ISOLAT BAKTERI ASAM LAKTAT (BAL) DARI SUSU KAMBING KACANG YANG BERPOTENSI SEBAGAI ANTIBAKTERI, KEMAMPUAN PROTEOLITIK DAN KETAHANAN ANTIBIOTIK

ABSTRAK

Aditya Prasetya (212410012). Isolat Bakteri Asam Laktat (BAL) Dari Susu Kambing Kacang Yang Berpotensi Sebagai Antibakteri, Kemampuan Proteolitik Dan Ketahanan Antibiotik. Skripsi. Program Studi Peternakan Fakultas Pertanian Muhammadiyah Purworejo. 2025. Pembimbing: Dr. Roisu Eny Mudawaroch, S.Pt, M.P. dan Faruq Iskandar, S.Pt, M.Si.

Kambing kacang merupakan kambing asli Indonesia yang tersebar luas di seluruh Indonesia. Penelitian ini bertujuan untuk mengisolasi dan mengidentifikasi bakteri asam laktat (BAL) dari susu kambing kacang. Proses isolasi dilakukan menggunakan media Man Rogosa (MRS) agar serta metode identifikasi fenotip dan biokimia. Selain itu, penelitian ini juga meliputi uji antibakteri menggunakan bakteri patogen seperti *Escherichia coli* dan *Staphylococcus aureus*, serta pengujian terhadap kemampuan proteolitik menggunakan susu skim tinggi protein dan ketahanan terhadap antibiotik menggunakan seperti *Amoxicilin*, *Clindamycin*, *Azithromycin*, *Levofloxacin*. Data dikumpulkan dengan mengukur zona hambat yang dihasilkan oleh isolat terhadap kemampuan antibakteri, proteolitik dan ketahanan antibiotik. Data disajikan secara deskriptif.

Hasil penelitian ini, berhasil diisolasi 12 bakteri asam laktat (BAL), yang terdiri dari sebelas isolat jenis *coccus* dan satu isolat jenis *bacillus*. Dari total isolat, 10 di antaranya menunjukkan sifat motil, sedangkan 2 lainnya non-motil. Semua isolat teridentifikasi sebagai katalase negatif dan bersifat heterofermentatif tanpa kemampuan homofermentatif. Semua isolat dapat tumbuh pada suhu 10°C dan 37°C, tetapi tidak dapat tumbuh pada suhu 45°C. Selain itu, semua isolat tumbuh pada konsentrasi 6,5% NaCl, tetapi tidak tumbuh pada konsentrasi 18%. Isolat juga dapat tumbuh pada pH 4,4, tetapi tidak tumbuh pada pH 9,6.

Kemampuan antibakteri yang ditunjukkan oleh isolat bervariasi. Isolat AB1 menunjukkan zona hambat tertinggi terhadap *E. coli* dan *S. aureus*, masing-masing mencapai 29,9 mm dan 23,9 mm, sedangkan isolat AB4 menunjukkan zona hambat terendah terhadap *E. coli* dan *S. aureus*, masing-masing 13,5 mm dan 11,2 mm. Dalam hal kemampuan proteolitik, zona hambat tertinggi mencapai 18 mm, sedangkan zona hambat terendah pada isolat AB12 mencapai 2 mm. Untuk ketahanan terhadap antibiotik, semua isolat menunjukkan daya tahan yang lemah terhadap empat jenis antibiotik, dengan zona hambat tertinggi terhadap Amoxicillin, Clindamycin, Azithromycin, dan Levofloxacin masing-masing mencapai 4,18 mm, 3,81 mm, 3,90 mm, dan 2,55 mm. Secara keseluruhan, isolat BAL dari susu kambing kacang menunjukkan potensi yang menjanjikan sebagai agen antibakteri dan memiliki kemampuan proteolitik, meskipun ketahanan terhadap antibiotik tergolong lemah. Isolat tersebut dapat dimanfaatkan dalam produksi susu fermentasi sebagai agen antibakteri dan proteolitik.

Kata Kunci: Kambing Kacang, Bakteri Asam Laktat, Antibakteri, Proteolitik, Ketahanan Antibiotik.

ISOLATED LACTIC ACID BACTERIA (LAB) FROM GOAT MILK OF KACANG GOATS WITH POTENTIAL AS ANTIBACTERIAL AGENTS, PROTEOLYTIC CAPABILITY, AND ANTIBIOTIC RESISTANCE

ABSTRACT

Aditya Prasetya (212410012). Isolated Lactic Acid Bacteria (LAB) from Goat Milk of Kacang Goats with Potential as Antibacterial Agents, Proteolytic Capability, and Antibiotic Resistance. Thesis. Animal Husbandry Study Program, Faculty of Agriculture, Muhammadiyah Purworejo. 2025. Supervisors: Dr. Roisu Eny Mudawaroch, S.Pt, M.P., and Faruq Iskandar, S.Pt, M.Si.

Kacang goats are a native breed of Indonesia that is widely distributed across the country. This research aimed to isolate and identify lactic acid bacteria (LAB) from kacang goat milk. The isolation process was conducted using Man Rogosa (MRS) agar medium along with phenotypic and biochemical identification methods. Additionally, this study included antibacterial testing against pathogenic bacteria such as *Escherichia coli* and *Staphylococcus aureus*, as well as evaluating proteolytic capability using high-protein skim milk and antibiotic resistance testing with agents such as *Amoxicillin, Clindamycin, Azithromycin,* and *Levofloxacin*. Data were collected by measuring the inhibition zones produced by the isolates concerning antibacterial activity, proteolytic capability, and antibiotic resistance, and were presented descriptively.

The results revealed that 12 LAB isolates were successfully obtained, consisting of eleven coccus isolates and one bacillus isolate. Among these, 10 isolates were motile, while 2 isolates were non-motile. All isolates were characterized as catalase negative and heterofermentative without homofermentative capabilities. They were able to grow at both 10°C and 37°C but could not grow at 45°C. Additionally, all isolates thrived at a 6.5% NaCl concentration but failed to grow at an 18% concentration. The isolates also demonstrated growth at pH 4.4, whereas growth was inhibited at pH 9.6.

The antibacterial capabilities exhibited by the isolates varied significantly. Isolate AB1 showed the highest inhibition zones against E. coli and S. aureus, measuring 29.9 mm and 23.9 mm, respectively, while isolate AB4 demonstrated the lowest inhibition zones against *E. coli* and *S. aureus*, measuring 13.5 mm and 11.2 mm, respectively. In terms of proteolytic capability, the highest inhibition zone reached 18 mm, while the lowest for isolate AB12 was 2 mm. In terms of antibiotic resistance, all isolates exhibited weak resistance against four types of antibiotics, with the highest inhibition zones against *Amoxicillin, Clindamycin, Azithromycin,* and *Levofloxacin* measuring 4.18 mm, 3.81 mm, 3.90 mm, and 2.55 mm, respectively. Overall, LAB isolates from kacang goat milk demonstrated promising potential as antibacterial agents and possess proteolytic capabilities, although their antibiotic resistance was relatively weak. These isolates could be utilized in fermented milk production as antibacterial and proteolytic agents.

Keywords: Kacang Goats, Lactic Acid Bacteria, Antibacterial, Proteolytic, Antibiotic Resistance.