Transgenic Watermelon Lines Expressing Chimeric Construct Containing Antifungal Protein and Chitinase Confer Resistance

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ABSTRACT

Watermelon (Citrullus lanatus) is an economically important crop of worldside. Fungal diseases often causes serious economy loss of watermelon and people is usually spray tons of agricultural chemicals or bacteria inhibitor to protect against watermelon fungal diseases. In consideration of the harmful and dangerous effects to the environment ecosystem, we are trying to introduced antifungal protein and chitinase genes into watermelons to control watermelon diseases. This investigation tried to set up an approach of Agrobacterium-mediated transformation of watermelon carrying with chimeric gene, cp-AFP3-CHI. The anti-fungal protein genes, cp-AFP3 and PR-protein genes cp-CHI chimeric gene from Caria papaya L., were kindly provide by Dr. Xiao, Chiehfu of Academia Sinica. Seed was through pretreatment for 3 days, and cotyledons were cut into six part segments as explants. The explants co-cultured with Agrobacteria for 3 days and then transferred to the selection medium. There were 7 putative cp-AFP3-CHI transgenic lines were obtained. PCR analysis confirmed that the foreign gene was present in the regenerates. RT-PCR analysis indicated using primers specific for the mRNA sequence of cp-CHI-AFP to monitor expression of the gene at the mRNA level and showed 0.85 kb and 0.25 kb. Three transgenic lines(F27, F47, F49) conferred better degrees against Rhizoctonia solani, and we confirmed protein express were increase after Rhizoctonia solani by inoculation in vitro in westhern blot. One transgenic watermelon (F47 line) from cp-AFP3-CHI lines exhibited resistance to infection fungi under greenhouse conditions.

Keywords : antifungal protein、chitinase、transgenic watermelon

Table of Contents

圖目錄

表目錄

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