123-240/Anabaena

DATA EVALUATION REVIEW

EFED Document

ECOLOGICAL EFFECTS BRANCH

2002038

1. Chemical: Tilt

2. Test material: CGA-64250

3. Study Type: Nontarget Area Phytotoxicity, blue-green alga Anabaena flos-aquae. MRID# 00133362

4. Study I.D.: Hollister, T. (1981). The effect of CGA-64250 to the blue-green alga Anabaena flos-aquae. Unpublished study prepared by EG&G Bionomics for Ciba-Geigy Corp. Acc# 4324-012-01.

5. Reviewed By: Dana Barrett
Biologist
EEB
Signature: Dana Barrett
Date: 5/3/91

6. Approved By: Charles Lewis
Head, Section III
EEB
Signature: Charles Lewis
Date: 5/3/91

7. Conclusions: The study does not follow the guidelines for the aquatic plant nontarget phytotoxicity test - Anabaena flos-aquae. This study is classified as "core". See 14a.

8. Recommendations: Under new guidelines A. flos-aquae study is not required as part of the aquatic plant nontarget phytotoxicity test.

9. Background: This study was submitted in support of registration.

10. Discussion of Individual Tests and Studies:

11. Materials and Methods:

a. Test Organism: The blue-green alga Anabaena flos-aquae was obtained from the U.S. E.P.A. Research Laboratory, Corvallis, OR. Upon initiation of the study the cultures were 8 days old.

Test System: 125 ml glass flasks, each which contained 50 ml of test medium, housed the cultures. The cultures were incubated at 24C under 2000 Lux illumination. Flasks were on a shaker set at 100 r.p.m.

b. Dosage: The following nominal concentrations were used: control, solvent control (acetone), 3, 6, 12, 25, and 50 ppm. Three replicates were used at each concentration. See Table 1.

c. Description: Observations were made on test days 3, 4, 7, 9, and 11. Measurements of in viro chlorophyll a were performed by using a Turner Model-III fluorometer. Gravimetric methods for measurement of dry-cell weights followed EPA guidelines.

d. Statistics Employed: The 11 day maximum standing crop dry-cell weight values were subjected to analysis of variance (ANOVA) and Williams' method.

12. Reported Results: The 11 day EC50 was reported as 13.58 ppm with 95% confidence limits of 10.21 - 18.07 ppm. Growth of A. flos-aquae exposed to test concentrations of >6.33 ppm appeared to be adversely affected during the 11 days of exposure. The test was terminated after 11 days of exposure because measurements on the control and most test cultures indicated maximum standing crop had been achieved.

13. Study Authors Conclusions: "Based on dry-cell weight at day 11, growth of cultures exposed to concentrations >6.33 ppm was significantly less than growth of solvent control cultures. Decreases ranged from 11% in those exposed to 6.33 ppm to 96% in those exposed to 49.55 ppm". (excerpt from study).

14. Reviewer's Discussion:

a. Test Procedures: The study deviated from the protocol outlined in "Subdivision-J-Guidelines". The following discrepancies were noted:

- pH data was not submitted
- Photoperiod data was not submitted

b. Statistical Analysis: Using the Probit Method the EC50 was determined to be 8.63 ppm with 95% confidence limits of 7.54 - 9.82 ppm. (Statistical Analysis attached). Analysis of variance (ANOVA) determined the NOEL to be 2.94 ppm.

c. Conclusion:
1). Classification: Core
2). Rationale:
3). Repairability:

122101 tilt b-g algae

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
49.55	100	95	95	0
25.42	100	90	90	0
12.43	100	60	60.00001	0
6.33	100	43	43	0
2.94	100	11	11	0

THE BINOMIAL TEST SHOWS THAT 6.33 AND 12.43 CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 8.352887

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
3	2.417632E-02	8.539556	7.522312	9.675553

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
3	2.306846E-02	1	.2357258

SLOPE = 2.375447

95 PERCENT CONFIDENCE LIMITS = 2.014657 AND 2.736238

LC50 = 8.636356

95 PERCENT CONFIDENCE LIMITS = 7.541294 AND 9.817809

LC10 = 2.521706

95 PERCENT CONFIDENCE LIMITS = 1.897538 AND 3.138692

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