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棉花叶柄分化率主基因+多基因混合遗传分析

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Mixed Major Gene and Polygene Inheritance Analysis of Embryogenesis Callus Induction Ratio in Upland Cotton Mature Leaf Petioles as Explants

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摘要

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摘要 以2个叶柄分化率性状稳定的棉花材料W10、W12为亲本, 构建了两个5个世代联合群体(P_1 、 P_2 、 F_1 、 F_2 、 $F_{2:3}$), 采用植物数量性状主基因+多基因混合遗传模型对这2个群体(W10×TM-1, W12×CCRI12)的叶柄组织培养分化率进行多世代联合分析。结果表明, 棉花叶柄组织培养分化率在2个群体中均表现为遗传受2对加性、显性、上位性主基因+加性、显性多基因(E-1模型)控制。2对主基因的加性效应均为正值, 均使分化率提高。2个 F_2 群体显示的主基因遗传率分别为83.22%和74.68%, 多基因遗传率分别为10.47%和16.78%。

关键词: 棉花 组织培养 主基因+多基因

Abstract: Two high embryogenic callus-producing lines (W10 and W12) of upland cotton (*Gossypium hirsutum* L.) were selected by petiole callus culture from a commercial cotton cultivar CCRI 24. Five generations (P_1 , P_2 , F_1 , F_2 , and $F_{2:3}$) of two crosses (W10 × TM-1 and W12 × CCRI 12) were used as genetic populations. Using the model of the major gene plus polygene of quantitative traits, a joint analysis of five generations from the cross of two high embryogenic callus-producing lines was carried out to investigate the inheritance of the embryogenesis callus induction ratio. The inheritance of this ratio was controlled by two additive, dominant, epistatic major genes plus an additive, dominant polygene (E-1 model). Both the additive effects and the dominance effects of the two major genes were important. Heritabilities of the major genes were estimated to be 83.22% and 74.68% in F_2 . Heritabilities of the polygenes were estimated to be 10.47% and 16.78% in F_2 .

Keywords: cotton tissue culture major gene and polygene inheritance analysis

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