

US EPA ARCHIVE DOCUMENT

DATA EVALUATION RECORD
 EC₅₀ TEST WITH LEMNA GIBBA
 GUIDELINE 122-2 OR 123-2 (TIER I OR II)

1. CHEMICAL: 2-chloro-4,6-bis(isopropylamino)-s-triazine
PC Code No.: 080808

2. TEST MATERIAL: Propazine Purity: 98%

3. CITATION

Authors: S. L. Hicks; D. W. Gledhill; J. Veltri
Title: 14-Day static toxicity of propazine to
 Lemna gibba G3

Study Completion Date: 05/24/95

Laboratory: ABC Laboratories, Inc.

Sponsor: Griffin Corporation

Laboratory Report ID: ABC Laboratories #41963

DP Barcode: D237791

MRID No.: 442873-09

4. REVIEWED BY: Thomas M. Steeger, Ph.D., Fishery Biologist,
 EFED, ERB IV, U.S. EPA

Signature: *Thomas M Steeger*

Date: 10/2/97

5. APPROVED BY: Nicholas E. Federoff, Wildlife Biologist, EFED,
 ERB IV, U.S. EPA

Signature: *N.E. Federoff*

Date: 10/8/97

6. STUDY PARAMETERS

Definitive Test Duration: 14 days

Type of Concentrations: Mean measured/Nominal

7. CONCLUSIONS: This study is scientifically sound and does fulfill the 123-2 guideline requirements for 14-Day static toxicity tests for algae. The Day 14 EC₅₀ value was 0.10 mg a.i./L and the 14-day no-observed effect concentration was 0.022 mg a.i./L., based on the absence of a growth inhibition effect.

Results Synopsis

EC₅₀: 0.10 ppm ai

95% C.I.: 0.88-0.12 ppm ai

NOEL: 0.022 ppm ai

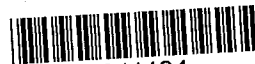
Slope: 1.53

8. ADEQUACY OF THE STUDY

A. Classification: Core

B. Rationale: Methodology was consistent with FIFRA guidelines; conclusions were verifiable.

C. Repairability:



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C. Repairability:

9. GUIDELINE DEVIATIONS

1.

2. (etc.)

10. SUBMISSION PURPOSE: To evaluate the growth inhibition or enhancement effect of Propazine to *Lemna gibba*.

11. MATERIALS AND METHODS

A. Test Organisms

Guideline Criteria	Reported Information
<u>Species</u> <i>Lemna gibba</i>	<i>Lemna gibba</i> G3
<u>Number of Plants/Fronds</u> 5 plants, 3 fronds per plant.	15 fronds
<u>Nutrients</u> Standard formula, e.g. Hoagland E. + EDTA, M-Hoagland (no EDTA, no sucrose), or 20XAAP	Hoaglands nutrient medium

B. Test System

Guideline Criteria	Reported Information
<u>Solvent</u>	dimethylformamide (DMF)
<u>Temperature</u> 25°C	25 ± 2°C
<u>Light Intensity</u> 4.2-5.8 K lux (±15%)	5,010 ± 810 lux
<u>Photoperiod</u> Continuous	Continuous

Guideline Criteria	Reported Information
<p><u>pH</u> Varies with media used, as follows: Hoagland E + EDTA, 4.60; M-Hoagland (no EDTA, no sucrose), 5.00 ± 0.1; 20XAAP, 7.50 ± 0.01.</p>	Range: 5.0 - 6.1
<p><u>Test System</u> Static or renewal</p>	static

C. Test Design

Guideline Criteria	Reported Information
<p><u>Dose range</u> 2X or 3X progression</p>	2X progression
<p><u>Doses</u> at least 5</p>	0.025, 0.050, 0.10, 0.20, 0.40, and 0.080
<p><u>Controls</u> negative and/or solvent</p>	Control and vehicle control
<p><u>Replicates per dose</u> 3 or more</p>	3
<p><u>Duration of test</u> 14 days</p>	14 days
<p>Daily observations were made?</p>	No (0, 2, 4, 7, 9, 11, 14 days)
<p><u>Method of Observations</u></p>	observations of necrosis, chlorosis, frond death, and changes in color
<p><u>Maximum Labeled Rate</u></p>	1.2 lb ai/acre

12. REPORTED RESULTS

Guideline Criteria	Reported Information
Quality assurance and GLP compliance statements were included in the report?	Yes
Initial and 14 day frond count?	Yes
Control frond count at 14 day \geq 2X initial count?	Yes (40X)
Initial chemical concentrations measured? (Optional)	Yes
Raw data included?	No

Dose Response

Dose (mg ai/L)	Plant/Frond Density	% Inhibition	14-Day pH
Control	0.0732	--	6.1
Solvent Control	0.0788	0.00	5.9
0.022	0.0663	9.43	6.0
0.054	0.0517	29.37	5.9
0.088	0.0368	49.73	5.8
0.19	0.0188	74.32	5.6
0.40	0.0093	87.30	5.6
0.81	0.0139	93.72	5.4

Other Significant Results:

Statistical Results

Statistical Method: Proc GLM/Dunnett's multiple means comparison test.

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EC₅₀: 0.10 ppm

95% C.I.: 0.88 - 0.12 ppm

Slope: _____

NOEC: 0.022 ppm

13. Verification of Statistical Results

Statistical Method: TOXANAL

EC₅₀: 0.107 ppm

95% C.I.: 0.052-0.199 ppm

Slope: 1.53

NOEC: 0.022 ppm

Adjusted for active ingredient: EC₅₀ and NOEC based on actual measured concentrations; thus reported values do not have to be adjusted for active ingredient.

EC₅₀: 0.10 ppm ai

95% C.I.: 0.88 - 0.12 ppm ai

NOEC: 0.022 ppm ai

14. REVIEWER'S COMMENTS:

Percent inhibition numbers reported above are personal calculations; the report text does not report percent inhibition. The percent inhibition equation is elaborate and differs from that used to make the above calculations:

$$\%inhibition = \frac{(0.076 - BIOMASS)}{0.076} * 100$$

Also, the equation for percent inhibition provided in the text has unbalanced parenthesis and thus could not be properly interpreted.

Regression analysis and multiple means testing (Dunnett's) of percent inhibition over log₂-transformed dose of Propazine indicated that duckweed cultures treated with greater than 0.022 mg/L exhibited significantly different growth relative to controls. The regression equation was:

$$\%inhibition = (\log_2(dose) * 16.5939539) + 106.57667$$

Using this equation and solving for 50% inhibition yields an estimated EC₅₀ of 0.0941 mg/L. This value approximates the 14-day EC₅₀ reported in the text (0.10 mg/L) and falls within the 95% confidence interval (0.088 - 0.12 mg/L).

Using the TOXANAL program and averaging the control with

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solvent control to yield the following values:

dose	number {dead}
0	0
0.013	0
0.022	140
0.044	176
0.090	192
0.180	244

[LC50] 0.0353 (95% CI: .0332 - .0374)

0.0210

0.0316 (95% CI: 1.06E-10 - 0.3487)

Except for variability associated with estimates of the 95% confidence intervals, the EC50 values are within the confidence intervals estimated by the study.