Green Algae as a Viable Substrate in a Microbial Fuel Cell

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Microbial fuel cells generate electricity through bacterial decomposition of waste matter. Recently various materials have been investigated as potential electricity producing substrates in microbial fuel cells. One of these substrates investigated is dead algae which is produced as a by-product when making bio-fuels. A gap in the research is a comparative study of whether whole cell algae or lipid extracted algae would produce a higher electrical current in a microbial fuel cell. This study investigates the form of green algae (Scenedesmus obliquus) as a viable substrate in Microbial Fuel Cells. Specifically this study investigates whether whole cell algae or lipid extracted algae will produce a higher current in a microbial fuel cell. Three fuel cells with anode and cathode chambers were set up as follows: (1) control: 500ml E.coli bacteria inoculation; (2) 500ml E.coli bacteria and 10 grams whole cell algae; (3) 500ml E.coli bacteria and 10 grams lipid-extracted algae. The voltage capacities of the three cells were measured at 10 minute intervals over 100 minutes. Three trials for each of the aforementioned fuel cells were completed. The fuel cell containing E.coli only produced the lowest amount of electricity (2.3 mV mean). The fuel cell containing the lipid extracted algae produced a higher amount of electricity (4.0 mV mean) but it was the whole cell algae that produced the highest voltage (4.4 mV mean). Hence whole cell algae are a viable substrate for microbial fuel cells.

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