108801

DATA EVALUATION RECORD

1. CHEMICAL: Metolachlor (108801)

2. FORMULATION: Technical

3. CITATION: Sachsse, K.; Ullman, L. (1974) Acute Toxicity to Rainbow Trout, Crucian Carp, Channel Catfish, Bluegill, and Guppy of Technical CGA 24705. Project No. Siss 3516. Received Sep. 26, 1974 under 5G1553. (Unpublished report prepared by CIBA GEIGY Ltd., Basle, Switzerland; CDL:112840-N).

4. REASON FOR REVIEW: Generic Standard for Metolachlor

5. REVEIWED BY: H. T. Craven
Biologist
Efficacy and Ecological Effects Branch
Registration Division

6. DATA REVIEWED: 12/16/77

7. TEST TYPE:- Cold Water Fish Acute 96 hr. (LC_{50})

A. TEST ID: ES F 1

B. TEST SPECIES: Rainbow Trout (Salmo gairdneri)

C. TEST MATERIAL Technical Metolachlor

D. REPORTED RESULTS: 96 hr (LC_{50}) = Approx. 2 ppm. In the report, a general comment was made with regard to all species tested: About 4 to 6 hours after adding the substance, the fish in concentrations where mortality occurred showed hypersensitivity, loss of equilibrium and later apathy.

E. CONCLUSIONS:

The aeration of a static bioassay may result in the volatilization of the toxicant from the medium, therefore it is impossible to assess the validity of the reported LC_{50}. This study does not meet the requirement for a cold water fish acute LC_{50}.

MATERIALS AND METHODS

A. Test Conditions: The study was described to only a limited extent as it relied on the statement:

> "The procedure for testing followed that prescribed by the United States Federal Department of the Interior Fish and Wildlife Services: 'Procedures for evaluation of acute toxicity of Pesticides to fish and wildlife' 1964."

B. Statistical Analysis: The LC_{50} values were calculated by probit analysis according to Goulden A., 1960, Method of Statistical Analysis, John Wiley and Sons, third printing p. 404-408.

DISCUSSION/RESULTS

Reported Results: 96 hr (LC_{50}) = Approx. 2 ppm. In the report, a general comment was made with regard to all species tested: About 4 to 6 hours after adding the substance, the fish in concentrations where mortality occurred showed hypersensitivity, loss of equilibrium and later apathy.

REVIEWER'S EVALUATION

A. Test Procedure

Several deviations from the recommended protocol described in the proposed 1977 Guideline include: (1) Only four vs. a minimum of five dosage levels were tested; (2) Although acetone controls were run, no acetone free controls were established; (3) The test containers were aerated during the study. It is noted that the loading factor (1.9 g/liter) exceeded the recommended 1.0 g/liter thereby possibly necessitating aeration.

B. Statistical Analysis

The Environmental Safety Section did not attempt to validate the statistics portion of this study because aeration was performed, thereby negating any LC_{50} value.

C. Validation

1. Category: Invalid

2. Rationale: The aeration of a state bioassay may result in the volatilization toxicant from the medium.

3. Repairability Rationale: The rainbow trout section of the study cannot be repaired even to supplemental.

CONCLUSIONS

The aeration of a static bioassay may result in the volatilization of the toxicant from the medium; therefore it is impossible to assess the validity of the reported LC_{50}; it is noted that the loading factor (1.9 g/liter) exceeded the recommended 1.0 g/liter thereby possibly necessitating aeration. This study does not meet the requirement for a cold water fish acute LC_{50}.

8. TEST TYPE: Warm Water Fish Acute 96 hr (LC_{50})

A. Test ID: ES G1

B. Test Species: Crucian Carp (Carassius carassius), Guppy (Lebiates reticulatus , Bluegill (Lepomis machrochirus), Channel Catfish (Ictaluris ameriurus).

C. Test Material Technical Metolachlor

D. Reported Results:

Species	96 Hour LC_{50} (ppm)	95% Confidence Limits
Crucian Carp (Carassius carassius)	4.9	3.6 - 6.8
Channel Catfish (Ictaluris ~~ameiurus~~ punctatus)	4.9	3.6 - 6.8
Bluegill (Lepomis macrochirus)	15	*
Guppy (Lebistes reticulatus)	8.6	7.4 - 10.5

* No confidence limits were calculable

In the report, a general comment was made with regard to all species tested: About 4 to 6 hours after adding the substance the fish in concentrations where mortality occurred showed hypersenstitivity, loss of equilibrium and later apathy. These symptoms were seen at 2.1 ppm in carp and 6.5 ppm in guppy.

E. Results of Evaluation:

The LC_{50} values reported for the guppy, crucian carp and channel catfish (bluegill? sunfish?) are scientifically sound. These LC_{50} values indicate metalachlor is moderately toxic to warm water fish.

MATERIALS AND METHODS

Test procedure and method of Statistical analysis was the same as previously cited in the rainbow trout portion of this study.

