Functional analysis of Quercetin 3′-*O-methyltransferase* from Soybean(*Glycine max* L.)

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Abstract

Many O-methyltransferaes from the phenylpropanoid pathway are involved in the synthesis of secondary products such as lignin, flavonoids and phytoalexins. This is thought to play an importans role in processed such as inactivation of reactive hydroxyl group, plant structural support, chemical defence, signaling, lipophilicity increase and antimicrobial activity. *O*-methyltransferase, SOMT-10, was cloned from soybean by RT-PCR method. The blast result showed that it showed high homology with Caffeoyl-CoA O-methyltransferase. In order to determine the substrate of SOMT-10, was expressed in *E. coli* and the expressed fusion protein was purified using affinity chromatography. With purified protein, several substrates including naringenin, quercetin, 5, 3′, 4′-trihydroxyflavone, caffeic acid, catechin, kaempferol and luteonin were tested. Reaction product was analyzed by TLC, HPLC and NMR. It converts quercetin, luteolin, caffeic acid, catechin and 5, 3′,4′-trihydroxyflacone. The methylation position is determined to be at 3′ position by NMR. SOMT-10 encodes a *O*-methyltransferase which converts the quercetin into isorhamenetin. In addition, SOMT-10 could convert kaempferol that does not have the hydroxyl group at the 3′ position.

References

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