Streszczenie w języku angielskim/Abstract

Biotransformation is a field of biotechnology that enjoys growing interest. Microbes isolated form nature produce usually small quantities of the desired metabolites, so using them on an industrial scale is unprofitable. Selection and appropriate methods for improving these strains combined with the induction of enzymatic activity under stress conditions may be potentially useful in biotransformation processes of toxic organic compounds such as monoterpenes. In addition, biocatalysis of β-pinene using the psychrotrophic fungus *Chrysosporium pannorum* A-1 will reduce the volatility problem of this substrate.

The studies presented in this work includes selection of psychrotrophic fungal strains, optimization of culture and biotransformation conditions, impact of stress factors (pH, osmotic, oxidative), induction of fungal mutants of *C. pannorum* A-1 using mutagenic agents (UV and MNNG), as well as an assessment of the utility of the unconventional method of oxygenation of culture. The goal of these experiments was to obtain the highest possible β-pinene biotransformation efficiency. The strains were selected on the basis of their ability to grow on a minimal medium with α-pinene and biotransformation of this compound, as well as several other terpenes. The research in the main part of this work was based on the use of *C. pannorum* A-1 mycelium in the determination of its overall metabolic activity and determination of biotransformation efficiency based on gas chromatography analysis of obtained terpenoid products.

The methods used to induce abiotic stress and an unconventional method of oxygenation of the medium in the most optimal conditions allowed to obtain about 1.35 to 2.6-fold an increase in biotransformation efficiency compared to the control. Whereas, the highest β-pinene biotransformation efficiency was obtained using the adapted mutant *C. pannorum* 2-6, which showed a nearly 4-fold increase in efficiency compared to the control (parental strain). The maximum concentration of the main product of biotransformation, *trans*-pinocarveol, was approx. 600 mg/L of medium. This result indicates that the *C. pannorum* A-1 fungus is an efficient biocatalyst for the conversion of β-pinene to valuable products. That will creating in the future possibility of practical using the β-pinenu biotransformation by psychrotrophic fungi.

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