B71

Molecular Cloning and Characterization of cDNAs Encoding Caffeoyl CoA O-Methyltransferase (ClCCM) and Cinnamoyl CoA Reductase (ClCCR) from Codonopsis lanceolata

Ha-Na Kim[a], Myung-Kyum Kim[a], Jun-Kyo In[b], Jin-Woo Min[a], Deok-Chun Yang[a]†

[a] Dept. of Oriental Medicinal Material & Processing, College of Life science, Kyung Hee University, 1 Seocheon-dong, Kiheung-gu Yongin, Kyunggi-do 449-701, South Korea

[b] Biopia Co., Ltd., 384-4 Singal-dong, Kihung-gu Yongin, Kyunggi-do 449-598, South Korea

Objectives

Most of the genes encoding enzymes of the lignin biosynthesis pathway, have been reported to be induced by wounding, elicitors, and/or fungal infection. Despite the biochemical studies on lignin biosynthesis, the response of the pathway under abiotic stress remains partly elucidated. In this study, we report on the cloning of *Cl*CCM and *ClCCR* genes from *Codonopsis lanceolata*and provide detailed analyses on the expression profile of the genes in the defense response to abiotic stresses.

Materials and Methods

① RNA isolation and construction of a cDNA library
② Nucleotide sequencing and sequence analysis
③ Stress treatments
④ Quantitative RT-PCR anal*ysis*

ResultsandDiscussions

*Cl*CCM and *Cl*CCR cDNA (accession number AB243012) consists of a 967-bp and 1232-bp fragment with the translational start site of the major open reading frame (ORF), respectably. We report here the functional characterization of two full length cDNA clones, The *Cl*CCM and *Cl*CCR genes were highly expressed in callus and roots of intact plants, whereas expressed at low levels in leaves and adventitious roots (Fig.1). However, *Cl*CCM and *Cl*CCR genes were highly induced in leaf tissue by several abiotic stresses including oxidative and salt stress, wounding and UV light, but these genes were not differently expressed by chilling or heating (Fig.2). The present study supports that lignin biosynthesis is a protective process upon diverse environmental stresses such as oxidative stress, salt and UV exposure as well as wounding and pathogen infection.

Corresponding author : 양덕춘 E-mail : deokchunyang@yahoo.co.kr Tel.: 031-201-2688

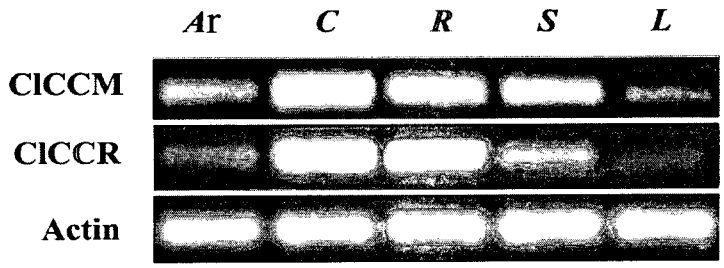

Fig. 1. Expressionsof *Cl*CCM and *ClCCR* genes in various tissues of whole plant and cultured cells of *Codonopsis lanceolata*. Total RNAs were extracted from adventitious root (Ar), callus (C), root (R), stems (S) and leaves (L).

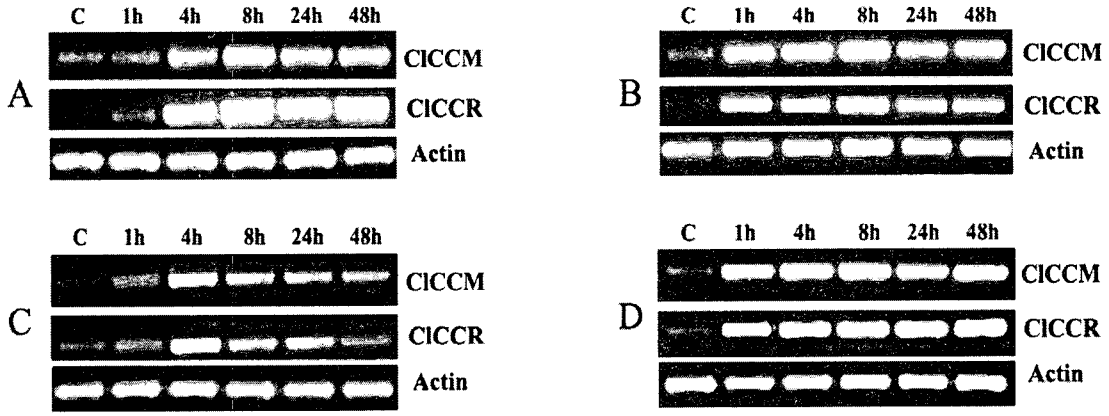

Fig. 2. RT-PCR analysis of the expression of the *Cl*CCM and *ClCCR* genes in leaves of *Codonopsis lanceolata* under various stress conditions. A, 10 mM H_2O_2 B, 100 mM NaCl C, Wounding D, UV light. Actin was used as an internal control.