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Appendix A

For extraction of *Derris trifoliata* leaves

Apparatuses and equipments

1. Plant chopper
2. Soxhlet extractor
3. Rotary evaporator
4. Liquid-liquid extractor
5. Liofirizer (freeze-dry method)
6. Water-bath

Chemical agent

Ethanol 95% and Dichloromethane (CH_2Cl_2)

For culturing and testing of potential toxicity

Apparatuses and equipments

1. 14 L glass chamber
2. 300 L aquarium tank
3. 200 L reservoir unit
4. Carbon filter chamber
5. Air pump, air line and air stones
6. pH and DO meters
7. Thermometers
8. Venire Caliper
9. Electronic balances
10. Beakers, Volumetric flasks, graduated cylinders, pipettes, droppers, and other glassware

Chemical agent

1. Ethanol 95 %
2. 10 % formalin in Phosphate buffer
3. 4 % glutaraldehyde in Millonig's phosphate buffer

For tissue study processing

Apparatuses and equipments

1. Hot air oven
2. Beakers, Volumetric flasks, graduated cylinders, pipettes, droppers, and other glassware
3. Rotary Microtome
4. Cryostat Rotary Microtome
5. Electronic balances
6. pH-meter
7. Light Microscope
8. Transmission Electron Microscope

Chemical agent

1. Ethanol 95 % for preparing the series grade of ethanol
2. Paraplast
3. N-Butyl
4. Xylene
5. Tissuetek
6. Glutaraldehyde 4%
7. OsO_4
8. Uranyl acetate
9. Propelene oxide
10. Epoxy resin (Epon812)

Appendix B

The yield percentage of *D. trifoliata* crude extract

Table B-1 : The yield percentage of *D. trifoliata* leaves extract.

The extraction part	yield	percent yield (wt. by wt.)	physical appearance
ethanol part	410.10 g	2.56 %	dark green gum
dichloromethane part (water insoluble part)	101.04 g	0.6315 %	dark green gum
water soluble part	210.0 g	1.3125 %	pale brown crystal

The mortality data of acute toxicity testing

Table B-2 : Preliminary Toxicity Range-Finding Tests of the water extract.

Concentration (mg/L)	Number of fish in experiment	Percent mortality							
		24-hour		48-hour		72-hour		96-hour	
		No. of dead	death (%)	No. of dead	death (%)	No. of dead	death (%)	No. of dead	death (%)
Control	30	0	0	0	0	0	0	0	0
Solvent Control	30	0	0	0	0	0	0	0	0
0.01	30	0	0	0	0	0	0	0	0
0.1	30	0	0	0	0	0	0	0	0
1	30	0	0	0	0	0	0	0	0
10	30	0	0	0	0	0	0	0	0
100	30	0	0	0	0	0	0	0	0

Table B- 3 : Preliminary Toxicity Range-Finding Tests of the dichloromethane extract.

Concentration (mg/L)	Number of fish in experiment	Percent mortality							
		24-hour		48-hour		72-hour		96-hour	
		No. of dead	death (%)	No. of dead	death (%)	No. of dead	death (%)	No. of dead	death (%)
Control	30	0	0	0	0	0	0	0	0
Solvent Control	30	0	0	0	0	0	0	0	0
0.01	30	2	6.67	2	6.67	4	13.33	4	13.33
0.1	30	2	6.67	3	10.0	4	13.33	4	13.33
1	30	10	33.3	10	33.3	11	36.67	11	36.67
10	30	30	100	-	-	-	-	-	-
100	30	30	100	-	-	-	-	-	-

Table B-4 : First Definitive Toxicity Tests of the dichloromethane extract.

Concentration (mg/L)	Number of fish in experiment	Percent mortality							
		24-hour		48-hour		72-hour		96-hour	
		No. of dead	death (%)	No. of dead	death (%)	No. of dead	death (%)	No. of dead	death (%)
Control	30	0	0	0	0	0	0	0	0
Solvent Control	30	0	0	0	0	0	0	0	0
2.0	30	4	13.33	21	70.0	24	80.0	25	83.33
2.5	30	5	16.67	23	76.67	28	93.33	28	93.33
3.0	30	19	63.33	30	100	-	-	-	-
3.5	30	21	70	30	100	-	-	-	-
4.0	30	27	90	30	100	-	-	-	-
4.5	30	30	100	-	-	-	-	-	-
5.0	30	30	100	-	-	-	-	-	-

Table B-5 : Secound Definitive Toxicity Tests of the dichloromethane extract.

