

Supplementary file

Title - Bioprocessing of coconut husk to produce second-generation bioethanol using *Zymomonas mobilis* ZM4

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Figure S1.

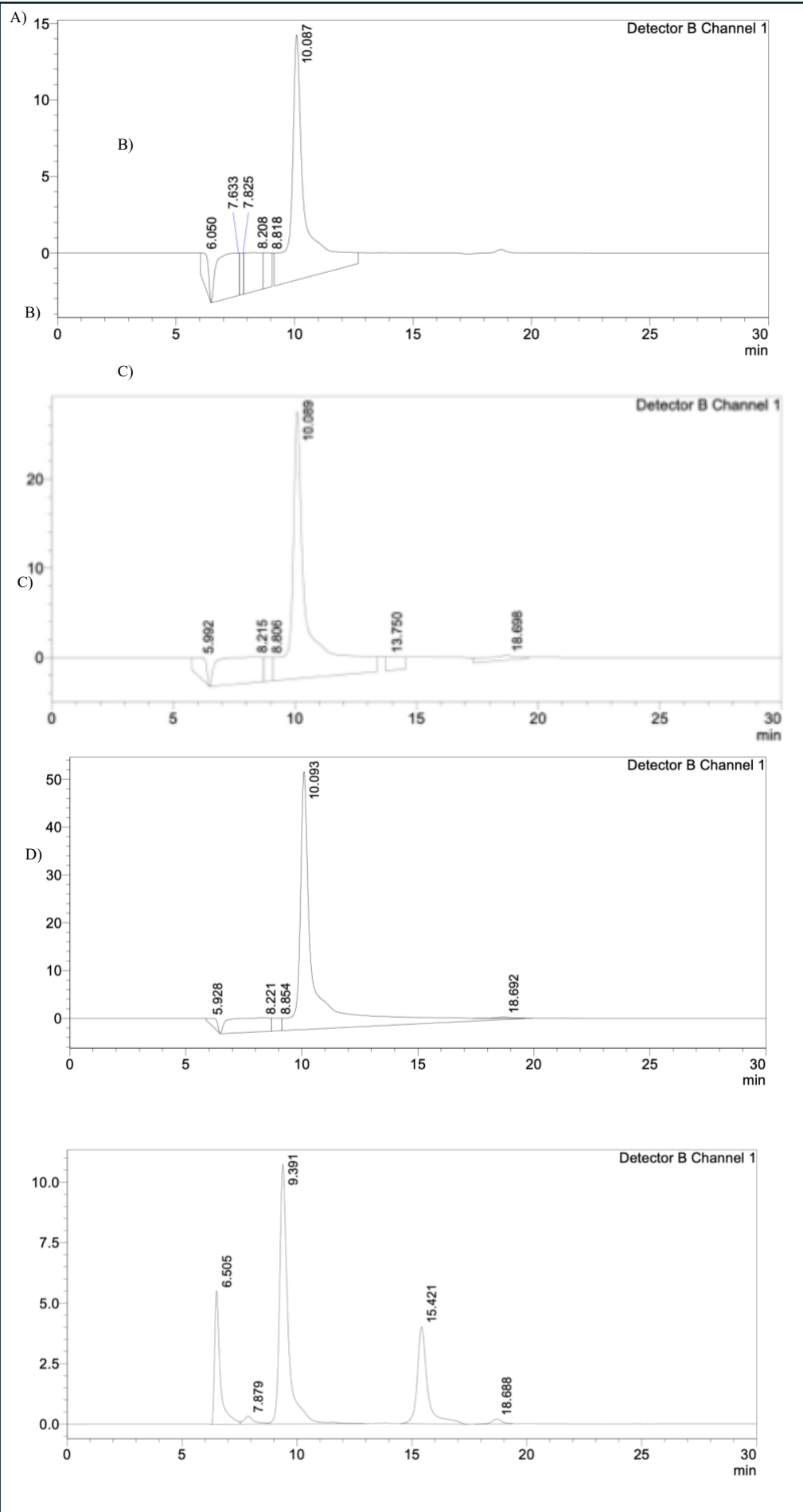


Figure S1. HPLC chromatograms of xylose standards and coconut husk hydrolysate analyzed using a RI detector. A) chromatogram of 10 μ L of 2.5 mg mL⁻¹ xylose standard; B) 5 mg mL⁻¹ xylose standard; C) 10 mg mL⁻¹ xylose standard; and D) Hydrolysate (10 μ L of a 5 $\times$ diluted sample). All chromatograms show a prominent peak corresponding to xylose with a retention time of approximately 10.087; 10.089; and 10.093 min. This retention time was subsequently used as a reference to identify and quantify xylose in the enzymatic hydrolysate samples.

