Potensi Aktivitas Antibakteri Isolat Bakteri Asam Laktat dari Makanan Fermentasi Tradisional "Tempoyak" = The Potential Antibacterial Activity of Lactic Acid Bacteria Isolates from Traditional Fermented Food âTempoyakâ

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Abstrak

Tempoyak merupakan makanan fermentasi tradisional yang difermentasi oleh Bakteri Asam Laktat (BAL). Sebagai makanan fungsional, tempoyak diketahui memiliki efek mendukung fungsi fisiologis tubuh. Penelitian ini bertujuan untuk mengisolasi BAL dari tempoyak yang memiliki aktivitas antibakteri dan memiliki karakteristik seperti probiotik. Isolasi BAL menggunakan metode quadrant streak pada medium de Man Rogosa Sharpe Agar (MRSA) dengan penambahan kalsium karbonat (CaCO3) 0,3%. Karakterisasi dilakukan untuk mengetahui karakteristik morfologi (pengecatan Gram), fisiologi (uji pertumbuhan pada variasi konsentrasi bile, pH, NaCl, dan suhu), dan biokimia (uji O-F, katalase, oksidase, aerob, anaerob, dan koagulasi susu). Uji aktivitas antibakteri dilakukan dengan teknik difusi, yaitu uji antagonis dengan metode agar plug dan antibiosis dengan silinder terhadap delapan bakteri uji (Staphylococcus aureus NBRC 100910, Kocuria rhizophila NBRC 12078, Escherichia coli CP, Bacillus cereus G18, Klebsiella oxytoca G7, Proteus mirabilis, Pseudomonas aeruginosa WDCM 00114, dan Salmonella typhi). Hasil isolasi diperoleh 15 isolat yang menghasilkan zona bening pada MRSA dengan penambahan CaCO3. Sembilan di antara 15 isolat mampu menghasilkan zona bening secara terpisah setelah dilakukan konfirmasi ulang. Seluruh isolat tersebut digunakan untuk uji antagonis dan tiga isolat dengan indeks aktivitas tertinggi (T2.3, T3.1, dan T3.2) dipilih untuk karakterisasi dan uji antibiosis. Hasil karakterisasi menunjukkan ketiga isolat berbentuk batang dan memiliki beberapa karakteristik probiotik. Ketiga isolat juga menunjukkan aktivitas antibakteri terhadap delapan bakteri uji.

..... Tempoyak is a traditional fermented food fermented by Lactic Acid Bacteria (LAB). As a functional food, tempoyak is known to have beneficial effects that support physiological functions. This research aims to isolate LAB from tempoyak that have antibacterial activity and probiotic-like characteristics. Isolation of LAB was carried out using the quadrant streak method on de Man Rogosa Sharpe Agar (MRSA) supplemented with 0,3% Calcium Carbonate (CaCO3). Characterization was conducted to determine morphological (Gram-stain), physiological (growth test on various concentrations of bile, pH, NaCl, and temperatures) and biochemical characteristics (O-F, catalase, oxidase, aerobic and anaerobic tests, and milk-coagulating activity). Antibacterial activity tests were conducted using diffusion methods, namely the antagonistic test using the agar-plug method and antibiosis using cylinders against eight bacterial species (Staphylococcus aureus NBRC 100910, Kocuria rhizophila NBRC 12078, Escherichia coli CP, Bacillus cereus G18, Klebsiella oxytoca G7, Proteus mirabilis, Pseudomonas aeruginosa WDCM 00114, and Salmonella typhi). The isolation results yielded 15 clear-zone producing isolates on CaCO3-supplemented MRSA. Nine out of 15 isolates were found to have the ability to produce clear zones consistently after reconfirmation. All isolates were used for the antagonistic test, and the three isolates with the highest activity index (T2.3, T3.1, and T3.2) were chosen for further characterization and antibiosis tests. Characterization results showed that these three isolates were rod-shaped and had some probiotic

characteristics. The three isolates also exhibited antibacterial activity against the eight tested bacteria.