2-17-98

MRID No. 443717-16

DATA EVALUATION RECORD
AQUATIC INVERTEBRATE LIFE CYCLE TEST
GUIDELINE 72-4(B)

1. **CHEMICAL:** Methyl Parathion — PC Code No.: 53501

2. **TEST MATERIAL:** Methylparathion — Purity: 80%

3. **CITATION:**

Authors:	A. Fernández-Casalderrey, M.D. Ferrando, and E. Andreu-Moliner
Title:	Chronic Toxicity of Methylparathion to *Daphnia magna*: Effects on Survival, Reproduction, and Growth
Study Completion Date:	Publication received on September 15, 1993
Laboratory:	Laboratory for Ecotoxicology, University of Valencia, Valencia, Spain
Sponsor:	Comision Interministerial de Ciencia y Tecnologia (CICYT) del Ministerio de Educacion y Ciencia, Spain
Laboratory Report ID:	Bull. Environ. Contam. Toxicol. (1995) 54:43-49
MRID No.:	443717-16
DP Barcode:	Not Available

4. **REVIEWED BY:** Max Feken, M.S., Environmental Toxicologist, Golder Associates Inc.

Signature: [signature] **Date:** 12/8/97

APPROVED BY: Pim Kosalwat, Ph.D., Senior Scientist, Golder Associates Inc.

Signature: P. Kosalwat **Date:** 12/8/97

5. **APPROVED BY:**

Signature: [signature] **Date:** 2/17/98

6. **STUDY PARAMETERS:**

Age of Test Organism:	<24 hours
Definitive Test Duration:	21 days
Study Method:	Static Renewal
Type of Concentrations:	Nominal

7. **CONCLUSIONS:** This study is scientifically sound but does not fulfill the guideline requirements for a freshwater invertebrate life-cycle test using *Daphnia magna*. Based on the most sensitive parameters (survival, growth, and reproduction), the MATC was between 0.20 and 0.25 ppt. The geometric mean MATC was 0.22 ppt.

Results Synopsis:

NOEC: 0.20 ppt **LOEC:** 0.25 ppt **MATC:** 0.22 ppt

LOEC's for specific effects:
Neonates Produced: 0.25 ppt
Daphnid Survival: 0.25 ppt
Growth (length): 0.25 ppt

8. **ADEQUACY OF THE STUDY:**

A. **Classification:** Supplemental

B. **Rationale:** The study was not conducted following the guidelines set forth by EPA.

C. **Repairability:** No.

9. **GUIDELINE DEVIATIONS:** This study was submitted to provide supplemental information for the registration/re-registration of methyl parathion. The test procedures did not follow the SEP and pertinent information was missing from the article.

10 **SUBMISSION PURPOSE:**

11. **MATERIALS AND METHODS:**

A. **Test Organisms/Acclimation:**

Guideline Criteria	Reported Information
Species *Daphnia magna*	*Daphnia magna*
Source	In-house culture
Parental Acclimation Conditions Parental stock must be maintained separately from the brood culture in dilution water and under test conditions.	Daphnid cultures were maintained under similar conditions as those used during the test.

Guideline Criteria	Reported Information
Parental Acclimation Period At least 21 days.	Not reported
Age of Parental Stock At least 10-12 days old at the beginning of the acclimation period.	Not reported
Food Synthetic foods (trout chow), algae, or synthetic foods in combination with alfalfa yeast and algae.	*Nannochloris oculata*
Food Concentration 5 mg/l (dry wt.) of synthetic food or 10^8 cells/l of algae is recommended.	5 X 10^5 cell/mL of algal suspension daily
Were daphnids in good health during acclimation period?	Yes

B. Test System:

Guideline Criteria	Reported Information
Test Water Unpolluted well or spring that has been tested for contaminants, or appropriate reconstituted water (see ASTM for details).	Dechlorinated tap water
Water Temperature 20°C ±2°C. Must not deviate from 20°C by more than 5°C for more than 48 hours.	Not reported
pH 7.6 to 8.0 is recommended. Must not deviate by more than one unit for more than 48 hours.	7.9 ± 0.2
Total Hardness 160 to 180 mg/l as $CaCO_3$ is recommended.	250 mg/L as $CaCO_3$

