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ภาคผนวก ก

ตัวชี้วัดเพื่อการประเมินผลสำเร็จของโครงการ

1. นำเสนอผลงานในงานประชุมวิชาการที่มีการตีพิมพ์เฉพาะ Abstract จำนวน 1 เรื่อง

งานประชุมวิชาการ : การประชุมวิชาการวิทยาศาสตร์และเทคโนโลยีแห่งประเทศไทย
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หัวข้อเรื่อง : Improvement of lovastatin production by *Aspergillus terreus* using
vegetable oils as sole and supplementary carbon sources

รูปแบบการนำเสนอ : โปสเตอร์และตีพิมพ์ Abstract ในเอกสารประกอบการประชุม
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Acknowledgement

Dear Pattana Sripalakit

The secretariat committee of STT37 would like to inform you that we have received your STT37 registration information for ID: **0357** and e-mail address: **pattanas@nu.ac.th**
The secretariat committee of STT37 have received

Ordinary participant Participant with paper submission

We recieved the payment as cash bank transfered cheque bank
with amount **1,800.00** baht (หนึ่งพันแปดร้อยบาทถ้วน)

Your submitted paper entitled **Improvement of lovastatin production by Aspergillus terreus ATCC 20542 using vegetable oils as sole and supplementary carbon sources**

was reviewed from academic subcommittee of STT with the result:

- Poster
 Oral presentation (the presentation schedule ban be checked at the uploaded files)
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Sincerely yours,

Associate Professor Dr. Thararat Supasiri



Improvement of Lovastatin Production by *Aspergillus terreus* ATCC 20542 Using Vegetable Oils as Sole and Supplementary Carbon Sources

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Abstract

This study investigated the effect of vegetable oils as sole and supplementary carbon sources during the production of lovastatin by *Aspergillus terreus* ATCC 20542 in submerged culture. The eleven vegetable oils tested were camellia tea oil, canola oil, coconut oil, corn oil, olive oil, palm olein oil, rice bran oil, safflower oil, sesame oil, soya bean oil and sunflower oil. Lovastatin concentration and biomass were measured. Lovastatin production was higher in oil-containing media compared with the control medium. In particular, coconut oil and soya bean oil significantly improved lovastatin production. Yields with coconut oil and soya bean oil were 8- and 5-fold higher, respectively, compared with control media without oil supplementation. Biomass was proportional to coconut oil concentration, but an excessive concentration of oil resulted in a lower yield. The cultivations with coconut oil and soya bean oil used as a sole carbon source gave lower production than the control medium. Thus, it can be concluded that vegetable oils appear to be excellent supplementary carbon sources for improving lovastatin production efficiency.

Introduction

Hypercholesterolemia is considered as an important risk factor in coronary artery diseases of human being. Lovastatin, a widely used anti-hypercholesterolemic drug, is a secondary metabolite produced by the fermentation of *A. terreus*. As with any fermentation product, the culture medium has a significant influence on the yield of product. The selection and composition optimization of a suitable medium is important for establishing a process for producing lovastatin. Numerous examples of the successful use of vegetable oils as carbon sources are cited in the literature. Many studies proved that the vegetable oils can improve fermentation efficiency.

The present work reports on the effect of adding vegetable oils as a sole and supplementary carbon sources to enhance fermentation productivity of lovastatin by *A. terreus*.

Methodology

The standard fungal of *A. terreus* was reactivated by culturing on PDA (potato dextrose agar) slants at room temperature. The culture media contained (per L): 10 g lactose (C source), 8 g yeast extract (N source), 1.51 g KH_2PO_4 , 0.52 g $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$, 0.4 g NaCl, 1 mg $\text{ZnSO}_4 \cdot \text{H}_2\text{O}$, 2 mg $\text{Fe}(\text{NO}_3)_3$, 0.04 mg biotin and some trace elements. All fermentations were carried out at room temperature in 250-mL shake flasks held on an orbital shaker (150 rpm). Lovastatin was extracted by ethyl acetate from the media and was determined as its β -hydroxyacid form by high performance liquid chromatography (HPLC).

Results and Discussion

The maximum production levels of lovastatin were found in coconut oil and soya bean oil, whereas sesame oil gave lowest production (Fig. 1). As supplementary oil concentration of 1 %v/v resulted in the highest lovastatin production; higher concentrations tended to give lower yields (Fig. 2). The biomass increased with increasing oil concentration, which suggests that cell growth is related to oil concentration. Fig. 3 shows the effects of vegetable oils in different concentrations as a sole carbon source. The experiment with only oil as carbon source shows negative effect on lovastatin production. Vegetable oil used as supplementary carbon source gave higher yield than their sole carbon source (Fig. 4).

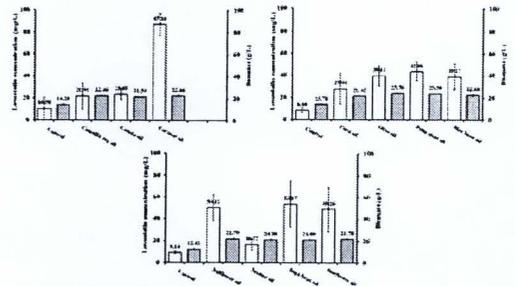


Fig. 1 Effect of vegetable oils on lovastatin production (light bar) and biomass (dark bar)

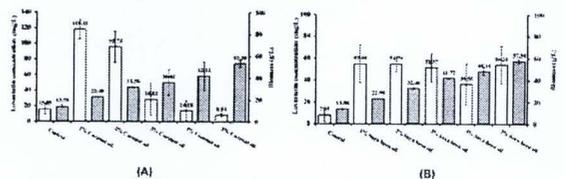


Fig. 2 Effect of concentration of coconut oil (A) and soya bean oil (B) as supplementary carbon sources on lovastatin production (light bar) and biomass (dark bar) (Control = C+N)

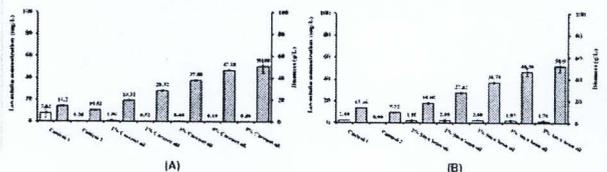


Fig. 3 Effect of concentration of coconut oil (A) and soya bean oil (B) as sole carbon sources on lovastatin production (light bar) and biomass (dark bar) (Control 1 = C+N; Control 2 = N)

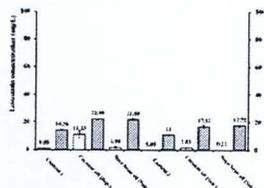


Fig. 4 Influence of supplementary and sole carbon sources on lovastatin production (light bar) and biomass (dark bar) (Control 1 = C+N; Control 2 = N)

Conclusion

The lovastatin production performance of *A. terreus* depends on the composition of medium. Clearly, the vegetable oil supplement as a carbon source seemed to improve fermentation yield.

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