Cloning and Characterization of *O*-methyltransferase from *Populus deltoides*

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Abstract

Enzymatic *O*-methylation, catalyzed by *S*-adenosyl-L-methionine dependent OMTs, is a ubiquitous reaction that takes place in almost all organisms including fungi, plants, bacteria, and mammals. Expecially, plant *O*-methyltranferases are known to be involved in the methylation of plant secondary metabolites that include phenylpropanoid and flavonoid compounds. An *O*-methyltransferase, POMT-2, was cloned and characterized from poplar by a RT-PCR method. POMT-2 consists of 1095 bp open reading frame which encodes a 39.7-kDa protein The blast results of POMT-2 show a 87 % identity with *O*-methyltransferase from *Prunus dulcis* and 87 % with caffeic acid *O*-methyltransferase from *Rosa chinensis*. POMT-2 was expressed in *E. coli* and its recombinant protein purified using affinity chromatography. It was tested for its capacity to transfer the methyl group of *S*-adenosyl-L-methionine to the flavonoid substrates, quercetin, luteolin, and taxifolin, all of which have a 3'-hydroxyl functional group. The reaction products were analyzed by TLC and HPLCR. POMT-2 transferred the methyl group specifically to 3'-hydroxyl group of quercetin.

References

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