CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)

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Project Number

34182

Project Title

Effects of Pollution on Plants

Abstract

Objectives/Goals

The purpose of this experiment was to determine if plants produce less oxygen in the presence of pollution. This was thought to be true, based on the facts the stomata size decreases in the presence pollution and pollution damages critical plant parts such as the roots and leaves.

Methods/Materials

This experiment measured the oxygen output of the aquatic plants, Lemna minor and Elodea canadensis, which were contained in 175 mL bottles with 100 mL of water. The environments were polluted with either hydrogen sulfide (H2S), Miracle Gro, or gasoline. At the end of the experiment, the amount of accumulated dissolved oxygen was measured by using a colorimetric assay ampule, the pH was measured using pH strips, and the fogginess of the water was measured on a gray scale.

Results

The data suggests that gasoline severely affects the oxygen output for both plants, Miracle Gro has little to no effect, and that H2S affects Lemna minor less than Elodea canadensis though both plants were affected. This shows that pollution has an effect on the oxygen output of plants.

Conclusions/Discussion

The decrease in oxygen output observed by in the presence of the majority of the pollutants indicates that the hypothesis speculated was accurate. The severe drop in oxygen output thoroughly supported the hypothesis.

Further experiments could test potentially milder pollutants, different concentrations of pollutants, and a wider range of plant species.

Summary Statement

By measuring the effects of pollutants on two plant species, we show that some species maintain overall health and biological function substantially better than others, and this information identifies plants useful to treat polluted water.

Help Received

Guidance and supplies - Ms. Abrams (teacher), Rebecca Crites (mother), Patricia Tavormina(mother) and Patricia Tavormina for microscopic images using lab instruments at California Institute of Technology