CHAPTER 5

CONCLUSIONS

P. urinae-equi TISTR 1499, which cultured in MRS medium, could rather produce high EPS yield when compared with other LAB. In this work, the production of EPS by *P. urinae-equi* TISTR1499 was favored in solid support fermentation on the laboratory scale. The cultivation of *P. urinae-equi* TISTR 1499 on MRS agar medium surface was used to predict its potential EPS productivity by SSF. The optimum conditions of agar culture when incubated at 37°C were 28 mL/min moist-air supplement, 10 mL MRS agar medium per plate and 12 g/L initial sucrose concentration. Under optimum conditions, the maximum EPS yield was 8.76 g/L within 24 h.

The plastic bead, polystyrene sponge, paper put on cellulose sponge and terra-cotta, which immerged with MRS medium, were also used as solid supports for EPS production. The suitable solid support was found to be plastic bead, which produced EPS in the highest yield amount 6.75 g/L within 18 h at 37°C.

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่
Copyright© by Chiang Mai University
All rights reserved

Agricultural waste such as rice husk, rice straw and sugarcane bagasse could be used as solid support for EPS production. The suitable agricultural solid waste support was found to be rice husk, which produced EPS in the highest yield amount 7.30 g/L. When compared EPS production yield obtained from plastic bead support with rice husk support, it was found that the rice husk gave a higher EPS yield. So, optimum conditions for EPS production by using rice husk as solid support were investigated. The optimum conditions when incubated at 37°C were 1-to-3 (w/v) ratio of the rice husk to MRS medium, 15% (v/v) inoculum size, 20 g/L initial sucrose concentration, 4.30 g/L yeast extract, 3.60 g/L meat extract, 5.00 g/L bacto-peptone and 2.10 g/L diammonium hydrogen citrate. The maximum EPS yield was 10.27 g/L after 18 h of incubation and without moist-air supplement. It can be seen that the EPS yield is higher than those obtained from submerged and agar plate culture.

It can be seen that, after MRS medium was modified on rice husk culture, the amount of yeast extract, meat extract and bacto-peptone could be decreased 14%, 55% and 50%, respectively. Furthermore, lower amount of 95% ethanol for EPS precipitation during recovery step was decreased

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่
Copyright© by Chiang Mai University
All rights reserved

30-50% due to the volume of EPS solution obtained from solid support was lower than those obtained from submerged culture.

This work could be an alternative method to benefit of using agricultural waste. The rice husk, which is the low cost agricultural waste, can be used as support material to produce EPS which is the high cost product.

In the future work, the EPS production using rice husk as solid support should be developed in scale-up. The purification of EPS by *P. urinae-equi* TISTR 1499 should be investigated and then, the characteristic of EPS would be determined. Furthermore, bacteriocin production and secretion by *P. urinae-equi* TISTR 1499 should also be studied.

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่
Copyright© by Chiang Mai University
All rights reserved