Concentration (mg/L)	Number of fish in experiment	Percent mortality							
		24-hour		48-hour		72-hour		96-hour	
		No. of dead	death (%)	No. of dead	death (%)	No. of dead	death (%)	No. of dead	death (%)
Control	30	0	0	0	0	0	0	0	0
Solvent Control	30	0	0	0	0	0	0	0	0
1.0	30	0	0	1	3.33	2	6.67	2	6.67
1.25	30	0	0	2	6.67	2	6.67	2	6.67
1.5	30	0	0	4	13.33	0	3.33	2	6.67
1.75	30	1	3.33	10	33.33	10	33.33	11	36.67
2.0	30	1	3.33	7	23.33	9	30.0	11	36.67
2.25	30	1	3.33	13	43.33	17	56.67	18	60.0
2.5	30	2	6.67	22	73.33	24	80.0	26	86.67

The growth data of sub-acute toxicity testing

Table B-6 : Month 0

Non-Treat					
R1		R2		R3	
Length (cm)	Weight (g)	Length (cm)	Weight (g)	Length (cm)	Weight (g)
2.94	0.4	3.2	0.3	3.26	0.5
2.72	0.3	3.12	0.3	3.46	0.6
3.4	0.6	2.92	0.2	2.8	0.3
3.81	0.8	3.12	0.3	2.94	0.3
3.1	0.4	3.15	0.4	2.91	0.4
3.44	0.6	3.05	0.4	3.37	0.5
3.32	0.5	3.8	0.8	3.33	0.5
3.42	0.5	2.8	0.3	2.95	0.4
3.42	0.5	3.26	0.7	3.23	0.4
3.55	0.6	2.93	0.3	2.89	0.3

Table B-7 : 1st Month

Control				Solvent Control				Treatment					
R1		R2		R1		R2		R1		R2		R3	
Length (cm)	Weight (g)	Length (cm)	Weight (g)	Length (cm)	Weight (g)	Length (cm)	Weight (g)	Length (cm)	Weight (g)	Length (cm)	Weight (g)	Length (cm)	Weight (g)
4.635	1.6	4.705	1.9	4.455	1.3	4.525	1.6	6.225	3.5	6.345	4.1	5.215	2.4
6.225	3.5	6.14	3.9	6.345	4.1	6.315	3.9	6.14	3.9	5.52	3.2	4.455	1.3
4.98	2.4	5.1	2.2	4.745	1.9	4.865	1.8	5.525	2.8	5.23	2.2	3.785	0.9
5.525	2.8	5.52	3.2	6	3.1	5.755	3.2	5.1	2.2	4.98	2.4	4.525	1.6
5.49	2.4	5.215	2.4	5.175	2.8	5.23	2.2	4.705	1.9	4.865	1.8	6.795	4.7
								6.515	4.1	5.49	2.4	4.635	1.6
								5.175	2.8	4.745	1.9	5.755	3.2
								6	3.1	6.315	3.9	3.93	1

Table B-8 : 2nd Month

Control				Solvent Control				Treatment					
R1		R2		R1		R2		R1		R2		R3	
Length (cm)	Weight (g)	Length (cm)	Weight (g)	Length (cm)	Weight (g)	Length (cm)	Weight (g)	Length (cm)	Weight (g)	Length (cm)	Weight (g)	Length (cm)	Weight (g)
7.53	6.4	6.645	5.2	8.225	9.3	7.91	8.2	5.465	2.5	7.675	7.1	9.46	13.4
5.81	3.6	8.13	11.9	7.35	6.1	7.45	5.1	7.075	5.8	8.135	9	8	8.6
5.51	3	6.55	5.3	6.51	4.9	8.55	10.7	7.925	9	6.7	4.5	5.73	3.2
7.515	7.6	6.325	4.3	7.2	6.5	6.25	5	5.775	3.8	6.9	6.9	7.355	6.2
7.335	6.7	7.48	6.6	6.38	4.2	6.08	4.1	8.77	11.1	7.92	8.9	7.49	7.4
								9.16	12.8	3.36	4.4	9.72	15
								7.525	8	6.025	3.8	6.805	5.7
								6.72	5.3	8.02	11.1	5.69	2.9

Table B-9 : 3rd Month

Control				Solvent Control				Treatment					
R1		R2		R1		R2		R1		R2		R3	
Length (cm)	Weight (g)	Length (cm)	Weight (g)	Length (cm)	Weight (g)	Length (cm)	Weight (g)	Length (cm)	Weight (g)	Length (cm)	Weight (g)	Length (cm)	Weight (g)
9.425	17.2	8.95	14.3	12.7	29.9	13.17	38.6	10.345	17.1	8.55	11.7	9.5	14.3
11.245	26.9	10.895	27.6	12.175	26	11.9	29.3	9.63	14.9	7.7	7.5	8.315	10.2
10.85	19.9	13.425	45.4	11.8	24.3	10.64	19.2	11.6	21.4	8.15	10.9	9.435	14.5
8.26	9.9	11.415	26.3	12.355	27.4	11.625	24.2	9.02	12.9	6.915	5.8	10.095	16.6
10.7	23.4	11.635	28.2	12.925	32.8	9.815	14.5	9.135	12	9.01	11.8	10.365	19.7
								10.51	22.4	8.645	10.3	8.78	11.9
								9.36	14.7	8.945	12.1	10	16.4
								8.42	9	8.64	11	9.3	12.6

