

**YIELD AND QUALITY ANALYSIS OF BIOETHANOL PRODUCED  
FROM WASTE COCONUT WATER (*Cocos nucifera L.*) AND  
SUGARCANE MOLASSES UNDER DIFFERENT  
FERMENTATION CONDITIONS**

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## ABSTRACT

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Bioethanol production involves materials containing sugar to be converted into alcohol. It is a process that requires fermentation, where active organisms are utilized to break down sugar and turns them into alcohol. The purpose of this study was to determine the ideal conditions in the fermentation of waste coconut water and sugarcane molasses with initial pH level between 4.0 – 5.0 for six days in order to produce good quality of bioethanol. The experimental samples were laid in complete randomized design (CRD) with three treatments, namely; T1 (Aerobic), T2 (Anaerobic) and T3 (Aerobic-anaerobic) and each was replicated four times. The parameters assessed were pH level after fermentation, alcohol content (%), ethanol content (%) and yield (%) of the bioethanol. The gathered

data was analyzed using One-way ANOVA and LSD at 5% level of significance.

Based on the results, T3 obtained the highest mean pH level of 3.15 after fermentation and alcohol content of 1.6%, followed by T2 with a mean pH level of 3.0 and an alcohol content of 1.1%. T1 obtained the lowest mean pH level of 2.92 after fermentation and an alcohol content of 0.4%. The results revealed further that T3 produced highest percentage of ethanol content of 24.4% and yielding 2.8% bioethanol, followed by T2 obtaining 16.4% ethanol content and yielding 1.8% bioethanol. Lastly, T1 got the lowest ethanol content of 3.01% and yielding 1% bioethanol among the three treatments. The ANOVA results revealed that there's a high significant difference in terms on the pH level after fermentation and alcohol content (%) among the means of the three treatments.

Generally, based on the results, the researcher concludes that, T3 (Aerobic-anaerobic) is the most effective condition in the fermentation process of waste coconut water (*Cocos nucifera* L.) and sugarcane molasses utilizing *Saccharomyces cerevisiae* for bioethanol production.

**Keywords:** Waste coconut water, Sugarcane molasses, Fermentation, Bioethanol