

CHAPTER V

CONCLUSION AND SUGGESTION

5.1 Conclusion

The research aimed to investigate the influence of cultivation parameters on oil production. It was found MEB was the most quantity of oil production. MEB medium was selected to study period of growth that the endophytic fungus produced the highest oil at the beginning of stationary phase (20-23 days).

The amount of malt extract in MEB medium was varied (0, 1, 5, 10, 20, 30 and 40 g/L). The best result was obtained at 10g/L of malt ratio which dry mycelium was 5.81 g/L and amount of oil was up to 1.98 g/L (34.07% w/w dry weight of mycelia). The oil production was increased in range of 0-10 g/L of malt extract. On the other hand, the oil was decreased when above 10 g/L of malt extract was used.

The effect of various carbon sources including glucose, sucrose, cassava and molasses, and effect of various nitrogen sources including sodium nitrate, ammonium chloride, urea and yeast extract on the oil production were investigated. The results showed that glucose was the best carbon source which dry mycelia 12.15 g/L and amount of oil up to 3.40 g/L (27.98%w/w dry weight) were obtained. The variation of nitrogen sources showed that yeast extract gave the best result. Dry mycelium 16.91 g/L and amount of oil up to 5.73 g/L (33.89%w/w dry weight) were obtained. Since yeast extract contains some necessary nutrition such as vitamins or minerals, the growth and oil of endophytic fungus were enhanced.

In addition, free fatty acid (FFA) and unsaturated fatty acids in the oils produced from all culture conditions were analyzed. The FFA of about 12.2% was contained in the oil cultured in all culture conditions. The unsaturated fatty acids present in the oil were determined by ¹H-nuclear magnetic resonance spectroscopy. The result showed that the unsaturated fatty acids of the oil were varied and up to 53.01% of the unsaturated fatty acids were obtained from the fungus cultured in MEB.

From the effect of various carbon sources, glucose was the best carbon source. Therefore, in this work bagasse was hydrolyzed to glucose in medium for oil production that it was produced up to 56.99 mg/100 mL of medium.

Biodiesel production from oil of endophytic fungus with a high content of FFA has been investigated. A two-stage transesterification process was selected to improve the methyl ester yield. The first stage was acid pretreatment process, which can be reduced the FFA level of oil of endophytic fungus to less than 1%. The second stage, alkali base catalyzed transesterification process gave 98.92% methyl ester yield.

The viscosity of biodiesel is close to that diesel. The flash point of biodiesel (about 150°C) is greater than that of diesel and the calorific value is slightly lower than that of diesel. This two-stage transesterification method reduces the overall production cost of the biodiesel, as it uses low cost unrefined non-edible oils. The present analysis reveals that biodiesel from oil of endophytic fungus is quite suitable as an alternative to diesel.

5.2 Suggestion

The source of media were varied that the manufacture cost was decreased.