

Jan. 15, 1992

Addendum to the DER of the Shell Deposition Study MAIB # 420945-01

Statistical Analysis

A One-Way Anova performed by SAS showed that there was significant difference between treatments ($p < 0.0001$). The Dunnett's T test showed that the 50 mg/L and 90 mg/L treatments were significantly different from the control. Using EPA Toxanal Program the EC50 was calculated as 49.8 mg/L. The 95% confidence limits are 46.1-53.9 given by the moving average method.

Discussion

The EC50 value calculated by the author is higher than the value calculated in EEB.

Oyster's growth was not as expected (2.00 mm at the end of the 96 hours). However, there was a significant difference between the control and the highest concentrations tested. There was no growth at the 90 mg/L treatment and the 50 mg/L treatment growth was half the control. This rationale makes the study core because there was a response of the organism to the chemical.

Classification of the study: Core

Conchi Rodriguez Sencor Shell Deposition

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*****
CONC.      NUMBER      NUMBER      PERCENT      BINOMIAL
          EXPOSED      DEAD        DEAD        PROB. (PERCENT)
90         40         40         100         0
50         40         21         52.5        0
33         40         2          5          0
20         40         2          5          0
16         40         0          0          0
  
```

BECAUSE THE NUMBER OF ORGANISMS USED WAS SO LARGE, THE 95 PERCENT CONFIDENCE INTERVALS CALCULATED FROM THE BINOMIAL PROBABILITY ARE UNRELIABLE. USE THE INTERVALS CALCULATED BY THE OTHER TESTS.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 49.10501

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

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SPAN      G      LC50      95 PERCENT CONFIDENCE LIMITS
2          3.064286E-02      49.9486      46.15238
53.90657
  
```

RESULTS CALCULATED USING THE PROBIT METHOD

```

ITERATIONS      G      H
GOODNESS OF FIT PROBABILITY
7          1.096458      6.138152
  
```

0

A PROBABILITY OF 0 MEANS THAT IT IS LESS THAN 0.001.

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

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SLOPE      =      +6.685069
95 PERCENT CONFIDENCE LIMITS = -.3149924      AND      13.68513
  
