

P 42 Metabolic Engineering Increased Vitamin C levels in Lettuce by Overexpression of a L-gulono-1,4-lactone oxidase

Bong Kyu Kim, So Young Park, Do Yeob Hwang, Byung Whan Min

Biotechnology Center, Nong Woo Bio Co., Ltd., Yeosu-gun, Gyeonggi-do 469-885, Korea

Objectives

The goal of this study is to increase the ascorbic acid contents of transgenic lettuce (*Lactuca sativa* L.). Despite the fact that plants and animals synthesize ascorbic acid via different pathways, transgenic lettuce plants expressing a rat cDNA encoding L-gulono- γ -lactone oxidase (GLOase) accumulated up to four times more ascorbic acid than untransformed plants.

Material and Methods

1. Plant material: cotyledons 3 days after seedling of Lettuce (*Lactuca sativa* L.) var. Yeonsanhong

2. Method

- *Agrobacterium*-mediated transformation with GLOase gene.
- L-ascorbic acid assay: Reflectoquant plus (Merck)

Results and Discussion

1. We have obtained over 100 transformed lettuce plants with 1.7% transformation efficiency.
2. Transgenic lettuce plants expressing GLOase contained up to 4-fold more L-ascorbic acid than corresponding controls. This results indicate that transgenically expressed GLOase is capable of utilizing an endogenous substrates effectively for L-ascorbic acid synthesis in lettuce.

