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ISOLATION OF LIPOLYTIC BACTERIA FROM OIL CONTAMINATED SOIL AND PRODUCTION OF LIPASES

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Hydrolytic enzymes, such as lipases, have emerged as key enzymes in a broad array of biotechnological industries due to their multifaceted characteristics. The aim of this study was to isolate lipase producing bacteria from oil contaminated soil and subsequent optimization of their culture conditions to maximize lipase production. Novel lipolytic bacteria were isolated from oil contaminated soil by serial dilution technique on a minimal salt media containing olive oil as the main carbon source. Out of nine bacterial isolates purified, five isolates (LDB1, LDB2, LDB3, LDB4 and LDB5) screened positive for lipase activity by means of phenol red and tween 20 media. To select a promising lipolytic candidate para-nitrophenol palmitate assay was used. LDB-1 isolate, which showed the highest absorbance at 410 nm was chosen for further optimization. To determine the optimum culture conditions, pH (3-12), temperature (30-70 °C), carbon source and nitrogen source were studied. Isolate LDB-1 showed the highest lipase activity at the temperature of 30 °C (0.112 U mL^{-1}) and at a pH of 6 (0.076 U mL^{-1}). Among the various carbon sources tested, olive oil exhibited the maximum enzyme activity of 0.115 U mL^{-1}. With yeast extract as the nitrogen source, the highest enzyme activity of 0.102 U mL^{-1} was recorded in comparison with other nitrogen sources tested. Hence the optimum culture conditions for enhanced lipolytic activity was identified as pH 7, at a temperature of 30 °C, with olive oil as the carbon source and yeast extract as the nitrogen source. The results are a clear indication of culture conditions being able to bring about remarkable alterations in the level of enzyme production and activity.

Keywords: Lipase, Oil contamination, Optimization, pNPP assay, Screening