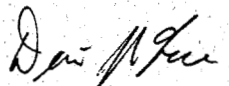


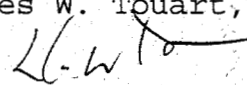
US EPA ARCHIVE DOCUMENT

DATA EVALUATION RECORD
S 72-2 -- ACUTE LC₅₀ TEST WITH A FRESHWATER INVERTEBRATE

1. CHEMICAL: Glyphosate S#:103601
2. TEST MATERIAL: Roundup Purity: Not reported
3. CITATION

| | |
|--------------------------------|--|
| <u>Authors</u> : | W. A. Hartman & D.B. Martin |
| <u>Title</u> : | Effect of Suspended Bentonite Clay on the Acute Toxicity of Glyphosate to <i>Daphnia pulex</i> and <i>Lemna minor</i> , Bull. Environ. Contam. Toxicol. 33:355-361 |
| <u>Study Completion Date</u> : | Published 1984 |
| <u>Laboratory</u> : | Columbia National Fisheries Research Laboratory, Field Research Station, R.R.1 Box 295, Yankton, SD 57078 |
| <u>Sponsor</u> : | I. Pi. CI. SpA. |
| <u>Laboratory Report ID</u> : | N/A |
| <u>MRID No.</u> : | 44125714 |
| <u>DP Barcode</u> : | D231056 |
4. REVIEWED BY: Dennis McLane, Wildlife, EEB, EFED

| | | |
|--------------------|--|-----------------------|
| <u>Signature</u> : |  | <u>Date</u> : 4-11-97 |
|--------------------|--|-----------------------|
5. APPROVED BY: Les W. Touart, Head of Section 1, EEB, EFED

| | | |
|--------------------|---|-----------------------|
| <u>Signature</u> : |  | <u>Date</u> : 4/24/97 |
|--------------------|---|-----------------------|
6. STUDY PARAMETERS

| | |
|---------------------------|-----------------|
| Age of Test Organism: | Mature daphnids |
| Definitive Test Duration: | 48 hours |
| Study Method: | Static |
| Type of Concentrations: | Nominal |
7. CONCLUSIONS:

This study contained five tests, three with *Daphnia pulex* and two with *Lemna minor*. For each species two tests were performed: one with glyphosate and one with glyphosate + suspended sediment. In addition, there was an experiment simulating a single dose of glyphosate to *D. pulex* populations. For simplicity sake three DERs were created one for the *Lemna minor* and two for *Daphnia pulex*. One of the DERs is for the acute *Daphnia* studies and the other for the population study.

This DER is for the *Daphnia pulex* both with and without sediments. This EC50 test is scientifically sound based on the available data. However, it does not fulfill the



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guideline requirements. The test species and its age are different than the guidelines requirements.

Results Synopsis

Glyphosate without suspended sediments

48 hr EC₅₀: 7.9 ppm ai 95% C.I.: 7.2 -8.6 ppm ai
NOEL: Not reported ppm ai; Probit Slope: N/A

Glyphosate + suspended sediments

48-hr LC₅₀: 3.2 ppm ai 95% C.I.: 3.0-3.4 ppm ai
Probit Slope: N/A NOEC: Not reported

8. ADEQUACY OF THE STUDY

A. Classification: Supplemental

B. Rationale: The test species and the age do not meet the guidelines.

C. Repairability: The above items mentioned under Rational can not be changed after the study is completed.

9. Guideline Deviations

1. The study failed to report:
 - 1.10 If all organisms were the approximately the same size and weight.
 - 1.11 Any signs of disease or injury.
 - 1.12 Any feeding during the study.
 - 1.13 Percent mortality during the 48 hours prior to testing.
 - 1.14 D.O. Concentration.
 - 1.15 Biomass loading rate.
 - 1.16 Photoperiod.
 - 1.17 Range finding test.
 - 1.18 If any organisms were randomly assigned to there dose level.

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1.19 How often D.O., Temperature, and PH were monitored.

1.20 Quality assurance and GLP documentation.

1.21 Raw data.

1.22 Deaths per level per day.

1.23 Concentration levels.

2. Item that did not fulfill the guidelines:

2.10 Species tested.

2.11 First instar not mature daphnids:

2.12 Temperature was 15°C rather than 20°C.

2.13 Hardness was 282 mg/L as CaCO₃, rather than 44 mg/L as CaCO₃.

10. SUBMISSION PURPOSE:

Registration of an older chemical by other company.

