122804

DATA EVALUATION RECORD

1. CHEMICAL: Avermectin B_1

2. FORMULATION: Technical (91.43% purity)

3. CITATION: EG&G Bionomics. 1981. Acute toxicity of L-676, 863-00V50 technical to bluegill (Lepomis macrochirus). Report # BW-81-6-901 Submitted to Merck Sharp & Dohme, Rahway, N.J. Accession No. 246358 in 618-EUP-10.

4. REVIEWED BY: Mary L. Gessner
Fishery Biologist
HED/EEB

5. DATE REVIEWED: 12/17/81

6. TEST TYPE: 96-hour acute toxicity to warmwater fish

Test species: Bluegill sunfish

7. REPORTED RESULTS: The 96-hour LC_{50} (and 95% C.I.) for bluegill exposed to L-676, 863-00V50 was 9.6 (5.8-16) ppb.

8. Reviewer's Conclusions

This study is scientifically sound and with an LC_{50} of 9.6 ppb, Avermectin B_1 is very highly toxic to bluegill sunfish. This study is adequate to fulfill the acute LC_{50} requirement for warmwater fish.

Materials/Methods

Test Procedure

Test fish were obtained from a commercial supplier and held in a 1700 l epoxy-coated concrete raceway under a photoperiod of 16 hour light and 8 hours dark. Fish were fed, ad libitum, daily except during the 48 hours prior to testing. There was 0.3% mortality in the test fish population during this 2 day period. Holding tank water had a total hardness of 24 mg/l, alkalinity of 22 mg/l, specific conductance of 80-105 u mhos/cm, pH of 6.6-6.7, and D.O. of 90-100% saturation. Test fish were held for 14 days prior to testing.

Testing was conducted in 19.6 l glass jars containing 15L of test solution. Dilution water was reconstituted water with the following chemical characteristics: hardness-42 mg/l, alkalinity-32 mg/l, pH-7.4. A solvent control and a dilution water control were run. Test temperatures were maintained at 22 ± 1°C. Test solutions were not aerated. Ten fish , having a mean length of 31 (23-36)mm and mean weight of 0.34 (0.11-0.68) g, were randomly distributed to test jars. Feed was withheld during testing. Mortalities were recorded and removed and biological observations were made and recorded at 0, 24, 48, 72 and 96 hours of exposure.

Statistical Analysis

Data were analyzed by a computer program using binomial probability methods.

Discussion/Results

The 96-hour LC_{50} (and 95% C.I.) for bluegill exposed to L-676, 863-00V50, estimated by binomial probability, was 9.6 (5.8-16) ug/l. The no effect concentration was determined to be 5.8 ug/l.

Reviewer's Evaluation

A. Test Procedure

Test procedure generally followed EPA-recommended protocol. Fish were smaller than the preferred size of 0.2 - 5.0g.

B. Statistical Analysis

Data analysis was validated using the Stephans program, with the following results:

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
75	10	10	100	0.08765625
45	10	10	100	0.09765625
27	10	10	100	0.09765625
16	10	10	100	0.09765625
9.7	10	2	20	5.46875
5.8	10	0	0	0.09765625
3.5	10	0	0	0.09765625

THE BINOMIAL TEST SHOWS THAT 5.8 AND 16 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 LC_{50} FOR THIS SET OF DATA IS 11.35486

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.

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C. Discussion/Results

The reported LC_{50} of 9.6 ppb for bluegill sunfish exposed to L-676, 863-00V50 is acceptable.

D. Conclusions

1. Category: Core