



Skrining Dan Karakterisasi Bakteri Asam Laktat Penghasil Bakteriosin Dari Fermentasi Naniura

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ABSTRAK

Naniura merupakan produk fermentasi tradisional dengan bahan utama ikan yang berpotensi sebagai sumber bakteri asam laktat penghasil bakteriosin yang merupakan peptida dengan potensi luas. Penelitian ini bertujuan melakukan skrining dan karakterisasi bakteriosin yang dihasilkan oleh bakteri asam laktat dari fermentasi naniura dan diuji aktivitas antimikroba pada 4 bakteri patogen. Isolat Bal diperoleh melalui proses isolasi dan pemurnian, yang kemudian dikulturkan untuk menghasilkan *Crude* Bakteriosin dan diskriming. Isolat penghasil *Crude* Bakteriosin terpilih dikarakterisasi dengan perlakuan suhu, pH, lama dan suhu penyimpanan, sensitifitas enzim proteolitik dan SDS-PAGE. Isolat terpilih diidentifikasi secara molekuler. Aktivitas antimikroba diuji menggunakan metode *Well Diffusion* pada 4 bakteri patogen *Listeria monocytogenes* FNCC 0156, *Bacillus Cereus* FNCC 0057, *Staphylococcus aureus* FNCC 0047 dan *Eschericia coli* FNCC 0091, aktivitas *Crude* Bakteriosin dinyatakan dalam satuan *Arbitraty Unit* per mililiter (AU/mL). Data dianalisis secara statistik menggunakan ANOVA. Hasil penelitian diperoleh bakteri asam laktat terpilih merupakan jenis Bal *Lactobacillus plantarum*, *Ligilactobacillus salivarius* dan *Pediococcus sp.*, yang mampu menghasilkan bakteriosin. *Crude* bakteriosin yang diperoleh memiliki spektrum penghambat luas bukan hanya pada bakteri patogen gram positif akan tetapi pada bakteri patogen gram negatif juga, dengan Isolat potensial dari 5 isolat terpilih ialah isolat NF 8 dengan rata-rata aktivitas penghambatnya 1881,82 AU/mL pada *L.monocytogenes*, 2077,43 AU/mL pada *B.cereus*, 2115,38 AU/mL pada *S.aureus* dan 1223,72 AU/mL pada *E.coli*. *Crude* Bakteriosin dari 5 isolat memiliki karakter termostabil sampai pada suhu 121°C dan tetap stabil setelah dua bulan penyimpanan. *Crude* bakteriosin yang diperoleh hanya stabil pada pH asam pH 2-5 dan sensitif terhadap enzim pepsin, tripsin dan proteinase-K. Berat molekul crude yang diuji berkisar 16,7 kDa.

Kata Kunci : Bakteriosin, Bakteri Asam Laktat, Naniura, Karakterisasi, *Screening*, Berat Molekul, AU/mL

Screening and Characterization of Lactic Acid Bacteria Producing Bacteriocins from Naniura Fermentation

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ABSTRACT

Naniura is a traditional fermented product with fish as its main ingredient, which has the potential to be a source of lactic acid bacteria that produce bacteriocins, which are peptides with broad potential. This study aims to screen and characterize bacteriocins produced by lactic acid bacteria from naniura fermentation and test their antimicrobial activity on four pathogenic bacteria. LAB isolates were obtained through isolation and purification processes, which were then cultured to produce crude bacteriocins and screened. Selected crude bacteriocin-producing isolates were characterized by treatment with temperature, pH, storage duration and temperature, proteolytic enzyme sensitivity, and SDS-PAGE. Selected isolates were identified molecularly. Antimicrobial activity was tested using the Well Diffusion method on 4 pathogenic bacteria: *Listeria monocytogenes* FNCC 0156, *Bacillus Cereus* FNCC 0057, *Staphylococcus aureus* FNCC 0047, and *Eschericia coli* FNCC 0091. Crude Bacteriocin activity was expressed in Arbitrary Units per milliliter (AU/mL). The data were statistically analyzed using ANOVA. The results of the study showed that the selected lactic acid bacteria were *Lactobacillus plantarum*, *Ligilactobacillus salivarius*, and *Pediococcus sp.*, which were capable of producing bacteriocins. The crude bacteriocins obtained had a broad inhibitory spectrum, not only against gram-positive pathogenic bacteria but also against gram-negative pathogenic bacteria. The most potent isolate among the five selected isolates was isolate NF 8, with an average inhibitory activity of 1881.82 AU/mL against *L. monocytogenes*, 2077.43 AU/mL against *B. cereus*, 2115.38 AU/mL against *S. aureus*, and 1223.72 AU/mL against *E. coli*. Crude bacteriocins from the five isolates were thermostable up to 121°C and remained stable after two months of storage. The crude bacteriocins obtained were only stable at acidic pH 2-5 and were sensitive to pepsin, trypsin, and proteinase-K enzymes. The molecular weight of the crude bacteriocins tested ranged from 16.7 kDa.

Keywords : Bacteriocin, Lactic Acid Bacteria, Naniura, Characterization, Screening, Molecular Weight, AU/mL