

US EPA ARCHIVE DOCUMENT

DATA EVALUATION RECORD

9-12-86

1. Chemical: PP 321
2. Test Material: EC, 12.92% ai
3. Study/Action Type: Fish 96-hr Acute Toxicity - Continous Flowthrough Bluegill Sunfish
4. Study ID: PP 321: Determination of acute toxicity of a 1 lb/US gallon EC formulation to bluegill sunfish (Lepomis macrochirus) by R.W. Hill, ICI, March 1985, EPA Accession No. 259807.

5. Reviewed By: Ann Stavola
Aquatic Biologist
EEB/HED

Signature: *Ann Stavola*
Date: *Sept 5, 1986*

6. Approved By: Doug Urban
Supervisory Biologist
EEB/HED

Signature: *Douglas J. Urban*
Date: *9/12/86*

7. Conclusions:

The study is scientifically sound but does not meet EPA Guidelines requirement since it was conducted with a formulated product. The study indicates that with an LC₅₀ value of 2.2 (1.9-2.7) ug/L an EC formulation of PP 321, 12.92% ai is very highly toxic to warmwater fish.

8. Recommendations:

If formulated product testing is required for this product, this study will be Core for that requirement.

9. Background:

This study was submitted to support the EUP application of Karate 1 EC Insecticide.

10. Materials and Methods:

- a. Test Animals: Bluegill Sunfish (*Lepomis macrochirus*) obtained from Sea Plantations, Inc., Salem, MA:

Weight = 1.06 g, range of 0.47 to 2.06 g.
Length = 35.2 mm, range of 29 to 45 mm.

- b. Dosage: PP 321, EC formulations (GFU383C), 1 lb/gal, 12.92% ai. Stock concentrations were made with deionized water; Dilution water - hardness of 64.1, alkalinity of 21 and conductivity of 176. Continuous flowthrough system with a renewal rate of 200 mL/min and 95% exchange of the test solution within 4.5 hours. Concentrations were measured by GC.

- c. Study Design: The test was conducted in 20 L glass vessels. The measured concentrations were: fw control, 0.24, 0.31, 0.77, 1.72, 3.81, 7.43, and 11.40 ug PP 321/L. There were 20 fish per concentration. The fish were acclimatized in the test vessels for at least 2 days at the test temperature of 22 °C prior to the initiation of the test.

- d. Statistical Analysis: The data were analyzed with Finney's probit analysis.

11. Reported Results:

Nominal conc. (ug/L)	Measured Conc. (ug/L)	% Mortality			
		24h	48h	72h	96h
18	11.40	100	100	100	100
10	7.43	100	100	100	100
5.6	3.81	0	60	100	100
3.2	1.72	0	0	5	15
1.8	0.77	0	0	0	0
1.0	0.31	0	0	0	0
0.56	0.24	0	0	0	0
FW control	-	0	0	0	0

Time	LC ₅₀ (ug/L)	95% ci (Based on measured concentrations)
24h	5.3	(3.8-7.4)
48h	3.5	(2.9-4.1)
72h	2.4	(2.0-2.9)
96h	2.2	(1.9-2.7)

The general symptoms of toxicity were loss of equilibrium, quiescence, darkening in color, spiraling and rapid and irregular respiration. These symptoms generally occurred at 0.77 $\mu\text{g/L}$ and greater.

DO levels ranged from 7.6 to 8.4 mg/L, and pH values ranged from 7.5 to 7.7 in the fish exposure vessels.

12. Study Author's Conclusions/QA Measures:

The 96-hr LC_{50} value of PP 321 EC, 12.92% ai is 2.2 (1.9-2.7) $\mu\text{g/L}$ to bluegill sunfish.

"The conduct of this study has been inspected/audited in accordance with ICI's Policies and Procedures for Good Laboratory Practices."

13. Reviewer's Evaluation:

- a. Test Procedures: The protocol used in this study basically follows Methods for Acute Toxicity Tests With Fish, Macroinvertebrates and Amphibians, EPA-660/3-75-009, April 1975. Instead of the technical grade, a formulated product was the test material.
- b. Statistical Analysis: The data were analyzed with EEB's "Aquatox Program." The 96-hr LC_{50} values was computed to be 2.27 (1.72-3.81) $\mu\text{g/L}$ by the binomial method.
- c. Discussion/Results: The data indicate that an EC formulation of PP 321, 12.92% ai is very highly toxic to warmwater fish.
- d. Conclusions:
 1. Category: Supplemental.
 2. Rationale: The study is scientifically sound but does not meet EPA Guidelines requirement for an acute toxicity test with a warmwater fish.
 3. Reparability: If formulated product testing is required with this formulation, this study will be Core for that requirement.

STAVOLA PP321 EC BLUEGILL ACUTE 96 HR

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
11.4	20	20	100	9.536742E-05
7.43	20	20	100	9.536742E-05
3.81	20	20	100	9.536742E-05
1.72	20	3	15	.1288414
.77	20	0	0	9.536742E-05
.31	20	0	0	9.536742E-05
.24	20	0	0	9.536742E-05

THE BINOMIAL TEST SHOWS THAT 1.72 AND 3.81 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 2.274421

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.