Table B-10 : 4th Month

Control				Solvent Control				Treatment					
R1		R2		R1		R2		R1		R2		R3	
Length (cm)	Weight (g)	Length (cm)	Weight (g)	Length (cm)	Weight (g)	Length (cm)	Weight (g)	Length (cm)	Weight (g)	Length (cm)	Weight (g)	Length (cm)	Weight (g)
10.275	23.5	10.505	21.7	13.21	48.2	13.225	41	9.945	16.7	11.355	24.9	10.1	15.8
9.55	20.7	11.28	26.3	12.3	29.6	12.7	38.6	9.805	15.6	10.9	19.8	11.54	22.5
9.64	18	12.4	34.4	10.59	22.2	11.14	25.2	9.61	13.9	11.325	23.5	9.61	13.5
12.485	42.4	11.11	25.1	12.88	38.5	13.3	40.2	9.605	16.5	10.455	20.5	12.13	29.5
12.07	32	12.47	35.2	14.8	54.9	13.15	41.4	10.125	16.2	12.085	29.8	8.865	12.1
								11.58	21.7	9.425	14.1	10.43	19.6
								13.1	40	9.3	18.5	10.1	17
								11.36	24.8	8.8	12.6	11.58	28

Table B-11 : Month 5

Control				Solvent Control				Treatment					
R1		R2		R1		R2		R1		R2		R3	
Length (cm)	Weight (g)	Length (cm)	Weight (g)	Length (cm)	Weight (g)	Length (cm)	Weight (g)	Length (cm)	Weight (g)	Length (cm)	Weight (g)	Length (cm)	Weight (g)
15.805	74.8	16.38	81.8	14.325	51.4	14.225	44.5	13.92	43.7	12.505	28	14.93	53.3
14.685	53.3	14.69	59.8	16.415	81.2	14.725	52	14.515	49.4	10.75	22.2	13.93	45.1
14.455	59.9	16.66	73.3	15.36	57.1	14.585	53.2	13.94	40.4	11.875	27.7	13.8	43.9
15.135	60.6	15.915	62.4	16.575	74.3	15.3	57.2	12.71	40.2	12.935	32.4	15.2	46.7
15.3	75.8	15.915	79	14.875	48.8	14.005	46.3	15.78	36.7	12.825	39.7	13.28	38.6
								13.79	37.4	12.68	32.4	14.64	44.8
								13.52	39.8	13.44	34.4	14.825	48.3
								14.45	45	11.31	27.1	14.41	48.2

Relative Liver Weight Index

Table B-12 : Relative liver weight index (calculated from growth data of 4th month)

Control		Solvent Control		Treatment		
R1	R2	R1	R2	R1	R2	R3
0.017	0.027	0.018	0.0244	0.0211	0.03	0.027
0.021	0.0293	0.014	0.0246	0.022	0.026	0.033
0.029	0.022	0.023	0.014	0.026	0.033	0.029
0.0221	0.020	0.025	0.023	0.029	0.054	0.027
0.0272	0.0165	0.0234	0.0184	0.044	0.03	0.024
				0.035	0.0278	0.049
				0.028	0.033	0.027
				0.033	0.030	0.030
0.02304211 ± 0.004887281		0.020640156 ± 0.004328708		0.031089651 ± 0.007752197		

Table B-13 : Relative liver weight index (calculated from growth data of 5th month)

Control		Solvent Control		Treatment		
R1	R2	R1	R2	R1	R2	R3
0.037	0.032	0.033	0.031	0.032	0.025	0.034
0.034	0.027	0.0296	0.033	0.036	0.032	0.035
0.030	0.035	0.019	0.032	0.0223	0.0325	0.036
0.035	0.0288	0.026	0.0455	0.0398	0.0308	0.026
0.032	0.034	0.0287	0.0367	0.022	0.0353	0.031
				0.0455	0.052	0.036
				0.0223	0.026	0.0414
				0.0267	0.044	0.0373
0.03246 ± 0.003562		0.031444 ± 0.006852		0.033421 ± 0.007802		

Appendix C

24hr-LC_{50}

************* PROBIT ANALYSIS *************

DATA Information

7 unweighted cases accepted.
0 cases rejected because of missing data.
2 cases are in the control group.
0 cases rejected because LOG-transform can't be done.

MODEL Information

ONLY Normal Sigmoid is requested.

Hi-Res Chart # 1:Probit transformation

Parameter estimates converged after 18 iterations.
Optimal solution found.

Parameter Estimates (PROBIT model: (PROBIT(p)) = Intercept + BX):

	Regression Coeff.	Standard Error	Coeff./S.E.
CONC	3.40863	2.36857	1.43911

Intercept	Standard Error	Intercept/S.E.
-3.01583	.76437	-3.94551

Pearson Goodness-of-Fit Chi Square = 1.432 DF = 5 P = .921

Since Goodness-of-Fit Chi square is NOT significant, no heterogeneity factor is used in the calculation of confidence limits.

