

Aim: To develop and automate a continuous harvesting system for microalgae photobioreactors.

INTRODUCTION

The main objectives of this project include:

- Developing a biomass production system that is continuous, automated, and versatile.
- Developing a system which effectively separates produced biomass and clarified water.
- Developing a sustainable system that minimizes space and resource consumption.



Fig 1-2. Photobioreactors at NPDEAS (UFPR), PR, Brazil.

DESIGN

Front View

Angled Front View

Back View

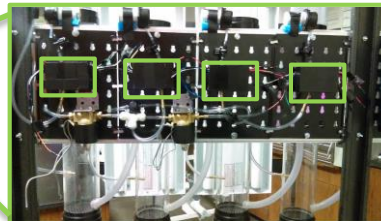
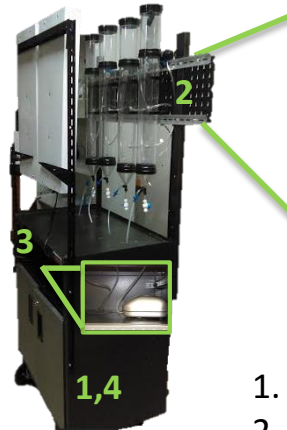
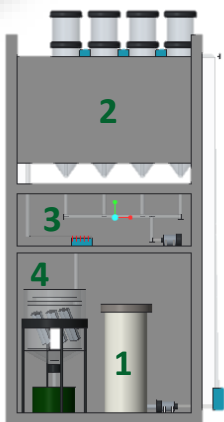


Fig 4. Set up of automated control for cultivation stage, sensor boxes are highlighted.

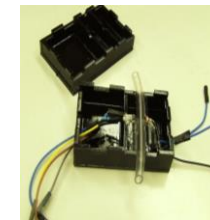


Fig 5. LED sensor built to relate light diffusivity to algae density.

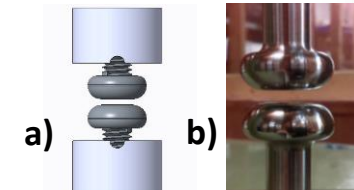


Fig 6. a) CAD electrodes, b) Bruce electrodes.

Fig 3. 1. Nutrient supply, 2. Cultivation, 3. PEF Treatment, 4. Separation

1. Developed a continuous harvesting system for airlift photobioreactors.
2. Invented a novel PEF lysis chamber, use of modified Bruce electrodes for lysis.
3. Created a mathematical model to predict lysing effectiveness.

FUTURE

Outstanding work for the automated microalgae photobioreactor project includes: refining the mathematical model, optimizing PEF lysis, and separating the oil from recyclable medium and biomass.



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