



# HUMI-VULGARIS

PORTABLE ECO-FRIENDLY HUMIDIFIER

## WHAT IS IT

A portable eco-friendly humidifier that uses a sustainable electrical energy supplied by algae and simultaneously cleanses wastewater.

## OPPORTUNITIES

- Due to the hot weather in Malaysia, humidifiers would be the perfect home device to add moisture in the air.
- Humidifiers may prevent dryness that would cause irritation in human body parts; skin, nose, throat, lips.
- Ease symptoms of dry throat, flu, and common cold.
- Avoiding electrical energy consumption in household by replacing it with electrical energy (electrons) produced by algae.



THE TEAM  
Humi-vulgaris.co

Say  
BYE-  
BYE  
To  
DRY,  
DRY  
Air

at RM199.90

Leader

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## DETAILS

### Purpose

- To provide eco-friendly humidifier that uses sustainable electrical energy and cleanses wastewater simultaneously.

### Type

- Console evaporators with tires for mobility.

### Size

- Able to be filled up to 4 liters.

## ADVANTAGES

### 1. Low Cost

- It uses solar energy instead of electricity.

### 2. Environmental Friendly

- Reduce greenhouse gases.

### 3. High Efficiency

- Algae has higher photosynthesis rate than most plants.

### 4. Resistance Towards Harmful Materials

- Able to treat wastewater

## DISADVANTAGES

### 1. Low Generation Per Cell

- It needs millions of cells to generate a generous amount of electricity.

### 2. Low Stability of System

- Algae stops generating as it enters death phase.

### 3. Uncertainty of Source and Intensity of Light

- Stop conducting photosynthesis during night time.

### 4. Uncertainty of Cell Growth Factors

- pH values, temperature, cell density, chlorophyll content, and dissolved oxygen content.

# Chlorella Vulgaris

Domain: Eukaryota

Kingdom: Protista

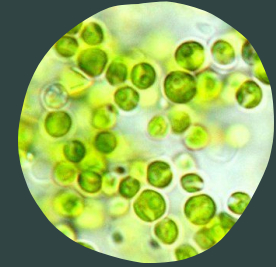
Division: Chlorophyta

Class: Trebouxiophyceae

Order: Chlorellales

Family: Chlorellaceae

Genus: Chlorella



- The microalgae that is chosen for this product- as a contributor to generate electrons for electrical energy supply and biological purification of wastewater.
- Converts carbon dioxide into oxygen as light stimulates the carbon fixation by Calvin cycle.

## The Idea

- Algal fuel cell (AFC): a device that is able to produce electricity through the photosynthesis reaction of microalgae.
- AFC have anode and cathode compartments enclosed with a photosynthetic microorganism.

Anolyte: Carbon sources; glucose formate.

Catholyte: Microalgae; *Chlorella vulgaris*.

Electrode: Graphite & carbon based.

Membranes: Sulfonated polyether ether ketone & salt bridges.

Solar panel: To run the humidifier during the night where algae no longer undergo photosynthesis (no sun)

