

US EPA ARCHIVE DOCUMENT

REVIEW OF ECOLOGICAL
EFFECTS TEST DATA

1. Chemical: Fenoycarb
2. Test Material: 96% a.i.
3. Study Type: Estuarine Acute Toxicity Tests with:
Fish Menidia menidia 96-hr
Shrimp Palaemonetes pugio 96-hr
Oyster Crassostrea virginica 48-hr EL
4. Study ID: Acute Toxicological Evaluations of Estuarine Organisms
Author: Ken Simon
Laboratory: EnviroSystems, Inc.
Study No: 8522
Study Date: July, 1985
Sponsor: MAAG Agrochemicals
Acc. No: 528864 258864

5. Reviewed By:

Daniel Rieder
Wildlife Biologist
EEB/HED

Signature: Daniel RiederDate: 9/18/856. Approved By:

Norman Cook
Head-Section 2
EEB/HED

Signature: Norman CookDate: 9.18.857. Conclusions:

These studies are scientifically sound.
The resulting LC₅₀'s show that phenoxycarb is moderately toxic to estuarine fish and shrimp and highly toxic to larval oysters.

<u>SPECIES</u>	<u>RESULTS (ppm)</u>	
<u>Menidia menidia</u>	LC ₅₀ = 1.074	(95% C.L. = 0.94-1.18)
<u>Palaemonetes pugio</u>	LC ₅₀ = 2.223	(95% C.L. = 1.75-2.5)
<u>Crassostrea virginica</u>	EC ₅₀ = 0.15	(95% C.L. = 0.1-0.17)

These studies fulfill the guideline requirements for estuarine acute toxicity tests.

8. Recommendations: N/A
9. Background: This study was provided to support registration.

10. Discussion of Individual Tests:

Three tests were reported in this study.

11. Methods/materials: Fish

- A. Test Material: Fenoxycarb
Percent active ingredient: 96% a.i.
- B. Test Organism: Menidia menidia
Source: Sea Plantations, Inc.,
of Salem MA
Length: \bar{X} = 29.7 mm
Acclimation: 10 days
Organisms per container: 10
No./level: 20
Loading: 0.0274 g/l
Weight: \bar{X} = 0.0274 g
- C. Test Containers: glass
Size: 20 liter w/10 liters of water
Replicates: 2
Aerated: No
- D. Test Conditions: Static, Replace solution with concentra-
tion at 48 hrs.
Temperature: 21.5-22 °C
Controls: untreated and solvent
control
Way test begun: Test material added
before test organisms
Reference: Standard Methods for Evaluation of Water and
Wastewater 15th edition (APHA 1980), and ASTM
(1980).
Solvent: Acetone
Test Solution:
filtered water
from Hampton Est.
- E. Statistics: LC₅₀ and EC₅₀ values generated by computer
program developed by EPA Duluth (Stephan, 1982)

12. Reported Results:

96-hour LC₅₀=1.074 ppm 95% C.L. - 0.94 to 1.18 ppm

See TABLE 1

CONCENTRATION PPM		MORT. 96HRS	CONTIDIONS		
Nominal			DO	pH	Salinity
Control	--	0	4.6-6.3	7.4-7.7	26-27 ppt
Solvent Control	--	0	3.8-6.2	7.5-7.7	26-27 ppt
0.94	--	1	4.0-6.6	7.4-7.7	26-28 ppt
1.18	--	17			
1.47	--	20	3.7-6.8	7.5-7.8	26-28 ppt
1.84	--	20	3.8-7.0	7.5-7.8	27-28 ppt
2.3	--	20			
2.88	--	20	5.9-6.4	7.5-7.6	27 ppt

* See attached table for results of concentration measurments (Table 2)

13. Study Author's Conclusions:

The 96-hr LC₅₀ is 1.074 ppm for Menidia menidia exposed to fenoxycarb.

14. Reviewer Discussion:

- A. Test Procedure: The test procedure was acceptable, however several items were not reported. The hours pretest without food and the photoperiod was not provided.
- B. Statistical Analysis: The statistics reported were generated with essentially the same program used by EEB. See table 6.
- C. Discussion/Results: This study shows that Fenoxycarb (96% a.i.) is moderately toxic to estuarine fish.

