

ABSTRAK

IDENTIFIKASI GENUS ISOLAT BAKTERI ASAM LAKTAT (BAL) DARI EKOENZIM DAN AKTIVITAS ENZIM SECARA KUALITATIF

Pengolahan limbah organik terutama air limbah, masih menjadi permasalahan lingkungan yang signifikan. Salah satu solusi alternatif dengan biaya murah dan pengaplikasian murah yang berkembang saat ini adalah pemanfaatan agen hayati berbasis mikroorganisme, seperti ekoenzim. Penelitian ini bertujuan mengisolasi dan mengidentifikasi bakteri asam laktat (BAL) dari ekoenzim umur 3 dan 6 bulan, serta aktivitas enzimatikanya. Isolasi dilakukan pada media MRS Agar, diikuti karakterisasi morfologi, pewarnaan Gram, uji biokimia, serta uji aktivitas enzim protease, lipase, dan selulase. Hasil menunjukkan seluruh isolat bersifat Gram positif, terdiri dari bentuk kokus, basil, dan oval. Uji biokimia menunjukkan variasi fermentasi gula dan sifat homofermentatif, sebagian besar isolat non-motil dan tidak menghasilkan enzim katalase yang mendukung dugaan isolat termasuk genus *Pediococcus sp.*, *Bacillus sp.*, dan *Candida sp.* Beberapa isolat menunjukkan aktivitas enzim secara kualitatif yang mengindikasikan potensinya dalam proses pengolahan limbah berbasis mikroba.

Kata-kata kunci: bakteri asam laktat; ekoenzim; Gram positif; lipase; protease; selulase.



ABSTRACT

GENUS IDENTIFICATION OF LACTIC ACID BACTERIA (LAB) ISOLATES FROM ECOENZYMES AND QUALITATIVE ENZYME ACTIVITY

*The treatment of organic waste, particularly wastewater, remains a significant environmental issue. One promising low-cost and easily applicable alternative is the use of bio-agents based on microorganisms, such as ecoenzymes. This study aimed to isolate and identify lactic acid bacteria (LAB) from ecoenzymes fermented for 3 and 6 months, and to evaluate their enzymatic activity. Isolation was performed on MRS Agar, followed by morphological characterization, Gram staining, biochemical tests, and qualitative assays for protease, lipase, and cellulase activity. All isolates were Gram-positive, with cocci, bacilli, and oval cell morphologies. Biochemical tests revealed variations in sugar fermentation patterns and homofermentative characteristics; most isolates were non-motile and catalase-negative, supporting their identification as *Pediococcus* sp., *Bacillus* sp., and *Candida* sp. Several isolates showed qualitative enzyme activity indicating their potential in microbial-based waste treatment processes.*

Keywords: lactic acid bacteria; ecoenzyme; Gram-positive; lipase; protease; cellulase.

