

US EPA ARCHIVE DOCUMENT

DATA EVALUATION RECORD

1. **CHEMICAL:** Trisulfuron.
Shaughnessey No: 128969-3.
2. **TEST MATERIAL:** CGA-131036; Batch NO. P306001; 94.5% active ingredient; colorless.
3. **STUDY TYPE:** Growth and Reproduction of Aquatic Plants.
Species Tested: Scenedesmus subspicatus.
4. **CITATION:** Rufli, Dr. H. 1984. Report on the test for acute toxicity of CGA-131036 to algae (Afnor T 90-304) Laboratory Project ID #03-13-34. Prepared by Giba-Geigy Limited, Basle, Switzerland. Submitted by Ciba-Geigy Corporation, Greensboro, NC. MRID No. 407283-24.
5. **REVIEWED BY:**

Debra S. Segal, M.S. Associate Scientist KBN Engineering and Applied Sciences, Inc.	Signature: <i>Debra S. Segal</i> Date: 8-24-89 <i>Charles Lee 9/12/89</i>
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6. **APPROVED BY:**

Michael L. Whitten, M.S. Staff Toxicologist KBN Engineering and Applied Sciences, Inc.	Signature: <i>Michael L. Whitten</i> Date: 8-31-89
Henry T. Craven, M.S. Supervisor, EEB/HED USEPA	Signature: <i>Henry T. Craven</i> <i>10/4/87</i> Date:
7. **CONCLUSIONS:** This study appears scientifically sound but does not fulfill the guideline requirements for a Tier 2 growth and reproduction of a non-target green alga test. The 5-day EC50 value of CGA-131036 for S. subspicatus was 0.70 mg/L.
8. **RECOMMENDATIONS:** N/A.
9. **BACKGROUND:** N/A.
10. **DISCUSSION OF INDIVIDUAL TESTS:** N/A.

7 HRS

sm

11. MATERIALS AND METHODS:

- A. Test Species: Scenedesmus subspicatus used in this test came was a strain of Cambridge 276/20. S. subspicatus was precultured for five days to a density of 1.25×10^5 cells/ml. Stock cultures were maintained at approximately 4000 lux cold white fluorescent light for 16 hours of light and 8 hours of dark each day at a temperature of $24 \pm 1^\circ\text{C}$. A stock solution was made by dissolving 200g of CGA-131036 in DMSO; 4000 mg Pluronic F108 and made up to 1000ml with DMSO. The solution was diluted to 1:20,000 with water.
- B. Dosage: Five-day growth and reproduction test.
- C. Test System and Design: Test vessels used were 25-mL Erlenmeyer flasks fitted with cotton plugs. The test substance was homogeneously distributed at all test concentrations. Samples for analysis were taken after 0h and 120h exposure. Five nominal concentrations of CGA-131036 (0.1, 0.3, 0.9, 2.7, and 8.1 mg/L) were selected for the definitive test. Test concentrations were prepared by adding the appropriate volumes of the stock solution to produce the desired test concentrations to water and homogeneously distributed. Reference substance consisted of 1.0, 1.5, 2.3, and 3.4 mg potassium bichromate/L. Controls used were water and a control vehicle consisting of 45 mg DMSO, 0.2 mg Pluronic F108 per liter water in the concentration used for the highest test concentration. Cell counts at test termination on day 5 for each nominal test concentration were made with TOA cell counter.
- D. Statistics: The EC50 values were calculated according to J. Berkson, JASA 48 (1953), 569-599. EC50 was also graphically determined on gaussio-logarithmic probability paper. Percent inhibition (I) was calculated according to the following formula:

$$\% I = \frac{C - T}{C} \times 100$$

where: C = mean growth in the control or solvent control,
T = mean growth in treated culture.

12. REPORTED RESULTS: The 5-day EC50 value relative to the solvent control based on J. Berkson was 0.77 mg/L with a confidence limit of 0.66 - 0.94 mg/L. The 5-day EC50

value determined graphically by the gausso-logarithmic probability paper was 0.78 mg/L. Based on the reference substance (potassium bichromate) the EC50 value was calculated at 1.2 mg/L with a confidence limit of 1.1 - 1.2 mg/L. The EC0 value determined graphically was less than the lowest test concentration used (<0.1 mg/L).

Percent inhibition was 11, 11, 46, 97, and >100% for the nominal concentrations of 0.1, 0.3, 0.9, 2.7, and 8.1 mg/L, respectively.

13. STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES: No conclusions were made by the authors.

A statement was included maintaining that the study was conducted in accordance with "good and acceptable scientific practices", and signed by K. Balu, an agent of the submitter/sponsor.

14. REVIEWER'S DISCUSSION AND INTERPRETATION OF STUDY RESULTS:

- A. Test Procedure: The test procedure and the report were not in accordance with the SEP and Subdivision J guidelines. The following deviations were noted:

The test species used was Scenedesmus subspicatus rather than the required Selenastrus capricornutum for algae test; no reason was stated for the substitution.

No chemical formula or lot number was given for the test material.

Nominal test concentrations were increased 3X rather than 2X as specified in Subdivision J.

The number of treatment replicates was unclear.