11. Methods/materials: Shrimp

- A. Test Material: Fenoxycarb
Percent active ingredient: 96% a.i.
- B. Test Organism: Palaemorets pugio
Source: Sea Plantations, Inc., No./level: 20
of Salem MA Loading: 0.0715 g/l
Length: \bar{X} = 17.1 mm Weight: \bar{X} = 0.0715 g
Acclimation: 10 days,
Organisms per container: 10
- C. Test Containers: glass
Size: 20 liter w/10 liters of water Aerated: No
Replicates: 2
- D. Test Conditions: Static, Test solution changed at 48 hrs.
Temperature: 22 °C Solvent: Acetone
Controls: solvent, untreated Test Solution:
Way test begun: Test material added filtered seawater
before test organisms
Reference: Standard Methods 15th edition, method 807
- E. Statistics: LC₅₀ and EC₅₀ values generated by computer
program developed by EPA Duluth (Stephan, 1982)

12. Reported Results:

96-hour LC₅₀=2.2 ppm 95% C. L. - 1.75 to 2.5 ppm

See TABLE 3

CONCENTRATION PPM MORT.		CONDITIONS	
<u>Nominal</u>	<u>96HRS</u>	<u>DO</u>	<u>pH</u>
Control	-- 0	6.1-6.5	7.26-7.87
Solvent Control	-- 0	5.6-6.8	7.43-7.85
0.86	-- 1	5.3-7.0	7.47-7.8
1.00	-- 17		
1.23	-- 20	4.6-6.8	7.52-7.73
1.75	-- 20		
2.5	-- 20	4.9-7.0	7.52-7.78

* See attached table for results of conc. measurements (Table 2)

13. Study Author's Conclusions: LC₅₀ = 2.2 ppm14. Reviewer Discussion:

- A. Test Procedure: The test procedure was adequate. There were some errors in the report. Most were reconciled via telephone (Richard Staunton, MAAG, 8-7-85) Photoperiod was not provided.

- B. Statistical Analysis: The reported statistics were generated with essentially the same program EEB uses. See table 7.
 - C. Discussion/Results: This study shows that Fenoxycarb (96% a.i.) is moderately toxic to shrimp.
 - D. Adequacy: Core
- 15. Completion of One-liners: One liner completed
 - 16. CBI Appendix: N/A

11. Methods/materials: Oyster

- A. Test Material: Fenoxycarb
Percent active ingredient: 96% a.i.
- B. Test Organism: Crassostrea virginica
Source: Marine Bio Services, South Bristol, ME No./level: 13 larvae per mm
- C. Test Containers: glass beakers
Size: 150 ml w/100 ml test solution Aerated: No
Replicates: 3
- D. Test Conditions:
Temperature: 20 °C Solvent: Acetone
Controls: untreated Test Solution:
Way test begun: Test material added before test organisms seawater obtained from Bristol, ME
Reference: ASTM, 1982, Standard Practice for Conducting Static Acute Toxicity Tests with Larvae of Molluscs, Std Practice STD 724-80.
- E. Statistics: The EC₅₀ was calculated using a computer program developed by EPA Duluth (Stephan, 1982)

12. Reported Results:

48-hour EC₅₀ = 0.15 ppm 95% C. L. - 0.1 to 0.17 ppm

See Attached TABLE 3

<u>CONCENTRATION</u>	<u>PERCENT REDUCTION</u>
Control	0
Solvent Control	6
0.022	11.3
0.036	14.3
0.060	15.8
0.1	12.6
0.17	62.9
0.28	96.9
0.47	99.5
0.78	100
1.3	100
2.16	100
3.6	100
6.0	100

13. Study Author's Conclusions: The percent reduction was calculated by dividing the number of shelled larvae at 48 hrs by the number examined at the beginning and subtracting from 100.
48-hr EC₅₀ = 0.15 ppm.

