

研究论文

长江和黄河流域棉区棉花品种体细胞胚胎发生和植株再生比较研究

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收稿日期 2006-3-22 修回日期 网络版发布日期 接受日期 2006-7-24

摘要 选用我国长江和黄河流域棉区各10个棉花品种以及珂字201和YZ1共22个基因型, 研究和优化棉花体细胞胚胎发生的相关条件参数。在此基础上, 比较了两生态区棉花品种的体细胞再生能力。结果表明, 在IBA+KT的激素组合下, 多数基因型有较强再生能力; 在愈伤组织诱导时期, 铵态氮是必需的, 而在愈伤组织继代分化时期, 一定浓度的硝态氮则能促进分化; 没有铁盐不能诱导出愈伤组织, 而铁盐浓度为56 mg L⁻¹时有利于胚分化; 长江流域和黄河流域棉花品种的植株再生潜力没有明显差别, 但长江流域的品种体细胞胚胎发生所需的时间长。本文首次获得了鄂抗棉3号、5号、鄂棉20、鄂棉23、豫棉9号、豫早73、豫棉12、豫棉1221等8个品种的体细胞胚胎发生和植株再生。

关键词 [棉花](#) [基因型](#) [体细胞胚胎发生](#) [再生能力](#)

分类号

Somatic Embryogenesis and Plant Regeneration in Cotton Cultivars from Yellow and Yangtze River Planting Areas

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Abstract Many restrict factors still remain in cotton genetic transformation, which requires appropriate tissue followed by regeneration. Long tissue culture duration, unpredictability of tissue culture, and a high degree of genotype dependence are more troublesome in plant regeneration of cotton. The objectives of this study were to examine some factors (including hormone combination, salts of ammonium, Fe²⁺ content and genotypes) significantly affect the efficiency of regeneration and transformation in cotton and optimize the somatic embryogenesis of upland cotton using 22 cultivars including 10 cultivars from Yellow River valley, 10 cultivars from Yangtze River valley, and two highly responsible genotypes Coker 201 and YZ-1. Most of the genotypes showed high regenerability under the IBA/KT hormone regime. NH₄⁺ was necessary during the callus induction and subculture, but it should be omitted and replaced by NO₃⁺ during somatic embryogenesis. The content of Fe²⁺ was the key factor for callus induction and differentiation. The differentiation medium could significantly improve the conversion from the fast growing callus to embryogenic callus with the FeSO₄ concentration of 56 mg L⁻¹. Under the optimized culture procedure, most of the genotypes collected from the two valleys showed the similar regeneable abilities, except a relative longer time taken during the somatic embryogenesis of cultivars from the Yangtze River valley. The somatic embryogenesis and plant regenerations of eight genotypes(i.e. Ek3, Ek5, Em20, Em23, Ym9, Ym12, Yz73, and Ym1221) firstly obtained.

Key words [Cotton \(Gossypium hirsutum L.\)](#) [Genotype](#) [Somatic embryogenesis](#) [Regenerability](#)

DOI:

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