

US EPA ARCHIVE DOCUMENT

DATA EVALUATION RECORD

1. **CHEMICAL:** Acetochlor.
Shaughnessey No: 121601.
2. **TEST MATERIAL:** MON 097; lot # NBP-1924845, BA 29; 95.6%
Active Ingredient; a purple liquid.
3. **STUDY TYPE:** Freshwater Fish Static Acute Toxicity Test.
Species Tested: Lepomis macrochirus.
4. **CITATION:** Griffen, J. and C.M. Thompson. 1981. Acute
Toxicity of MON-097 (AB-81-181) to Bluegill Sunfish (Lepomis
macrochirus). Static Acute Bioassay Report #27815.
Conducted by Analytical Biochemistry Laboratories, Inc.,
Columbia, Missouri. Submitted by Monsanto Chemical Company,
St. Louis, Missouri. Monsanto Study No. AB-81-181.
5. **REVIEWED BY:**

G. Scott Ward Manager Aquatic Toxicology Laboratory Toxikon Environmental Sciences	Signature: <i>P. Kosalwat</i> for G. Scott Ward Date: 6/20/90
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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: 6-18-90
Henry T. Craven, M.S. Supervisor, EEB/HED USEPA	Signature: <i>Cynthia A. Moulton</i> 10-29-90 Date: <i>Henry T. Craven</i> 10/30/90
7. **CONCLUSIONS:** The study is scientifically sound and fulfills
the guideline requirements for a static acute toxicity test
using a freshwater fish species. The 96-hour LC50 of the
test substance to bluegill was 1.3 mg/L. The NOEC was 1.0
mg/L.
8. **RECOMMENDATIONS:** N/A.

9. **BACKGROUND:**10. **DISCUSSION OF INDIVIDUAL TESTS:** N/A.11. **MATERIALS AND METHODS:**

- A. **Test Animals:** Bluegill sunfish used in the test were obtained from Aquatic Control, Inc. in Seymour, Indiana. Fish were held in culture tanks on a 16-hour day-light photoperiod and observed daily for 14 days prior to testing. Temperature in holding tanks was not mentioned. Bluegill had a mean weight of 0.16 g and a mean standard length of 20 mm. Fish were fed a standard commercial fish food daily until 48-hours prior to testing at which time feeding was discontinued.
- B. **Test System:** The test system consisted of five gallon glass vessels containing 15 liters of soft reconstituted freshwater. The vessels were kept in a water bath at $22 \pm 1^\circ\text{C}$. Test fish were acclimated to dilution water and test temperature and held without food 48-hours before testing. The photoperiod during the test period was not mentioned. The dilution water used in the test was a soft reconstituted water with the following characteristics: dissolved oxygen: 9.0 mg/L; pH, 7.6; total hardness of 45 mg/L as CaCO_3 ; and total alkalinity of 35 mg/L as CaCO_3 (conductivity was not mentioned).
- C. **Dosage:** This was a 48-hour static, acute toxicity test.
- D. **Design:** Based on a preliminary 48-hour range-finding test, five nominal concentrations of the test substance (1.0, 1.8, 3.2, 5.6 10 mg/L) were selected for the definitive study. Although the text of the report does not mention the use of any control, it is apparent from data in Appendix I that a solvent control (acetone at a concentration of 667 $\mu\text{L/L}$) was used. There was no untreated control. Each treatment vessel including the control contained 10 fish with no replication.

All treatments were observed for mortality and behavioral effects at the end of each 24 hour period. Mortality data and water quality parameters are presented in Table 3 (attached).

The water quality parameters (temperature, dissolved oxygen, pH) were measured at 0, 48, and 96 hours of testing in the control and lowest concentration (1.0 mg/L). The parameters were also measured at 48 hours in the 1.8 mg/L concentration and 0 hour in the 10 mg/L concentrations. Ammonia concentrations were measured at 0, 48 and 96 hours in the control and lowest concentration (1.0 mg/L) and at 0 hour in the highest concentration.

E. **Statistics:** LC50 values and their corresponding confidence limits were calculated by the method of Stephan et al. (1978).

12. **REPORTED RESULTS:** During the test the pH ranged from 6.8-7.6 while the temperature ranged from 22-23°C. Dissolved oxygen concentrations decreased toward the end of the test but were within acceptable levels. Ammonia concentrations were higher at the end of the test, but below toxic levels. After 24 hours there was 100% mortality of bluegill at 5.6 and 10 mg/L and 90% mortality at 3.2 mg/L. After 48 hours there was 70% mortality at 1.8 mg/L and 100% mortality at 3.2 mg/L (Table 3, attached). There was no mortality throughout the test at 1.0 mg/L. The 24-, 48- and 96-hour LC50 values (based on nominal concentrations) were 2.6 mg/L (95% C.L. = 1.8-3.2 mg/L), 1.6 mg/L (95% C.L. = 1.0-3.2 mg/L) and 1.3 mg/L (95% C.L. = 1.0-1.8) mg/L, respectively.

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

The daily mortality rate of organisms was inspected prior to study initiation by the Quality Assurance Unit of ABC Laboratories. An in-progress inspection and final inspection of data and records were also made. A study compliance statement was included in the report, indicating that the study was conducted in compliance with Good Laboratory Practice Regulations.

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

A. **Test Procedure:** The test procedure was in general agreement with the SEP, except for the following deviations:

- o The fish had a mean weight of 0.16 gram. The SEP recommends weights between 0.5 and 5 grams.

- o A concurrent, untreated (dilution water only) control was not used.
 - o No photoperiod or light/dark transition period were reported.
 - o The solvent concentration (667 $\mu\text{L/L}$) exceeded that recommended in the SEP (500 $\mu\text{L/L}$).
 - o Water quality measurements should have been taken from the control, high, medium, and low concentrations. In this study, measurements were not taken at initiation in the medium (3.2 mg/L) concentration.
 - o Age of the fish at initiation of testing was not reported.
 - o Each designated treatment group was exposed to a concentration that is approximately 56 percent of the next highest concentration. The SEP recommends 60 percent of the next highest concentration.
- B. Statistical Analysis: The reviewer recalculated the 96-hour LC50 using EEB's Toxanal computer program. The result (attached) was similar to that performed by the author.
- C. Discussion/Results: This study is scientifically sound and fulfills the requirements for an acute static toxicity test using bluegill sunfish. The deviations from the guideline recommendations probably did not affect the toxicity results. With a 96-hour LC50 value of 1.3 mg/L (95 % C.L. = 1.0-1.8 mg/L) based on nominal concentrations, MON 097 is considered to be moderately toxic to bluegill. The NOEC, although not mentioned by the author, was 1.0 mg/L.
- D. Adequacy of the Study:
- (1) Classification: Core
 - (2) Rationale: N/A
 - (3) Repairability: N/A
15. COMPLETION OF ONE-LINER: Yes. June 11, 1990.

ACETOCHLOR

Page 5 is not included in this copy.

Pages _____ through _____ are not included.

The material not included contains the following type of information:

- Identity of product inert ingredients.
 - Identity of product impurities.
 - Description of the product manufacturing process.
 - Description of quality control procedures.
 - Identity of the source of product ingredients.
 - Sales or other commercial/financial information.
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SCOTT WARD ACETOCHLOR LEPOMIS MACROCHIRUS 06-11-90

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
10	10	10	100	9.765625E-02
5.6	10	10	100	9.765625E-02
3.2	10	10	100	9.765625E-02
1.8	10	10	100	9.765625E-02
1	10	0	0	9.765625E-02

THE BINOMIAL TEST SHOWS THAT 1 AND 1.8 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 1.341641

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE PROBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.