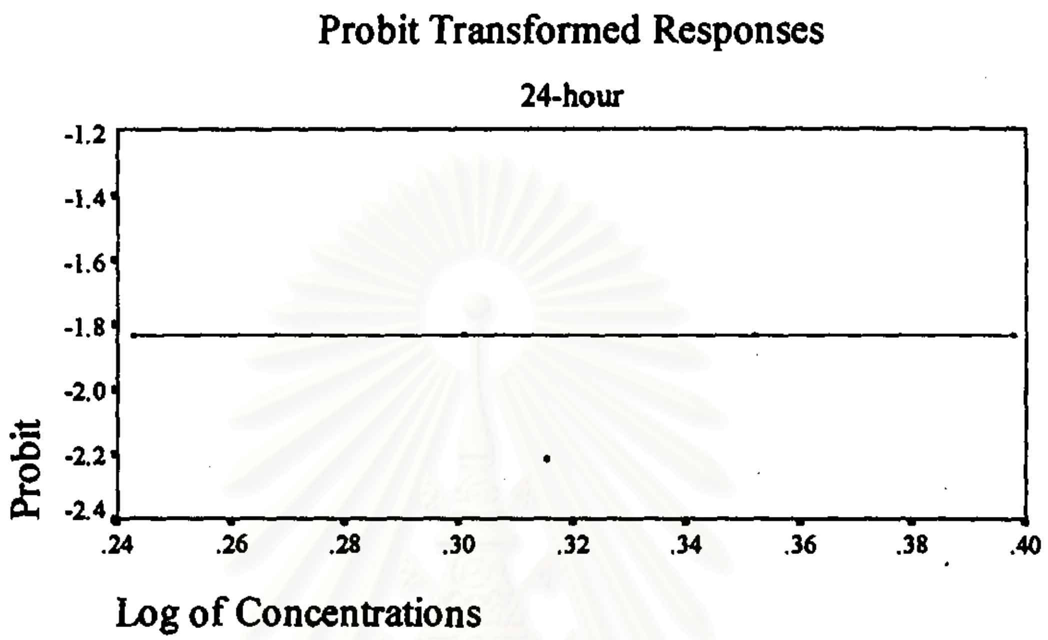
Observed and Expected Frequencies

CONC	Number of Subjects	Observed Responses	Expected Responses	Residual	Prob
.00	30.0	.0	.038	-.038	.00128
.10	30.0	.0	.109	-.109	.00362
.18	30.0	.0	.236	-.236	.00785
.24	30.0	1.0	.431	.569	.01436
.30	30.0	1.0	.699	.301	.02331
.35	30.0	1.0	1.042	-.042	.03473
.40	30.0	1.0	1.456	-.456	.04852

Confidence Limits for Effective CONC

		95% Confidence Limits	
Prob	CONC	Lower	Upper
.01	1.59322	.	.
.02	1.91536	.	.
.03	2.15273	.	.
.04	2.35050	.	.
.05	2.52469	.	.
.06	2.68309	.	.
.07	2.83013	.	.
.08	2.96862	.	.
.09	3.10044	.	.
.10	3.22695	.	.
.15	3.80805	.	.
.20	4.34366	.	.
.25	4.86281	.	.
.30	5.38170	.	.
.35	5.91183	.	.
.40	6.46307	.	.
.45	7.04529	.	.
.50	7.66945	.	.
.55	8.34891	.	.
.60	9.10101	.	.
.65	9.94963	.	.
.70	10.92973	.	.
.75	12.09599	.	.
.80	13.54170	.	.
.85	15.44635	.	.
.90	18.22791	.	.
.91	18.97168	.	.
.92	19.81410	.	.
.93	20.78364	.	.
.94	21.92265	.	.
.95	23.29807	.	.
.96	25.02467	.	.
.97	27.32363	.	.
.98	30.70993	.	.
.99	36.91918	.	.

Figure C-1 24-hour LC_{50}



48hr-LC_{50}

************* PROBIT ANALYSIS *************

DATA Information

7 unweighted cases accepted.
0 cases rejected because of missing data.
2 cases are in the control group.
0 cases rejected because LOG-transform can't be done.

MODEL Information
ONLY Normal Sigmoid is requested.

Hi-Res Chart # 2:Probit transformation

Parameter estimates converged after 13 iterations.
Optimal solution found.

Parameter Estimates (PROBIT model: (PROBIT(p)) = Intercept + BX):

	Regression Coeff.	Standard Error	Coeff./S.E.
CONC	5.88623	.96166	6.12092

Intercept	Standard Error	Intercept/S.E.
-2.07694	.28261	-7.34901

Pearson Goodness-of-Fit Chi Square = 6.591 DF = 5 P = .253

Since Goodness-of-Fit Chi square is NOT significant, no heterogeneity factor is used in the calculation of confidence limits.

