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研究论文

应用RAMP分子标记分析小豆栽培型种质资源遗传多样性

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摘要 利用42对引物组合，对93份小豆栽培型种质资源的基因组DNA进行了RAMP分析，得到308条扩增谱带，其中297条（96.43%）具有多态性，每对引物组合可扩增出3～17条多态性谱带，平均7.1条，总遗传多样性指数或平均期望杂合度（Ht）达0.693，表明小豆栽培型种质资源内存在较丰富的遗传多样性；小豆种质间遗传距离变异幅度为0.066～0.494，平均值为0.281，表明来源于不同生态区的小豆栽培型种质间的亲缘关系较近；利用RAMP扩增谱带数据进行聚类分析，可将93份小豆栽培型种质材料中的91份区分开，并划分为5个类群；其RAMP分子标记表现出明显的生育特性和生长习性趋同性，及一定的地域相关性。

关键词 RAMP 小豆 种质资源 遗传多样性

分类号 S512

Genetic Diversity of the Cultivated Adzuki Bean (Vigna angularis) Germplasm Resources Analysed with RAMP Molecular Markers

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Abstract Adzuki bean is an important legume crop in China and East Asia. To investigate the genetic diversity in the cultivated adzuki bean germplasm and to provide information for parental selection and germplasm improvement, ninty-three adzuki bean germplasm, including 8 released cultivars and 85 land varieties (Table 1), were analysed with random amplified microsatellite polymorphism (RAMP) markers. PCR was performed with 5’ anchored primers complementary to microsatellites in combination with random primers. The results showed that: (1) A total of 308 RAMP bands were obtained with 42 informative primer combinations, of which 297 bands (96.43%) were polymorphic. A mean of 7.1 polymorphic bands was detected for each RAMP primer combination ranging from 3 to 17 (Table 2). (2)The total heterozygosity (Ht) of RAMP loci in the adzuki bean resources was 0.693. Nei and Li’s genetic similarity (GS) coefficients ranged from 0.506 to 0.934. The mean genetic distance based on the GS values among the materials was 0.281 ranging from 0.066 to 0.494. It is revealed that there was sufficient genetic diversity in the studied materials but the genetic base of these materials was narrow. (3)Clustering analysis was made with unweighted pair group method for arithmetic averages (UPGMA) using the symmetric matrix of similarity coefficients. The 93 materials were clustered into five groups (Fig.2). The group Ⅱ included three subgroups. The dendrogram revealed that the cluster pattern showed obvious correlation with the growth characteristics and the locations of the cultivated adzuki bean. (4)Heterogenous germplasms should be introduced into the cultivated adzuki bean to enlarge the genetic base and to create excellent new germplasms for the improvement of adzuki bean varieties.

Key words RAMP(random amplified microsatellite polymorphism) Adzuki bean (Vigna angularis) Germplasm resources Genetic diversity

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