Molecular Cloning and Characterization of *Bacillus cereus* O-Methyltransferase

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Abstract

Biotransformation is a good tool to synthesize regiospecific compounds and it could be performed with diverse sources of genes. Microorganisms provide myriads of gene sources for biotransformation. We are interested in modification of flavonoids. We cloned a putative O-methyltransferase from Bacillus cereus, BcOMT-2. It has 668 bp open reading frame which encodes 24.6kDa protein. In order to investigate the modification reaction mediated by BcOMT-2, it was expressed in E. coli as His-tag fusion protein and purified with homogeneity. Several substrates such as naringenin, luteolin, kaempferol, and quercetin were tested and reaction products were analyzed by thin layer chromatography (TLC) and high performance liquid chromatography (HPLC). BcOMT-2 could transfer a methylation group to substrates that have a 3'functional hydroxyl group such as luteolin and quercetin. Comparison of HPLC retention time, and UV spectrum of quercetin reaction product with authentic corresponding 3'-methylated and 4' methylated compounds showed that the methylation position was at either 3'-hydroxyl or 4' -hydroxyl group. Thus, BcOMT-2 transfers a methyl group either to 3'-hydroxyl or 4' -hydroxyl group of flavonoids when both hydroxyl groups are available. Among the several flavonoids that contain 3' and 4'hydroxyl group, fisetin was a best substrate for the BcOMT-2.

Reference

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