

**PENGARUH PERLAKUAN PANAS DAN LAMA FERMENTASI  
TERHADAP HASIL BIOETANOL DARI LIMBAH PEPAYA  
(*Carica papaya L*)**

**INTISARI**

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Limbah pepaya dapat digunakan sebagai bahan baku pembuatan bioetanol melalui proses fermentasi dan destilasi. Lama fermentasi dan perlakuan panas merupakan faktor penting yang mempengaruhi kualitas hasil bioetanol karena mempengaruhi kinerja ragi dalam proses fermentasi. Penelitian ini mengkaji potensi limbah pepaya (*Carica papaya L*) dari pepaya busuk atau lewat matang sebagai bahan baku pembuatan bioethanol. Proses fermentasi dilakukan menggunakan ragi tape dengan mikrobial spesifik *Saccharomyces cereviceae* serta jamur *Aspergillus*. Lama fermentasi divariasikan dari 3, 6, 9, 12, dan 15 hari. Perlakuan panas divariasikan dengan perlakuan tanpa pemanasan dan dengan pemanasan. Penyulingan hasil fermentasi dilakukan dengan menggunakan destilator bertingkat.

Berdasarkan penelitian, diperoleh hasil bahwa lama fermentasi dan perlakuan panas berpengaruh terhadap kadar dan volume bioetanol hasil, waktu optimum destilasi, serta nilai kalor bioetanol yang dihasilkan. Nilai rata-rata kadar bioetanol tertinggi yaitu sebesar 63% diperoleh dari perlakuan 15 hari fermentasi dengan perlakuan panas. Perlakuan terbaik dipilih berdasarkan metode *scoring* dan diperoleh hasil perlakuan terbaik yaitu lama fermentasi 15 hari dengan pemanasan.

**Kata kunci:** bioetanol, limbah pepaya, destilator bertingkat, lama fermentasi, perlakuan panas.

## **EFFECT OF HEATING TREATMENT AND FERMENTATION TIME OF BIOETHANOL FROM PAPAYA (*Carica papaya L*) WASTE**

### **ABSTRACT**

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Papaya waste can be used as raw material for bioethanol production through fermentation and distillation process. Fermentation time and heating treatment were important factors that affect the quality of bioethanol product. Those factors affected the performance of yeast in fermentation process. This study examined the potential of papaya waste (*Carica papaya L*) of rotten or over ripe papaya fruit as raw material for bioethanol production. The fermentation process was performed using yeast from the making of 'tape' with specific microbe *Saccharomyces cereviceae* and fungus *Aspergillus*. Fermentation time was varied from 3, 6, 9, 12, and 15 days. Heating treatment varied with their treatment without heating and with heating. Fermentation product was distilled by staged distillator.

Based on the results, fermentation time and heating treatment affected the concentration and volume of bioethanol product, the optimum time of distillation, as well as the calorific value of bioethanol produced. The average value of the highest ethanol content of 63% was obtained from the treatment 15 days of fermentation by heat treatment. The best treatment is selected based on the method of scoring and the best treatment results are obtained fermentation time of 15 days with heating.

**Keyword:** bioethanol, papaya waste, staged distillator, fermentation time, heating treatment.