

ABSTRAK

Kebutuhan bahan bakar fosil di Indonesia semakin tinggi, seiring meningkatnya kebutuhan energi akibat pertumbuhan penduduk yang semakin pesat dan peningkatan aktivitas bidang Industri dan transportasi. Kondisi ini juga berpengaruh pada faktor lingkungan terkait bahan dasar dari bahan bakar yang tidak ramah lingkungan, khususnya emisi karbon dioksida yang berkontribusi pada percepatan pemanasan global. Salah satu alternatif yang berpotensi dikembangkan adalah energi terbarukan berbasis biomassa, seperti bioetanol. Penelitian ini bertujuan menganalisis pengaruh penambahan ragi tape dan ragi Fermipan terhadap produksi bioetanol dari limbah kulit durian yang kaya lignoselulosa. Proses produksi meliputi pretreatment kulit durian, hidrolisis dengan HCl, netralisasi menggunakan NaOH, fermentasi selama lima hari pada suhu ruang ($\pm 30^{\circ}\text{C}$), dan destilasi. Variasi massa ragi tape adalah 10, 20, dan 30 gram, sedangkan ragi Fermipan adalah 5, 10, dan 15 gram. Hasil penelitian menunjukkan bahwa perlakuan dengan ragi Fermipan 10 gram menghasilkan kadar etanol tertinggi sebesar 60% dengan volume destilat 128 ml. Perlakuan terbaik ragi tape diperoleh pada massa 20 gram dengan kadar etanol 56%. Temuan ini membuktikan bahwa ragi Fermipan lebih efektif dibandingkan ragi tape dalam fermentasi bioetanol dari limbah kulit durian. Penelitian ini berkontribusi pada pengembangan energi alternatif sekaligus mendukung pengelolaan limbah organik secara berkelanjutan.

Kata kunci: Bioetanol, Kulit Durian, Ragi Fermipan, Ragi Tape

ABSTRACT

The demand for fossil fuels in Indonesia continues to increase in line with the growing energy needs driven by rapid population growth as well as the expansion of industrial and transportation activities. This condition also affects environmental factors, particularly due to the non-renewable and environmentally unfriendly nature of fossil fuels, with carbon dioxide emissions contributing significantly to the acceleration of global warming. One promising alternative to address this issue is renewable energy derived from biomass, such as bioethanol. This study aims to analyze the effect of adding tape yeast and Fermipan yeast on bioethanol production from durian peel waste, which is rich in lignocellulose. The production process includes durian peel pretreatment, hydrolysis using HCl, neutralization with NaOH, fermentation for five days at room temperature ($\pm 30^{\circ}\text{C}$), and distillation. The variations of tape yeast used were 10, 20, and 30 grams, while Fermipan yeast was applied at 5, 10, and 15 grams. The results showed that the treatment with 10 grams of Fermipan yeast produced the highest ethanol concentration of 60% with a distillate volume of 128 ml. The best result for tape yeast was obtained at 20 grams, producing an ethanol concentration of 56%. These findings demonstrate that Fermipan yeast is more effective than tape yeast in the fermentation of bioethanol from durian peel waste. This research contributes to the development of alternative energy while supporting sustainable organic waste management.

Keywords: Bioethanol, Durian Peel, Fermipan Yeast, Tape Yeast