128834

DATA EVALUATION RECORD

1. Chemical: Pyridate

2. Test Material: Technical (90% ai)

3. Study Type: Acute Toxicity (96-hr LC_{50}) marine/estuarine shrimp toxicity

   Species tested: Mysidopsis bahia

4. Study ID: Irwin, S. and G. S. Ward. 1984. Acute Toxicity of LX101-01 technical to shrimp (Mysidopsis bahia). Prepared by Springborn Bionomics; submitted to W.R. Landis Assoc. Inc.; submitted by Gilmore, Inc., Acc. No. 073281

5. Review By: John J. Bascietto
   Wildlife Biologist
   Ecological Effects Branch/HED
   Signature: John J. Bascietto
   Date: 5/1/85

6. Approved By: Dave Coppage
   Supervisory Biologist
   Ecological Effects Branch/HED
   Signature: D Coppage
   Date: 5/1/85

7. Conclusions:

   The study is scientifically sound with an LC_{50} = 4 (3.4-5.1) ppm, LX-101-01 technical is considered "moderately" toxic to mysid shrimp. The study fulfills the requirement for an acute toxicity study on shrimp.

8. Recommendations:

   N/A

9. Background:

The study was required to support proposed registration on cotton, rice and peanuts.

10. Discussion of Individual Studies:

N/A

11. Materials/Methods:

(Definitive study)

A. Test Animal: 2-3 day-old mysid shrimp cultured at the test facility, fed brine shrimp nauplii (Artemia salina) daily prior to test. Test system was six (6) concentrations two replicates of ten shrimp for a total of 20 shrimp per concentration and acetone carrier and negative seawater controls; test vessels were 1.6 glass culture dishes with 1 solution; salinity of test water was 30 parts per thousand; test conducted under flourescent lighting 14 hr light/10 hr dark; water temp = 22-23°C; no aeration. Feeding on Day 0 and Day 2 of test to reduce cannabalism. Loading $\leq$ 0.8 g/ on test.

B. Dose: static bioassay using nominal conc.

C. Design: Two (2) replicate bowls - 10 shrimp each replicate; at six (6) doses - 0.64, 1.0, 1.7, 2.9, 4.8 and 8.0 mg/ ; plus a control (seawater and a solvent control (acetone at 0.2 ml - the max. used in any vessel).

D. Statistics: none used

12. Reported Results:

The study authors estimated the 96-hr LC_{50} to be >2.9 <4.8 ppm. No 95% confidence limits can be indicated for estimations. A completely linear dose-response curve was not obtained because of fewer mortalities of 8.0 ppm (40%) than at 4.8 ppm (70%); however the lower portion of the curve (0.64 ppm, 1.0 ppm, 1.7 ppm, 2.9 ppm and 4.8 ppm) was linear with mortality from 5% to 70%. 5% mortality was observed in the solvent control.

13. Study Author's Conclusions/QA Measures

96 hr LC_{50} >2.9 <4.8 ppm. Q.A. statement attached to report (p.6)- signed by Thomas Maziarz.

14. Reviewer's Discussion and Interpretation of the Study

A. Test Procedures: were generally in accordance with the protocols suggested by the Pesticide Assessment Guidelines.

B. Statistical Analysis: EEB evaluated the mortality data using the Toxanal (Stephan's) LC_{50} program - results attached.

C. Discussion/Results: The authors speculate and EEB agrees that the lack of correlation between the upper doses and mortality occurred because of the solubility of LX 101-01 in seawater (8 ppm exceeds the solubility in seawater).

EEB recalculated the 96-hr LC_{50} and 95% c.i. excluding the data at 8 ppm and including Abbot's correction for control mortality. Using three different methods the LC_{50} was estimated at approximately 4 ppm. 95% c.i. were: 2.9 + infinity (binomial); 3.4 - 5.1 (moving average); and 1.2 + infinity (probit).

Although the data obtained did not produce a definitive LC_{50}, the mortality obtained meets the criteria of Guidelines protocols.

With an LC_{50} = 4 ppm (3.4 - 5.1) the tested material is considered moderately toxic to mysid shrimp.

D. Adequacy of Study:

1. Classification: Core
2. Rationale: Guidelines
3. Repair: N/A

E. Completion of One Liner: 4/15/85

F. CBI Appendex: Statistical analysis attached as Appendix A.

Appendix A to DER

NOTE: BECAUSE THERE WAS CONTROL MORTALITY, AND NONE
OF THE LOWER CONCENTRATIONS PRODUCED ZERO MORTALITY,
THE DATA HAS BEEN SUBJECTED TO ABBOTT'S CORRECTION.

LX 101-01 Technical

BASCIETTO PYRI DATE MYSID SHRIMP ACUTE LC50 Technical LX101-01

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
4.8	19	13	68.4211	3.17841
2.9	19	3	15.7895	.221252
1.7	19	4	21.0526	.960541
1	19	4	21.0526	.960541
.64	19	0	0	1.90735E-04

THE BINOMIAL TEST SHOWS THAT 2.9 AND +INFINITY 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 4.05351

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
1	.345723	4.05351	3.47527	5.16098

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
4	1.87535	2.93449	.0320212

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED
USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 2.12955
95 PERCENT CONFIDENCE LIMITS =-.786728 AND 5.04582

LC50 = 4.1272
95 PERCENT CONFIDENCE LIMITS = 1.24277 AND +INFINITY

LC10 = 1.0454
95 PERCENT CONFIDENCE LIMITS = 0 AND 2.6461

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