

Review of: "Recycling of Waste Bamboo (*Bambusa vulgaris*) into Value-Added Platform Chemicals: Bioethanol and Bioethylene"

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Potential competing interests: No potential competing interests to declare.

Extraction and Processing Efficiency:

Given that the yield of bio-ethanol from bamboo biomass was 65%, and the yield of bio-ethylene gas from bio-ethanol was 53%, what specific steps and optimizations could be recommended to improve the efficiency of each stage (pulverization, pretreatment, enzymatic hydrolysis, fermentation, and dehydration) to potentially increase these yields?

Pretreatment Methodology:

The pretreatment process involved the use of sodium hydroxide and hydrogen peroxide. Could you elaborate on the selection criteria for these chemicals and their concentrations? What alternative pretreatment methods or chemicals could be explored to enhance cellulose accessibility and reduce potential environmental impacts?

Enzymatic Hydrolysis Optimization:

The enzymatic hydrolysis used cellulase at 9 FPU/g. What are the specific factors that influenced the choice of this enzyme concentration, and how could varying enzyme loadings or the addition of supplementary enzymes (like hemicellulases or ligninases) impact the overall hydrolysis efficiency and glucose yield?

Fermentation Process and Yeast Selection:

The study utilized *Saccharomyces cerevisiae* for fermentation. What are the potential advantages and limitations of using this yeast strain compared to other industrial strains or genetically modified organisms (GMOs) that might offer higher ethanol yields or greater tolerance to fermentation inhibitors? How would these alternatives affect the overall process?

Economic and Environmental Impact:

The paper mentions the potential economic viability and low carbon footprint of bio-ethanol and bio-ethylene production from bamboo. Can you provide a more detailed comparative analysis of the economic costs, energy requirements, and environmental impacts (e.g., GHG emissions, water use) between this bamboo-based biorefinery process and conventional fossil fuel-based production methods? What key metrics would be essential to evaluate for a comprehensive sustainability assessment?

