

US EPA ARCHIVE DOCUMENT

(9-15-92)

MRID No. 418695-10

DATA EVALUATION RECORD

- 1. **CHEMICAL:** Cimectacarb.
Shaughnessey No. 112602.
- 2. **TEST MATERIAL:** CGA-163935 Technical; Batch No. 891393;
92.2% active ingredient; a dark amber liquid.
- 3. **STUDY TYPE:** Marine Fish Acute Flow-Through Toxicity Test.
Species Tested: Sheepshead Minnow (*Cyprinodon variegatus*).
- 4. **CITATION:** Sousa, J.V. 1991. (CGA-163935 Technical) -
Acute Toxicity to Sheepshead Minnow (*Cyprinodon variegatus*)
Under Flow-Through Conditions. SLI Report No. 91-1-3622.
Performed by Springborn Laboratories, Inc., Wareham, MA.
Submitted by CIBA-GEIGY Corporation, Greensboro, NC. EPA
MRID No. 418695-10.

5. **REVIEWED BY:**

Rosemary Graham Mora, M.S.
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Signature: *Rosemary Graham Mora*
Date: 7/24/92

6. **APPROVED BY:**

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7. **CONCLUSIONS:** This study is scientifically sound and meets the guideline requirements for an acute flow-through toxicity study using marine fish. Based on mean measured concentrations, the 96-hour LC₅₀ of CGA-163935 Technical for *Cyprinodon variegatus* was 180 mg a.i./l which classifies CGA-163935 Technical as practically non-toxic to sheepshead minnow. The NOEC could not be determined since toxicant-related effects were observed at all exposure concentrations. No mortality was seen at concentrations > 80 mg a.i./l

8. **RECOMMENDATIONS:** N/A.

9. **BACKGROUND:**

10. DISCUSSION OF INDIVIDUAL TESTS: N/A.

11. MATERIALS AND METHODS:

- A. Test Animals: Sheepshead minnow (*Cyprinodon variegatus*) were obtained from Aquatic Biosystems, Fort Collins, CO. The fish were held for a minimum of 14 days in a 500-l tank under recirculating conditions with a photoperiod of 16 hours of light and 8 hours of darkness. The seawater had a temperature of 21-22°C and a salinity of 29-31 parts per thousand (ppt). Fish were fed a commercial flake food daily, except for the 48 hours prior to test initiation.

A representative sample of the test organism population had a mean total length and wet weight of 25 (range of 19-32) mm and 0.25 (range of 0.12-0.49) g, respectively. In the 48 hours prior to test initiation, 2.8% mortality in the test organism population was recorded.

- B. Test System: The test system consisted of an intermittent flow proportional diluter, a temperature-controlled water bath, and 14 glass aquaria (29.25 x 14.5 x 19 cm) with self-starting siphons which maintained a solution volume of 3.4-5.9 l. The flow rate to each aquarium was adequate to provide 8.6 volume replacements every 24 hours.

The aquaria were impartially positioned in the water bath which was designed to maintain the test temperature at 22 ±1°C. The photoperiod during the test was the same as that used during holding with a light intensity range of 24-54 footcandles (259-583 lux). Sudden transitions from light to dark and dark to light were avoided.

The dilution water used during the study was filtered (20 and 5 µm) natural seawater collected from the Cape Cod Canal, Bourne, MA. The seawater had a salinity of 31 ppt and a pH range of 7.9-8.0.

A stock solution (500 mg a.i./l) was prepared by adding 162.69 g (150.0 g as a.i.) of test material to a total of 300 l of filtered seawater. This stock solution provided the highest test concentration; subsequent proportional dilutions provided the remaining 5 concentrations.

- C. **Dosage:** Ninety-six-hour flow-through test. Based on the results of preliminary testing, six nominal concentrations were used (58, 89, 140, 210, 330, and 500 mg a.i./l). In addition, a dilution water control was included.
- D. **Design:** Ten fish were randomly loaded into each of two replicate aquaria per treatment (twenty fish/treatment level). At any given time during the test, the organism loading rate was 0.049 g/l/day.

Biological observations and observations of physical characteristics of the test solutions were noted at test initiation and every 24 hours. Dead fish were removed at each observation.

The dissolved oxygen concentration, pH, salinity, and temperature were measured daily. The temperature in one replicate of the control solution was monitored continuously.

Chemical analysis of CGA-163935 Technical was performed using high pressure liquid chromatography on each test solution collected on days 0 and 4 to verify the test concentrations.

- E. **Statistics:** The author used a computer program by Stephan (1977, 1982) to calculate LC₅₀ values.
12. **REPORTED RESULTS:** The mean measured concentrations were 60, 80, 130, 200, 310, and 490 mg a.i./l (Table 2, attached). The coefficients of variation averaged 3.6% for all mean measured concentrations. No undissolved test material was observed in any test chamber throughout the test period.

Only five percent mortality was noted in the dilution water control (Table 3, attached). Sublethal effects were exhibited by several of the surviving fish at all exposure concentrations. No sublethal effects were noted in the control.

Based on mean measured concentrations, the 96-hour LC₅₀ for *Cyprinodon variegatus* exposed to CGA-163935 Technical was 180 mg a.i./l (95% confidence interval of 160-200 mg a.i./l). The slope of the concentration-response curve was 8.7. The NOEC was <60 mg a.i./l.

During the study, the daily temperature was 22-23°C, the pH was 7.0-8.0, the dissolved oxygen concentration was 6.2-7.9 mg/l (86-110% of saturation), and the salinity was 31-32

ppt. The continuous temperature of the test solution ranged from 21.0 to 23.4°C.

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:**

"Based on criteria established by EPA (1985), CGA-163935 Technical is classified as practically non-toxic to sheepshead minnow (*Cyprinodon variegatus*)."

Good Laboratory Practice Compliance and quality assurance statements were included in the report, indicating that the study was in accordance with GLP regulations (40 CFR, Part 160) except for the stability, characterization and verification of the test substance identity.

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

A. **Test Procedure:** The test procedures were in accordance with the SEP, except for the following deviation:

- The age of the test organisms was not reported.
- AN NOEL was not established (preferable though not required)

B. **Statistical Analysis:** The reviewer used EPA's Toxanal program to calculate the LC₅₀ value and obtained results similar to those of the author (printout, attached).

C. **Discussion/Results:** This study is scientifically sound and meets the guideline requirements for an acute flow-through toxicity study using marine fish. Based on mean measured concentrations, the 96-hour LC₅₀ was 180 mg a.i./l which classifies CGA-163935 Technical as practically non-toxic to sheepshead minnow (*Cyprinodon variegatus*). The NOEC could not be determined for behavioral effects

D. **Adequacy of the Study:**

- (1) **Classification:** Core.
- (2) **Rationale:** N/A.
- (3) **Repairability:** N/A.

15. **COMPLETION OF ONE-LINER FOR STUDY:** Yes, July 21, 1992.

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Pages 5 through 7 are not included in this copy.

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