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研究报告
Research Report

人工诱导多倍体刺槐及其倍性鉴定

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摘 要 试验以 3 个半同胞家系的刺槐(*Robinia pseudoacacia* L.)种子为材料,以质量百分比浓度为 0.3%、0.4%、0.5%三种浓度梯度秋水仙素水溶液浸渍处理诱导得到多倍体刺槐植株并进行倍性鉴定,探究了不同秋水仙素处理浓度对不同刺槐种子的成活及变异率的影响,并利用流式细胞仪对所得变异苗在多次继代培养过程中进行了持续性的倍性检测以研究变异苗在继代过程中的倍性变化情况。结果表明:以质量百分比浓度为 0.4%的秋水仙素浸渍处理刺槐种子 2 d,诱导多倍体效率最高,其成活率与成活苗变异率分别为 70.4%与 49.06%。诱变苗中经直接萌发所得植株占 68.3%,其中嵌合体所占比例约为 28.1%;经根萌所得植株占31.7%,其中嵌合体所占比例约为 5.1%。植株倍性在以 30 d 为周期继代两次后趋于稳定。四倍体植株相比二倍体具有叶面积增大,叶形指数减小,叶绿体数明显增多等特征。本研究为四倍体刺槐诱导及培育过程中有效排除嵌合体干扰提供了手段,为四倍体刺槐植株批量诱导后的变异苗初选及倍性初步鉴定工作提供了参考。

关键词 刺槐, 四倍体诱导, 倍性鉴定, 流式细胞仪检测

Artificial Induction of Polyploid *Robinia pseudoacacia* L. and Identification of Its Ploidy

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Abstract In this experiment, *Robinia pseudoacacia* seeds from three half-sib families were used as materials to induce polyploid plants by dipping in colchicine solution with three different concentrations (0.3%, 0.4%, 0.5%), and ploidy identification was carried out. The effect of different colchicine concentrations on the survival rate and mutation rate of different *Robinia pseudoacacia* seeds were investigated. Also, a continuous ploidy test was carried out to study the variation of the mutant seedlings in the subculture process by the flow cytometry. The results showed that the polyploid induction rate was the highest with a mass percentage concentration of 0.4% colchicine soaking for two days. The survival rate and mutation rate were 70.4% and 49.06%, respectively. 68.3% of the mutagenic plants were obtained by direct germination, of which the proportion of chimeras was about 28.1%. The plants obtained via root sprouting accounted for 31.7%, of which the proportion of chimeras was about 5.1%. Plant ploidy tended to be stable after subculture twice in 30 days. Compared with diploid, the tetraploid plants had the characteristics of larger leaf area, smaller leaf index and more chloroplast number. This study could provide a method to effectively remove chimeras in induction and cultivation of *Robinia pseudoacacia* tetraploid, and

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