

PRODUKSI, EKSTRAKSI DAN KARAKTERISASI BAKTERIOSIN BAKTERI ASAM LAKTAT HASIL ISOLASI CAIRAN RUMEN DOMBA EKOR TIPIS

INTISARI

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Penelitian ini bertujuan untuk memproduksi, ekstraksi dan karakterisasi bakteriosin bakteri asam laktat (BAL) hasil isolasi dari cairan rumen domba ekor tipis. Bakteri asam laktat diperoleh melalui isolasi, seleksi dan karakterisasi dari cairan rumen domba ekor tipis. Bakteri asam laktat diisolasi dan ditumbuhkan pada media *De Man Rogosa and Sharpe* (MRS). Kultur BAL murni kemudian digunakan untuk identifikasi strain bakteri dan karakterisasi bakteriosin yang dihasilkannya. Penelitian ini terbagi dalam 3 tahap, tahap pertama yaitu isolasi dan seleksi BAL. Tahap kedua yaitu optimasi pertumbuhan dan penumbuhan BAL unggul dalam medium cair, dan karakterisasi BAL. Tahap ketiga yaitu produksi dan karakterisasi bakteriosin. Data perlakuan ketahanan bakteriosin terhadap pH, suhu, dan lama penyimpanan dianalisis secara rancangan faktorial, kemudian bila terdapat perbedaan nyata besarnya variable karena perlakuan dilanjutkan dengan uji Duncan's New Multiple Range Test (DMRT). Data isolasi dan karakterisasi bakteri dan bakteriosin disajikan secara deskriptif. Seleksi bertahap BAL dilakukan berdasarkan nilai pH, kandungan asam laktat, dan daya hambat BAL terhadap *E. coli*. Hasil seleksi diperoleh 3 isolat BAL unggul yaitu BAL 0 A, BAL 1 A, dan BAL 4 C. Berdasarkan identifikasi yang dilakukan, BAL 0 A, BAL 1 A, dan BAL 4 C merupakan bakteri asam laktat yang memiliki sifat Gram positif dan katalase negatif. Bakteri BAL 0 A bersifat heterofermentatif sedangkan BAL 1 A dan BAL 4 C bersifat homofermentatif. BAL 0 A teridentifikasi sebagai *Lactobacillus brevis*, sedangkan BAL 1 A dan BAL 4 C teridentifikasi masih sebagai strain campuran. Berat molekul bakteriosin yang terdeteksi dari ketiga jenis BAL yaitu antara 11,68-35,54 kDa. Aktivitas bakteriosin ketiga jenis BAL terhadap *S.aureus* lebih besar dibandingkan dengan *E.coli*. Aktivitas bakteriosin yang dihasilkan BAL 0 A, BAL 1 A, dan BAL 4 C cenderung stabil pada suhu 80, 100, dan 121°C, namun semakin menurun seiring bertambahnya nilai pH. Aktivitas bakteriosin ketiga jenis BAL masih baik ketika disimpan pada suhu -8°C selama 14 hari. Berdasarkan hasil yang diperoleh, dapat disimpulkan bahwa cairan rumen domba ekor tipis berpotensi sebagai sumber isolat BAL penghasil bakteriosin.

Kata kunci : Bakteri asam laktat, Bakteriosin, Isolasi dan karakterisasi, Cairan rumen.

PRODUCTION, EXTRACTION AND CHARACTERIZATION OF BACTERIOCIN OF LACTIC ACID BACTERIA ISOLATED FROM RUMEN LIQUID OF THIN-TAIL SHEEP

ABSTRACT

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This study aimed to produce, extract and characterize bacteriocin of lactic acid bacteria (LAB) isolated from rumen liquid of thin-tail sheep. Lactic acid bacteria was obtained by isolation, selection, and characterization from rumen liquid of thin-tail sheep. Lactic acid bacteria were isolated and cultured in De Man Rogosa and Sharpe (MRS) medium. Pure LAB culture was used to identify bacteria strain and to characterize bacteriocin which was produced. This research was divided into 3 steps. The first step was isolation and selection of lactic acid bacteria. The second step was optimizing and culturing lactic acid bacteria on liquid medium and characterization of LAB. The third step was production and characterization of bacteriocin. The data of stability of bacteriocin on pH, temperature and time of storage were analyzed by factorial method, if there was significant value continued by Duncan's New Multiple Range Test (DMRT). The data of isolation and characterization of bacteria dan bacteriocin was showed descriptively on table or image. The selection based on pH value, lactic acid content, and inhibition zone of lactic acid bacteria against *E. coli* was obtained 3 isolates of lactic acid bacteria, that were LAB 0 A, LAB 1 A, and LAB 4 C. They were Gram positive, and negative catalase. LAB 0 A was heterofermentatif but LAB 1 A and LAB 4 C were homofermentative. LAB 0 A was identified as *Lactobacillus brevis*, while LAB 1 A and LAB 4 C were mix cultures. The molecule weight of bacteriocin detected from three types of BAL was between 11,68-35,54 kDa. The bacteriocin activity of the three types of LAB against *S. aureus* was greater than that of *E. coli*. The activity of bacteriocin produced by LAB 0 A, LAB 1 A, and LAB 4 C tended to be stable for heating temperature of 80, 100, and 121° C, but decreased with increasing pH value. Bacteriocin activity of the three types of LAB was still good when kept at -8° C for 14 days. Based on the results, it can be concluded that the rumen liquid of thin tailed sheep was potential as a source of LAB isolates that produced bacteriocin.

Keywords : Lactic acid bacteria, Bacteriocin, Isolation and characterization, Rumen liquid.