

ABSTRAK

PENGARUH JENIS *PRETREATMENT* BERBASIS NATRIUM DAN VARIASI KONSENTRASI HCL TERHADAP KADAR GLUKOSA HASIL HIDROLISIS KULIT SINGKONG

Alya Anggraini, 2026, 43 Halaman, 53 Gambar, 37 Tabel, 4 Lampiran

Kulit singkong merupakan limbah pertanian yang mengandung lignoselulosa dan berpotensi dimanfaatkan sebagai bahan baku produksi glukosa. Penelitian ini bertujuan untuk menganalisis pengaruh *pretreatment* Na_2SO_3 dan NaOH terhadap kadar lignoselulosa kulit singkong serta menentukan kondisi optimum hidrolisis menggunakan variasi konsentrasi HCl untuk menghasilkan glukosa tertinggi. *Pretreatment* dilakukan menggunakan Na_2SO_3 1% dan NaOH 1%, kemudian dilanjutkan dengan hidrolisis menggunakan HCl pada konsentrasi 0,25; 0,50; 0,75; 1,00; dan 1,25 N. Analisis lignoselulosa dilakukan dengan metode Chesson-Datta, kadar glukosa menggunakan refraktometer Brix, serta identifikasi glukosa melalui uji Benedict dan FTIR. Hasil penelitian menunjukkan bahwa *pretreatment* Na_2SO_3 1% lebih efektif dibandingkan NaOH 1%, ditandai dengan kadar lignin terendah sebesar 9,4% dan kadar selulosa tertinggi sebesar 46,6%. Hasil ANOVA menunjukkan bahwa *pretreatment* berpengaruh nyata terhadap kadar hemiselulosa dan selulosa, tetapi tidak berpengaruh nyata terhadap kadar lignin. Kondisi optimum hidrolisis diperoleh pada *pretreatment* Na_2SO_3 1% dengan konsentrasi HCl 1,00 N yang menghasilkan kadar glukosa 14,2% dan yield glukosa 39,4445%. Hasil uji Benedict menunjukkan terbentuknya gula pereduksi, dan analisis FTIR mengonfirmasi keberadaan gugus fungsi khas glukosa berupa gugus O–H dan C–O. Namun kadar glukosa yang diperoleh masih belum mencapai persyaratan SNI 01-3544-1994, yaitu minimum 65%.

Kata kunci: kulit singkong, *Pretreatment*, Natrium, Na_2SO_3 , NaOH, hidrolisis, glukosa.

ABSTRACT

THE EFFECT OF SODIUM-BASED PRETREATMENT METHODS AND HCL CONCENTRATION VARIATIONS ON GLUCOSE YIELD FROM CASSAVA PEEL HYDROLYSIS

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Cassava peel is an agricultural waste rich in lignocellulosic components and has the potential to be utilized as a raw material for glucose production. This study aimed to analyze the effect of Na₂SO₃ and NaOH pretreatments on the lignocellulosic composition of cassava peel and to determine the optimum hydrolysis conditions using various HCl concentrations to obtain the highest glucose content. Pretreatment was carried out using 1% Na₂SO₃ and 1% NaOH, followed by hydrolysis with HCl at concentrations of 0.25, 0.50, 0.75, 1.00, and 1.25 N. Lignocellulosic analysis was performed using the Chesson-Datta method, glucose content was measured using a Brix refractometer, and glucose identification was conducted through Benedict's test and FTIR analysis. The results showed that 1% Na₂SO₃ pretreatment was more effective than 1% NaOH pretreatment, as indicated by the lowest lignin content of 9.4% and the highest cellulose content of 46.6%. ANOVA results revealed that pretreatment had a significant effect on hemicellulose and cellulose contents but did not significantly affect lignin content. The optimum hydrolysis condition was achieved with 1% Na₂SO₃ pretreatment and 1.00 N HCl concentration, resulting in a glucose content of 14.2% and a glucose yield of 39.4445%. Benedict's test confirmed the presence of reducing sugars, while FTIR analysis verified the existence of glucose-characteristic functional groups, namely O–H and C–O groups. However, the glucose content obtained did not meet the requirement specified in SNI 01-3544-1994, which sets a minimum glucose content of 65%.

Keywords: *cassava peel, pretreatment, sodium, Na₂SO₃, NaOH, hydrolysis, glucose*