14. Reviewer Discussion:

- A. Test Procedure: The test procedure was adequate. There were a few typographical errors in the report, but these were corrected via telephone.
- B. Statistical Analysis: The statistics were conducted with essentially the same program EEB uses. See tables 8, 9, 10, and 11.
- C. Discussion/Results: This results show that Fenoxycarb (96% a.i.) is highly toxic to oyster larvae.
- D. Adequacy: Core

15. Completion of One-liners: One liner completed16. CBI Appendix: N/A

Table 1. Summary of Survival and Water Quality from Menidia
menidia Definitive Assay. MAAG Agrochemical Company
Registration Action 35977-L.

Nominal Conc.	Rep.	Number Exposed	Survivors @ 96 Hrs.	Dissolved Oxygen (mg/L)	pH	Tempera- ture °C	Salinity (ppt)
2.88	Total	20	0	5.9-6.4	7.52-7.6	21.5-22	27
	1	10	0				
	2	10	0				
2.30	Total	20	0				
	1	10	0				
	2	10	0				
1.84	Total	20 20	0	3.8-7.0	7.54-7.84	21.5-22	27-28
	1	10	0				
	2	10	0				
1.47	Total	20	0 0	3.7-6.8	7.53-7.79	21.5-22	26-28
	1	10	10 0				
	2	10	8 0				
1.18	Total	20	5 3				
	1	10	10 0				
	2	10	10 3				
0.94	Total	20	19 19	4.0-6.6	7.44-7.71	21.5-22	26-28
	1	10	10 9				
	2	10	10 10				
Acetone Control	Total	20	20	3.8-6.2	7.51-7.69	21.5-22	26-27
	1	10	10				
	2	10	10				
Control	Total	20	20	4.5-6.3	7.4 -7.69	21.5-22	26-27
	1	10	10 10				
	2	10	10 10				

Water Quality Data from Replicate "A".

Table 2. Summary of Nominal and Actual Concentrations (Parts Per Million) of Product in Solution for Definitive Assays. MAAG Agrochemical Company Registration Action 35977-L.

Time	Concentration							
	Proposed/ ppm	Actual ppm	Proposed/ ppm	Actual ppm	Proposed/ ppm	Actual ppm	Proposed/ ppm	Actual ppm

Fish Assay

Initial 0 Hrs.	1.84	/ Sample Broken	1.47	/ Sample Broken	0.94	/ Sample Broken	Control/<0.1
Old At 48 Hrs.	1.84	/ 1.05	1.47	/ Sample Broken	0.94	/ 0.49	Control/<0.1
New At 48 Hrs.	1.84	/ 1.78	1.47	/ Sample Broken	0.94	/ 0.97	Control/<0.1
Old At 96 Hrs.	1.84	/ All* Dead	1.47	/ 1.10	0.94	/ 0.53	Control/<0.1

Shrimp Assay

Initial 0 Hrs.	2.5	/ Sample Broken	1.75	/ Sample Broken	1.0	/ Sample Broken	Control/<0.1
Old At 48 Hrs.	2.5	/ 1.90	1.75	/ 1.41	1.0	/ 0.81	Control/<0.1
New At 48 Hrs.	2.5	/ 2.02	1.75	/ 1.71	1.0	/ 0.91	Control/<0.1
Old At 96 Hrs.	2.5	/ Sample Broken	1.75	/ Sample Broken	1.0	/ 0.79	Control/<0.1

Oyster Larvae Assay

No Samples Taken for Analysis of Fenoxycarb

* In samples were all animal were dead prior to sampling no material was collected.

Registration Action Number 35977-L; Fenoxycarb

Table 3. Summary of Survival and Water Quality from Palaemonetes pugio Definitive Assay. MAAG Agrochemical Company Registration Action 35977-L.

Nominal Conc.	Rep.	Number Exposed	Survivors @ 96 Hrs.	Dissolved Oxygen (mg/L)	pH	Temperature °C	Salinity (ppt)
2.5	Total	20	8 8	4.9-7.0	7.52-7.78	22	24-25
	1	10	5 3				
	2	10	8 5				
1.75	Total	20	14				
	1	10	5				
	2	10	9				
1.23	Total	20	17	4.6-6.8	7.52-7.73	22	24-25
	1	10	9				
	2	10	8				
1.00	Total	20	17				
	1	10	7				
	2	10	10				
0.86	Total	20	19	5.3-7.0	7.47-7.80	22	23.5-25
	1	10	10				
	2	10	9				
Acetone Control	Total	20	18	5.6-6.8	7.43-7.85	22	23.5-24
	1	10	9				
	2	10	9				
Control	Total	20	18	6.1-6.5	7.26-7.87	22	23-24.5
	1	10	9				
	2	10	9				

Water Quality Data from Replicate "A", except 150 ppm treatment where replicate B was monitored.