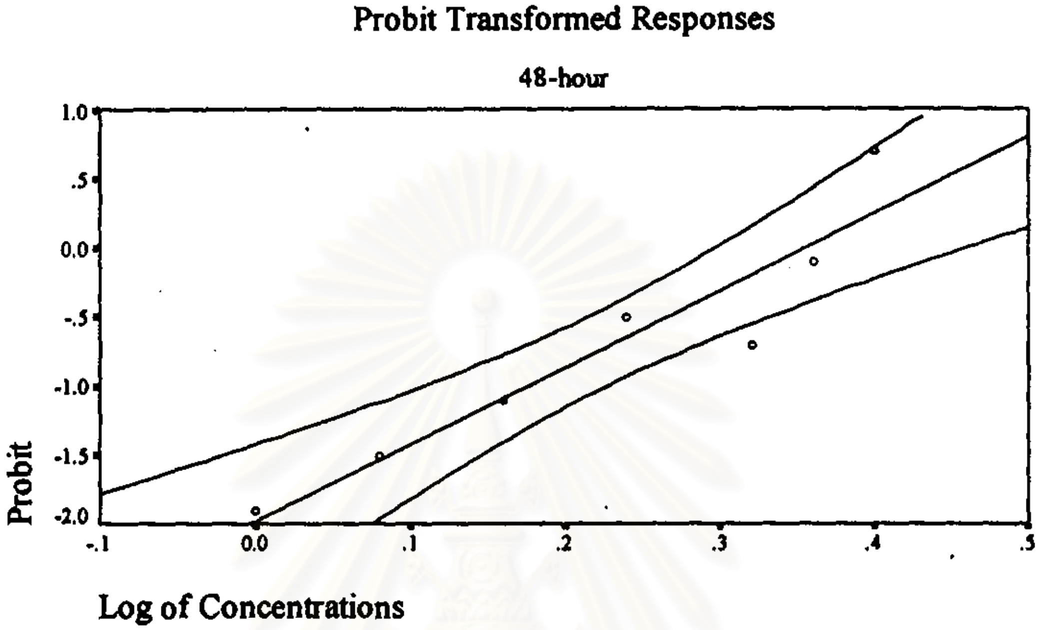
Observed and Expected Frequencies

CONC	Number of Subjects	Observed Responses	Expected Responses	Residual	Prob
.00	30.0	1.0	.567	.433	.01890
.10	30.0	2.0	1.979	.021	.06597
.18	30.0	4.0	4.472	-.472	.14907
.24	30.0	10.0	7.771	2.229	.25902
.30	30.0	7.0	11.405	-4.405	.38018
.35	30.0	13.0	14.953	-1.953	.49844
.40	30.0	22.0	18.140	3.860	.60466

Confidence Limits for Effective CONC

		95% Confidence Limits	
Prob	CONC	Lower	Upper
.01	.90704	.63532	1.09631
.02	1.00911	.74170	1.19098
.03	1.07975	.81795	1.25571
.04	1.13613	.88020	1.30704
.05	1.18415	.93412	1.35063
.06	1.22662	.98243	1.38913
.07	1.26511	1.02666	1.42403
.08	1.30060	1.06778	1.45626
.09	1.33373	1.10644	1.48643
.10	1.36498	1.14309	1.51498
.15	1.50234	1.30547	1.64255
.20	1.62131	1.44550	1.75802
.25	1.73085	1.57092	1.87138
.30	1.83551	1.68499	1.98858
.35	1.93814	1.78981	2.11343
.40	2.04083	1.88758	2.24830
.45	2.14535	1.98076	2.39479
.50	2.25345	2.07184	2.55458
.55	2.36698	2.16314	2.73002
.60	2.48821	2.25695	2.92462
.65	2.62004	2.35572	3.14364
.70	2.76654	2.46243	3.39506
.75	2.93383	2.58122	3.69155
.80	3.13205	2.71860	4.05475
.85	3.38006	2.88631	4.52608
.90	3.72021	3.11018	5.20093
.91	3.80737	3.16655	5.37890
.92	3.90438	3.22887	5.57930
.93	4.01390	3.29870	5.80846
.94	4.13985	3.37837	6.07575
.95	4.28833	3.47144	6.39590
.96	4.46959	3.58389	6.79397
.97	4.70296	3.72692	7.31791
.98	5.03216	3.92557	8.07820
.99	5.59843	4.25967	9.44160

Figure C-2 48-hour LC_{50}



72hr-LC_{50}

************* PROBIT ANALYSIS *************

DATA Information

7 unweighted cases accepted.
0 cases rejected because of missing data.
2 cases are in the control group.
0 cases rejected because LOG-transform can't be done.

MODEL Information

ONLY Normal Sigmoid is requested.

Hi-Res Chart # 3:Probit transformation

Parameter estimates converged after 13 iterations.
Optimal solution found.

Parameter Estimates (PROBIT model: (PROBIT(p)) = Intercept + BX):

	Regression Coeff.	Standard Error	Coeff./S.E.
CONC	6.07533	.91029	6.67405

Intercept	Standard Error	Intercept/S.E.
-1.95468	.26133	-7.47961

Pearson Goodness-of-Fit Chi Square = 7.120 DF = 5 P = .212

Since Goodness-of-Fit Chi square is NOT significant, no heterogeneity factor is used in the calculation of confidence limits.

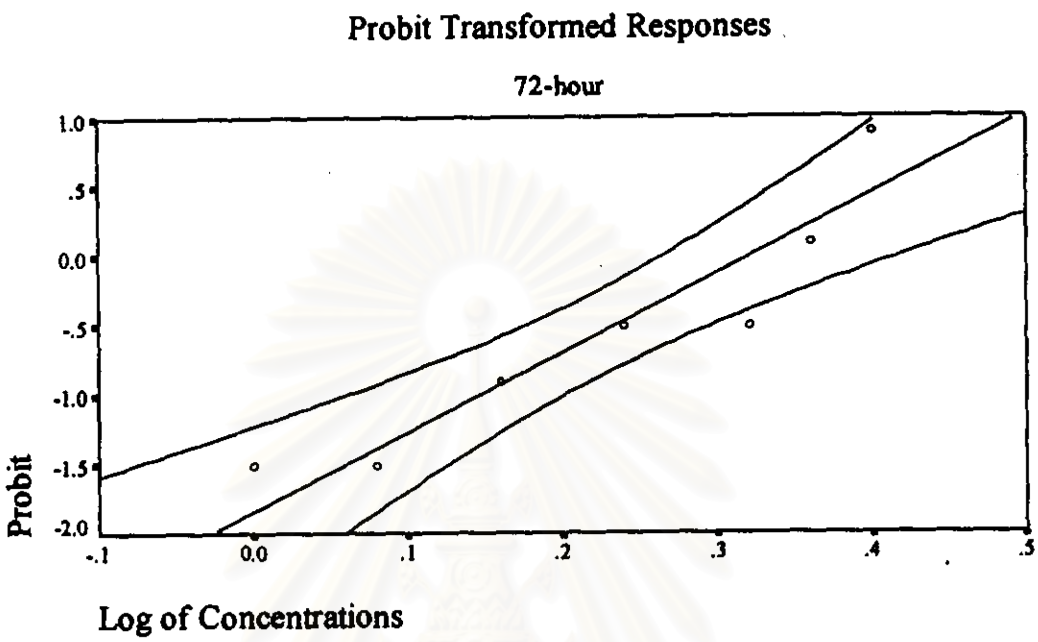
Observed and Expected Frequencies

CONC	Number of Subjects	Observed Responses	Expected Responses	Residual	Prob
.00	30.0	2.0	.759	1.241	.02531
.10	30.0	2.0	2.579	-.579	.08598
.18	30.0	5.0	5.643	-.643	.18811
.24	30.0	10.0	9.488	.512	.31627
.30	30.0	9.0	13.498	-4.498	.44994
.35	30.0	17.0	17.201	-.201	.57336
.40	30.0	24.0	20.349	3.651	.6782

Confidence Limits for Effective CONC

Prob	CONC	95% Confidence Limits Lower	Upper
.01	.86861	.62776	1.04284
.02	.96315	.72532	1.13159
.03	1.02840	.79470	1.19214
.04	1.08038	.85105	1.24007
.05	1.12460	.89968	1.28069
.06	1.16366	.94312	1.31649
.07	1.19902	.98280	1.34888
.08	1.23159	1.01963	1.37872
.09	1.26198	1.05420	1.40659
.10	1.29062	1.08693	1.43290
.15	1.41626	1.23185	1.54942
.20	1.52479	1.35730	1.65287
.25	1.62450	1.47094	1.75199
.30	1.71959	1.57612	1.85187
.35	1.81266	1.67461	1.95610
.40	1.90564	1.76780	2.06737
.45	2.00012	1.85721	2.18772
.50	2.09769	1.94461	2.31896
.55	2.20001	2.03191	2.46316
.60	2.30909	2.12119	2.62312
.65	2.42753	2.21476	2.80297
.70	2.55892	2.31545	3.00897
.75	2.70871	2.42715	3.25109
.80	2.88584	2.55595	3.54638
.85	3.10697	2.71281	3.92739
.90	3.40945	2.92172	4.46882
.91	3.48682	2.97427	4.61084
.92	3.57286	3.03233	4.77041
.93	3.66992	3.09736	4.95243
.94	3.78143	3.17152	5.16415
.95	3.91276	3.25811	5.41694
.96	4.07290	3.36268	5.73011
.97	4.27878	3.49559	6.14047
.98	4.56865	3.68006	6.73252
.99	5.06591	3.99002	7.78516

Figure C-3 72-hour LC_{50}



96hr-LC_{50}

************* PROBIT ANALYSIS *************

DATA Information

7 unweighted cases accepted.
0 cases rejected because of missing data.
2 cases are in the control group.
0 cases rejected because LOG-transform can't be done.

MODEL Information
ONLY Normal Sigmoid is requested.

Parameter estimates converged after 13 iterations.
Optimal solution found.

Parameter Estimates (PROBIT model: (PROBIT(p)) = Intercept + BX):

	Regression Coeff.	Standard Error	Coeff./S.E.
CONC	6.38842	.90486	7.06011

Intercept	Standard Error	Intercept/S.E.
-1.90602	.25538	-7.46359

Pearson Goodness-of-Fit Chi Square = 7.094 DF = 5 P = .214

Since Goodness-of-Fit Chi square is NOT significant, no heterogeneity factor is used in the calculation of confidence limits.

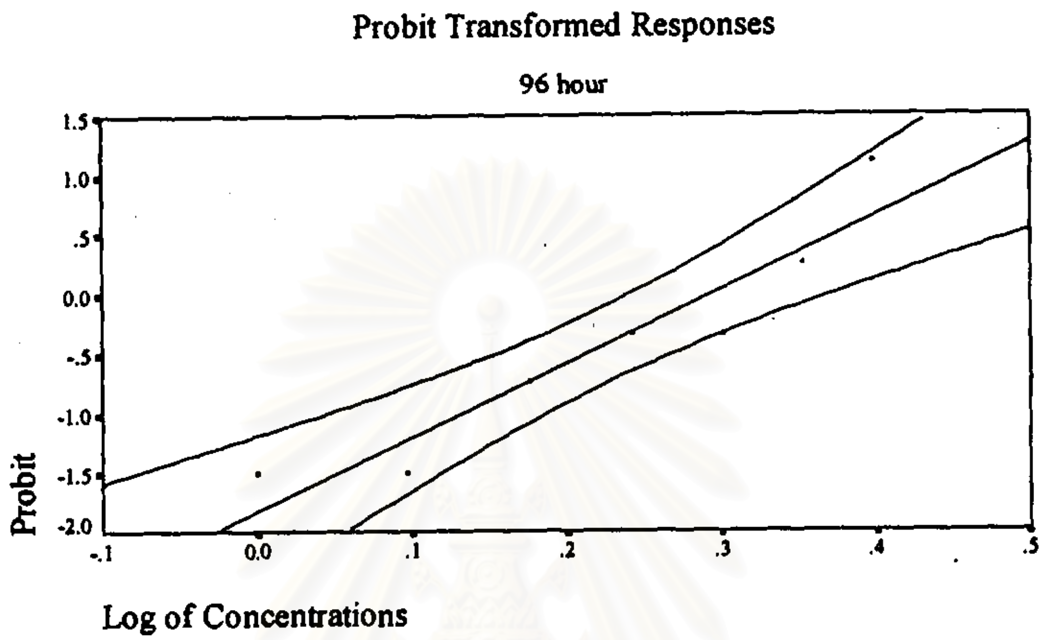
Observed and Expected Frequencies

CONC	Number of Subjects	Observed Responses	Expected Responses	Residual	Prob
.00	30.0	2.0	.850	1.150	.02832
.10	30.0	2.0	2.972	-.972	.09906
.18	30.0	7.0	6.521	.479	.21738
.24	30.0	11.0	10.857	.143	.36190
.30	30.0	11.0	15.204	-4.204	.50682
.35	30.0	18.0	19.036	-1.036	.63453
.40	30.0	26.0	22.130	3.870	.73767

Confidence Limits for Effective CONC

		95% Confidence Limits	
Prob	CONC	Lower	Upper
.01	.85942	.63676	1.02330
.02	.94815	.72835	1.10690
.03	1.00913	.79297	1.16374
.04	1.05758	.84520	1.20863
.05	1.09871	.89008	1.24658
.06	1.13496	.93005	1.27997
.07	1.16774	.96647	1.31011
.08	1.19788	1.00020	1.33783
.09	1.22598	1.03180	1.36366
.10	1.25242	1.06169	1.38800
.15	1.36810	1.19357	1.49514
.20	1.46762	1.30757	1.58909
.25	1.55875	1.41115	1.67777
.30	1.64539	1.50771	1.76563
.35	1.72998	1.59902	1.85585
.40	1.81426	1.68625	1.95092
.45	1.89970	1.77048	2.05297
.50	1.98772	1.85297	2.16388
.55	2.07982	1.93521	2.28559
.60	2.17777	2.01898	2.42051
.65	2.28387	2.10634	2.57203
.70	2.40127	2.19990	2.74523
.75	2.53475	2.30323	2.94820
.80	2.69214	2.42188	3.19473
.85	2.88797	2.56580	3.51112
.90	3.15472	2.75673	3.95750
.91	3.22276	2.80463	4.07400
.92	3.29835	2.85751	4.20461
.93	3.38350	2.91669	4.35324
.94	3.48120	2.98409	4.52567
.95	3.59609	3.06271	4.73092
.96	3.73591	3.15752	4.98430
.97	3.91528	3.27785	5.31489
.98	4.16712	3.44455	5.78921
.99	4.59734	3.72388	6.62559

Figure C-4 96-hour LC_{50}



ANOVA for acute toxicity testing

----- O N E W A Y -----

Variable Observe mortality
By Variable Group

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	8	213.4074	26.6759	6.3180	.0006
Within Groups	18	76.0000	4.2222		
Total	26	289.4074			

Multiple Range Tests: LSD test with significance level .05

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 1.4530 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE: 2.97

(*) Indicates significant differences which are shown in the lower triangle

```
               G G G G G G G G G
               r r r r r r r r r
               p p p p p p p p p

               1 2 3 4 5 6 7 8 9

  Mean    GROUP

   .0000  Grp 1
   .0000  Grp 2
   .6667  Grp 3
   .6667  Grp 4
  2.3333  Grp 5
  3.6667  Grp 6    * *
  3.6667  Grp 7    * *
  6.0000  Grp 8    * * * * *
  8.6667  Grp 9    * * * * * * *
```

Homogeneous Subsets (highest and lowest means are not significantly different)

Subset 1

Group	Grp 1	Grp 2	Grp 3	Grp 4	Grp 5
Mean	.0000	.0000	.6667	.6667	2.3333

Subset 2

Group	Grp 3	Grp 4	Grp 5	Grp 6	Grp 7
Mean	.6667	.6667	2.3333	3.6667	3.6667

Subset 3

Group	Grp 6	Grp 7	Grp 8
Mean	3.6667	3.6667	6.0000

Subset 4

Group	Grp 8	Grp 9
Mean	6.0000	8.6667

Group 1	=	Control		
Group 2	=	Solvent Control (Ethanol)		
Group 3	=	Treatment	1.0	mg/L
Group 4	=	Treatment	1.25	mg/L
Group 5	=	Treatment	1.5	mg/L
Group 6	=	Treatment	1.75	mg/L
Group 7	=	Treatment	2.0	mg/L
Group 8	=	Treatment	2.25	mg/L
Group 9	=	Treatment	2.5	mg/L

Test Concentration for Sub-acute Toxicity Testing

$$AF = MATC / LC_{50} = (NOEC \sim LOEC) / LC_{50}$$

from the Probit Model

LC_{50} 96-hour. = 1.98772 mg/L

from the ANOVA

NOEC = 1.5 mg/L

LOEC = 1.75 mg/L

$$AF = (1.5 \sim 1.75) / 1.98772$$

$$AF = 0.7546 \sim 0.8804$$

Average *AF*

$$AF = 0.8175$$

The average of upper and lower AF used to determine the MATC

$$MATC = 0.8175 \times 1.98772$$

$$MATC = 1.625 \text{ mg/L}$$

12.5 % of MATC was selected to be the test concentration of sub-acute toxicity testing.

