



CALIFORNIA STATE SCIENCE FAIR 2016 PROJECT SUMMARY

Name(s) Juan C. Lara De Nova	Project Number 36314
Project Title Bioremediation: The Effect of Oil-Eating Bacteria on the Oxygen Production of Elodea canadensis	
Abstract Objectives/Goals Objective: To determine the effects of oil-eating bacteria on the bioremediation process of oil spills on Elodea canadensis's ability to produce oxygen. Methods/Materials I used plastic chambers with oxygen sensor probes plugged into Ion Quests and then transferred my data on the Logger Lite Software from Vernier Software and Technology. Results It was shown that the experimental plant had produced 17.38% less oxygen than the control plant in the first trial and 12.20% less oxygen in the second trial. The key finding is that the experimental plant began to produce more oxygen when the oil-eating bacteria solution was introduced to its environment. The oxygen production had increased 14.5% in the first trial and 10.3% in the second trial as a result from oil-biodegradation. This variation in oxygen levels produced from an impaired E. canadensis has revealed the negative impact from the oil, but positive effect from bioremediation on its photosynthetic capability. Conclusions/Discussion The experimental group had major changes in oxygen production levels. An influential factor was the addition of 10mL of oil that soon created an oil slick on the surface. This prevented natural sunlight from reaching the Elodea Canadensis plants within the water. Some oil was coated on the leaves of the E. canadensis plant, the fundamental location for photosynthesis. Oil also caused water pollution, reducing the water quality. These factors damaged E. Canadensis by reducing photosynthesis. When the oil-eating bacteria solution was introduced to the oil affected plant, it soon began to produce more oxygen than it did when it was harmed by the oil. The bacteria degraded oil molecules and cleared a lot of the oil concentration. This increased the water quality and allowed more sunlight to reach the leaves of the plants. However, this plant had not produced as much oxygen as the control plant in the experimental time frame. Although the biodegradability from the bacteria solution was great, it did not totally eliminate the hydrocarbon and toxic molecules from the environment. Since it only broke a percentage of them down, these molecules are still present in the water and prevent the plant from completely recovering and producing as much oxygen as the control plant.	
Summary Statement I tested the effects of Bioremediation via oil-eating bacteria on the oxygen production of an aquatic plant affected by an oil spill.	
Help Received Summer Science Institute, Allan Hancock College, Riccardo Magni	