Table 4. Summary of Survival and Water Quality from Crassostrea virginica Definitive Assay. MAAG Agrochemical Company Registration Action 35977-L.

Nominal Conc.	Number* Examined	Number* Shelled Larvae @ 48 Hr.	Dissolved Oxygen (mg/L)	pH	Temperature	Salinity
6.0	178	0	6.7-6.8	7.81-7.87	20	27-29.5
3.60	202	0				
2.16	351	0	6.7-6.8	7.81-7.91	20	27-30.2
1.3	184	0				
0.78	192	0				
0.47	198	1	6.7	7.80-7.94	20	
0.28	198 133	4				
0.17	232	86				
0.10	404	353	6.7	7.80-7.94	20	
0.060	329	277				
0.036	343	294				
0.022	291	258	6.6-6.7	7.75-7.94	20	27-30.2
Control						
(Rep A)	132*	127*	6.6-6.7	7.75-7.94	20	27-30.0
(Rep B)	131*	122*				
(Rep C)	158*	145*	$\bar{x} = 132.25$			
(Rep D)	148*	135*				
Carrier Control						
(Rep A)	113	103				
(Rep B)	117	109				
(Rep C)	116	120				
(Rep D)	113	116				
Percent Normal Development in Controls At 48 Hours						
	Dilution Water		Solvent Carrier			
(Rep A)	87.61		91.35			
(Rep B)	96.72		93.16			
(Rep C)	88.46		86.66			
(Rep D)	93.33		88.55			

* Number recovered from 10 ml subsample of culture at start and finish of assay.

Table 5. Summary of LC-50 and EC-50 Values and 95% Confidence Limits for Fish, Shrimp, and Oyster Larvae Exposed To Fenoxycarb. MAAG Agrochemical Company. Registration Action 35977-L

Computation Method	<u>Menidia menidia</u>	Species <u>Palaemonetes pugio</u>	<u>Crassostrea virginica</u>
Range Finding Assays			
Binomial	2.236 (.5)*	2.236 (.5)	NC
Moving Average	NC	NC	NC
Probit	NC	NC	NC
Definitive Assays			
Binomial	1.074 (0.94-1.18)	2.223 (1.75-2.5)	0.15 (0.1-0.17)
Moving Average	1.084 (1.02-1.14)	2.223 (1.44-infinity)	0.126 (0.12-0.13)
Probit	1.08 (1.02-1.13)	2.242 (1.83-3.46)	0.13 ** (0.09-0.20)

Concentrations in parts per million

* 95% Confidence Limits

** As probability associated with LC-50 computed by Probit Method is less than 0.05 the value is questionable.

Table 6

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ESI PROJECT 8522 RUN: 1 SPECIES: Menidia menidiaSAMPLE: Fenoxycarb EXPOSURE (HR): 96

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
2.88	20	20	100	LESS THAN 0.001
2.3	20	20	100	LESS THAN 0.001
1.84	20	20	100	LESS THAN 0.001
1.47	20	20	100	LESS THAN 0.001
1.18	20	17	85	.128841
.94	20	1	5	2.00272E-03

THE BINOMIAL TEST SHOWS THAT .94 AND 1.18 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 OF 1.07407 IS OBTAINED BY NONLINEAR INTERPOLATION BETWEEN .94 AND 1.18

-----RESULTS CALCULATED USING THE MOVING AVERAGE METHOD-----

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
2	.0657295	1.08375	1.01854	1.13971
1	.119814	1.07407	1.03198	1.12388

AN LC50 CALCULATED USING THE MOVING AVERAGE METHOD MAY NOT BE A VERY GOOD ESTIMATE IF THE SPAN IS MUCH LESS THAN THE NUMBER OF CONCENTRATIONS.

