

CONFERENCE PROCEEDING

Electricity Generation Using Photosynthetic Algae Plantation

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Abstract

Electricity can be generated from many ways such as from kinetic energy of flowing water. Energy also can be split into two categories such as renewable energy and non-renewable energy. Photosynthetic organism is the plant that can make own food by itself. Basically, the plant will absorb sunlight and convert it into food and also energy chemically. Thus, this research indicates that photosynthetic plants can produce electricity by itself. The aim of this research is to measure the portion of electricity that can be manufactured by photosynthetic algae plantation. First and foremost, the expected result of this research is the electricity that will be produced will be greater when it was measured at noon because there is ample source of light energy from sun for the plants to undergo photosynthesis. In addition, lower electricity will be recorded when it was measured at night because of the low rate of photosynthesis. From this project, we also can prove that the certain plant in this world can be used in electricity production. Furthermore, we want to develop the usage of photosynthesis of algae plantation in order to produce electrical energy in our country.

Keywords: *Photosynthetic algae plantation, electricity production, outdoor environment*

INTRODUCTION

Electricity is a necessity in our lives. Without it, mankind's life is not complete as we have reached a point of our civilization when electricity is used for all purposes. Electricity has improved our living standard and efficiency of work. Even though it is most often used in our daily routine, it is not the primary energy which present in nature. As we know, electricity is frequently produced by electrochemical generators at a power plant. It is primarily driven by heat engines that is fuelled by combustion or nuclear fission but also by other means such as the kinetic energy of flowing water and wind. In addition, there are various types of electricity source. For instance, electricity can be generated from photosynthetic of algae plantation.

Photosynthetic organisms have been considered as an autotroph, able to produce organic substances from inorganic nutrients based on energy harvested from light. Mixotrophy (i.e., the ability to combine autotrophy with the metabolization of organic/fixed carbon and nitrogen sources) was demonstrated on species from major photosynthetic organisms such as terrestrial plants, eukaryotic microalgae and cyanobacteria. In microalgae, heterotrophic cultivation was known as a feasible alternative to photoautotrophic cultivation on photo bioreactors for the production of value-added products, eventually coupled with product conversion or waste water treatment.

MATERIALS AND METHODS/ METHODOLOGY

The reading of the electrical current has been taken from the root of the water lettuce. This process requires the digital multimeter to get the reading of electric current from the process of the photosynthesis of water lettuce. The measurement of electric current reading was taken by using digital multimeter for each water lettuce in the plantation. Due the lack of space provided, we can only plant about 15 water lettuce in our plantation.

In our plantation, the species of water lettuce have been use the for the same species to control the fixed variable of this research experiment. In this case, the digital multimeter has been connected with copper plate as positive terminal and zinc plate as negative terminal with crocodile clip. The reading of the electricity produced were taken at 4.00 p.m. – 5.00 p.m. and 9.00 p.m. – 10.00 p.m. These different time were taken for the reading of the electric current as we are going to observe the difference amount of electric current based on rate of photosynthesis of the water lettuce at day and night time.

RESULTS AND DISCUSSION

During we were conducting this experiment, there were various types of challenge that we need to face. First and foremost, we had difficulties in getting the water lettuce itself. The pandemic Covid-19 is the main cause that all shops need to be closed. So, we need find another resort to buy the plants. Next, this kind of plant is really sensitive towards environment. For instance, water lettuce cannot be exposed directly to sunlight because the plant may be dead. Last but not least, the breeding of mosquito larvae. As we know that, mosquito used to breed in stagnant water.

Table 1. Reading of electricity produced

Day / Date		Reading (μ A)		Reading (V)	
		Day	Night	Day	Night
1	4/10/2020	0.7	0.4	0.883	0.778
2	5/10/2020	0.8	0.4	0.878	0.762
3	6/10/2020	0.9	0.5	0.874	0.782
4	7/10/2020	0.8	0.4	0.882	0.788
5	8/10/2020	0.7	0.3	0.872	0.758
6	9/10/2020	0.7	0.4	0.871	0.767
7	10/10/2020	0.9	0.5	0.888	0.765

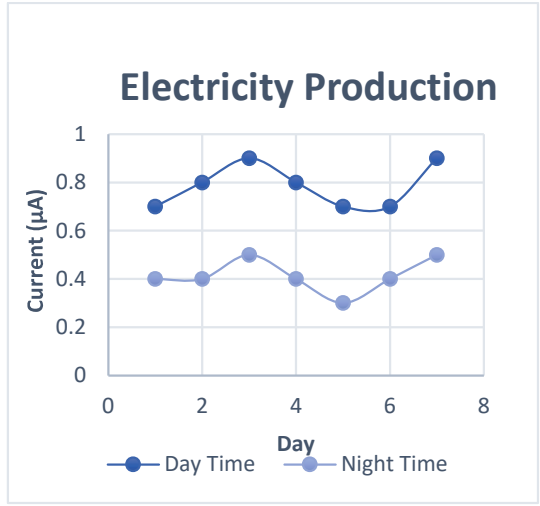


Figure 1. Reading taken in unit microampere (µA)

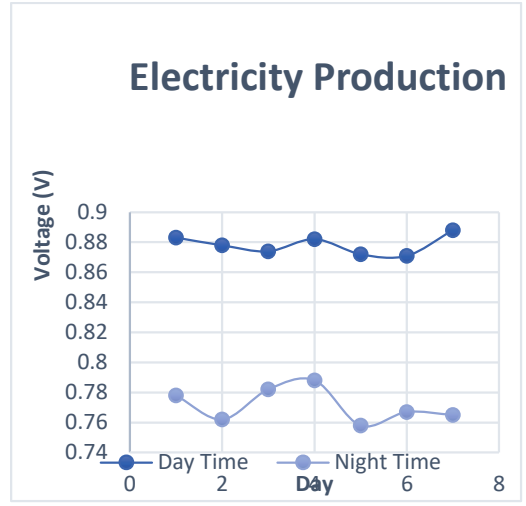


Figure 2. Reading taken in unit voltage (V)

CONCLUSION

After seeing all of this kind of challenges, this research project should be improved for better results as we are going to develop this to our country. Malaysia could be a success country in generating electricity in an efficient way. This research also could help another researcher to be one step ahead in inventing new revolution in electricity generation by photosynthetic of plants in future.

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