

***Potential Utilization of Expired Cassava Tape Waste in the
Bioethanol Production Process***

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ABSTRACT

*Indonesia's increasing dependence on fossil fuels, combined with their declining availability, has intensified the need for the development of sustainable renewable energy sources. One promising alternative is biomass-based bioethanol. This study aims to analyze the potential utilization of expired cassava tape waste from Bondowoso as a raw material for bioethanol production, including the production process, ethanol content, and bioethanol yield. The research employed an experimental method using two approaches: utilization of cassava tape extract and cassava tape residue. The residue was subjected to particle size reduction, hydrolysis using an H₂SO₄ solution, pH adjustment, fermentation for 96 hours with varying concentrations of *Saccharomyces cerevisiae* (0%, 1%, 2%, and 3%), followed by purification through simple distillation. The observed parameters included changes in Brix value, pH, ethanol content, and bioethanol yield. The results indicate that the fermentation process proceeded effectively, as evidenced by decreasing Brix and pH values during fermentation. The highest ethanol content was obtained in treatment R0 at 87.44%, while the highest bioethanol yield was achieved in treatment R3 at 2.74 %. These findings demonstrate that cassava tape waste has significant potential as a bioethanol feedstock and can serve as an alternative solution for organic waste management and renewable energy development.*

Keywords: *cassava tape waste, bioethanol, *Saccharomyces cerevisiae*, tape yeast, ethanol content, yield.*