11. MATERIALS AND METHODS

A. Test Organisms

| Guideline Criteria | Reported Information |
|---|--|
| <u>Species</u> Preferred species is <i>Daphnia magna</i> | <i>Daphnia pulex</i> |
| All organisms are approximately the same size and weight? | Not Reported |
| <u>Life Stage</u> Daphnids: 1 st instar (<24 h). Amphipods, stoneflies, and mayflies: 2 nd instar. Midges: 2 nd & 3 th instar. | Mature daphnids |
| <u>Supplier</u> | The laboratories own culture originally collected from the Missouri River. |

| Guideline Criteria | Reported Information |
|-------------------------------------|----------------------|
| All organisms from the same source? | Yes |

B. Source/Acclimation

| Guideline Criteria | Reported Information |
|--|------------------------|
| <u>Acclimation Period</u> Minimum 7 days | Laboratory own culture |
| Wild caught organisms were quarantined for 7 days? | Yes |
| Were there signs of disease or injury? | Not reported |
| If treated for disease, was there no sign of the disease remaining during the 48 hours prior to testing? | N/A |
| <u>Feeding</u> No feeding during the study. | Not reported |
| <u>Pretest Mortality</u> No more than 3% mortality 48 hours prior to testing. | Not reported |

C. Test System:

| Guideline Criteria | Reported Information |
|---|----------------------|
| <u>Source of dilution water</u> Soft reconstituted water or water from a natural source, not dechlorinated tap water. | Well water |
| Does water support test animals without observable signs of stress? | Yes |
| <u>Water Temperature</u> Daphnia: 20°C Amphipods and mayflies: 17°C Midges and mayflies: 22°C Stoneflies: 12°C | 15°C |

| Guideline Criteria | Reported Information |
|--|------------------------------------|
| Ph Prefer 7.2 to 7.6. | 7.6 |
| Dissolved Oxygen Static: $\geq 60\%$ during 1 st 48 h and $\geq 40\%$ during 2 nd 48 h, flow-through: $\geq 60\%$. | Not reported |
| Total Hardness Prefer 40 to 48 mg/L as CaCO ₃ . | 282 mg/L as CaCO ₃ |
| Test Aquaria 1. Material: Glass or stainless steel. 2. Size: 250 ml (daphnids and midges) or 3.9 L (1 gal). 3. Fill volume: 200 ml (daphnids and midges) or 2-3 L. | 1. glass 2. 400 ml 3. 200 ml |
| Type of Dilution System Must provide reproducible supply of toxicant. | 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 |
| Biomass Loading Rate Static: ≤ 0.8 g/L at $\leq 17^\circ\text{C}$, ≤ 0.5 g/L at $> 17^\circ\text{C}$; flow- through: ≤ 1 g/L/day. | Not reported |
| Photoperiod 16 hours light, 8 hours dark. | Not reported |
| Solvents Not to exceed 0.5 ml/L for static tests or 0.1 ml/L for flow-through tests. | water |

D. Test Design:

| Guideline Criteria | Reported Information |
|--------------------|----------------------|
|--------------------|----------------------|

| | |
|---|---|
| <p><u>Range Finding Test</u> If LC₅₀ >100 mg/L, then no definitive test is required.</p> | <p>Not reported</p> |
| <p><u>Nominal Concentrations of Definitive Test</u> Control & 5 treatment levels; a geometric series with each concentration being at least 60% of the next higher one.</p> | <p>12 ranging from 0 to 20 mg/L</p> |
| <p><u>Number of Test Organisms</u> Minimum 20/level, may be divided among containers.</p> | <p>10 per beaker four beakers per level</p> |
| <p><u>Test organisms randomly or impartially assigned to test vessels?</u></p> | <p>Not reported</p> |
| <p><u>Water Parameter Measurements</u> 1. <u>Temperature</u> Measured continuously or, if water baths are used, every 6 h, may not vary > 1°C. 2. <u>DO and Ph</u> Measured at beginning of test and ever 48 h in the high, medium, and low doses and in the control.</p> | <p>Not reported</p> |
| <p><u>Chemical Analysis</u> Needed if solutions were aerated, 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</p> | <p>N/A</p> |

12. REPORTED RESULTS:

| Guideline Criteria | Reported Information |
|---|----------------------|
| <p>Quality assurance and GLP compliance statements were included in the report?</p> | <p>Not reported</p> |

| | |
|--|--------------|
| <u>Control Mortality</u> Static: ≤10% Flow-through: ≤10% | Not reported |
| <u>Percent Recovery of Chemical</u> | N/A |
| <u>Raw data included?</u> | No |

Mortality The results were supplied only for the EC50 and C.L. The mortality data was not reported.

Other Significant Results:

B. Statistical Results

Glyphosate **without** suspended sediments

Method: Litchfield and Wilcoxon

48-hr LC₅₀: 7.9 ppm ai 95% C.I.: 7.2-8.6 ppm ai

Probit Slope: N/A NOEC: Not reported

Glyphosate + suspended sediments

Method: Litchfield and Wilcoxon

48-hr LC₅₀: 3.2 ppm ai 95% C.I.: 3.0-3.4 ppm ai

Probit Slope: N/A NOEC: Not reported

13. VERIFICATION OF STATISTICAL RESULTS

Insufficient data was available for verification of the statistical results.

14. REVIEWER'S COMMENTS:

As many open literature study do, this study failed to report the many of the items required by the guidelines. In addition the species tested, *pulex* was not the recommended and mature rather than 1st instar daphnids were tested. Also, the statistical method could not be verified due to the lack of data.