

عنوان مقاله:

Bialaphos-resistant Transgenic Soybeans Produced by the Agrobacterium-mediated Cotyledonary-node Method

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نویسندگان:

S. C. Liu - National Center for Soybean Improvement, Nanjing Agricultural University, Nanjing ۲۱۰۰۹۵, People's Republic of China

G. C. Zhang - College of Horticulture, Nanjing Agricultural University, Nanjing ۲۱۰۰۹۵, People's Republic of China

L. F. Yang - College of Horticulture, Nanjing Agricultural University, Nanjing ۲۱۰۰۹۵, People's Republic of China

M. Mii - Graduate School of Horticulture, Chiba University, ۶۴۸ Matsudo, Matsudo-Shi, Chiba, ۲۷۱-۸۵۱۰, Japan

J. Y. Gai - National Center for Soybean Improvement, Nanjing Agricultural University, Nanjing ۲۱۰۰۹۵, People's Republic of China

Y. L. Zhu - National Center for Soybean Improvement, Nanjing Agricultural University, Nanjing ۲۱۰۰۹۵, People's Republic of China

خلاصه مقاله:

A stable Agrobacterium-mediated transformation system was established using bialaphos as the selective agent in soybeans [*Glycine max* (L.) Merr.]. The cotyledonary node explants of the soybean cultivar 'NY-۱۰۰۱' were inoculated with the Agrobacterium tumefaciens strain EHA۱۰۵, harboring the vector pCAMBIA۳۳۰۱ containing the gus gene as the reporter gene and the bar gene conferring bialaphos resistance. The highest frequency of GUS transient expression (۹۲%) was obtained after inoculation and ۴-day co-cultivation with A. tumefaciens strain EHA۱۰۵. Efficient GUS expression was observed in regenerated shoots from explants after ۴-day co-cultivation combined with culturing on shoot induction medium (SIM) without bialaphos for ۷ days followed by ۴ mg.L^{-۱} bialaphos for ۲ weeks. Bialaphos (۴ mg.L^{-۱} in SIM; ۲ mg.L^{-۱} in shoot elongation medium (SEM)) effectively selected the transformants. The putative transformants and escapes could be exactly distinguished by using a half-leaf GUS assay method to detect GUS expression in the elongated resistant shoots, which resulted in the shortening of culture period for the early detection of transformed shoots. The transformation efficiency of this system was ۱.۰۶%. The transgenic plants were verified by polymerase chain reaction (PCR), Southern blotting, and herbicide-resistant responses. All four T₀ transgenic plants were fertile and transmitted the phenotypes of both gus and bar in a ۳:۱ ratio to their progeny. These results indicate that the established system is suitable for further breeding of herbicide-resistant transgenic cultivars, as well as for functional genomics studies of soybeans.

کلمات کلیدی:

Bar gene, Glycine max, Genetic transformation, Herbicide-resistance, Transgene inheritance

