

(05-1-127)

Resveratrol synthase gene transformation and expression in *Rehmannia glutinosa*

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Objectives

The objectives of this study were to establish the genetic transformation system of stilbene synthase in *Rehmannia glutinosa*. Resveratrol, which is both a phytoalexin with antifungal activity and a phytochemical associated with reduced cancer risk and reduced cardiovascular disease, is synthesized in a limited number of plant species including peanut.

Materials and Methods

Stilbene synthase gene (RS3) obtained from peanut, *Arachis hypogaea*, Fabaceae has been transferred into chinese foxglove, *Rehmannia glutinosa* by using *Agrobacterium* mediated transformation. Also, gene expression pattern was investigated in transgenic plant using RNA gel blot analysis.

Results and Discussion

RS3 transcript was found to be highly expressed in transgenic *R. glutinosa*. This expression pattern correlated with the occurrence of resveratrol-forming stilbene, which was detected in higher amounts in transgenic plant of *R. glutinosa*.

RS t-DNA introduced to chinese foxglove (*R. glutinosa* L) by transformation and its reaction product, resveratrol-3-O- β -D-glucoside was isolated and characterized using NMR, MS, and HPLC. Also its biological effects were tested in inhibition of the lipid peroxidation of human LDL by glycosylated stilbenes derivatives obtained from transgenic plants. Resveratrol-3-O- β -D-glucoside (piceid) isolated from transgenic *R. glutinosa* L. showed pathogen resisted activity against *Fusarium oxysporum* R-10 isolated from field-infected roots of *R. glutinosa*. Therefore, this compound can be contributed to be useful as a phytoalexin for plant health as well as a phytochemical for human health.

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