Guideline Criteria	Reported Information
Dissolved Oxygen Renewal: must not drop below 50% for more than 48 hours. Flow-through: ≥ 60% throughout test.	Not reported
Test Vessels or Compartments 1. Material: Glass, No. 316 stainless steel, or perfluorocarbon plastics 2. Size: 250 ml with 200 ml fill volume is preferred; 100 ml with 80 ml fill volume is acceptable.	1. Glass 2. 60-mL filled to approximately 50 mL
Covers Renewal: Test vessels should be covered with a glass plate. Flow-through: openings in test compartments should be covered with mesh nylon or stainless steel screen.	Not reported
Type of Dilution System Must provide reproducible supply of toxicant. Intermittent flow proportional diluters or continuous flow serial diluters should be used.	N/A
Flow Rate Consistent flow rate of 5-10 vol/24 hours, meter systems calibrated before study and checked twice daily during test period.	N/A
Aeration Dilution water should be vigorously aerated, but the test tanks should not be aerated.	Not reported
Photoperiod 16 hours light, 8 hours dark.	Not reported

Guideline Criteria	Reported Information
Solvents Not to exceed 0.5 ml/l for static tests or 0.1 ml/l for flow-through tests. Acceptable solvents are dimethyl formamide, triethylene glycol, methanol, acetone and ethanol.	Solvent: acetone Maximum conc.: 0.1 µL/L

C. Test Design:

Guideline Criteria	Reported Information
Duration 21 days	21 days
Nominal Concentrations Control(s) and at least 5 test concentrations; dilution factor not greater than 50%.	Dilution water control, solvent control and 6 nominal concentrations: 0.07, 0.15, 0.20, 0.25, and 0.27 ng/L
Number of Test Organisms 22 daphnids/level; 7 test chambers should contain 1 daphnid each, and 3 test chambers should contain 5 daphnids each.	15 daphnids raised individually
Test organisms randomly or impartially assigned to test vessels?	Yes
Renewal Parent daphnids in all beakers must be transferred to containers with fresh test solution (< 4 hours old) three times each week (e.g. every Monday, Wednesday and Friday).	Parent daphnids were transferred to a clean beaker containing fresh medium and food every other day.

Guideline Criteria	Reported Information
Water Parameter Measurements 1. Dissolved oxygen must be measured at each concentration at least once a week. 2. pH, alkalinity, hardness, and conductance must be measured once a week in one test concentration and in one control. 3. Temperature should be monitored at least hourly throughout the test in one test chamber, and near the beginning, middle and end of the test in all test chambers.	Not reported
Chemical Analysis Needed if chemical was volatile, insoluble, or known to absorb, if precipitate formed, if containers were not steel or glass, or if flow-through system was used.	No analysis was performed.

12. **REPORTED RESULTS:**

A. General Results:

Guideline Criteria	Reported Information
Quality assurance and GLP compliance statements were included in the report?	No
Control Mortality ≤ 30%	0% in both the dilution water and solvent control
Did daphnids in each control produce at least 40 young after 21 days?	Yes
Were any ephippia produced in any of the controls?	Not reported

Guideline Criteria	Reported Information
Data Endpoints - Survival of first-generation daphnids, - Number of young produced per female, - Dry weight (required) and length (optional) of each first generation daphnid alive at the end of the test, - Observations of other effects or clinical signs.	- Survival of first-generation daphnids, - Number of young produced per female, - Day to first eggs - Intrinsic rate of natural increase "r", - Mean caparace length of 21-day-old daphnids.
Raw data included?	No

Effects Data

Nominal Toxicant Concentration (ng/L)	Percent Mortality (21 Days)	Mean Number Young per Female	Mean Caparace Length (cm)
Pooled Control	0%	51.92	0.76
0.07	0%	NR[a]	NR
0.15	0%	NR	NR
0.20	13%	NR	NR
0.25	40%[b]	33.81[b]	0.68[b]
0.27	43%[b]	25.36[b]	0.68[b]

[a] NR - Not Reported
[b] Significantly different from the pooled control ($p \leq 0.05$).

Toxicity Observations: None

B. **Statistical Results:** Analyses were based on mean response values compared to the pooled control.

Endpoint	Method	NOEC (ppt)	LOEC (ppt)
Survival	Duncan's test	0.20	0.25
Young per adult	Duncan's test	0.20	0.25
Length	Duncan's test	0.20	0.25

13. **VERIFICATION OF STATISTICAL RESULTS:** The report did not contain raw data. Therefore, the reviewer could not verify the statistical results.

14. **REVIEWER'S COMMENTS:** This study is scientifically sound but does not fulfill the guideline requirements for a daphnid life-cycle test. Based on the most sensitive endpoints (survival, growth and reproduction), the NOEC and LOEC were 0.20 and 0.25 ppt, respectively. The geometric mean MATC was 0.22 ppt. This study is classified as **Supplemental.**