

ENVIRONMENTAL-FRIENDLY EXTRACTION OF CHLOROPHYLL FROM PINEAPPLE PLANTATION WASTE FOR DYE SENSITIZED SOLAR CELL (DSSC) FABRICATION



INVENTOR : NOOR FAIRUZ BINTI MD ROSKAN
FACULTY : COLLEGE OF ENGINEERING
UNIVERSITY : UNIVERSITI MALAYSIA PAHANG
EMAIL : noorfairuz99@gmail.com
TEAM : ASSOC. PROF. IR. DR NORAZWINA BINTI ZAINOL, DR AHMAD SYAHIMAN BIN MOHD SHAH, ALYAA AFIQAH BINTI ZI @ FAUZI



1 INTRODUCTION

Improper disposal of pineapple waste can cause negative impact to the environment. To reduce the waste, we decide to recycle it. Recently, we discover that the present of chlorophyll in the pineapple plantation waste in the leaves can be used to fabricate the **Dye Sensitized Solar Cell (DSSC)** which is can be categorised as a **renewable energy as well as environmental-friendly**. The experimental and analysis was done to obtain the best condition of chlorophyll yield from the waste. The best condition from the mechanical extraction can be achieved by uncut the processed leaves at **3 cycle for extraction cycle** by using the sugarcane machine. The highest value of **chlorophyll a is 52.57 mg/ml and chlorophyll b is 113.05 mg/ml**.

2 NOVELTY

The novelty of this research is application of extraction process for extract the chlorophyll from the pineapple plantation waste.

3 METHODOLOGY

The pineapple plantation waste was used to extract the chlorophyll by using the mechanical extraction. Figure 1 shows the process of extraction chlorophyll.

