

JIGNASA - STUDENT STUDY PROJECT 2022 -23
COMMISSIONERATE OF COLLEGIATE EDUCATION
HYDERABAD, TELANGANA

GOVERNMENT DEGREE COLLEGE NARSAPUR
MEDAK DISTRICT

PHYSICS PROJECT
ON

ECO ELECTRICITY WITH ALOE VERA PLANT



Project Done by

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SYNOPSIS OF JIGNASA STUDENT STUDY PROJECT

Name of the College: GDC Narsapur, Medak District, Telangana.

Subject: Physics

Title: Eco electricity with Aloe vera plant

Abstract: Electrical energy can be harvested from the living plants as a new potential renewable energy source. Characterization of the electrical signal is needed to enable an optimum energy harvesting set up condition. In the present paper, an investigation is conducted to analyze the characteristics of Aloe barbadensis Miller / Aloe vera leaves in terms of electrical energy generation under specific experimental setups. The experimental results shows that 870.55uW electrical power can be harvested from the Aloe vera with 15 pairs of electrodes and this energy is capable to be stored in a capacitor. This energy has a high potential to be used to power up a low power consumption device.

Introduction: Advancement of technology in the 21st century has created a series of low power consumption and smaller size consumer electronics. This phenomenon has opened up the opportunity for the development of energy harvesting technique from low power energy sources. This research would like to introduce the usage of living plants as another new renewable energy source to harvest micro-energy. Photosynthesis is a process used by plants to synthesize carbohydrate molecules from carbon dioxide and water via the usage of light energy, normally from the sun. This process will cause the transport of electrons inside the plants, which creates a potential difference between the leaves and roots under exposure of light.

Objectives: The objective of the present project is to investigate the characteristics of the Aloe vera plant as a potential energy source and to determine its optimum set up to harvest a higher amount of energy from the plant.

Apparatus: Aloe vera plant, Copper plates, Zinc plates, Multimeter, Connecting wires, Timer, Graph sheets, Patch cords

Conclusion: It is concluded that the Aloe vera plant can generate electrical energy, which can be potentially useful to power up ultra-low power consumption devices. As compared to other living plants used in other researches to harvest energy, Aloe vera has been observed to generate the highest magnitude of voltage and current. This energy can be stored in a capacitor. From the results of the experiments, it is observed that copper as the cathode electrode and zinc as the anode electrode is the best combination to generate maximum voltage and current

Future scope: Hence, from this research, it is proven that electrical energy can be tapped from Aloe vera leaves and it can be optimized to meet the desired voltage and current value via various experimental setups. This green energy, which can be stored in a capacitor, can be potentially used to power up ultra-low power devices such as remote sensors where energy is scarce in remote areas in future works.