

**PENGGUNAAN *Bacillus cereus* TD5B, *Bacillus cereus* LS2B dan
Pseudomonas sp. PK4 PENGHASIL ENZIM KERATINASE DALAM
MENGHIDROLISIS BULU AYAM JOPER**

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INTISARI

Bulu ayam joper didominasi oleh protein keratin. Keratin merupakan protein yang sulit untuk didegradasi karena mengandung sulfur dan membentuk ikatan disulfida. Keratinase merupakan enzim protease spesifik yang dapat memutus ikatan disulfida pada keratin. Penelitian yang telah ada menunjukkan bahwa enzim keratinase dapat diproduksi melalui metabolisme bakteri yang mana di antaranya yaitu *Bacillus cereus* TD5B, *Bacillus cereus* LS2B dan *Pseudomonas* sp. PK4 sehingga mampu dalam mendegradasi bulu unggas. Penelitian ini bertujuan untuk (1) mengetahui pertumbuhan *Bacillus cereus* TD5B, *Bacillus cereus* LS2B, dan *Pseudomonas* sp. PK4 dengan penambahan substrat bulu ayam joper, (2) mengetahui tingkat degradasi bulu ayam joper oleh *Bacillus cereus* TD5B, *Bacillus cereus* LS2B, *Pseudomonas* sp. PK4 (3) mengetahui perbedaan kemampuan masing-masing strain bakteri dalam mendegradasi bulu ayam joper. Pengujian yang akan dilakukan meliputi uji kemampuan pertumbuhan strain bakteri pada medium cair dengan penambahan substrat bulu ayam joper, uji aktivitas keratinase metode zona bening, uji viabilitas, uji aktivitas keratinase metode spektrofotometri dan uji degradasi bulu. Analisis yang digunakan yaitu analisis deskriptif. Hasil yang diperoleh menunjukkan bahwa *Bacillus cereus* TD5B, *Bacillus cereus* LS2B dan *Pseudomonas* PK4 memiliki enzim keratinase yang ditandai dengan adanya zona bening. Aktivitas enzim tertinggi pada substrat keratin *Bacillus cereus* TD5B, *Bacillus cereus* LS2B, *Pseudomonas* PK4 secara berturut-turut sebesar 49,4 U/ml, 30,6 U/ml, 24,2 U/ml. Tingkat degradasi bulu ayam joper oleh *Bacillus cereus* TD5B, *Bacillus cereus* LS2B, *Pseudomonas* sp. PK4 secara berturut-turut sebesar 25%, 24% dan 18%. Kesimpulan dari penelitian ini yaitu ketiga isolat bakteri dapat tumbuh pada medium cair dengan penambahan substrat bulu joper dan mampu menghasilkan enzim keratinase yang dapat mendegradasi bulu ayam joper. *Bacillus cereus* TD5B memiliki kemampuan paling efektif dalam mendegradasi bulu ayam joper.

Kata kunci: degradasi, bulu, aktivitas enzim, protease, mikroorganisme

THE USE OF *Bacillus cereus* TD5B, *Bacillus cereus* LS2B and *Pseudomonas* sp. PK4 PRODUCTION OF KERATINASE ENZYME IN HYDROLYSIS OF JOPER FEATHER

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ABSTRACT

Joper chicken feathers are dominated by keratin protein. Keratin is a protein that is difficult to degrade because it contains sulfur and forms disulfide bonds. Keratinase is a specific protease enzyme that can break disulfide bonds in keratin. Existing research shows that the keratinase enzyme can be produced through bacterial metabolism, which include *Bacillus cereus* TD5B, *Bacillus cereus* LS2B and *Pseudomonas* sp. PK4 so that it is able to degrade poultry feathers. This study aims to (1) determine the growth of *Bacillus cereus* TD5B, *Bacillus cereus* LS2B, and *Pseudomonas* sp. PK4 with the addition of joper feathers as a substrate, (2) determine the level of degradation of joper feathers by *Bacillus cereus* TD5B, *Bacillus cereus* LS2B, *Pseudomonas* sp PK4 (3) determine differences in the ability of each bacterial strain in degrading joper feathers. The tests that will be carried out include testing the growth ability of bacterial strains in liquid medium with the addition of joper chicken feather substrate, keratinase activity test with clear zone method, viability test, keratinase activity test using spectrophotometric method and feather degradation test. The analysis used is descriptive analysis. The results obtained showed that *Bacillus cereus* TD5B, *Bacillus cereus* LS2B and *Pseudomonas* PK4 had keratinase enzymes which were indicated by the presence of a clear zone. The highest enzyme activity on the keratin substrate of *Bacillus cereus* TD5B, *Bacillus cereus* LS2B, *Pseudomonas* PK4 was 49,4 U/ml, 30,6 U/ml, 24,2 U/ml, respectively. The level of degradation of joper feathers by *Bacillus cereus* TD5B, *Bacillus cereus* LS2B, *Pseudomonas* sp PK4 was 25%, 24% and 18%, respectively. The conclusion of this study is that the three bacterial isolates can grow in liquid medium with the addition of joper feather substrate and are able to produce keratinase enzymes that can degrade joper feathers. *Bacillus cereus* TD5B has the most effective ability in degrading joper feathers.

Keywords: Degradation, feathers, enzyme activity, protease, microorganism