作物学报 2005 31 (4): 444-450 ISSN: 0496-3490 CN: 11-1809/S

研究论文

甘蔗种质遗传基础的AFLP分析

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收稿日期 2004-3-1 修回日期 2004-7-16 网络版发布日期 接受日期

摘要 采用AFLP分子标记技术对54份甘蔗种质（14份祖亲种、40份栽培品种或品系）的遗传基础进行了分析。利用筛选出的4对多态性较强的引物组合（M+CAG/E+ACG，M+CTC/E+ACT，M+CTG/E+ACC，M+CTG/E+ACG），构建了甘蔗54份种质的AFLP指纹图谱，这4对引物组合共扩增出396条谱带，其中多态带390条，占98.5%。54份种质的遗传相似系数变化范围在0.281～0.943，平均0.708。聚类分析表明，随着相似系数结合线的不同，可分别将参试的甘蔗种质从属间（甘蔗属与斑茅种）、野生种（割手密种、大茎野生种）与栽培种（热带种、印度种、中国种）间、栽培种与杂交栽培品种（或品系）间区别开来。各祖亲种与杂交栽培品种（或品系）的遗传相似性由大到小依次为热带种＞印度种和中国种＞大茎野生种＞割手密种＞斑茅。多数品种（品系）的AFLP聚类结果与系谱基本相符，某一品种常与其父代或其祖代的某一亲本聚在同一组中。印度种与中国种之间的亲缘关系最近。

关键词 甘蔗 种质资源 AFLP 遗传基础

分类号 S566

AFLP Analysis for Sugarcane Germplasms

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Abstract Modern sugarcane cultivars (Saccharum spp.) are polyploid or aneuploid clones with complex genetic background, and the major components of the genome derived from S. officinarum, and the remainder from S. spontaneum, S. barberi, S. robustum, S. sinense, and Erianthus arundinaceus. In this study, 54 accessions of sugarcane germplasms (14 parental species, 40 cultivars or clones) were analyzed by amplified fragment length polymorphism (AFLP). Four primer pairs, i.e., M+CAG/E+ACG, M+CTC/E+ACT, M+CTG/E+ACC and M+CTG/E+ACG, were selected and used to establish the AFLP fingerprints of the germplasms. There were 396 bands, of which 390 were polymorphic, accounting for 98.5%. The AFLP data were clustered using UPGMA method. The genetic similarity coefficients among 54 germplasms ranged from 0.281 to 0.943, with a mean of 0.708. Based on the difference of the similarity coefficients, the sugarcane germplasms could be distinguished among inter-genus(Saccharum and Eranthus arundinaceus), wild species(S. spontaneum and S. robustum), cultivated species(S. officinarum, S. barberi and S. sinense), cultivated species and cultivars derived from interspecific hybridization. The similarity between cultivars and parental species S. officinarum were highest, and followed by S. barberi, S. sinense, S. robustum, S. spontaneum, and E. arundinaceus in the order from high to low. Clustering based on AFLP showed that the groupings of most cultivars were corresponded to their pedigree, in which a given cultivar and one of its parents was always clustered into the same group. For example, the cultivar Co290 and its hybrid offspring such as Co419, F134, Mintang70/611, Guangdong 7, Yuetang71/210, Yuetang64/395, Guangxi 1, Yacheng62/40 and Haizhe 4 etc., were clustered into the group D(see Fig.2). The relationship between S. barberi and S. sinense was closest among the parental species. E. arundinaceus was distantly related to Saccharum.

Key words Sugarcane Germplasm AFLP Genetic base

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