Natural Electricity (Electro-Botany)

Lozada, Biancamar (School: Adela Rolon Fuentes)

This research project aimed to design and evaluated a prototype of Plant Electric Cells (PEC) capable of generating clean electricity from the natural growth of living plants. A green area will be transformed into an electric network that generates energy during both day and night without harming the ecosystem? The hypothesis proposed: If plant metabolic processes and their interaction with soil biological components release electrons, then bioelectricity can be generated. To test this hypothesis, six individual cells were built using plastic containers, soil, and Mexican oregano plants (Plectranthus amboinicus). In each pot. a zinc electrode was placed as the anode and a copper electrode as the cathode. The cells were connected in series to increase the total voltage of the system. Direct current voltage was measured daily with a digital multimeter, and variations were recorded according to environmental conditions and the state of the plants. The collected data showed that each cell produced between 0.3 and 0.8 volts, and when connected in series, an approximate voltage of 5 volts was achieved, sufficient to power low-consumption LED lights. It was observed that the voltage increased during the first few days and then stabilized, and that electricity generation continued during the night. indicating that microbial activity does not depend exclusively on sunlight. These results confirmed that the hypothesis was correct. as bioelectricity was successfully captured in a stable and continuous manner without affecting plant health. This demonstrates the feasibility of integrating natural biological processes into sustainable electricity generation technologies.

Awards Won:
King Abdulaziz &amp
his Companions Foundation for Giftedness and Creativity: Full Scholarship from King Fahd University of Petroleum and Minerals(KFUPM) (and a $400 cash prize)
King Abdulaziz &amp
his Companions Foundation for Giftedness and Creativity: NOT TO BE READ -- $400 cash prize for each Full Scholarship from King Fahd University award recipient