

Abstract

This project in its present form is the result of bioassay experimentation on the effects of two-cycle marine engine exhaust water on certain green algae. The initial idea was to determine the toxicity of outboard engine lubricant. Some success with lubricants eventually led to the formulation of “synthetic” exhaust water which, in turn, led to the use of actual two-cycle engine exhaust water as the test substance. Toxicity was determined by means of the standard bottle or “batch” bioassay technique. *Scenedesmus quadricauda* and *Ankistrodesmus* sp. were used as the test organisms. Toxicity was measured in terms of a decrease in the maximum standing crop. The effective concentration - 50% (EC50) for *Scenedesmus quadricauda* was found to be 3.75% exhaust water; for *Ankistrodesmus* sp. 3.1% exhaust water using the bottle technique. Anomalies in growth curves raised the suspicion that evaporation was affecting the results; therefore, a flow-through system was improvised utilizing the characteristics of a device called a Biomonitor. Use of a Biomonitor lessened the influence of evaporation, and the EC 50 was found to be 1.4% exhaust water using *Ankistrodesmus* sp. as the test organism. Mixed populations of various algae gave an EC 50 of 1.28% exhaust water. The contributions of this project are twofold. First, the toxicity of two-cycle marine engine exhaust was found to be considerably greater than reported in the literature (1.4% vs. 4.2%). Secondly, the benefits of a flow-through bioassay technique utilizing the Biomonitor was demonstrated.

After finishing research and experimentation, you need to write an abstract. The abstract needs to be a maximum of 250 words on one page. An abstract should include the a) purpose of the experiment, b) procedures used, c) data, and conclusions. It also may include any possible research applications. Only minimal reference to previous work may be included. The abstract must focus on work done in the current year and should not include a) acknowledgments, or b) work or procedures done by the mentor. Refer to the abstract above to get an idea of what yours should look like.

Discussion (At least 1.5 pages)

This is the essence of your paper. Compare your results with theoretical values, published data, commonly held beliefs, and/or expected results. Include a discussion of possible errors. How did the data vary between repeated observations of similar events? How were your results affected by uncontrolled events? What would you do differently if you repeated this project? What other experiments should be conducted?

Conclusion (At least 1 page)

Briefly summarize your results. State your findings in relationships of one variable with the other. Support those statements with empirical data (one average compared to the other average, for example). Be specific, do not generalize. Never introduce anything in the conclusion that has not already been discussed. Also mention practical applications.

Your research paper must be:

- ❖ *Double spaced*
- ❖ *Typed in Times New Roman size 12 font*
- ❖ *Stapled on the top left hand corner*
- ❖ *The COMPLETED RESEARCH paper must be turned in on*

NOVEMBER 25, 2013

- ❖ *Stored electronically in multiple places (jump drive, Google docs, and/or desk top computer) to prevent loss of information.*

Your data log book must:

- ❖ *Be hand written*
- ❖ *Include all data collection in rough draft*
- ❖ *Include list of resources*
- ❖ *Be organized chronologically*
- ❖ *Contain all related material (receipts, pictures, phone call log, etc.)*

Your POWER POINT MUST be completed using template:

- ❖ *Be completed using the reference sheets in this packet*

Your presentation must:

- ❖ *Be about your science fair project*
- ❖ *Be three to five minutes long.*
- ❖ *Summarize your project*
- ❖ *Emphasize the problem or question you researched*
- ❖ *Explain your experimental procedures and results*
- ❖ *List your conclusions and applications*

If you follow these directions and samples, I am sure your science fair project will be a success. Should you have any questions, please contact me via email at maria_rodriguez@dadeschools.net. I am here to help, you just need to let me know. Great Luck !

Mrs. Rodriguez