

ABSTRAK

PENGARUH KONSENTRASI H₂SO₄, LAMA WAKTU HIDROLISIS DAN FERMENTASI TERHADAP KADAR BIOETANOL YANG DIHASILKAN RUMPUT LAUT *Eucheuma cottonii*

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2014

Indonesia memiliki beragam sumber daya laut yang dapat dijadikan sebagai sumber energi alternatif. Produksi rumput laut di Indonesia selalu mengalami peningkatan tiap tahun. Rumput laut jenis *Eucheuma cottonii* mengandung karbohidrat 58% sehingga mampu dijadikan bioetanol melalui proses fermentasi. Tujuan penelitian ini adalah untuk mengetahui pengaruh konsentrasi H₂SO₄, lama waktu hidrolisis dan fermentasi terhadap kadar bioetanol yang dihasilkan rumput laut *Eucheuma cottonii*.

Jenis penelitian ini adalah eksperimental laboratoris. Hidrolisis asam dilakukan dengan H₂SO₄ konsentrasi 0,2M, 0,3M, 0,4M, 0,5M dan variasi waktu 30 menit, 60 menit, 120 menit. Pengujian kadar glukosa dalam rumput laut dilakukan dengan menggunakan metode DNS. Fermentasi dilakukan dengan khamir *Saccharomyces cerevisiae* dengan waktu inkubasi 1 hari, 3 hari, 6 hari, dan 8 hari. Pengukuran kadar etanol dilakukan menggunakan titrasi iodometri. Analisis data menggunakan metode statistik regresi linier.

Hasil penelitian menunjukkan kondisi terbaik hidrolisis dikonsentrasi H₂SO₄ 0,4M dan waktu 120 menit (7 ppm). Selama proses fermentasi, kadar bioetanol maksimum dicapai pada waktu inkubasi 6 hari yaitu 5,56%. Kesimpulan dari penelitian ini adalah konsentrasi H₂SO₄, lama waktu hidrolisis dan fermentasi mempengaruhi kadar bioetanol yang dihasilkan rumput laut *Eucheuma cottonii*.

Kata Kunci: *Eucheuma cottonii*, Bioetanol, Fermentasi.

ABSTRACT

**EFFECT OF H₂SO₄ CONCENTRATION, DURATION TIME OF
HYDROLYSIS AND FERMENTATION TO THE LEVEL OF BIOETHANOL
PRODUCED BY *Eucheuma cottonii* SEAWEED**

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Indonesia has various kind of marine resources that can be used as an alternative energy source. Seaweed production in Indonesia always increases each year. *Eucheuma cottonii* seaweed contains 58% carbohydrates so that they can be used as bioethanol through fermentation process. The purpose of this study was to determine the effect of H₂SO₄ concentration, duration of hydrolysis and fermentation to bioethanol levels produced by *Eucheuma cottonii* seaweed.

This research is an experimental laboratory. Acid hydrolysis was conducted with H₂SO₄ concentration of 0.2 M, 0.3 M, 0,4M, 0.5M and it took 30 minutes, 60 minutes, 120 minutes. The testing of glucose levels in seaweed was done by using the DNS method. Fermentation was carried out with the yeast *Saccharomyces cerevisiae* with incubation time of 1 day, 3 days, 6 days, and 8 days. The measurement of ethanol level was done by using iodometric titration. Analysis of the data use the linear regression statistical.

The result of the research showed the best conditions 0,4M hydrolysis of concentrated H₂SO₄ and time of 120 minutes (7 ppm). During the fermentation process, the maximum of ethanol level was achieved at an incubation time of 6 days, it was 5.56%. The conclusion of this study is the concentration of H₂SO₄, duration time of hydrolysis and fermentation affect the levels of bioethanol produced by *Eucheuma cottonii* seaweed.

Keywords: *Eucheuma cottonii*, Bioetanol, Fermentation.