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利用RAPD和ISSR分子标记分析怀地黄种质遗传多样性

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摘要 用RAPD与ISSR技术对怀地黄的8个品种和2个脱毒品系进行了种质遗传多样性分析。分别从80条RAPD引物和44条ISSR引物中筛选出适合怀地黄种质分析的17条RAPD引物和10条ISSR引物，用于RAPD和ISSR分析。17条RAPD引物共扩增出177条带，多态性位点数为109；多态性位点比率为61.58%;平均多样性指数(I)为0.3135；每个位点的有效等位基因数（Ne）是1.3641；10条ISSR引物共扩增出110条带. 多态性位点数为79；多态性位点比率为71.58%;平均多样性指数(I)为0.3577；每个位点的有效等位基因数（Ne）是1.4037。 基于扩增条带数据库建立了各自的Jaccard遗传相关系数矩阵，构建了相似的分子树状图，将10个供试材料分为2类:一类群含组培85.5、大田85.5、组培9302、大田9302、金状元和金白6个材料；另一类群含北京1号、大红袍、地黄9104和野生地黄4个材料。两种分子标记的分析结果呈极显著正相关(r＝0.649)。结果表明，RAPD与ISSR标记适合于怀地黄种质遗传多样性分析，ISSR标记技术是一种多态性和重复性优于RAPD技术的实用技术。

关键词 怀地黄 RAPD ISSR 种质遗传多样性 DNA分子标记

分类号

Assessment of Genetic Diversity of Rehmannia glutinosa Libosh .f. hueichingensis (Chao et Schih) Hsiao Germplasm detected by RAPDs and ISSRs

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Abstract

RAPD and ISSR markers were used to assess the germplasm genetic diversity among 10 individuals of Rehmannia glutinosa Libosh .f. hueichingensis (Chao et Schih) Hsiao, including 8 cultivars and 2 virus-free lines micropropagated by tip tissue culture. 17 RAPD primers and 10 ISSR primers, with polymorphic and informative patterns, were selected from a total of 80 RAPD ones and 44 ISSR ones to determine these individuals' genetic diversity. The 17RAPD primers and 10 ISSR primers generated 177RAPDfragments and 110 fragments, respectively. The number of effective loci, the percentage of polymorphic loci, Shannon's Information index (I)
and effective number of alleles (Ne) is in turn109, 61.58%, 0.3135, 1.3641 for RAPD makers, and 79, 71.82 %, 0.3577 and 1.4037 for ISSR markers; Jaccard's genetic similarity matrice and dendrograms for the 10 individuals were formed based on RAPD and ISSR-generated polymorphic bands. In dendrograms, they could be divided into two groups: one group containing six individuals such as Zupei 85.5, Datian 85.5, jinzhuangyuan, Jinbai, Zupei 9302 and Datian9302; the other composed of 4 ones such as Beijing No.1, Dahongpao, Dihuang 9104 and wild dihuang; the correlation coefficient of 0.649 between RAPD and ISSR markers GSs indicated that these two markers were significantly correlated. The results revealed that RAPD and ISSR markers were suitable for assessment of germplasm genetic diversity of Rehmannia glutinosa Libosh .f. hueichingensis (Chao et Schih) Hsiao, and ISSR marker was superior to RAPD marker.

Key words Rehmannia glutinosa Libosh .f. hueichingensis (Chao et Schih) Hsiao RAPD ISSR germplasm genetic diversity DNA molecular marker

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