

ABSTRAK

Putu Medista Lisa Watumbara (01113180030)

ISOLASI DAN KARAKTERISASI *Lactobacillus* spp. DARI SUSU KAMBING

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(xv + 42 halaman; 6 gambar; 6 tabel; 4 lampiran)

Lactobacillus spp. adalah salah satu jenis bakteri asam laktat (BAL) dengan sifat probiotik yang biasanya terdapat dalam produk fermentasi. Susu kambing mengandung BAL yang dapat digunakan sebagai sumber *strain* probiotik. Tujuan dari penelitian ini adalah untuk mengisolasi dan mengkarakterisasi bakteri *Lactobacillus* spp., terutama *Lactobacillus delbrueckii* dari susu kambing. Isolasi dan karakterisasi dilakukan dengan beberapa tahap yaitu: isolasi dan pemurnian isolat, karakterisasi morfologi koloni dan sel (pewarnaan Gram, pewarnaan endospora, dan pewarnaan tahan asam), karakterisasi aktivitas biokimia isolat, dan uji ketahanan isolat terhadap NaCl, pH rendah, dan suhu. Isolasi bakteri dilakukan dengan inokulasi sampel susu kambing yang sudah didilusi pada MRS agar dengan metode *spread plate*. Kemudian koloni dimurnikan dengan metode *streaking*. Isolat yang sudah murni dikarakterisasi dengan pengamatan morfologi koloni dan sel. Karakterisasi aktivitas biokimia dilakukan dengan uji aktivitas katalase, fermentasi 9 jenis gula (glukosa, laktosa, fruktosa, sorbitol, mannitol, sukrosa, maltosa, manosa, galaktosa), dan hemolitik. Kemudian, uji ketahanan isolat terhadap NaCl (2%, 4%, dan 6%), pH (2,3,4,5,6, dan 7) dan suhu (7°C, 37°C, dan 45°C). Dari hasil isolasi, diperoleh 10 koloni yang memiliki ciri-ciri morfologi koloni bakteri *L. delbrueckii*. Berdasarkan pengamatan morfologi koloni, hanya 6 isolat bakteri yang memenuhi kriteria koloni *L. delbrueckii*, yaitu yaitu bakteri Gram positif yang berbentuk batang, tidak membentuk spora, dan tidak tahan asam. Hasil uji biokimia menunjukkan hanya 1 isolat yang sesuai dengan karakterisasi bakteri *Lactobacillus delbrueckii subsp. bulgaricus* yang dapat memfermentasi gula dan bersifat gamma hemolitik. Uji ketahanan NaCl, pH, dan suhu menunjukkan isolat merupakan bakteri tahan asam karena mampu bertahan hidup pada pH rendah, bersifat toleran terhadap NaCl 2-4%, dapat tumbuh dengan baik pada suhu 37°C dan 45°C, dan tidak pada suhu 7°C.

Kata Kunci : Bakteri Asam Laktat, Isolasi, Karakterisasi, *Lactobacillus*

Referensi : 48 (1960-2022)

ABSTRACT

Putu Medista Lisa Watumbara (01113180030)

ISOLATION AND CHARACTERIZATION OF *Lactobacillus* spp. FROM GOAT'S MILK

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(xv + 42 pages; 6 picture; 6 table; 4 appendices)

Lactobacillus spp. is one of lactic acid bacteria (LAB) with probiotic properties which are usually found in fermented products. Goat's milk contains LAB that can be used as a source of probiotic strains. The purpose of this study was to isolate and characterize the bacteria *Lactobacillus* spp., especially *Lactobacillus delbrueckii* from goat's milk. Isolation and characterization were carried out in several stages, which is: isolation and purification of isolates, characterization of colony and cell morphology (Gram staining, endospore staining, and acid-fast staining), characterization of the biochemical activity, and tolerance test (NaCl, low pH, and temperature). Bacterial isolation was carried out by inoculation of diluted goat milk samples on MRS agar using the spread plate method. Then the colonies were purified by streaking methods. The pure isolates were characterized by observing colony and cell morphology. Characterization of biochemical activity was carried out by testing for catalase activity, fermentation of 9 types of sugar (glucose, lactose, fructose, sorbitol, mannitol, sucrose, maltose, mannose, galactose), and hemolytic. The isolates are also tested for tolerance towards NaCl (2%, 4%, and 6%), pH (2,3,4,5,6, and 7) and temperature (7°C, 37°C, and 45°C). 10 colonies were obtained based on the colony morphology of *L. delbrueckii*. Based on the observation of colony morphology, only 6 bacterial isolates met the criteria for *L. delbrueckii* that Gram positive bacteria that were rod-shaped, did not form spores, and were not acid-fast. The results of the biochemical test showed that only 1 isolate matched the characterization of *Lactobacillus delbrueckii subsp. bulgaricus* which has sugar fermentation capability and displayed gamma hemolytic capabilities. NaCl tolerance test, pH, and temperature showed that the isolate is an acid-fast bacterium because it can survive at low pH, is tolerant to NaCl (2-4%), can grow well at 37°C and 45°C, and not at 7°C.

Keywords : Lactic Acid Bacteria, Isolation, Characterization, *Lactobacillus*

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