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題名；Synthesis of Polyglycerol Fatty Acid mono-Esters by Lipase Reactions

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Polyglycerol fatty acid ester (PGE) has various features depending on its degree of esterification. In particular, monoester has a good property, such as high emulsifying or solubilizing capacity. Generally, commercial PGE is made by chemical synthesis methods, and it is known that the number of fatty acids esterified to a polyglycerol molecule varies around some central value. That is, most of the commercial PGE which is offered under the name of "monoester" has low amount of monoester in practice. Then, we approached to get a monoester-rich PGE through the use of lipase reactions. We have studied lipase reactions in oils and fats for many years, so we thought to be able to apply our know-how to synthesis of monoester-rich PGE by lipase reactions with high selectivity.

First, we carried out the screening of lipases which were able to synthesize monoester-rich PGE from polyglycerols and fatty acids. Then we found that some lipases had the capability to synthesize PGE even in organic solvents, and in particular, Candida cylindracea lipase was able to synthesize monoester with high selectivity in tert-butyl alcohol. We next tried to optimize some reaction conditions to increase the reaction rate. Then we found that initial water content in the reaction system significantly affected the reaction rate. Consequently, we were able to acquire the high-purity polyglycerol fatty acid monoester in a relatively short reaction time.