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Purification and characterization of lipase enzyme from *Lactobacillus brevis* and immobilization onto magnetic florisisil NPs

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Lipases (E.C.3.1.1.3; triglycerol acylhydrolases) are enzymes catalyzing reversible hydrolysis of animal and vegetable oils under normal conditions. Besides, they also catalyze reactions such as esterification and transesterification. In this study, a new lipase enzyme was isolated from *Lactobacillus brevis* and immobilized onto modified florisisil with iron NPs and the usability of free and immobilized lipases as a detergent additive material was investigated. Lipase enzyme was purified using ammonium sulphate precipitation, DEAE-Sephadex ion-exchange chromatography and sephacryl S200 gel filtration chromatography techniques. Its molecular mass was determined to be 57 kDa by SDS-PAGE and gel filtration chromatography. Purified lipase was immobilized onto magnetic florisisil NPs and determined immobilization conditions. Also immobilized lipase characterization was done using SEM, FTIR and XRD techniques. Immobilized lipase showed good thermo-stability and retained its activity at 80%, than free lipase enzyme at 60°C. The free and immobilized lipase enzymes were most stable in the alkaline pH. Also, immobilized lipase had more stability towards metal ions than free lipase enzyme. Washing performances of some detergents formulation were done and maximum percentage of olive oil was removed by the immobilized lipase than commercial detergents. The study on oil stain removal from cotton cloth indicated that oil removal was superior in the presence of immobilized lipase and immobilized lipase with detergent than the detergent alone.

Biography

Hayrunnisa Nadaroglu has completed her PhD and MSc from Ataturk University, Graduate Institute of Sciences, Department of Biochemistry (Erzurum, Turkey) in Bioorganic Reactions using purified carbonic anhydrase isoenzymes. She is a Scientific Expert in process development on bioremediation of waste water, some nano-biotechnological applications onto environmental pollution and some industrial enzyme applications onto food technology (clarification of fruit juice, hydrolyzation of phytate etc.). She has published more than 120 papers in the field of biochemistry, food technology and nano-biotechnology in journals and conferences.

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