

ABSTRACT

Maulina Rizqi Azzahra, 24020221130024, **Optimization of Inducer Concentration and Fermentation Duration on Lipase Enzyme Production of Bledug Kesongo Bacteria and its Application as Detergent Additive along with its Molecular Identification** (under the guidance of Wijanarka and Endang Kusdiyantini).

Lipase (EC 3.1.1.1) is a hydrolase enzyme capable of catalyzing the hydrolysis reaction of triglycerides into fatty acids and glycerol. The ability of lipase enzymes can be used in detergents to facilitate the release of oil stains on fabrics. The lipase enzyme can be obtained from Bledug Kesongo bacterial isolates that are able to survive in extreme environmental conditions, making it suitable for the conditions during washing. This study aims to determine Bledug Kesongo bacterial isolates that have the potential to produce lipase enzymes and the optimum conditions for lipase enzyme production when inducers and fermentation time variations are added and to analyze the ability of lipase enzymes as detergent additives. The research was conducted using a Factorial Complete Randomized Design with the factor of inducer concentration of 1%, 2%, 3% and the factor of fermentation time for 0 hours, 6 hours, 12 hours, and 18 hours with 3 repetitions. The results showed that bacterial isolate BK 6 has 97% similarity with *Marinobacter sp.* species based on BLAST results. Bacterial isolate BK 6 is also able to produce the largest turbid zone diameter on selective Tween 80 Agar media, making it the best lipase-producing bacterial isolate. The optimum condition of lipase enzyme production of bacterial isolate BK 6 occurred when the addition of 1% inducer accompanied by 18 hours fermentation time resulted in an absorbance value of 1.951 and enzyme activity of 1.75 U/mL. The lipase enzyme of bacterial isolate BK 6 at optimum conditions is compatible with commercial detergents R in liquid form. The ability to maintain the highest lipase enzyme activity in liquid detergent brand R amounted to 94.49%. It was proven to be able to remove olive oil stains by 64.26% at 50°C and 58.66% at 37°C.

Keywords: Detergent, Compatibility, Olive oil, Marinobacter sp., Tween 80 Agar