DATA EVALUATION RECORD

1. <u>Chemical</u>: PP 321 = *lambda Cyhalo*

2. <u>Test Material</u>: Technical, 98% ai

3. <u>Study/Action Type</u>: Fish 96-hr Acute Toxicity Study –
   Continuous Flow, Bluegill Sunfish

4. <u>Study ID</u>: PP 321: Determination of acute toxicity
   to bluegill sunfish (<u>Lepomis macrochirus</u>),
   R.W. Hill, ICI, August 1984, EPA Accession
   No. 259807.

5. <u>Reviewed By</u>: Ann Stavola   Signature: *Ann Stavola*
   Aquatic Biologist
   EEB/HED   Date: *Sept 11, 1986*

6. <u>Approved By</u>: Doug Urban   Signature:
   Supervisory Biologist
   EEB/HED   Date: *9/12/86*

7. <u>Conclusions</u>:

   The study is scientifically sound and meets EPA
   Guidelines requirement for acute toxicity testing with
   warmwater fish. With an LC_{50} value of 0.21 (8.18–0.25) *0.16 to 0.3*
   ug/L technical PP 321 is very highly toxic to warmwater
   fish.

8. <u>Recommendations</u>: N/A.

9. <u>Background</u>:

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

10. Materials and Methods:

    a. Test Animals: Bluegill sunfish (Lepomis macrochirus) obtained from Sea Plantations, Inc., Salem, MA, USA:

        Weight = 1.51 g, range = 0.7 to 2.6 g.
        Length = 38.2 mm, range = 36 to 46 mm.

    b. Dosage: PP 321, 98% ai. Stock concentrations made with acetone and deionized water. Dilution water – hardness 68 and conductivity 137. Continuous flowthrough system with a renewal rate of 200 ml/min and 95 percent exchange of test solutions 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, solvent control, 0.06, 0.10, 0.16, 0.31, 0.65, and 1.17 ug PP 321/L. There were 20 fish per concentration. The fish were acclimatized in the test vessels for 2 days at the test temperature of 22 °C prior to the initiation of the test.

    d. Statistical Analysis: The raw data were analyzed by Finney's probit analysis.

11. Report Results:

Nominal Conc. (ug/L)	Measured Conc. (ug/L)	% Mortality			
		24h	48h	72h	96h
1.8	1.17	100	100	100	100
1.0	0.65	95	100	100	100
0.56	0.31	5	70	70	100
0.32	0.16	0	0	0	5
0.18	0.10	0	0	0	0
0.10	0.06	0	0	0	0
Acetone Control	–	0	0	0	0
FW Control	–	0	0	0	0

Time	LC_{50} (ug/L)	95% ci (Based on measured concentrations)
24h	0.45	(0.38-0.52)
48h	0.28	(0.23-0.32)
72h	0.28	(0.23-0.32)
96h	0.21	(0.18-0.25)

DO levels and pH values ranged from 7.0 to 8.4 mg/L and 7.4 to 8.6 pH units, respectively, in the fish exposure vessels.

The general symptoms of toxicity in the fish exposed to PP 321 were loss of equilibrium, quiescence, darkening in color, and spiraling. These symptoms generally occurred more frequently in fish exposed to 0.16 ug/L and greater.

12. <u>Study Author's Conclusions/QA Measures</u>:

The 96-hr LC_{50} for PP 321 to warmwater fish is 0.21 (0.18-0.25) ug/L. The study followed Good Laboratory Practices.

13. <u>Reviewer's Discussion</u>:

a. <u>Test Procedure</u>: The protocol used in this study follows <u>Methods for Acute Toxicity Tests With Fish, Macro-invertebrates and Amphibians</u>, EPA-660/3-75-009.

b. <u>Statistical Analysis</u>: The data were analyzed with EEB's "Aquatox Program." The 96-hr LC_{50} value was computed to be 0.21 (0.16-0.31) ug/L with the binomial method.

c. <u>Discussion/Results</u>: The data indicate that PP 321 is very highly toxic to warmwater fish.

d. <u>Conclusions</u>:

1. Category: Core.

2. Rationale: The study is scientifically sound and meets EPA Guidelines requirement for acute toxicity testing with warmwater fish.

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STAVOLA PP321 BLUEGILL ACUTE 96 HR
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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
1.17	20	20	100	9.536742E-05
.65	20	20	100	9.536742E-05
.31	20	20	100	9.536742E-05
.16	20	1	5	2.002716E-03
.1	20	0	0	9.536742E-05
.06	20	0	0	9.536742E-05

THE BINOMIAL TEST SHOWS THAT .16 AND .31 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 .2132414

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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