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LC50 =      47.93953
95 PERCENT CONFIDENCE LIMITS = 0 AND +INFINITY
  
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LC10 =      30.9541
95 PERCENT CONFIDENCE LIMITS = 0 AND      45.32667
  
```

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General Linear Models Procedure
Class Level Information

Class	Levels	Values
TRT	6	a b c d e f

Number of observations in data set = 240

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General Linear Models Procedure

Dependent Variable: RESP

Source	DF	Sum of Squares	F Value	Pr > F
Model	5	102.24850000	24.94	0.0001
Error	234	191.84750000		
Corrected Total	239	294.09600000		

R-Square	C.V.	RESP Mean
0.347670	71.86205	1.26000000

Source	DF	Type I SS	F Value	Pr > F
TRT	5	102.24850000	24.94	0.0001

Source	DF	Type III SS	F Value	Pr > F
TRT	5	102.24850000	24.94	0.0001

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General Linear Models Procedure

Dunnett's T tests for variable: RESP

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 234 MSE= 0.819861

Critical Value of Dunnett's T= 2.529

Minimum Significant Difference= 0.5121

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison		Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit	
c	- a	-0.442	0.070	0.582	
b	- a	-0.485	0.027	0.540	
d	- a	-0.572	-0.060	0.452	
e	- a	-1.430	-0.918	-0.405	***
f	- a	-2.182	-1.670	-1.158	***

A. control

b - 16 mg/l

c - 20 mg/l

D - 33 mg/l → NOEC

E - 50 mg/l → LOEC

f - 90 mg/l

MATE 31 - 56 mg/l

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General Linear Models Procedure

Duncan's Multiple Range Test for variable: RESP

NOTE: This test controls the type I comparisonwise error rate,
not the experimentwise error rate

Alpha= 0.05 df= 234 MSE= 0.819861

Number of Means	2	3	4	5	6
Critical Range	0.402	0.423	0.436	0.446	0.455

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	TRT
A	1.755	40	c
A			
A	1.712	40	b
A			
C A	1.685	40	a
A			
A	1.625	40	(d) NOEC
	1.447		
B	0.767	40	(e) LOEC
C	0.015	40	f

A- control

B- 16 well

C- 20 well

D- 33 well

E- 50 well → NOEC

F- 90 well → LOEC

NOEL

LOEC

MATC

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General Linear Models Procedure

Dunnett's One-tailed T tests for variable: RESP

NOTE: This tests controls the type I experimentwise error for
comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 234 MSE= 0.819861

Critical Value of Dunnett's T= 2.246

Minimum Significant Difference= 0.4548

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison		Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit	
c	- a	-0.385	0.070	0.525	
b	- a	-0.427	0.027	0.482	
d	- a	-0.515	-0.060	0.395	
e	- a	-1.372	-0.918	-0.463	***
f	- a	-2.125	-1.670	-1.215	***

General Linear Models Procedure

Dunnett's One-tailed T tests for variable: RESP

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 234 MSE= 0.819861

Critical Value of Dunnett's T= 2.246

Minimum Significant Difference= 0.4548

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison		Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
c	- a	-0.385	0.070	0.525
b	- a	-0.427	0.027	0.482
d	- a	-0.515	-0.060	0.395
e	- a	-1.372	-0.918	-0.463
f	- a	-2.125	-1.670	-1.215

Metabuzin

Page 9 is not included in this copy.

Pages _____ through _____ are not included.

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OBS	TRT	RESP
1	a	1.4
2	a	1.0
3	a	3.9
4	a	2.0
5	a	2.5
6	a	0.0
7	a	1.4
8	a	0.5
9	a	2.7
10	a	1.7
11	a	2.0
12	a	3.0
13	a	2.3
14	a	1.5
15	a	1.7
16	a	1.7
17	a	1.7
18	a	0.2
19	a	0.0
20	a	2.2
21	a	2.9
22	a	2.1
23	a	0.5
24	a	1.2
25	a	1.1
26	a	0.5
27	a	2.1
28	a	0.9
29	a	0.0
30	a	1.5
31	a	0.7
32	a	1.2
33	a	3.1
34	a	5.8
35	a	1.1
36	a	2.2
37	a	2.4
38	a	0.5
39	a	2.5
40	a	1.7
41	b	2.9
42	b	2.0
43	b	1.9
44	b	1.4
45	b	2.3
46	b	1.8
47	b	2.9
48	b	1.1
49	b	1.7

50	b	2.6
51	b	1.9
52	b	2.0
53	b	1.4
54	b	2.8
55	b	0.6
56	b	2.1
57	b	1.4
58	b	2.4
59	b	0.8
60	b	3.0
61	b	1.7
62	b	2.5
63	b	3.5
64	b	0.0
65	b	1.9

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OBS	TRT	RESP
66	b	1.2
67	b	0.0
68	b	0.7
69	b	1.1
70	b	0.0
71	b	1.2
72	b	2.5
73	b	2.3
74	b	2.4
75	b	2.5
76	b	1.7
77	b	0.0
78	b	0.0
79	b	0.7
80	b	3.6
81	c	1.9
82	c	0.9
83	c	2.3
84	c	1.2
85	c	0.6
86	c	2.5
87	c	0.0
88	c	3.0
89	c	1.8
90	c	0.2
91	c	1.9
92	c	1.4
93	c	1.7
94	c	2.4
95	c	2.4
96	c	0.8
97	c	2.6
98	c	0.9
99	c	1.5
100	c	3.6
101	c	1.7
102	c	1.3
103	c	2.3
104	c	0.0
105	c	1.1
106	c	0.0
107	c	1.7
108	c	2.2
109	c	2.0
110	c	3.6
111	c	2.8
112	c	2.7
113	c	0.0
114	c	2.0

115	c	2.2
116	c	2.7
117	c	2.1
118	c	1.1
119	c	2.1
120	c	3.0
121	d	2.6
122	d	1.4
123	d	2.1
124	d	1.5
125	d	0.2
126	d	1.1
127	d	0.0
128	d	0.8
129	d	1.1
130	d	1.9

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OBS	TRT	RESP
131	d	2.0
132	d	1.8
133	d	2.5
134	d	2.7
135	d	1.1
136	d	0.0
137	d	0.0
138	d	0.7
139	d	1.2
140	d	1.8
141	d	3.0
142	d	3.0
143	d	1.1
144	d	1.4
145	d	1.1
146	d	1.5
147	d	2.6
148	d	2.5
149	d	1.5
150	d	2.1
151	d	0.0
152	d	2.9
153	d	2.5
154	d	3.3
155	d	1.4
156	d	0.0
157	d	0.8
158	d	2.0
159	d	1.8
160	d	4.0
161	e	0.0
162	e	1.5
163	e	1.6
164	e	1.7
165	e	1.5
166	e	0.0
167	e	0.0
168	e	2.0
169	e	1.2
170	e	1.0
171	e	0.7
172	e	0.0
173	e	0.0
174	e	1.2
175	e	1.0
176	e	0.8
177	e	0.0
178	e	0.0
179	e	0.0

180	e	0.6
181	e	0.7
182	e	3.4
183	e	1.8
184	e	0.0
185	e	0.1
186	e	0.0
187	e	0.0
188	e	0.0
189	e	2.0
190	e	1.3
191	e	0.0
192	e	0.0
193	e	0.6
194	e	0.7
195	e	1.4

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OBS	TRT	RESP
196	e	0.0
197	e	0.0
198	e	0.4
199	e	1.3
200	e	2.2
201	f	0.0
202	f	0.0
203	f	0.0
204	f	0.0
205	f	0.0
206	f	0.0
207	f	0.6
208	f	0.0
209	f	0.0
210	f	0.0
211	f	0.0
212	f	0.0
213	f	0.0
214	f	0.0
215	f	0.0
216	f	0.0
217	f	0.0
218	f	0.0
219	f	0.0
220	f	0.0
221	f	0.0
222	f	0.0
223	f	0.0
224	f	0.0
225	f	0.0
226	f	0.0
227	f	0.0
228	f	0.0
229	f	0.0
230	f	0.0
231	f	0.0
232	f	0.0
233	f	0.0
234	f	0.0
235	f	0.0
236	f	0.0
237	f	0.0
238	f	0.0
239	f	0.0
240	f	0.0