Figure S2.

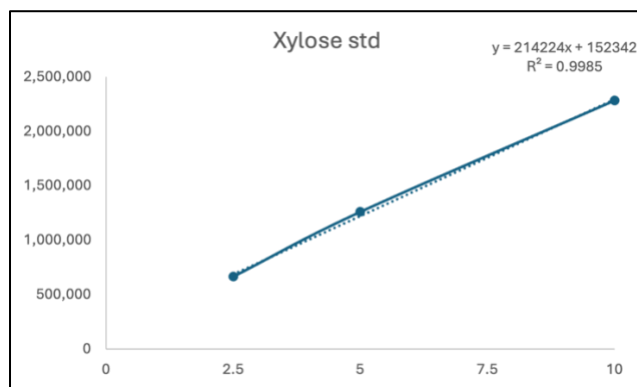


Figure S2. Calibration curve of xylose standards. generated by plotting HPLC peak area against xylose concentration (mg mL⁻¹) using the chromatographic data shown in Figure S1, Linear regression analysis using the 2.5 and 5 mg mL⁻¹ standards produced a slope of difference in peak area (2,282,631 – 664,000) divided by the difference in concentration (10 – 2.5) yielded a slope of 215,800 area units per mg mL⁻¹. The xylose concentration in the hydrolysate sample was determined using the equation Xylose (mg mL⁻¹) = Peak area/slope. Using a measured peak area of 271,654, the calculated concentration was 1.29 mg mL⁻¹. Since the hydrolysate samples were diluted five-fold prior to HPLC analysis, the corrected xylose concentration was 6.45 mg mL⁻¹, corresponding to 161.25 mg xylose per gram of raw coconut husk.

Figure S3.

Fig S3.a

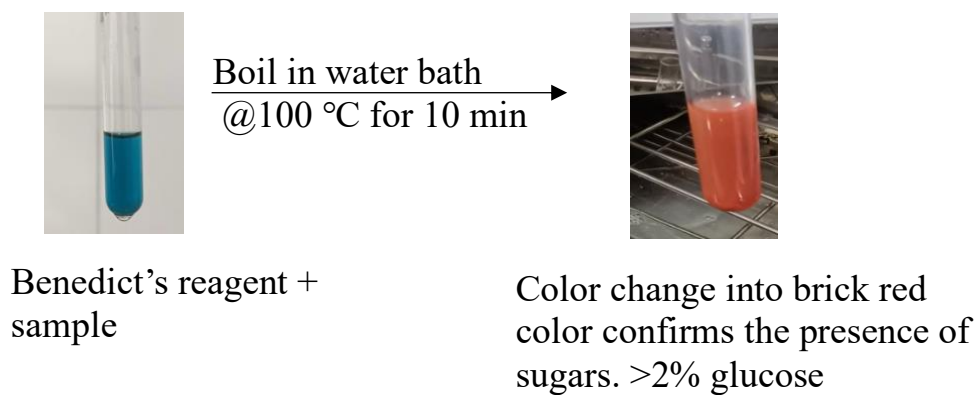
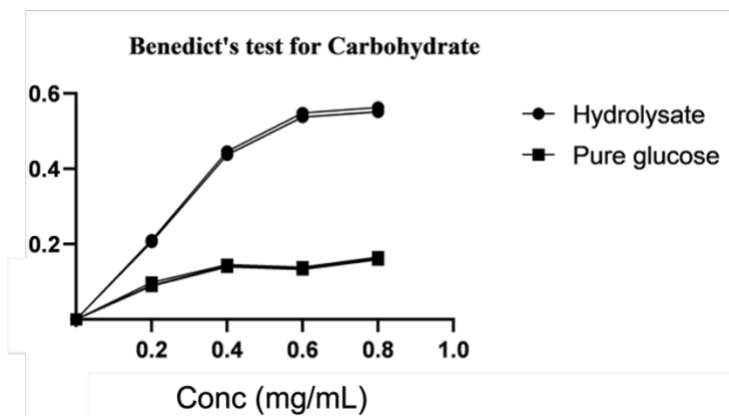


Fig S3.b



Supplementary Figure S3. Benedict's test for reducing sugars in coconut husk hydrolysate. The coconut husk hydrolysate was reacted with Benedict's reagent and heated in a boiling water bath at 100°C for 10 min. Development of a brick-red color indicated the presence of reducing sugars. The response of the hydrolysate was compared with that of pure glucose at different concentrations, and the absorbance showed a concentration-dependent response ($R^2 = 0.90$).

Based on comparison with the glucose standard, the hydrolysate showed a reducing sugar response corresponding to glucose equivalent.