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Use of Rice bran Lipase to enhance washing performance of commercial detergents

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Enzyme Lipase (triacylglycerolacyl hydrolases EC 3.1.1.3) which can digest triacyl glycerol was isolated from rice bran. Enzyme was extracted into pH 8 phosphate buffer and fractionated with ammonium sulphate. 60-80% $(NH_4)_2SO_4$ precipitation which had the highest enzyme activity was dialysed against the same buffer and part 2 purified by batch adsorption-desorption technique on DEAEcellulose. The enzyme was purified 2.6 3 fold with 71.41% recovery.

Studies on properties of the enzyme showed that enzyme exhibited higher activity at pH 8-9 and temperature 50-60°C. Significant enzyme activity was also observed even at pH 10. Kinetics of the product formation showed that formation of the product was continued over 30 min and was linear for the initial period of 10 min.

pH stability and thermal stability studies showed that the enzyme remains stable even for 1hr at pH 8-10 and 50-60º C respectively. Further, isolated lipase remains stable in the presence of $CaCl_2$ (tested up to 2000ppm level) SDS (up to 8%) and commercial detergents powders such as Sunlight, Rin, Diva, Dedunu and Wonderlight. Of them enzyme showed higher stability towards sunlight powder. Washing performance tests carried out with sunlight powder, showed that enzyme (4ml, 0.25mg/ml) with detergent (10ml, 0.0025mg/ml) can be used to remove oily stains caused by olive oil (1ml) successfully. However, prior incubation of the oily stain with lipase and 2%SDS (5.00 ml) for 30 min and subsequent washing with the detergent provide better results.

Results clearly indicate that rice bran lipase can be effectively used in laundry detergents to improve the removal of fatty soiling.

Key words: lipase, rice bran, washing performance, detergents

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