



转菜豆几丁质酶和葡聚糖酶基因抗病棉花与野西瓜苗和苘麻间的基因漂移和生存竞争力分析

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Analysis on Gene Flow and Survival Competitiveness of Transferred Disease Resistance Gene Cotton and Siblings Plant (*Hibiscus trionum* L. and *Abutilon theophrasti* Medic.)

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摘要

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摘要 利用培育的转菜豆几丁质酶和葡聚糖酶双价基因(*pBLGC*)的抗病棉花高代株系与同科植物(野西瓜苗和苘麻)杂交及其DNA渗入试验, 研究新疆生态区基因漂移的可能性。通过裸地种植的方式, 在棉花苗期、蕾期、花铃期和吐絮期对转基因抗病棉花与田间杂草的株高、群落的种类及种群密度、生物多样性和生物量进行监测, 分析转基因抗病棉花与田间杂草的生存竞争能力。试验结果表明: 棉花与同科植物(野西瓜苗和苘麻)远缘杂交不能正常结实。通过转基因棉花花粉DNA将目标基因渗入杂草基因组经检测均未获得阳性植株, 说明转基因抗病棉花的靶标基因转移至杂草基因组的可能性很小。在裸地种植的田间正常灌水和自然条件下, 不同区域物种种植株高以及种群密度等指标表明转基因棉花并未增强自身与杂草的竞争能力, 转化为杂草的可能性几乎为零。

关键词: 转基因抗病棉花 杂草群落 生物量 生物多样性 生物安全性评价

Abstract: The possibility of genetic drift between disease-resistant transgenic cotton, containing the chitinase and tobacco glucanase gene (*pBLGC*), and siblings plant (*Hibiscus trionum* L. and *Abutilon theophrasti* Medic), was analyzed using the hybridization and DNA introgression in north of Xinjiang. And the survival competition ability of transgenic cotton and field weed was assessed through the monitor of plant height, community species and population density, biological diversity, and biomass in the cotton seedling stage, budding period, flower fluid phase, and wadding stage in the situation of bare land planting. The results revealed that distant hybridizations between disease-resistant transgenic cotton and sibling plant (*Hibiscus trionum* L. and *Abutilon theophrasti* Medic.) could not fruit, and the possibility of the target genes of disease-resistant transgenic cotton being transferred to weeds by DNA introgression is very small. Furthermore, transgenic cotton did not enhance their competitive ability with weeds populations for plant height and population density index in natural field condition with normal irrigation and bare land planting. This suggests that the possibility of the disease-resistant transgenic cotton converting into weeds is almost zero.

Keywords: disease-resistant transgenic cotton weed community biomass species diversity biosafety evaluation

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