

基于表型和SRAP标记的切花菊品种遗传多样性分析

张冬菊^{1,2}, 李世超¹, 吴鹏夫¹, 张晓¹, 李秋香¹, 杨树华¹, 贾瑞冬¹, 葛红^{1,*}

¹ 中国农业科学院蔬菜花卉研究所, 北京 100081; ² 华中农业大学园艺林学学院, 武汉 430070

Genetic Diversity Analysis in Cut Chrysanthemum Cultivars Based on Morphology and SRAP Markers

ZHANG Dong-jun^{1,2}, LI Shi-chao¹, WU Peng-fu¹, ZHANG Xiao¹, LI Qiu-xiang¹, YANG Shu-hua¹, JIA Rui-dong¹, and GE Hong^{1,*}

¹Institute of Vegetables and Flowers, Chinese Academy of Agricultural Sciences, Beijing 100081, China; ²College of Horticulture & Forestry Sciences, Huazhong Agricultural University, Wuhan 430070, China

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摘要 利用45个表型性状和SRAP标记分析56个切花菊品种的遗传多样性。表型变异分析结果表明: 21个性状表现出品种内一致性高及品种间特异性强; 主成分分析发现, 主成分贡献值较大的性状有花序直径、花序类型和瓣型等花部性状, 其次是叶部和茎秆性状, 说明所选用的切花菊品种在分类时应以花部性状为主, 叶部和茎秆性状为辅; 表型性状基于遗传距离UPGMA聚类, 将56个切花菊品种分为平瓣类、匙瓣类、桂瓣类、匙瓣—平瓣类和管瓣类, 聚类结果大致按照花径—瓣型—花型分类。14对SRAP引物组合扩增56个切花菊品种的DNA, 共扩增出454条带, 其中多态性带423条, 占扩增带数的93.17%, 多态性含量PIC值在0.72~0.89之间, 平均为0.82, 说明切花菊品种在分子水平上具有丰富的遗传多样性。基于SRAP标记的UPGMA聚类分析显示: 品种间遗传相似系数在0.64~0.97之间, 将56个切花菊品种分为平瓣类—匙瓣、桂瓣类和管瓣类, 聚类结果大致按照花径—瓣型—花型分类。Mantel检验相关性系数为0.682, 两种聚类结果有相似之处, 均能很好体现试验切花菊品种间的遗传关系。

关键词: 切花菊 表型性状 SRAP标记 品种分类 遗传多样性

Abstract: Based on phenotypic analysis and SRAP markers, genetic diversity among 56 cultivars of cut chrysanthemum were analyzed. Variation analysis showed that there were 21 characters which presented the high consistency within cultivars and the distinct specificity between cultivars. Principal component analysis showed that flower characters such as inflorescence diameter, inflorescence form and petal type et al contributed mainly to the principal components, while leaf and stem characters as a secondary contribution. The results indicated that it would be necessary to primarily consider the flower traits, then leaf and stem traits, as the criterion of classification and identification for cut chrysanthemum. Phenotypic UPGMA clustering analysis showed that 56 cut chrysanthemum cultivars were classified into flat type, spatulate type, irregular type, spatulate-flat type and tubiform type groups, which were mainly according to three-grades classification as Inflorescence diameter - Petal type - Inflorescence form. 14 SRAP primer pairs were screened and generated 423 polymorphic bands among 454 bands in total, which the percentage of polymorphic bands reached 93.17%. The values of polymorphism information content (PIC) ranged from 0.72 to 0.89 with an average of 0.82. These results indicated there was abundant genetic diversity among cut chrysanthemum cultivars. UPGMA clustering analysis with SRAP markers showed 56 cultivars with the genetic coefficient ranged from 0.64 to 0.97 were divided into spatulate-flat type, irregular type and tubiform type groups, which were also according to three-grades classification as Inflorescence diameter - Petal type - Inflorescence form. Mantel's test with correlation coefficient of 0.682 indicated that the high accordance between phenotypic and molecular markers analysis, suggesting both analysis could well reflect the genetic relationship of cut chrysanthemum cultivars.

Keywords: cut chrysanthemum, phenotypic characters, SRAP marker, cultivar classification, genetic diversity

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