A Study of the Effects of Vibrio fischeri on Atmospheric Carbon Dioxide Consumption

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In phase one of my research, I focused on the amount of bacterium required in order to produce a comparable light source to a standard light bulb which was 21.6 grams of bacteria. This was supported by hypothesis one which stated that less than 50 grams of bacteria would produce enough light to be equivalent to a 4 watt LED and 4 watt incandescent. In phase two, I studied the possibility of this bacterium decreasing a substantial amount of atmospheric carbon dioxide by absorption during photosynthesis. The average absorption amongst ten trials for the bacteria was 91.4% of the available carbon dioxide. This was supported by hypothesis one which stated that the bacteria would absorb more than 50% of the carbon dioxide. The null hypothesis was rejected for both phases. The combined results of these phases could produce a new concept in outdoor lighting by providing an alternative light source, thereby eliminating the need for electricity-consuming lighting, as well as dramatically decreasing our carbon dioxide emissions with increased consumption by Vibrio fischeri.