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Karakteristik Fermentasi dan Aktivitas Antibakteri Water Kefir dengan Penambahan Bunga Telang (Clitoria ternatea L.)
Luthfia Kumala Dewi, Sari Darmasiwi, S.Si., M.Biotech., Ph.D.
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KARAKTERISTIK FERMENTASI DAN AKTIVITAS ANTIBAKTERI *WATER KEFIR* DENGAN PENAMBAHAN BUNGA TELANG (*Clitoria ternatea* L.)

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INTISARI

Water kefir merupakan minuman probiotik hasil fermentasi *water kefir grains* yang berpotensi mendukung kesehatan saluran pencernaan. Penambahan bunga telang (*Clitoria ternatea* L.) yang kaya senyawa fenolik dan memiliki aktivitas antioksidan tinggi diharapkan mampu meningkatkan karakteristik fermentasi, bioaktivitas, dan kualitas sensori produk. Penelitian ini bertujuan menganalisis karakteristik fermentasi, aktivitas antibakteri, dan kualitas sensori minuman fermentasi *water kefir* bunga telang. Preparasi fermentasi dilakukan dengan menyeduh bunga telang kering, madu dalam air panas bersuhu ±80°C selama 10 menit. Filtrat didinginkan hingga suhu ruang (±25°C), kemudian diinokulasikan *water kefir grains* sebanyak 15% (b/v) dan difermentasi dalam kondisi tertutup pada suhu ruang (±25°C) selama 48 jam. Sampel kontrol dibuat dengan prosedur yang sama tanpa penambahan bunga telang. Parameter yang diamati meliputi kualitas mikrobiologis, pH, total keasaman, total fenolik, aktivitas antibakteri, dan kualitas sensori. Aktivitas antibakteri diuji menggunakan metode difusi cakram Kirby–Bauer terhadap bakteri *Staphylococcus aureus, Salmonella typhi,* dan *Escherichia coli.* Data dianalisis menggunakan uji nonparametrik *Mann–Whitney* pada taraf signifikansi $p<0,05$, sedangkan data sensori dianalisis menggunakan *Wilcoxon Signed Rank Test.* Hasil penelitian menunjukkan penambahan bunga telang mampu meningkatkan jumlah Bakteri Asam Laktat, Bakteri Asam Asetat, dan *yeast* tertinggi masing-masing sebesar 218.000×10^5; 24.800×10^5; dan 63.000×10^5 CFU/mL pada fermentasi 0 jam. Jumlah Enterobacteriaceae pada fermentasi 48 jam berada di bawah batas kuantifikasi (<25 koloni) sehingga memenuhi standar keamanan pangan. Karakteristik fermentasi terbaik diperoleh pada fermentasi 48 jam dengan nilai pH 2,93±0,04, *titratable acidity* 1,197±0,025%, dan total fenolik 0,9795±0,0018 mgGAE/mL. Aktivitas antibakteri hanya teramati pada *Salmonella typhi* dengan zona hambat 11,35±2,30 mm. Berdasarkan analisis sensori, perbedaan signifikan hanya ditemukan pada atribut warna. Kesimpulan penelitian menunjukkan bahwa penambahan bunga telang mampu meningkatkan kualitas mikrobiologi dan karakteristik fermentasi *water kefir,* namun belum optimal dalam meningkatkan aktivitas antibakteri dan kualitas sensori secara keseluruhan.

KATA KUNCI: antibakteri, bunga telang, kefir air, TPC, uji sensori.

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FERMENTATION CHARACTERISTICS AND ANTIBACTERIAL ACTIVITY OF WATER KEFIR WITH BUTTERFLY PEA FLOWER (*Clitoria ternatea* L.)

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ABSTRACT

Water kefir is a probiotic beverage produced through the fermentation of water kefir grains and has potential benefits for digestive health. The addition of butterfly pea flower (*Clitoria ternatea* L.), which is rich in phenolic compounds and possesses high antioxidant activity, is expected to improve the fermentation characteristics, bioactivity, and sensory quality of the product. This study aimed to analyze the fermentation characteristics, antibacterial activity, and sensory quality of butterfly pea flower water kefir. Fermentation preparation was carried out by steeping dried butterfly pea flowers and honey in hot water at approximately 80°C for 10 minutes. The filtrate was cooled to room temperature (±25°C), inoculated with 15% (b/v) water kefir grains, and fermented under closed conditions at room temperature for 36 hours. The control sample was prepared using the same procedure without the addition of butterfly pea flowers. The observed parameters included microbiological quality, pH, titratable acidity, total phenolic content, antibacterial activity, and sensory quality. Antibacterial activity was evaluated using the Kirby–Bauer disk diffusion method against *Staphylococcus aureus, Salmonella typhi*, and *Escherichia coli.* Data were analyzed using the nonparametric Mann–Whitney test at a significance level of $p<0.05$, while sensory data were analyzed using the Wilcoxon Signed Rank Test. The results showed that the addition of butterfly pea flower increased the populations of Lactic Acid Bacteria, Acetic Acid Bacteria, and yeast, with the highest counts reaching$218.000x10^5$; $24.800x10^5$; dan $63.000x10^5$ CFU/mL, respectively, at 0 hours of fermentation. The Enterobacteriaceae count after 48 hours of fermentation was below the quantification limit (<25 colonies), indicating compliance with food safety standards. The best fermentation characteristics were obtained after 48 hours, with a pH value of 2.93±0.04, titratable acidity of 1,197±0,025%, and total phenolic content of 0.9795±0.0018 mg GAE/mL. Antibacterial activity was only observed against *Salmonella typhi,* with an inhibition zone of 11.35±2.30 mm. Sensory analysis revealed that a significant difference was found only in the color attribute. In conclusion, the addition of butterfly pea flower improved the microbiological quality and fermentation characteristics of water kefir; however, it was not optimal in enhancing antibacterial activity and overall sensory quality.

KEYWORDS: antibacterial, butterfly pea flower, TPC, sensory test, water kefir