DISCUSSION/RESULTS

1. Guppy, Crucian carp and Channel Catfish

The 96 hour LC_{50} values and 95% 1.1. are respectively: Carp 4.9 (3.6-6.8) ppm, Channel Catfish 4.9 (3.6-6.8) and Guppy 8.6 (7.4-10.5) ppm. Where mortality occurred, those organisms displayed (after 4-6 hrs. exposure) hypersensitivity, loss of equilibrium and apathy. These symptoms were seen at 2.1 ppm in channel catfish and carp and 6.5 for guppy.

2. Bluegill

Four dosage levels were tested (1, 10, 21 and 49 ppm). No mortality occurred at the two lower levels; but the next two levels showed 75% and 100% mortality respecitvely. A 96 hour LC_{50} of 15 ppm without confidence limits was reported.

REVIEWER'S EVALUATIONS

A. Test Procedure

Several deviations from the recommended protocol described in the proposed 1977 Guidelines include: (1) only four vs. a minimum of five dosage levels were tested; (2) although acetone controls were run, no acetone free controls were established, (3) in the case of the carp and the bluegill, the test temperature (14°C $\pm$ 2°C) is below the recommended range (19°C - 26°C $\pm$ 1°C) for warm water species.

B. Statistical Analysis:

1. Carp and Guppy

Finney probit was performed on the guppy portion of the study; the resulting LC_{50} 8.6 (see accompanying printout) is the same as the reported value. The same statistical analysis the Evnironmental Safety Section performed on the Channel Catfish study applies to the carp becasue the dosage levels and 96 hr % mortality are the same for both species (see xerox copy of catfish statistics).

2. Channel Catfish

The Environmental Safety Section performed a Finney probit analysis on the data (see accompanying printout). The determined LC_{50} (4.8) compares favorably with the reported value of 4.9.

3. Bluegill

Environmental Safety Section did not perform a Finney probit analysis as the requirement for two partial mortality levels was not met. Instead, a linear regression line was constructed (see accompanying printout and graph). The LC_{50} of 12.1 ppm cannot be confirmed by a test for Chi^2 and fails the Tab T test.

C. Validation

1. Carp and Guppy

a. Category: Supplementary

b. Rationale: Neither of these species are recommended test test species. Furthermore, in the case of carp, the test temperature (14°C ± 2°C) is below the recommended range (19°C - 26°C) for warmwater species.

c. Repairability rationale: This portion of the study cannot be upgraded to core.

2. Channel Catfish

Core

a. Category: ~~Supplementary~~

b. Rationale: ~~The channel catfish~~ Ictalaurus punctatus is a recommended test species, however, the Environmental Safety section was not able to determine if Ictalurus ameiurus is the same species.

c. Repairability rationale: ~~This portion of the study can be upgraded to core providing~~ Ictalures ameriurus is the same species as Ictalurus punctatus.

Personal communication with Ida-Deizy indicated that the species reported as ameiurus was actually punctatus.

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3. Bluegill

a. Category: ~~Invalid~~ supplementary

b. Rationale: Conducting this portion of the study at too low a temperature (14°C ± 2°C) instead of (19°C - 26°C) prohibits this study from being classified as core. Secondly, the LC_{50} value cannot be supported by statistical analysis.

c. Repairability: This portion of the study can be upgraded to supplementary provided an appropriate statistical analysis is performed.

CONCLUSIONS

Carp and Guppy -

The studies are scientifically sound and indicate that metolachlor is moderately toxic to these species of fish. Neither the carp or the guppy are recommended test species therefore, while the studies augment the required data on a recommended warm water fish they do not serve as a substitute.

Channel catfish - This study indicates that metolachlor is moderately toxic to fish with an LC_{50} of 4.9 ppm (95% C.L. 3.6 - 6.8 ppm). The study on channel catfish is sound and acceptable to meet the requirement for a warm water fish acute LC_{50}.

Bluegill Sunfish - The study on bluegill is not statistically sound. This is due to having too few partial mortality levels.

Table 6
Catfish
50 1553 Dec 16

1.
C.
12.

Done
Finney Probit

2.1
1.
12.

Dual

6.5
7.
12.

10.
12.
12.

Tot CHI2 = 5.99 > 2.334

4.478	M
1.934	YINT
1.672	LW M
2.334	CHI²
4.838	LD50
3.633	LOCL
6.443	UPCL
2.503	LD10
1.552	LOCL
4.035	UPCL
9.353	LD90
6.480	LOCL
13.499	UPCL

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FORMULATION:			IA	IB	T	FW	EC	R		
% a.i.	SC #	CHEMICAL NAME	Validator:					Date:		
Tech.		CGA-24705 (Metolachlor)	Labuda					02 December, 1977		

Test Type:

Coldwater Fish Acute 96-hour LC_{50}

Test ID.# ESG4

CITATION: Sachesse, K., and L. Ullmann. 1974. Acute Toxicity to Rainbow Trout, Crucian Carp, Channel Catfish, Bluegill, and Guppy to Technical CGA-24705 Ciba-Geigy, Ltd.

VALIDATION CATEGORY: Invalid

RESULTS: 96-hour LC_{50} for Salmo gairdneri was reported to be "approximately 2 ppm".

VALIDATION CATEGORY RATIONALE: Test aquaria were aerated throughout the treatment.

CATEGORY REPAIRABILITY/RATIONALE: No.