

US EPA ARCHIVE DOCUMENT

DATA EVALUATION RECORD

1. Chemical: Thiophanate-methyl
2. Test Material: Technical, (95.8% ai)
3. Study Type: Aquatic invertebrate acute toxicity test

Species tested: Daphnia carinata

4. Study ID: Nishibe, T. 1986. Thiophanate-methyl - Acute Toxicity Study in Daphnids. Nippon Soda Co., Ltd., Report No. 0215. Submitted by Atochem North America, Inc., Philadelphia, PA. EPA Acc. No. 400955-05.

5. Reviewed By:

Allen W. Vaughan
Entomologist
EEB/EFED

Signature: Allen W. VaughanDate: 11.9.906. Approved By

Norman J. Cook
Supervisory Biologist
EEB/EFED

Signature: Norman J. CookDate: 11.16.907. Conclusions:

This study appears to be scientifically sound, but does not fulfill the guideline requirement for an acute toxicity study with a fresh-water aquatic invertebrate. There were significant deviations from recommended procedure and deficiencies in the study report.

8. Recommendations: The invertebrate acute study with thiophanate-methyl must be redone, as the present study cannot be repaired. Daphnia carinata is not a recommended test species; we have no information on this species.

9. Background: This study was submitted to support reregistration of thiophanate-methyl.

10. Discussion of Individual Tests: N/A

11. Materials and Methods:

A. Test animals were D. carinata from laboratory cultures, 0.96 mm in mean length and less than 24 hours old.

B. Test System : This experiment was done in small glass chambers containing 125 ml water, placed in an experimental room maintained at 20° C. Each chamber contained 5 daphnids. Tap water was used as dilution water.

C. Dose: Static bioassay using nominal concentrations; DMF and Tween 80 used as solvents.

D. Design: Eight concentrations (nominal = 3.2, 5.6, 10, 18, 32, 56, 100, and 178 mg/L), plus control and solvent control (136 mg/L DMF; 16 mg/L Tween 80); 4 reps. of each, with 5 daphnids per rep.

E. Statistics: LC50 was calculated using the probit method.

12. Reported Results:

Reported 48-hour LC50 = 20.2 mg/L.

13. Study Authors' Conclusions/ QA Measures

LC50 was determined to be 20.2 mg/L.

The study was conducted before the requirements for GLP were in effect.

14. Reviewer's Discussion and Interpretation of the Study

A. Test Procedures: There were numerous deviations from standard protocol, including the following:

- Daphnia carinata is not a recommended test species;
- Tap water was used as the dilution water;
- No lighting was provided during the test;
- Solvent concentrations were extremely high;
- Temperature, dissolved oxygen, and pH were not adequately measured and reported.

B. Statistical Analysis: EEB validated the analysis and determined that it was appropriate.

C. Discussion/Results: This study is scientifically sound, but does not fulfill the data requirement for an acute test with freshwater invertebrates.

D. Adequacy of Study:

1. Classification: Supplemental
2. Rationale: Numerous deviations in test procedure and deficiencies in study report.
3. Reparability: Not reparable.

15. Completion of One-Liner for Study:

One-liner completed October 15, 1990.

16. CBI Appendix: N/A

Vaughan Thiophanate-methyl Daphnid LC50

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
178	20	20	100	9.536742E-05
100	20	20	100	9.536742E-05
56	20	20	100	9.536742E-05
32	20	11	55	41.19014
18	20	9	45	41.19014
10	20	1	5	2.002716E-03
5.6	20	1	5	2.002716E-03
3.2	20	0	0	9.536742E-05

THE BINOMIAL TEST SHOWS THAT 10 AND 56 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 23.99999

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
7	4.940145E-02		20.89651	16.32836
6.41274				

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H
5	8.012626E-02	1
.2713616		

SLOPE = 3.668095
 95 PERCENT CONFIDENCE LIMITS = 2.629783 AND 4.706407

LC50 = 22.16661
 95 PERCENT CONFIDENCE LIMITS = 18.05745 AND 27.17823

LC10 = 9.987814
 95 PERCENT CONFIDENCE LIMITS = 6.755554 AND 12.83636