-----RESULTS CALCULATED USING THE PROBIT METHOD-----

ITERATIONS	G	H	CHI-SQUARE	PROBABILITY
7	.17747	1	2.85721E-03	.999999

SLOPE = 27.1999
95 PERCENT CONFIDENCE LIMITS = 15.7414 AND 38.6585

LC50 = 1.08065
95 PERCENT CONFIDENCE LIMITS = 1.02456 AND 1.13458

COMPARE RESULTS WITH ORIGINAL DATA TO SEE IF THEY ARE REASONABLE.

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ESI PROJECT 8522 RUN: 2 SPECIES: Palaemonetes pugio

SAMPLE: Fenoxycarb Definitive EXPOSURE (HR): 96

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
2.5	20	12	60	25.1723
1.75	20	6	30	5.76592
1.23	20	3	15	.128841
1	20	3	15	.128841
.86	20	1	5	2.00272E-03

AT A CONFIDENCE LEVEL OF 95 PERCENT THE BINOMIAL TEST

THE USEFULNESS OF ANY LC50 CALCULATED FROM THIS SET OF DATA IS QUESTIONABLE BECAUSE A CONCENTRATION-EFFECT RELATIONSHIP HAS NOT BEEN DEMONSTRATED OVER A REASONABLE RANGE (E.G. <37 TO >63) OF PERCENT DEAD.

AN APPROXIMATE LC50 OF 2.22321 IS OBTAINED BY NONLINEAR INTERPOLATION BETWEEN 1.75 AND 2.5

---RESULTS CALCULATED USING THE MOVING AVERAGE METHOD---

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS
1	1.10175	2.22321	1.44138 +INFINITY

AN LC50 CALCULATED USING THE MOVING AVERAGE METHOD MAY NOT BE A VERY GOOD ESTIMATE IF THE SPAN IS MUCH LESS THAN THE NUMBER OF CONCENTRATIONS.

---RESULTS CALCULATED USING THE PROBIT METHOD-----

ITERATIONS	G	H	CHI-SQUARE	PROBABILITY
2	.229863	1	.950296	.813276

SLOPE = 3.64055
95 PERCENT CONFIDENCE LIMITS = 1.89513 AND 5.38598

LC50 = 2.24227
95 PERCENT CONFIDENCE LIMITS = 1.83058 AND 3.45747

COMPARE RESULTS WITH ORIGINAL DATA TO SEE IF THEY ARE REASONABLE.

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ESI PROJECT 8522 RUN: 1 SPECIES: Crassostrea virginica

SAMPLE: Fenoxycarb Definitive All Reps Comb. EXPOSURE (HR): 48

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
6	178	178	100	LESS THAN 0.001
3.6	202	202	100	LESS THAN 0.001
2.16	351	351	100	LESS THAN 0.001
1.7	184	184	100	LESS THAN 0.001
.78	192	192	100	LESS THAN 0.001
.47	198	197	99.495	LESS THAN 0.001
.28	133	129	96.9925	LESS THAN 0.001
.17	232	146	62.931	4.92365E-03
.1	404	51	12.6238	LESS THAN 0.001
.06	329	52	15.8055	LESS THAN 0.001
.036	343	49	14.2857	LESS THAN 0.001
.022	291	33	11.3402	LESS THAN 0.001

THE BINOMIAL TEST SHOWS THAT .1 AND .17 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 OF .149963 IS OBTAINED BY NONLINEAR INTERPOLATION BETWEEN .1 AND .17

---RESULTS CALCULATED USING THE MOVING AVERAGE METHOD---

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
7	2.94739E-03	.125675	.118391	.133577
6	6.21816E-03	.130945	.122508	.139591
5	.0100299	.137974	.130217	.146165
4	7.78429E-03	.143622	.135614	.151801
3	.0150387	.143938	.136828	.151621
2	.0193795	.151009	.143269	.158311
1	.0372769	.149963	.142727	.158402

AN LC50 CALCULATED USING THE MOVING AVERAGE METHOD MAY NOT BE A VERY GOOD ESTIMATE IF THE SPAN IS MUCH LESS THAN THE NUMBER OF CONCENTRATIONS.

