OPTIMIZING CONDITIONS OF THE PRODUCTION OF INDIGENOUS GERMINATED JATROPHA CURCAS LIPASE FOR THE SYNTHESIS OF RENEWABLE BIODIESEL

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Production of renewable biodiesel is usually catalyzed by chemical catalysts those are not environmental friendly. In this research, indigenous lipase from germinated *jatropha curcas* was investigated. The objective of the research was to provide the optimum conditions for the production of high lipase activity from germinated jatropha curcas and used for the *in situ* production of renewable biodiesel. Factors, such as the effect of time and pH buffer of soaking, seeds aeration and sprouting time on lipase activity were investigated. Further more, the use of lipase for the synthesis of methyl ester was also optimized. Seeds were soaked in buffer solution and incubated in a dark room at 30 °C. Germinated seeds were classified into 4 stages based on sprout length. Lipase activities were determined. The results showed that stage 4, sprout length longer than 2 cm, has highest lipase activities. The pH buffer and time of soaking were 6 and 12 h, respectively. Lipase hydrolytic activity was 19.9 U/g. Non-aerated seeds produced 8.2 times higher lipase activity than aerated seeds during germination. The esterification activity was 110 U/g. The optimum conditions for the synthesis methyl ester were at the temperature of 40 °C and molar substrate ratio of 1 : 1. It is believed that the indigenous germinated *jatropha curcas* lipase can be used for the *in situ* biodiesel synthesis.