



OPTIMIZING THE GROWTH MEDIA OF *Saccharomyces cerevisiae* BY INCORPORATING COCONUT WATER WASTE FOR FOOD YEAST PRODUCTION

BY

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ABSTRACT

Coconut water waste is a valuable resource since it can be used sustainably in several sectors, such as agriculture, the manufacturing of biofuel, and as a nutrient-rich substrate for microbial development. The objective of this study was to compare the growth and survival of *Saccharomyces cerevisiae* in coconut water waste incorporated medium and conventional potato dextrose broth (PDB) medium. To conduct the study, growth media were prepared using a series of coconut water waste, and sterilized. Then, medias were inoculated with yeast cultures and subsequently incubated under controlled conditions. Numerous parameters were assessed, such as temperature, pH, optical density, transmittance, and cell viability. An analysis of the nutritional composition of the coconut water revealed considerable quantities of minerals and carbohydrates that are favorable to yeast development. One-way ANOVA and Tukey tests showed a significant difference between the treatments. The treatment (T5: Coconut wastewater 100%), with the greatest quantity of coconut water waste, demonstrated the highest growth metrics and cell survival across all the other treatments that were studied. In particular, the T5 exhibited significantly higher optical density and cell viability compared to other treatments, indicating optimal growth conditions for *Saccharomyces cerevisiae*. While PDB was associated with high pH levels, T5 outperformed in terms of cell viability and count, suggesting that coconut water waste can be an effective and sustainable alternative to conventional growth media for yeast cultivation, aligning well with the observed trends in this study. To maximize growth rates and investigate the long-term stability of yeast cultures in media based on coconut water, more investigation is advised. This study contributes to the field of sustainable biotechnology by proposing the efficient utilization of agro-industrial waste for microbial cultivation, potentially reducing both production costs and environmental impact.

Keywords: Agro-industrial waste, coconut water waste, *Saccharomyces cerevisiae*, sustainable biotechnology

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