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### Rubber seed Lipase as a possible candidate in bio-detergent industry

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The enzyme Lipase (triacyl glycerol acyl hydrolases EC 3.1.1.3), which digests triacyl glycerol liberating free fatty acids was extracted from the seeds of *Hevea brasiliensis* (rubber). The crude enzyme extract was partially purified 4.47 fold with a yield of 65.4 % recovery, by  $(\text{NH}_4)_2\text{SO}_4$  fractionation followed by batch adsorption on DEAE cellulose. The kinetic characterization of partially purified enzyme exhibited optimum activity at 40 °C and pH 8. The kinetics of the product formation was linear for first 10 mins and reach to a maximum at 30 mins. Studies on thermal stability and pH stability showed that the enzyme remains stable atleast for 1 hr at 40 °C and pH 8. Significant thermal stability was also observed at 60 °C. The enzyme exhibited good stability towards SDS (up to 6 %),  $\text{CaCl}_2$  (upto 4000ppm level) and commercial detergents such as Sunlight powder, Rin, Diva, Dedunu and Wonderlight. Washing performance tests with sunlight powder and Diva showed that the enzyme (4ml, 8.4 µg/ml) with the detergent (10ml, 0.25g/ml) can be used to remove oily stains successfully. However, prior incubation of the oily stain with lipase and 2 %SDS (5.00 ml) for 30mins and subsequent washing with the detergent provides better results.

These findings indicate rubber that seed lipase can be used as an ingredient to improve the cleaning efficiency of sunlight powder and Diva. Hence, we suggest, that rubber seed Lipase is a possible candidate for use in the bio-detergent industry.

**Keywords;** Lipase, *Hevea brasiliensis* . washing performance, detergents