IF ANY HIGHER CONCENTRATION PRODUCES A LOWER PERCENT DEAD THAN A LOWER CONCENTRATION, THE CONFIDENCE LIMITS OBTAINED BY THE MOVING AVERAGE METHOD WILL PROBABLY BE TO CLOSE.

---RESULTS CALCULATED USING THE PROBIT METHOD---

ITERATIONS	G	H	CHI-SQUARE	PROBABILITY
5	.159942	27.184	271.84	LESS THAN 0.001

BECAUSE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 2.52355
95 PERCENT CONFIDENCE LIMITS = 1.51431 AND 3.53279

LC50 = .129741
95 PERCENT CONFIDENCE LIMITS = .0896496 AND .200592

COMPARE RESULTS WITH ORIGINAL DATA TO SEE IF THEY ARE REASONABLE.

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ESI PROJECT 8522 RUN: 1 SPECIES: Crassostrea virginica

SAMPLE: Fenoxycarb Definitive Rep A EXPOSURE (HR): 48

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
6	132	132	100	LESS THAN 0.001
3.6	59	59	100	LESS THAN 0.001
2.16	168	168	100	LESS THAN 0.001
1.3	69	69	100	LESS THAN 0.001
.78	66	66	100	LESS THAN 0.001
.47	65	65	100	LESS THAN 0.001
.28	26	23	88.4615	4.39733E-03
.17	52	25	48.0769	44.4945
.1	122	15	12.2951	LESS THAN 0.001
.06	100	16	16	LESS THAN 0.001
.036	111	13	11.7117	LESS THAN 0.001
.022	84	7	8.33333	LESS THAN 0.001

THE BINOMIAL TEST SHOWS THAT .1 AND .28 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 OF .173705 IS OBTAINED BY NONLINEAR INTERPOLATION BETWEEN .17 AND .28

---RESULTS CALCULATED USING THE MOVING AVERAGE METHOD---

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
8	8.08663E-03	.135449	.119927	.153385
7	1.80283E-03	.139917	.125876	.156906
6	.0176925	.145363	.129003	.163498
5	.0162102	.154076	.140606	.16995
4	7.82013E-03	.166657	.152917	.182942
3	.0777793	.170177	.138519	.194949
2	.172678	.17121	.148722	.19578
1	.566255	.173706	.0635042	.211471

AN LC50 CALCULATED USING THE MOVING AVERAGE METHOD MAY NOT BE A VERY GOOD ESTIMATE IF THE SPAN IS MUCH LESS THAN THE NUMBER OF CONCENTRATIONS.

IF ANY HIGHER CONCENTRATION PRODUCES A LOWER PERCENT DEAD THAN A LOWER CONCENTRATION, THE CONFIDENCE LIMITS OBTAINED BY THE MOVING AVERAGE METHOD WILL PROBABLY BE TO CLOSE.

---RESULTS CALCULATED USING THE PROBIT METHOD---

ITERATIONS	G	H	CHI-SQUARE	PROBABILITY
4	.118481	6.65261	66.5261	LESS THAN 0.001

BECAUSE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 2.58129
95 PERCENT CONFIDENCE LIMITS = 1.69278 AND 3.4698

LC50 = .14463
95 PERCENT CONFIDENCE LIMITS = .103447 AND .213915

COMPARE RESULTS WITH ORIGINAL DATA TO SEE IF THEY ARE REASONABLE.

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ESI PROJECT 8522 RUN: 1 SPECIES: Crassostrea virginica

SAMPLE: Fenpxycarb Definitive Rep B EXPOSURE (HR): 48

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CONC.      NUMBER      NUMBER      PERCENT      BINOMIAL
            EXPOSED      DEAD        DEAD        PROB.(PERCENT)
6           132          132          100          LESS THAN 0.001
3.6         51           51           100          LESS THAN 0.001
2.16        102          102          100          LESS THAN 0.001
1.3          40           40           100          LESS THAN 0.001
.78          67           67           100          LESS THAN 0.001
.47          67           66           98.5075      LESS THAN 0.001
.28          54           54           100          LESS THAN 0.001
.17          97           58           59.7938      3.35256
.1           152          16           10.5263      LESS THAN 0.001
.06          116          19           16.3793      LESS THAN 0.001
.036         102          19           18.6275      LESS THAN 0.001
.022         102          16           15.6863      LESS THAN 0.001
  
