

Transformation and characterization of ginseng (*Panax ginseng* C.A. Meyer) using squalene synthase gene related saponin synthesis

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The most famous medicinal plants of the *Panax ginseng*, contain various phytosterols and bioactive triterpene saponins. The demonstrate that squalene synthase is a key regulatory enzyme not only for phytosterol but also for triterpene biosynthesis and overexpressing of squalene synthase confers the hyperproduction of triterpene saponins to *P. ginseng*. The transgenic ginseng plants were propagated using repetitive secondary embryogenesis and introduced HPT and transgenic ginseng were successfully identified by the PCR and survival test on the medium. The adventitious roots of transgenic by secondary embryogenesis, suspension cultures of ginseng an increase in quantity thrive by the plant cell 3% sucrose, 2mg/l IBA, B5 liquid medium. Growth responses of the induced adventitious roots of transgenic transformed with squalene synthase were observed. The elicitor chitosan, jasmonic acid, salicylic acid, mevalonic acid accumulation in the growth medium of ginseng suspension cultures and induced increased squalene synthase activity in ginseng cells. Growth of adventitious roots of transgenic ginseng was fastest in the medium of mevalonic acid. We conducted analysis of the ginsenoside content by HPLC and the cell elicitor tests in cell type. It was more often colored to jasmonic acid by ginsenoside separation. In addition, squalene synthase adventitious roots elicited the accumulation of jasmonic acid the defence compound saponin, and expression of genes encoding squalene synthase and key enzymes of saponin biosynthesis.

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