SL1B-03

Relative transcript analysis of a UDP glycosyltransferase and salidroside content in response to biotransformation of precursors in *Rhodiola rosea* L. callus culture

Iman Mirmazloum[1], Erzsebet Kiss-Baba[2], Márta Ladányi[3], Andrzej Pedryc[1], Zsuzsanna György[1]

[1] *Corvinus University of Budapest, Department of Genetics and Plant Breeding, Budapest, Hungary*

[2] *Corvinus University of Budapest, Department of Plant Biology and Plant Biochemistry, Budapest, Hungary*

[3] *Corvinus University of Budapest Dpt. of Biometrics and Agricultural Informatics, Budapest, Hungary*

Rhodiola rosea is a medicinal plant with adaptogenic properties and various health-promoting effects. The compounds responsible for its medicinal effects are believed to be the phenylethanol derivatives (tyrosol & salidroside) and phenylpropanoids (rosin, rosavin & rosarian) which are mostly missing in its *in vitro* cultures. Roseroot is difficult to cultivate and grows slowly. Therefore, new methods for production of its pharmaceuticals are of interest. In this study, a full length cDNA encoding a UDPG gene was identified, cloned and characterized. Its ORF (1425 bp) was transformed and expressed in *E.coli* (BL21) and the expression of the recombinant enzyme was confirmed by SDS-PAGE analysis. To monitor the enzyme activity *in vivo*, 3 precursors (tyramine, 4-hydroxyphenylpyruvate & tyrosol) of salidroside biosynthesis pathway [1] were added to roseroot callus cultures and samples were harvested after 1, 6, 12, 24, 48 & 96h. Along with the controls (without the precursors feeding), each sample was subjected to HPLC and qRT-PRC for phytochemical and relative UDPG gene expression analysis, respectively. The HPLC analysis showed that the salidroside content significantly increased; reaching 0.5% of the callus dry weight (26 fold higher than the control) 96h after 2mM tyrosol was given to the media. The expression of a UDP-glycosyltransferase (Figure); a gene responsible for glycosylation of tyrosol to salidroside also significantly increased with highest being at 12h after the feeding. The effect of tyramine and 4-hydroxyphenylpyruvate was not as pronounced as of tyrosol. Here, we introduce for the first time a *R. rosea* specific UDPG gene and an alternative biotransformation method to increase the salidroside content in *in vitro* roseroot cultures.