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 to rainbow trout (Salmo gaidneri). 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:** 12/15/81

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

   Test Species: Rainbow trout

7. **REPORTED RESULTS:**

   The 96-hour LC_{50} (and 95% C.I.) for rainbow trout exposed to L-676, 863-00V50 was 3.6 (2.2-6.0) ppb.

8. **REVIEWER'S CONCLUSIONS:**

   This study is scientifically sound and is adequate to fulfill the guideline requirement regarding acute toxicity to coldwater fish. With an LC_{50} of 3.2 ppb, Avermectin B_1 is very highly toxic to coldwater fish.

Materials/Methods

Test Procedure

Rainbow trout were obtained from a commercial supplier and held in a 500 liter fiberglass tank in a 16-hour light/8-hour dark photoperiod. Fish were fed a dry pelleted food, ad libitum, daily except during the 48 hours prior to testing. There was 0.1% mortality in the test fish population during the 2 days prior to testing. Water in the holding tank had total hardness of 25-28 mg/l, Alkalinity of 24-28 mg/l, conductance of 110-130 u mhos/cm, ph of 6.9-7.1 and D.O. of 85-100% saturation. Test fish were held for a minimum of 14 days at 13-17°C.

Testing was conducted in 19.6 L glass jars containing 15L of solution. Dilution water was reconstituted water with the following characteristics: hardness - 40 mg/l $CaCO_3$, alkalinity - 31 mg/l $CaCO_3$, pH-7.5, specific conductance - 120 u mhos/cm. Stock solution of the toxicant was prepared in acetone. Two control jars, one with acetone and one without, were maintained throughout the test period. Test tanks were kept at 12±1°C and were not aerated. Test fish had a mean length of 33(29-38)mm and mean weight of 0.31 (0.17-0.44) grams. Ten fish/tank were randomly distributed to test jars within 10 minutes of adding the test solution. Mortalities and behavioral observations were recorded at 0, 24, 48, 72 and 96 hours. The pH and D.O. were recorded at 0 and 96 hours.

Statistical Analysis

The computer program utilized estimated LC_{50} values using one of three statistical methods in the following order of perference: moving average angle analysis, probit analysis, binomial probability. The computer program scanned the data base, identified the most preferred statistical method and performed the analysis. In this case, binomial probability was utilized.

Discussion/Results

The 96-hour LC_{50} (and 95% C.I) for rainbow trout exposed to L-676, 863-00V50, estimated by binomial probability was 3.6 (2.2-6.0) ug/l. The 96-hour no discernible effect concentration was determined to be 0.78 ug/l.

Reviewer's Evaluation

A. Test Procedure

Test procedures generally followed EPA recommended testing protocols.

B. Statistical Analysis

Data was validated using the Stephan's program, with the following results:

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BONOMIAL PROB. (PERCENT)
6	10	10	100	0.09765625
3.6	10	7	70	17.1875
2.2	10	0	0	0.09765625
1.3	10	0	0	0.09765625
0.78	10	0	0	0.09765625
0.46	10	0	0	0.09765625

THE BINOMIAL TEST SHOWS THAT 2.2 AND 6 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 3.217206

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

   Our analysis of the data resulted in an LC_{50} of 3.2 ppb, as
opposed to the reported LC_{50} of 3.6 ppb. The C_{50} will therefore
be considered 3.2 ppb.

D. Conclusions

   1. Category: Core (based on a LC_{50} of 3.2 ppb)

   2. Rationale: N/A

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