

THE ABSTRACT – WHAT TO DO WITH IT ONCE IT IS WRITTEN**THE ABSTRACT AND THE FINAL PROJECT DISPLAY.**

- **Sequence:** Write the abstract after your research report is completed.
- The abstract *will not* be placed on the project display board. It will be in an abstract holder in front of your project.
- YOU MAY GET THE ABSTRACT HOLDER FROM ME. **BRING \$6.00** AND YOU CAN GET ONE FROM ME.
- PRINT 15 ADDITIONAL COPIES OF YOUR ABSTRACT TO BE PLACED ON THE TABLE BESIDE YOUR PROJECT SO THAT JUDGES CAN TAKE AN INDIVIDUAL COPY.

TWO (2) ABSTRACTS ARE REQUIRED

- ABSTRACT #1: One in front of your display board.
Also, print about 15 copies of your abstract so you can place them beside your project for the judges to take.
- ABSTRACT #2: Send it to me by e-mail (word document).

ABSTRACT #1: IN FRONT OF YOUR DISPLAY BOARD IN A SUITABLE ATTRACTIVE FRAME

- The abstract will be displayed in front of the display board contained in a self-supporting frame (like a picture frame).
- Print the abstract on a plain paper 8 x 11.
- See the sample abstract below for the format of how it will appear in the frame.
- Place the title above the text in **bold and underlined**.
- Text size. Adjust the text size so the entire abstract with the headings fits on one page. *The abstract should fit the whole page.* If it does not, expand the font, bold it, or make it double spaced.

BODIDDLY, Jim-Bob
MARINE BIOLOGY
2015

THE TOXICITY OF MARINE EXHAUST ON GREEN ALGAE

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.

ABSTRACT #2: YOU SEND THIS ONE TO ME BY E-MAIL (WORD DOCUMENT)

- Send your abstract to me by e-mail *as soon as possible*.
- Send the abstract *as a word document*.; **NOT pdf.**
- Put the information shown below in the top left corner.
(see example below)
- **DO NOT** make it a header.
 - Name (Surname first, first name last.)
 - Category
 - Year of research.

SEND IT TO ME BY E-MAIL EITHER AS AN ATTACHED WORD DOCUMENT OR RIGHT IN THE TEXT OF THE E-MAIL.

- In the top left corner put (**not as a header**)
 - Name (Surname first, first name last.)
 - Category
 - Year of research.

SEND YOUR ABSTRACT TO ME AT:
starodub@dypusd.net
SEND AS AN ATTACHED WORD
DOCUMENT OR TYPED
DIRECTLY INTO THE TEXT OF
THE EMAIL

DO NOT type
this as a header!!

BODIDDLY, Jim-Bob
MARINE BIOLOGY
2015

THE TOXICITY OF MARINE EXHAUST ON GREEN ALGAE

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.