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THE BINOMIAL TEST SHOWS THAT .1 AND .28 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 OF .154686 IS OBTAINED BY NONLINEAR INTERPOLATION BETWEEN .1 AND .17

---RESULTS CALCULATED USING THE MOVING AVERAGE METHOD---

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
7	.0123974	.126072	.113145	.140769
6	.0111508	.13321	.120364	.147347
5	.0273897	.138238	.124848	.153254
4	.0274398	.142083	.12791	.156292
3	.0284502	.142893	.132891	.154111
2	.0379908	.152318	.141308	.162581
1	.0839851	.154686	.1434	.170339

AN LC50 CALCULATED USING THE MOVING AVERAGE METHOD MAY NOT BE A VERY GOOD ESTIMATE IF THE SPAN IS MUCH LESS THAN THE NUMBER OF CONCENTRATIONS.

IF ANY HIGHER CONCENTRATION PRODUCES A LOWER PERCENT DEAD THAN A LOWER CONCENTRATION, THE CONFIDENCE LIMITS OBTAINED BY THE MOVING AVERAGE METHOD WILL PROBABLY BE TOO CLOSE.

---RESULTS CALCULATED USING THE PROBIT METHOD---

ITERATIONS	G	H	CHI-SQUARE	PROBABILITY
5	.220804	12.9055	129.055	LESS THAN 0.001

BECAUSE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

LOPE = 2.31324
 95 PERCENT CONFIDENCE LIMITS = 1.22625 AND 3.40023

LC50 = .129757
 95 PERCENT CONFIDENCE LIMITS = .0817589 AND .222257

COMPARE RESULTS WITH ORIGINAL DATA TO SEE IF THEY ARE REASONABLE.

ESI PROJECT 8522 RUN: 1 SPECIES *Crasostrea virginica*

SAMPLE: Fenoxycarb Definitive Rep C EXPOSURE (HR): 48

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
6	46	46	100	LESS THAN 0.001
3.6	92	92	100	LESS THAN 0.001
2.16	81	81	100	LESS THAN 0.001
1.3	75	75	100	LESS THAN 0.001
.78	59	59	100	LESS THAN 0.001
.47	66	66	100	LESS THAN 0.001
.28	53	52	98.1132	LESS THAN 0.001
.17	83	63	75.9036	LESS THAN 0.001
.1	130	20	15.3846	LESS THAN 0.001
.06	113	17	15.0442	LESS THAN 0.001
.036	120	17	14.1667	LESS THAN 0.001
.022	105	10	9.52381	LESS THAN 0.001

THE BINOMIAL TEST SHOWS THAT .1 AND .17 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 OF .136395 IS OBTAINED BY NONLINEAR INTERPOLATION BETWEEN .1 AND .17

---RESULTS CALCULATED USING THE MOVING AVERAGE METHOD---

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
7	.0142639	.112945	.101313	.125637
6	.0249954	.116782	.10586	.129318
5	.037015	.12247	.109342	.135453
4	.0442381	.12706	.114926	.142229
3	.0357066	.130969	.120219	.142186
2	.0441104	.139083	.126046	.150408
1	.0703213	.136395	.126884	.146327

AN LC50 CALCULATED USING THE MOVING AVERAGE METHOD MAY NOT BE A VERY GOOD ESTIMATE IF THE SPAN IS MUCH LESS THAN THE NUMBER OF CONCENTRATIONS.

---RESULTS CALCULATED USING THE PROBIT METHOD---

CONCENTRATIONS	G	H	CHI-SQUARE	PROBABILITY
5	.156874	8.59041	85.9041	LESS THAN 0.001

BECAUSE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 2.72782
95 PERCENT CONFIDENCE LIMITS = 1.6474 AND 3.80823

LC50 = .117791
95 PERCENT CONFIDENCE LIMITS = .0842214 AND .174816

COMPARE RESULTS WITH ORIGINAL DATA TO SEE IF THEY ARE REASONABLE.
