

US EPA ARCHIVE DOCUMENT

MRID No. 443206-38

**DATA EVALUATION RECORD
AQUATIC PLANT EC₅₀ TEST
GUIDELINE 123-2 (TIER II)**

1. **CHEMICAL:** Glyphosate acid PC Code No.: ~~103601~~ ⁴¹⁷³⁰⁰
2. **TEST MATERIAL:** Glyphosate acid Purity: 95.6%
3. **CITATION:**
Authors: D.V. Smyth, S.J. Kent, D.S. Morris, S.K. Cornish, and N. Shillabeer
Title: Glyphosate Acid: Acute Toxicity to Duckweed (*Lemna gibba*)
Study Completion Date: January 31, 1996
Laboratory: Brixham Environmental Laboratory, Brixham, Devon, UK
Sponsor: ZENECA Ag Products, Wilmington, DE
Laboratory Project ID: BL5662/B
MRID No.: 443206-38
DP Barcode: None reported

4. **REVIEWED BY:** Curtis E. Laird, Fishery Biologist
 Ecological Hazard Branch
 Environmental Fate and Effects Division (7507C)

Signature:

Date:

5. **APPROVED BY:** Tom A. Bailey, Branch Chief
 Ecological Hazard Branch
 Environmental Fate and Effects Division (7507C)

Signature:

Date:

6. **STUDY PARAMETERS:**

Definitive Test Duration: 14 days
Type of Concentrations: Mean measured

7. **CONCLUSIONS:** This study is scientifically sound but does not fulfill the guideline requirements for an aquatic plant toxicity test. If the phytotoxicity data is submitted and found acceptable, this study can be upgraded to core.

Results Synopsis:

EC₅₀: 12.4 ppm ai 95% C.I.: 9.8 - 15.6 ppm ai
 NOEC: 1.4 ppm ai Probit Slope: N/A

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8. ADEQUACY OF THE STUDY:**A. Classification:** Core.**B. Rationale:** N/A.**C. Repairability:** N/A.**9. GUIDELINE DEVIATIONS:** The maximum label rate was not reported.**10. SUBMISSION PURPOSE:****11. MATERIALS AND METHODS:****A. Test Organisms**

Guideline Criteria	Reported Information
Species <i>Lemna gibba</i>	<i>Lemna gibba</i>
Number of Plants/Fronds 5 plants, 3 fronds each	3 plants, 4 fronds/plant (12 fronds total) per replicate
Nutrients Standard formula, e.g. 20XAAP	M-Hoagland's medium without sucrose or EDTA

B. Test System

Guideline Criteria	Reported Information
Solvent	None
Temperature 25°C	24.6-25.7°C
Light Intensity 5.0 KLux ($\pm 15\%$)	5.2-5.3 KLux
Photoperiod Continuous	Continuous
Test System Static or Renewal	Solutions renewed on days 5 and 9 of the test
pH Approx. 5.0	"New" solutions: 3.5-4.9 "Old" solutions: 3.6-5.8

C. Test Design

Guideline Criteria	Reported Information
Dose range 2X or 3X progression	2X
Doses at least 5	0.75, 1.5, 3.0, 6.0, 12, 24, 48, and 96 ppm active ingredient (ai)
Controls negative and/or solvent	Negative control group
Replicates per dose 3 or more	3
Duration of test 14 days	14 days
Daily observations were made?	Counts and observations made on days 2, 5, 7, 9, 12, and 14
Method of Observations	Number of fronds/plants
Maximum Labeled Rate	Not reported

12. REPORTED RESULTS:

Guideline Criteria	Reported Information
Initial and 14 day frond numbers were measured?	Yes
Control frond at 14 days \geq2X initial count?	Yes
Initial chemical concentrations measured? (Optional)	Samples were collected from the "new" day 0, 5, and 9 solutions and from the "old" day 5 and 14 solutions and analyzed by HPLC
Raw data included?	Yes

Dose Response

Mean Measured concentration (ppm ai)	14-day Avg. Frond Number	% Inhibition	14-day pH
Control	327	N/A	5.7
0.70	343	0	5.8
1.4	323	1	5.7-5.8
2.9	300	9	5.6-5.8
5.6	269	18	5.7
12	173	49	5.5-5.6
23	91	75	5.0
48	30	94	4.2
96	17	98	3.7

Other Significant Results: Plants in all but the two lowest-concentration treatment groups demonstrated signs of test material toxicity by test termination. Signs of toxicity included chlorosis, with stunted new fronds and reduced roots. Some plants also were reported as not floating at the proper attitude.

Statistical Results

Statistical Method: Moving average angle method (to calculate the EC_{50}) and analysis of variance coupled with Dunnett's test (to determine the NOEC), results based on nominal concentrations

EC_{50} : 12 ppm ai

95% C.I.: 11 - 14 ppm ai

Probit Slope: N/A

NOEC: 1.5 ppm ai

13. VERIFICATION OF STATISTICAL RESULTS:

Statistical Method: Williams' test was used for mean separation and non-linear regression was used for EC_{50}

estimation. Analyses were based on mean measured concentrations.

EC₅₀: 12.4 ppm ai
Probit Slope: N/A

95% C.I.: 9.8 - 15.6 ppm ai
NOEC: 1.4 ppm ai

14. **REVIEWER'S COMMENTS:** It was reported that all test solutions had small white particles present. The reviewer believes that these particles are the result of autoclaving the test medium, as reported by the authors. Consequently, this study is scientifically sound and fulfills the guideline requirements. The study is categorized as supplemental, pending receipt and review of phytotoxicity data. If the phytotoxicity data meet the guideline requirement, then this study can be upgraded to core.