

**BIOELECTRIC PRODUCTION BASED ON TOFU WASTEWATER AND
PALM OIL MILL EFFLUENT AS INOCULUM USING SINGLE CHAMBER
MICROBIAL FUEL CELL**

UNDERGRADUATE THESIS

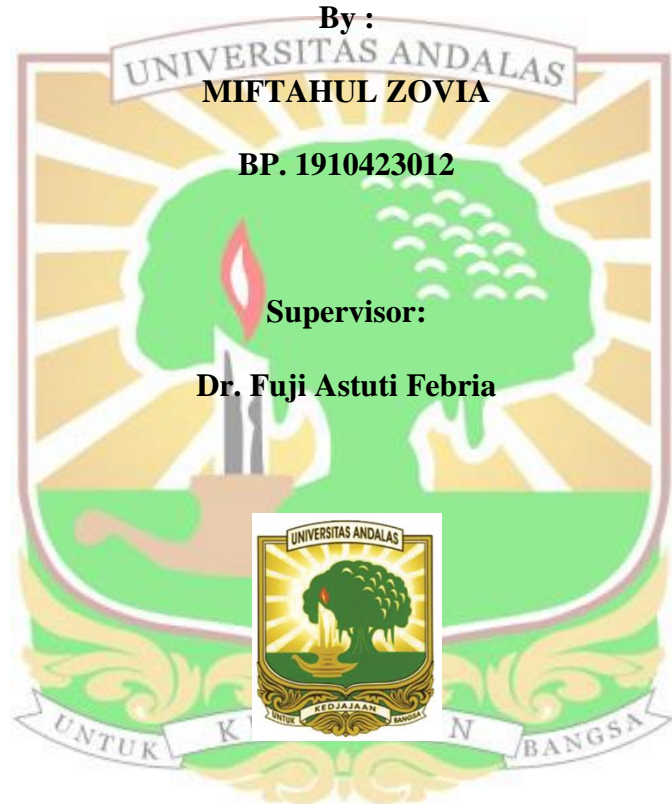
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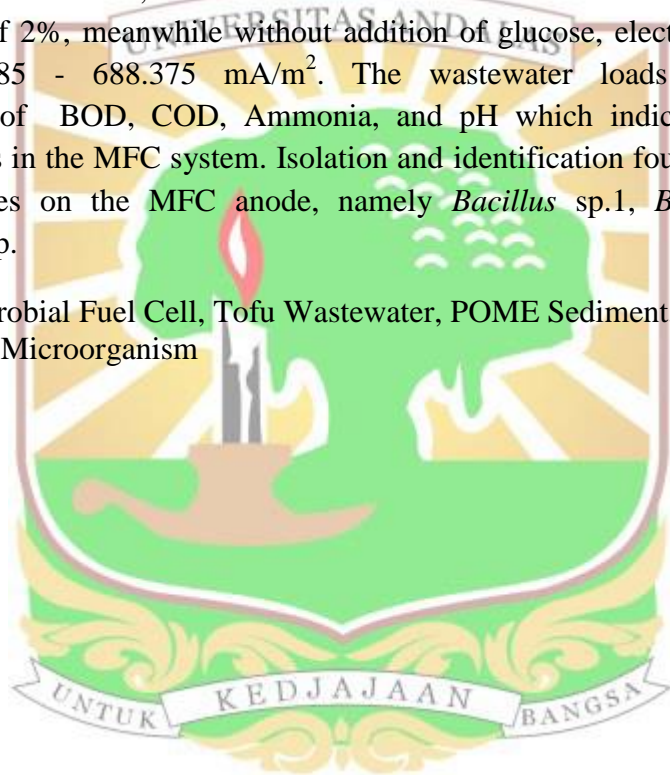


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PADANG
2023**

ABSTRACT

The Research "Bioelectric Production Based on Tofu Wastewater and Palm Oil Mill Effluent as Inoculum Using Single Chamber Microbial Fuel Cell" takes place from February to April 2023 at the Microbiology Laboratory and Baso Veterinary Hall. This research aims to determine the production of electrical energy that can produced from the MFC (Microbial Fuel Cell) system, utilizing the metabolic activity of microbes in degrading substrates such as tofu wastewater and POME sediment. The research treatment involved the addition of glucose at 2%, 2.5%, and 3% concentrations. The results showed that electricity energy production reached up to 807.99 - 1007.48 mA/m², which was obtained with the addition of glucose at a concentration of 2%, meanwhile without addition of glucose, electricity production reached 518.285 - 688.375 mA/m². The wastewater loads have decrease concentrations of BOD, COD, Ammonia, and pH which indicated the role of microorganisms in the MFC system. Isolation and identification found three types of bacterial isolates on the MFC anode, namely *Bacillus* sp.1, *Bacillus* sp.2 and *Enterobacter* sp.

Keywords: Microbial Fuel Cell, Tofu Wastewater, POME Sediment, Renewable Energy, Microorganism



ABSTRAK

Penelitian tentang “Bioelectric Production Based On Tofu Wastewater and Palm Oil Mill Effluent As Inoculum Using Single Chamber Microbial Fuel Cell” telah dilaksanakan pada bulan Februari hingga April 2023 di Laboratorium Mikrobiologi dan Balai Veteriner Baso. Tujuan penelitian adalah untuk mengetahui produksi energi listrik yang dihasilkan dari sistem MFC (Microbial Fuel Cell) dengan memanfaatkan aktivitas metabolisme mikroba dalam mendegradasi substrat berupa limbah tahu dan sedimen POME. Perlakuan penelitian adalah penambahan glukosa 2%, 2,5%, dan 3%. Hasil penelitian menunjukkan produksi energi listrik mencapai 807,99 - 1007,48 mA/m², yang diperoleh dengan penambahan glukosa sebesar 2%, sedangkan tanpa penambahan glukosa dapat dihasilkan energi listrik mencapai 518,285 - 688,375 mA/m². Pada penelitian ini juga terjadi penurunan beban limbah seperti BOD, COD, Ammonia, dan pH yang mengindikasikan peran mikroorganisme pada sistem MFC. Hasil isolasi dan identifikasi ditemukan tiga jenis isolat bakteri pada anoda MFC, yaitu *Bacillus* sp.1, *Bacillus* sp.2 dan *Enterobacter* sp.

Kata Kunci: Microbial Fuel Cell, Limbah Tahu, Sedimen POME, Energi Terbarukan, Mikroorganisme

