The Influence of pH Variation and H_2O_2 Catalyst Concentration on O_2 Content in Biohydrogen Production from Raja Banana Peel.
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ABSTRACT

The increase in fossil fuel consumption in Indonesia rises every year. This has become the main factor in the depletion of oil reserves. Therefore, it is necessary to create a new breakthrough in renewable energy aimed at substituting the dependence on fossil fuels. In addition, the combustion process from the use of fossil fuels produces gas emissions that have fatal consequences for global climate change. Biohydrogen is one of the alternative energies with potential for development because it has a relatively high calorific value and is free of carbon emissions. Biohydrogen is the result of fermenting materials that have a high carbohydrate content. One of the wastes that can be utilized as a raw material for biohydrogen is the peels of the raja banana (*Musa Paradisiaca L*). This is because banana peels contain a relatively high amount of carbohydrates compared to other types of banana peels. Therefore, banana peels can be utilized as a substrate in the fermentation process for biohydrogen production. This research aims to determine the concentration of H_2O_2 as a catalyst and to identify the optimal pH conditions of the fermentation medium for producing biohydrogen gas. The variables for H_2O_2 concentration used include 0.4 mM, 0.6 mM, and 0.8 mM, while the variables for the pH conditions of the medium used include pH 5, 6, and 7. The parameter used in this study is the yield volume of biohydrogen. The data processing method used in this research is the Response Surface Method. The optimum result obtained was with the use of H_2O_2 catalyst at a concentration of 0.8 mM and at a pH condition of 5, which produced a biohydrogen gas volume yield of 103±3.5 mL.

Keywords: Biohydrogen, Energy, Fermentation, H2O2, Raja banana peels, *Musa Paradisiaca L*