Thesis Title	The Kinetic Study of the Rice Bran Lipase-Catalysed Hydrolysis of Food Oil
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Abstract

Rice milling process in Thailand has a valuable by product, rice bran that rich in lipase. Lipase from various varieties of rice bran may has different property. So, the objective of this study is to investigate the difference of lipase in Thai rice bran by kinetic method. Rice bran (Khao Dawk Mali 105), white sticky rice bran (RD 6) and black sticky rice bran were used for the study. White sticky rice bran lipase and black sticky rice bran lipase showed the optimum temperature at 55 °C, and 60 °C for Khao Dawk Mali 105 rice bran lipase. The kinetic study of rice bran lipases-catalysed hydrolysis of olive oil, rice bran oil, sunflower oil, coconut oil and tuna oil was carried out at 55 °C in isooctane. Results from the kinetic measurement show that lipase from Khao Dawk Mali 105 rice bran has selectivity for olive oil and the Michaelis constants (K_m) is 12.20 mM, V_{max} 10.25 μmole/hr.g solid and V_{max}/K_m 0.84 μmole/hr.g solid.mM. Furthermore, this lipase has decreasing selectivity for sunflower oil, tuna oil, rice bran oil and coconut oil, respectively. Lipase from black sticky rice bran has selectivity for olive oil and the K_m value is 11.48 mM, V_{max} 16.53 μmole/hr.g solid and V_{max}/K_m 1.44 μmole/hr.g solid.mM. Furthermore, this lipase has decreasing selectivity for sunflower oil, rice bran oil, coconut oil and tuna oil, respectively. Lipase from white sticky rice bran has selectivity for rice bran oil and the K_m value is 6.08 mM, V_{max} 15.13 μmole/hr.g solid and V_{max}/K_m 2.49 μmole/hr.g solid.mM. Furthermore, this lipase has decreasing selectivity for olive oil, sunflower oil, tuna oil and coconut oil, respectively. White sticky rice bran lipase has higher hydrolytic activity

than lipases from other brans. Thus, it might be an alternative source of enzyme for the production of free fatty acid for industry.

Keywords: Rice bran lipase / White sticky rice bran lipase / Black sticky rice bran lipase / Michaelis constant / Hydrolysis