

(05-3-13)

Modification of fatty acid composition through engineering of Acyl-ACP thioesterase gene in *Perilla frutescens*

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Objectives

Plant acyl-acyl carrier protein (ACP) thioesterases play an essential role in chain termination during *de novo* fatty acid synthesis. To change lipid composition in the seed of perilla using acyl-ACP thioesterase, we transformed perilla by *Agrobacterium* -mediated method and analyzed on fatty acid composition.

Materials and Methods

1. Plant Material - *Perilla frutescens*
2. Plant transformation - *Agrobacterium*-mediated method
3. Lipid composition analysis -Gas chromatography

Result and Discussions

Acyl-ACP thioesterases play an essential role in chain termination step during the *de novo* fatty acid synthesis in plants. Two acyl-ACP thioesterase cDNA clones were isolated from the cDNA library of *Iris* root tissue and designated as *IgFatB1* and *IgFatB2*. In an effort to manipulate the lipid composition of perilla seeds, plant expression vectors bearing *IgFatB1* was constructed under the control of seed specific vicilin promoter and transformed to hypocotyls explants. The regenerated transformants were obtained by screening in the presence of 0.3% Basta. Transgenic plants were further verified using genomic Southern hybridization and RNA blot analysis. Overall, 2-3 folds higher palmitic acid content was observed in transgenic lines over wild-type perilla plants.