Abstract No: BO-51

Characterization of lipolytic bacteria isolated from oil mill waste

P. P. C. M. Dias[*1] and I. V. N. Rathnayake[1]

[1]Department of Microbiology, Faculty of Science, University of Kelaniya, GQ 11600, Sri Lanka
chaminimadu25@email.com*

Microbial lipases are enzymes that can catalyze the hydrolysis of esters formed from glycerol and long-chain fatty acids. Microbial lipases are used as biocatalysts in various biotechnological applications due to their stability in organic solvents. In the present study, a bacterial culture isolated from oil mill waste was characterized using morphological, cultural, and biochemical properties. Isolate was subjected to qualitative screening of extracellular lipolytic activity using culture-based methods on Tween peptone agar, olive oil with phenol red agar, and egg yolk agar. The lipase was produced using submerged fermentation. Fermented culture supernatant was used as the crude lipase. The crude lipase was extracted, and the activity was measured using olive oil as the substrate, and the concentration of the free fatty acid in the reaction was determined by titrating with 0.1 M NaOH. The effect of detergent on crude lipase activity was also assessed using three different commercial detergents. Based on morphological, cultural, and biochemical characteristics, the strain was identified as a bacterium belonging to the genus *Pseudomonas*. This bacterium showed the opaque zone on tween peptone agar and egg yolk agar and it displayed a yellow zone on phenol red agar. Crude lipase of this bacterium showed 14.50 µmol/h/mL of activity at 37 ˚C and pH 8. Crude lipase investigated in the study showed varying relative activities to the three detergents tested, 51.8% being the highest. The lipolytic capabilities of the isolated bacterial strain hold great promise for various biotechnological applications requiring the enzymatic breakdown of lipids.

Keywords: Biocatalysts, Detergents, Lipases, Lipolytic bacteria, Oil mill waste