ABSTRAK

ISOLASI DAN KARAKTERISASI MIKROORGANISME PENDEGRADASI LIMBAH BULU AYAM SERTA UJI BIODEGRADABILITASNYA

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Bulu ayam termasuk limbah industri unggas yang berpotensi untuk dimanfaatkan sebagai bahan alternatif pengganti sumber protein hewani dalam formulasi pakan ternak. Namun pengolahannya belum optimal karena protein pada bulu ayam termasuk keratin (protein serat) yang sulit terdegradasi. Tujuan dari penelitian ini adalah untuk mendapatkan isolat mikroorganisme yang mampu mendegradasi senyawa keratin pada limbah bulu ayam dan mengurangi pencemaran limbah bulu ayam di lingkungan. Kemampuan mikroorganisme dalam mendegradasi keratin pada limbah bulu ayam diukur berdasarkan Indeks Keratinolitk (IK) koloni pada medium *Feather Meal* Agar (FMA) dan aktivitas ekstrak enzim keratinolitik pada substrat tepung bulu ayam. Hasil penelitian ini diperoleh 2 isolat dari 17 isolat yang memilki aktivitas keratinolitik tertinggi pada medium padat dan medium cair. Dua isolat diantaranya yaitu isolat B-9-6 dan isolat B-9-7 memiliki nilai IK tertinggi sebesar 2,8 dan 2,3. Kedua isolat memiliki aktivitas enzim keratinase berturut-turut sebesar 12,73 U/ml dan 13,43U/ml. Konsorsium kedua isolat tersebut mampu mendegradasi 71% bulu ayam pada kultur cair dengan waktu fermentasi selama 14 hari.

Kata kunci: Isolasi, bulu ayam, mikroba keratinolitik, keratin, enzim keratinase.

ABSTRACT

ISOLATION AND CHARACTERIZATION OF CHICKEN FEATHER WASTEDEGRADING MICROORGANISM, AND BIODEGRADABILITY TEST

By

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Chicken feathers is a waste product of the poultry industry that has potential to be utilized as an alternative protein sources for animal feed formulations. However, the utilization process is not simply because the protein in chicken feathers, Keratin, is difficult to be degrade. The aimed of this research was to get isolates of microorganisms which able to degrade keratin in chicken feather waste. The ability of microorgnism to degrade keratin in the sample was measured based on keratinolytic index (KI) of the microbial colony on Feather Meal Agar (FMA) medium, and keratinase activity in liquid medium with chicken feather flour as substrate. The results showed that two out of 17 isolates had the highest keratinolytic activity on solid and liquid medium. The two isolates, i.e. B-9-6 and B-9-7, have KI values of 2.8 and 2.3 respectively. Both isolates have a keratinase enzyme of 12,73 U/ml and 13,43 U/ml, respectively. The consortium of two isolates were able to degrade 71% of chicken feathers (initial concentration 10% (w/v)) in liquid culture for 14 days.

Keywords: Isolation, chicken feathers, keratinolytic microbes, keratin, keratinase enzymes.