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**Fermentasi Skala Mikro Biji Kakao (Theobroma cacao L.) Menggunakan Inokulan Saccharomyces cerevisiae
PA5 dan BB3 serta Acetobacter pasteurianus NBRC106471T**
Intan Naura Nur Aini, Nur Akbar Arofatullah, S.P., M.Biotech., Ph.D.; Dr. Ir. Ngadiman, M.Si.
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Intisari

Kualitas biji kakao hasil fermentasi dipengaruhi oleh aktivitas mikroorganisme di dalamnya. Penelitian ini bertujuan untuk mengetahui kemampuan inokulasi *Saccharomyces cerevisiae* galur PA5 dan BB3 serta *Acetobacter pasteurianus* dalam meningkatkan biji kakao yang terfermentasi. *S. cerevisiae* ditumbuhkan pada medium YEPD (*Yeast Extract Peptone Dextrose*) cair, sedangkan *A. pasteurianus* ditumbuhkan pada medium GYPM (*Glucose Yeast Extract Peptone Magnesium Sulfate*). Inokulum khamir dan bakteri masing-masing ditambahkan dengan kerapatan akhir 10^6 sel/g biji kakao ke dalam 10 biji kakao dalam kantong plastik berukuran 4x6x1 cm^3, kemudian difermentasi di dalam inkubator pada suhu 28-45°C selama 144 jam. Tingkat fermentasi dievaluasi melalui uji belah dan pengukuran indeks fermentasi. Biji kakao dikategorikan terfermentasi baik (*well-fermented*) minimal 75%, sedangkan nilai indeks fermentasi sebesar ≥1,0. Hasil penelitian menunjukkan bahwa penambahan inokulan *Saccharomyces cerevisiae* galur PA5 dan BB3 serta *Acetobacter pasteurianus* menghasilkan hasil biji kakao yang terfermentasi antara 80-93,3% dibandingkan dengan tanpa inokulan (kontrol) sebesar 74,17%. Perlakuan BB3 menunjukkan hasil fermentasi paling baik, yakni biji terfermentasi sebesar 93,33% dan indeks fermentasi sebesar 1,24. Penambahan inokulan khamir dan bakteri asam asetat dapat meningkatkan persentase biji kakao yang terfermentasi.

Kata kunci: fermentasi kakao, skala mikro, *Saccharomyces cerevisiae*, *Acetobacter pasteurianus*

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Abstract

The quality of fermented cocoa beans is influenced by the activity of microorganisms involved in the fermentation process. This study aimed to determine the efficacy of inoculating *Saccharomyces cerevisiae* strain PA5 and BB3 and *Acetobacter pasteurianus* in improving the fermentation of cocoa beans. *S. cerevisiae* was cultured in liquid YEPD (Yeast Extract Peptone Dextrose) medium, while *A. pasteurianus* was cultured in GYPM (Glucose Yeast Extract Peptone Magnesium Sulfate) medium. The yeast and bacterial inocula were added to 10 cocoa beans placed in 4x6x1 cm^3 plastic bags to achieve a final density of 10^6 cells per gram of cocoa beans. These were then fermented in an incubator at temperatures of 28-45°C for 144 hours. The degree of fermentation was evaluated through a cut test and the calculation of a fermentation index. Cocoa beans were classified as "well-fermented" if at least 75% were properly fermented, with a corresponding fermentation index value of ≥1.0. The results showed that the addition of *S. cerevisiae* strains PA5 and BB3 and *A. pasteurianus* yielded a fermentation rate of 80-93.3%, compared to 74.17% for the non-inoculated control. The BB3 treatment yielded the best fermentation results with 93.33% of the beans being well-fermented and a fermentation index of 1.24. In conclusion, the addition of yeast and acetic acid bacteria inocula can enhance the percentage of well-fermented cocoa beans.

Keywords: cocoa fermentation, micro-scale, *Saccharomyces cerevisiae*, *Acetobacter pasteurianus*