Raw data was not provided nor were statistical comparisons among test concentrations.

Synthetic algal assay nutrient medium was not specified.

pH measurements were not included.

The confidence limits were assumed to be 95% but were not stated.

It was not stated whether Erlenmeyer flasks were sterilized prior to use.

Initial cell count too high. CRL 9/12/89

The maximum label rate was not provided in the report. However, according to the EEB, the application rate is 2.5 oz active ingredient/acre. Therefore, if the test substance were directly applied to the surface of a 15-cm or 6-inch water column one acre in size, the resulting concentration in the water would be approximately 0.11 mg/L.

Daily observations were not made.

- B. **Statistical Analysis:** The reviewer recalculated the EC50 values and obtained similar results to that calculated by the author. The EC50 value using the moving average method was 0.70 mg/L with a 95% confidence limit of 0.59 - 0.83 mg/L. No additional data was provided in the report for statistical comparison of cell counts at each treatment level.
- C. **Discussion/Results:** The 5-day EC50 value of CGA-131036 for S. subspicatus was 0.70 mg/L. The EC0 value determined by the authors was less than the lowest concentration used (0.1 mg/L). CGA-131036 is not expected to exert a detrimental effect on the alga (Scenedesmus subspicatus) following normal application methods at rates up to 2.5 oz a.i./acre.
- D. **Adequacy of the Study:**
- (1) **Classification:** Supplemental.
 - (2) **Rationale:** Deviations from the guidelines (selection of test species, proper identification of test chemical, and the absence of raw data) are of concern.
 - (3) **Repairability:** Pending registrants' response to items discussed in Section 14 A.
15. **COMPLETION OF ONE-LINER:** Yes, 08-24-89.

CGA-131036

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
8.100001		100	100	100
2.7 -	100	97	97	0
.9	100	46	46	0
.3	100	11	11	0
.1	100	11	11	0

BECAUSE THE NUMBER OF ORGANISMS USED WAS SO LARGE, THE 95 PERCENT CONFIDENCE INTERVALS CALCULATED FROM THE BINOMIAL PROBABILITY ARE UNRELIABLE. USE THE INTERVALS CALCULATED BY THE OTHER TESTS.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS .9635626

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
4	1.379994E-02	.7028683	.5883303	.8339149

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
5	.7119531	13.25629	0

A PROBABILITY OF 0 MEANS THAT IT IS LESS THAN 0.001.

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 2.177644
 95 PERCENT CONFIDENCE LIMITS = .3402065 AND 4.015081

LC50 = .7211288
 95 PERCENT CONFIDENCE LIMITS = .1186925 AND 3.906442

LC10 = .1882841
 95 PERCENT CONFIDENCE LIMITS = 8.173283E-05 AND .5063757

Shaughnessy No. 128969-3

Chemical Name Triasulfuron Chemical Class _____ Page _____ of _____

Study/Species/Lab/ Accession Chemical Results Reviewer/ Valid/ Date Stat

14-Day Single Dose Oral LD₅₀ LD₅₀ = mg/kg (95% C.L.) Contr. Mort. (X) =

Species Slope = # Animals/Level = Age (Days) = Sex =

Lab 14-Day Dose Level mg/kg/(X Mortality)

Acc. Comments:

14-Day Single Dose Oral LD₅₀ LD₅₀ = mg/kg. (95% C.L.) Contr. Mort. (X) =

Species Slope = # Animals/Level = Age (Days) = Sex =

Lab 14-Day Dose Level mg/kg/(X Mortality)

Acc. Comments:

8-Day Dietary LC₅₀ LC₅₀ = ppm (95% C.L.) Contr. Mort. (X) =

Species Slope = # Animals/Level = Age (Days) = Sex =

Lab 8-Day Dose Level ppm/(X Mortality)

Acc. Comments:

8-Day Dietary LC₅₀ LC₅₀ = ppm (95% C.L.) Contr. Mort. (X) =

Species Slope = # Animals/Level = Age (Days) = Sex =

Lab 8-Day Dose Level ppm/(X Mortality)

Acc. Comments:

48-Hour LC₅₀ LC₅₀ = pp (95% C.L.) Contr. Mort. (X) =

Species Sol. Contr. Mort. (X) = Slope = # Animals/Level = Temperature =

Lab 48-Hour Dose Level pp/(X Mortality)

Acc. Comments:

96-Hour LC₅₀ EC₅₀ 0.77 mg/L 95% C.L. Con. Mort. (X) = NA

5 Day EC₅₀ LC₅₀ = PPM (0.66 - 0.94) Sol. Con. Mort. (X) = NA

Species Slope = # Animals/Level = NA % Inhibition Temp. = 24°C

Lab 96-Hour Dose Level pp/(X Mortality) 0.1 (11) 0.3 (11) 0.9 (46) 2.7 (97) 8.1 (100)

Acc. 407283-24 Comments: Based on nominal concentrations

96-Hour LC₅₀ LC₅₀ = PP (95% C.L.) Con. Mort. (X) =

Species Sol. Con. Mort. (X) = Slope = # Animals/Level = Temp. =

Lab 96-Hour Dose Level pp/(X Mortality)

Acc. Comments: