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研究报告
Research Report

高温诱导胚囊染色体加倍选育杜仲三倍体

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摘 要 杜仲是极具潜力的温带胶源树种,在环烯醚萜苷类等药效成分利用方面也具有重要价值。由于杜仲以单科单属单种存在,无法利用远缘杂交获得杂种优势,因此三倍体育种可能是大幅度提高叶片杜仲胶和药效成分等次生代谢产物含量的有效途径。本研究以杜仲为材料,开展施加高温处理诱导胚囊染色体加倍选育杜仲三倍体技术研究,结果表明,杜仲雌雄花芽发育具有一定的相关性,可以根据同栽培条件下相邻雄树散粉天数和雌花芽长度来估计杜仲胚囊发育进程。当相邻雄株散粉 5~10 d 时,对杜仲雌花芽分别施加 45℃、48℃和 51℃高温持续处理 2 h、4 h 和 6 h 诱导杜仲胚囊染色体加倍。其中,在相邻雄株散粉第 6~10 天时,对雌花芽施加 48℃和 51℃高温持续处理 6 h 各获得了 1 株三倍体 ;施加 48℃高温持续处理 4 h 获得了 4 株三倍体。对施加高温处理同时固定的雌花芽进行组织切片观察表明,在相邻杜仲雄树散粉后第 6~10 天,杜仲胚囊发育处于 3 次有丝分裂时期,可同时见到单核胚囊、二核胚囊和四核胚囊,是施加高温处理诱导胚囊染色体加倍选育杜仲三倍体的有效时机。有关研究证明施加高温处理雌花芽诱导胚囊染色体加倍同样是一种获得杜仲三倍体的有效方法,对于杜仲遗传改良具有重要价值。

关键词 杜仲, 胚囊, 染色体加倍, 三倍体, 诱导率

Chromosome Doubling of Embryo Sac Induced by High Temperature for Selective Breeding of Triploid in *Eucommia ulmoides*

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Abstract *Eucommia ulmoides* is a very potential tree species for gum utilization in temperate zone in China, and it is also of important value in the utilization of medicinal ingredients, such as iridoid glycosides. Offspring with high heterosis could not be obtained by interspecific crossing because *Eucommia ulmoides* is the single species in the *Eucommia* genus in the Eucommiaceae family. Therefore, triploid breeding may be an effective way to significantly improve the content of secondary metabolites in leaves, such as gutta-percha and medicinal components. In this paper, *Eucommia ulmoides* was selected as the material, and a study on technique of embryo sac chromosome doubling by high temperature to produce triploids of *Eucommia ulmoides* was conducted. The results showed that the development of female and male flower buds had a certain correlation, and the development period of embryo sac could be estimated based on the number of days after pollen release of neighboring male trees and the mean

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