

PEMANFAATAN ENZIM KERATINASE DARI ISOLAT BAKTERI INDIGENOUS DALAM MENGHIDROLISIS SUBSTRAT BULU BEBEK

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INTISARI

Bulu bebek sebagian besar tersusun dari protein keratin. Keratin merupakan protein yang sulit didegradasi. Bakteri *Indigenus* yang diisolasi dari Rumah Potong Hewan Giwangan merupakan bakteri yang dapat menghasilkan enzim keratinase. Penelitian ini bertujuan untuk (1) mengetahui pertumbuhan isolat bakteri *Indigenus*, (2) mengetahui kemampuan isolat bakteri *Indigenus* dalam menghasilkan enzim keratinase, (3) mengetahui kemampuan isolat dalam mendegradasi bulu bebek, (4) mengetahui profil asam amino dari hidrolisat bulu bebek. Data yang diperoleh dari penelitian ini yaitu data hidrolisat bulu bebek, kultur mikrobial, profil pertumbuhan bakteri, uji aktivitas keratinolitik metode zona bening, uji aktivitas keratinase metode spektrofotometri, uji tingkat degradasi bulu bebek oleh bakteri *Indigenus*, dan susunan asam amino degradasi bulu bebek dianalisis deskriptif. Hasil yang diperoleh yaitu isolat bakteri *Indigenus* menunjukkan bahwa bakteri tersebut memiliki enzim keratinase dengan dibuktikan adanya zona bening. Aktivitas enzim tertinggi pada substrat kasein oleh *Pseudomonas* sp. PK4, *Bacillus cereus* LS2B, *Bacillus cereus* TD5B sebesar 16,42 U/ml, 10,52 U/ml, dan 6,24 U/ml, sedangkan pada substrat keratin bakteri *Pseudomonas* sp. PK4, *Bacillus cereus* LS2B, *Bacillus cereus* TD5B sebesar 11,3 U/ml, 5,23 U/ml, dan 7,01 U/ml. Tingkat degradasi substrat bulu bebek oleh bakteri *Pseudomonas* sp. PK4, *Bacillus cereus* LS2B, *Bacillus cereus* TD5B sebesar 38%, 38%, dan 19%. Profil asam amino yang terkandung dalam bulu bebek yaitu asam aspartat, asam glutamat, serin, glisin, threonin, arginin, alanin, valin, fenilalanin, isoleusin, leusin, dan lisin. Kesimpulan dari penelitian ini yaitu isolat bakteri *Indigenus* dapat menghasilkan enzim keratinase yang dapat mendegradasi substrat bulu bebek.

(Kata kunci : Bulu bebek, Hidrolisat keratin, Enzim keratinase, Hidrolisis, Bakteri *Indigenus*).

UTILIZATION OF KERATINASE ENZYME FROM *INDIGENOUS* BACTERIA ISOLATE IN HYDROLYZING DUCK FEATHER SUBSTRATE

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ABSTRACT

Duck feathers were mostly composed of the protein keratin. The protein was difficult to degrade is protein keratin. Keratinase enzymes can be produced from indigenous bacteria isolated from the Giwangan Slaughterhouse. The purpose of this research was to (1) determine the growth of indigenous bacterial isolates, (2) the production of keratinase enzyme produced from indigenous bacterial isolates (3) determine the degradation of duck feathers by indigenous bacterial isolates (4) determine the amino acid profile of hydrolyzed duck feathers. The data obtained from the research were duck feather hydrosylate, microbial culture, bacterial growth profile, keratinolytic test with clear zone method, producing keratinase enzyme, degradation of duck feathers by indigenous bacteria, and amino acid profile from degradation. The data obtained were analyzed descriptively. The results obtained were isolates of indigenous bacteria which showed that the bacteria had the enzyme keratinase with evidenced by the presence of a clear zone. The highest enzyme activity on casein substrate by bacteria *Pseudomonas* sp. PK4, *Bacillus cereus* LS2B, *Bacillus cereus* TD5B were 16.42 U/ml, 10.52 U/ml, and 6.24 U/ml while on the keratin substrate the bacteria *Pseudomonas* sp. PK4, *Bacillus cereus* LS2B, *Bacillus cereus* TD5B of 11.3 U/ml, 5.23 U/ml, and 7.01 U/ml. The level of substrate degradation of duck feathers by *Pseudomonas* sp. PK4, *Bacillus cereus* LS2B, *Bacillus cereus* TD5B by 38%, 38%, and 19%. The amino acid profiles contained in duck feathers are aspartic acid, glutamic acid, serine, glycine, threonine, arginine, alanine, valine, phenylalanine, ileucine, leucine, and lysine. The conclusion of the research was that indigenous bacterial isolates can be produced keratinase enzymes and can be hydrolyzed duck feather substrates.

(Keywords: Duck feathers, Keratin hydrosylate, Keratinase enzyme, Hydrolysis, *Indigenous* Bacteria).