

Biotransformation of 3-Phenyl coumarin by a recombinant *E. coli* pDTG141 which expressed naphthalene dioxygenase from *Pseudomonas* sp. Strain NCIB 9816-4

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Abstract

3-Phenyl coumarin is a kind of flavonoid. The importance of flavonoids increases because they usually play important roles in the biochemistry, physiology and ecology of plants as pigments, phytoalexins, antifeedants, and nodulation inducers,¹⁾ and have functions such as antioxidants, anticancers, oestrogenic to human body.²⁾ However there were just few research about 3-phenyl coumarin even though some coumarin-derived compounds were reported to have potential bioactive pharmacological activity.^{3,4)} Moreover there was no research about microbial biotransformation of this compound even though it has possibility to acts as enantioselective drug-intermediate candidate by microbial dioxygenase.⁵⁾ In this study, possibility have been studied to make 3-phenyl coumarin derivating *cis*-dihydrodiol and the biotransformational pattern of 3-phenyl coumarin and flavone have been compared. After incubation of *E. coli* pDTG141 which contains naphthalene dioxygenase in LB liquid medium, high concentrated resting cell were made at phosphoric buffer condition and tested biotransformation ability with 0.1mM 3-phenyl coumarin. LC eleution profile showed the *E. coli* pDTG141 produce one metabolite at 15min, while neither heat-killed *E. coli* pDTG141 nor *E. coli* pUK18 make any products. LC/MS spectrum shows 3-phenyl coumarin metabolite 1(PM) was 257 [m/z] at ES+ mode. Further studies will be done for the confirmation of structures by NMR spectroscopy and the kinetics.

References

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