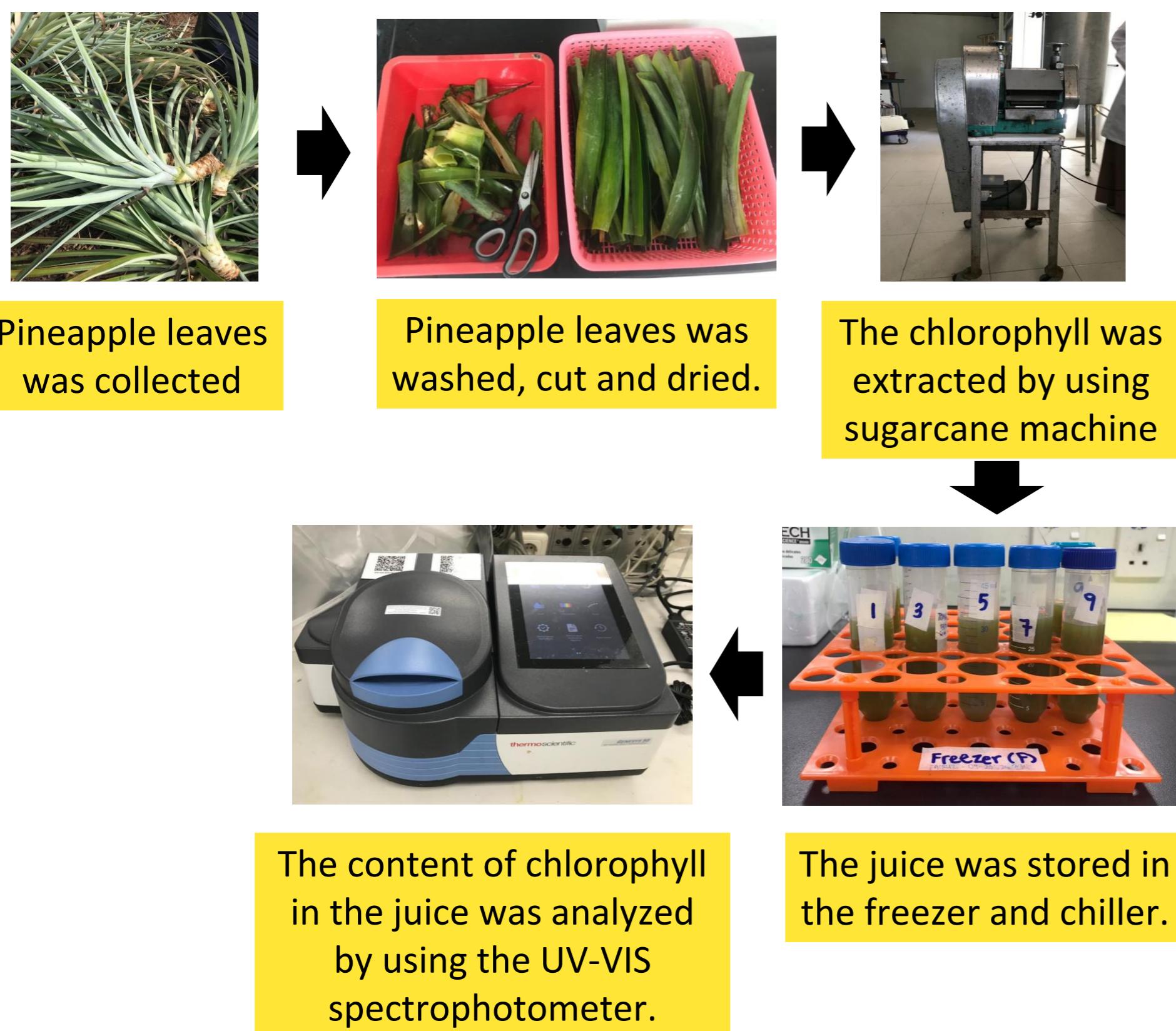


Figure 1: Process of extraction of chlorophyll by using mechanical extraction

4 RESULT

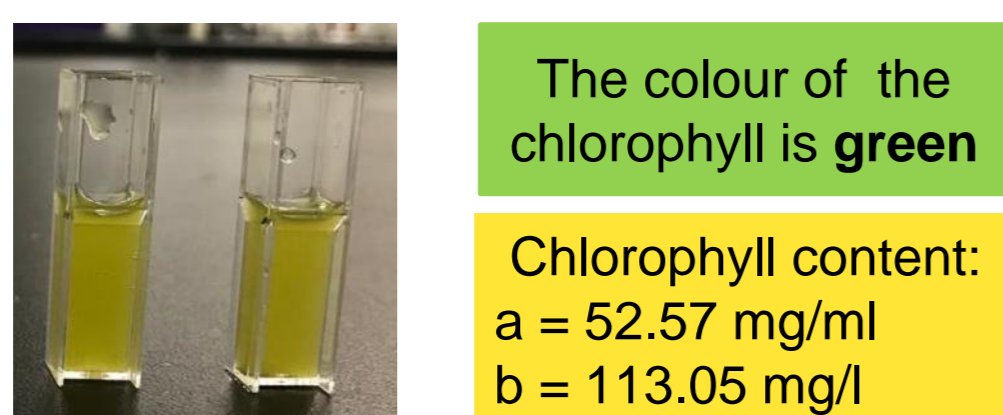


Figure 2: Result of chlorophyll content

5 MARKETABILITY OF EXTRACTION PROCESS

The table show the comparison between mechanical and chemical extraction for extract chlorophyll from pineapple plantation waste. (Kumara et al., 2006; Zainol et al., 2018)

Mechanical Extraction	Chemical Extraction
Used machine such as sugarcane machine	Involved chemical substance such as ethanol, methanol and acetone
Cheaper and easy to handle	Expensive and difficult to handle
Short time and produced high yield	Short time but produced low yield
100 g of pineapple leaves produced 50 mL of juice	100 g of pineapple leaves produces 20 ml of juice
MYR 283.00 for 10kg of sample	MYR 552.00 for 10kg of sample

***Mechanical extraction is preferable to extract the chlorophyll from the pineapple plantation waste.

6 BENEFITS OF USING MECHANICAL EXTRACTION

✓ The mechanical extraction by using sugar cane machine is easier than chemical extraction.

- 1 Non-corrosive
- 2 Ecologically friendly
- 3 Low energy manufacturing process
- 4 Low cost

7 USEFULLNESS OF DSSC

