标记NAU2987和BNL3145在双亲间多态性明显，能准确地鉴定BC_2F_1群体中的阳性植株；与非阳性植株相比，阳性植株的纤维长度、强度均有极显著地提高（$P < 0.01$）；在改良过程中，阳性植株的纤维长度和强度的提高呈极显著的相关性，说明纤维长度和强度性状可以同步提高。该研究结论可为利用海岛棉染色体片段置换系改良陆地棉纤维性状提供理论依据和参考信息。

关键词： 海岛棉 染色体片段置换系 新陆早45号 纤维品质

Abstract: *Gossypium barbadense* chromosome segment substitution lines could be used as an important germplasm resource for improving fiber quality traits of upland cotton. In this study, we used TM-1 background substitution lines CSSL-122, the Xinjiang upland cotton Xinluzao 45 and hybrid, backcross progeny BC_2F_1 populations comprising 120 individual plants as test materials. Nineteen SSR markers located in *Gossypium barbadense* chromosomes land inked with fiber length and strength were used to screen out obvious polymorphic primers between the parents. We then traced and detected chromosome segments of *Gossypium barbadense* in the BC_2F_1 populations. Simultaneously, we compared fiber quality traits of positive plants that contained *Gossypium barbadense* chromosome segments with non-positive plants in the BC_2F_1 populations. The results showed that two markers, NAU2987 and BNL3145, which were linked with fiber length, could accurately identify the positive plants. In addition, compared with non-positive plants, the increased fiber length and strength of the positive plants were very significant ($P < 0.01$). Our research suggested that alien *Gossypium barbadense* chromosome segments significantly improved the fiber quality traits of Xinluzao 45. Thus, the *Gossypium barbadense* chromosome segment substitution lines will provide a vital theoretical basis and practical reference for improving Upland Cotton fiber quality traits.

Keywords: *Gossypium barbadense* L. chromosome segment substitution lines Xinluzao 45 fiber quality

Received 2013-05-16;

Fund:

国家“863”计划资助项目（2012AA101108-05-04）；国家科技支撑计划项目（2011BAD35B05-3）；新疆兵团科技支疆项目（2011AB001）；科技部成果转化资金项目（2011GB2G410007）

Corresponding Authors: dengf.j@sohu.com

About author: 马麒（1990-），男，硕士研究生，maqi90@163.com；*共同第一作者

引用本文:

马 麒, 宿俊吉, 陈 红, 邓福军.利用海岛棉染色体片段置换系改良新陆早45号纤维品质性状的研究[J] 棉花学报, 2013,V25(6): 496-502

MA Qi, SU Jun-Ji, CHEN Hong, DENG Fu-Jun.Improving Fiber Quality Traits of Xinluzao 45 Using *Gossypium barbadense* Chromosome Segment Substitution Lines[J] Cotton Science, 2013,V25(6): 496-502