12.5 % (1.625) = 0.203 mg/L

Thus, the appropriate test concentration for sub-acute toxicity testing was 0.2 mg/L

Appendix D

ANOVA for growth rate in length in month 0 (non-treat)

----- O N E W A Y -----

Variable LENGTH
By Variable TEST GROUP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	.2366	.1183	1.5424	.2321
Within Groups	27	2.0706	.0767		
Total	29	2.3072			

Multiple Range Tests: Duncan test with significance level .05

The difference between two means is significant if
MEAN(J)-MEAN(I) >= .1958 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3
RANGE	2.90	3.05

- No two groups are significantly different at the .050 level

Homogeneous Subsets (highest and lowest means are not significantly different)

Subset 1

Group	Grp 3	Grp 2	Grp 1
Mean	3.1140	3.1350	3.3120

Group 1 = Control
Group 2 = Solvent Control (Ethanol)
Group 3 = Treatment

ANOVA for growth rate in weight in month 0 (non-treat)

----- O N E W A Y -----

Variable WEIGHT
By Variable TEST GROUP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	.0827	.0413	1.8235	.1808
Within Groups	27	.6120	.0227		
Total	29	.6947			

Multiple Range Tests: Duncan test with significance level .05

The difference between two means is significant if
MEAN(J)-MEAN(I) >= .1065 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3
RANGE	2.90	3.05

- No two groups are significantly different at the .050 level

Homogeneous Subsets (highest and lowest means are not significantly different)

Subset 1

Group	Grp 2	Grp 3	Grp 1
Mean	.4000	.4200	.5200

Group 1 = Control
Group 2 = Solvent Control (Ethanol)
Group 3 = Treatment

ANOVA for growth rate in length in month 1

----- O N E W A Y -----

Variable LENGTH
By Variable CONC.

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	.0033	.0016	.0030	.9970
Within Groups	41	22.4011	.5464		
Total	43	22.4044			

Multiple Range Tests: Duncan test with significance level .05

The difference between two means is significant if
MEAN(J)-MEAN(I) >= .5227 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3
RANGE	2.86	3.00

- No two groups are significantly different at the .050 level

Group 1 = Control
Group 2 = Solvent Control (Ethanol)
Group 3 = Treatment 0.2 mg/L

ANOVA for growth rate in weight in month 1

----- O N E W A Y -----

Variable WEIGHT
By Variable CONC.

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	.0093	.0046	.0049	.9951
Within Groups	41	38.5696	.9407		
Total	43	38.5789			

Multiple Range Tests: Duncan test with significance level .05

The difference between two means is significant if
MEAN(J)-MEAN(I) >= .6858 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3
RANGE	2.86	3.00

- No two groups are significantly different at the .050 level

Group 1 = Control
Group 2 = Solvent Control (Ethanol)
Group 3 = Treatment 0.2 mg/L

ANOVA for growth rate in length in month 2

----- O N E W A Y -----

Variable LENGTH
By Variable CONC.

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	.8594	.4297	.2889	.7506
Within Groups	41	60.9855	1.4875		
Total	43	61.8449			

Multiple Range Tests: Duncan test with significance level .05

The difference between two means is significant if
MEAN(J)-MEAN(I) >= .8624 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3
RANGE	2.86	3.00

- No two groups are significantly different at the .050 level

Group 1 = Control
Group 2 = Solvent Control (Ethanol)
Group 3 = Treatment 0.2 mg/L

ANOVA for growth rate in weight in month 2

----- O N E W A Y -----

Variable WEIGHT
By Variable CONC.

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	14.1750	7.0875	.7654	.4717
Within Groups	41	379.6730	9.2603		
Total	43	393.8480			

Multiple Range Tests: Duncan test with significance level .05

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 2.1518 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3
RANGE	2.86	3.00

- No two groups are significantly different at the .050 level

Group 1 = Control
Group 2 = Solvent Control (Ethanol)
Group 3 = Treatment 0.2 mg/L

ANOVA for growth rate in length in month 3

----- ONEWAY -----

Variable LENGTH
By Variable CONC.

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	56.2945	28.1473	21.9071	.0000
Within Groups	41	52.6787	1.2848		
Total	43	108.9732			

Multiple Range Tests: Duncan test with significance level .05

The difference between two means is significant if
MEAN(J)-MEAN(I) >= .8015 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3
RANGE	2.86	3.00

(*) Indicates significant differences which are shown in the lower triangle

```
                G G G
                r r r
                p p p

                3 1 2
Mean     TGROUP

 9.1819  Grp 3
10.6800  Grp 1   *
11.9105  Grp 2   * *
```

Group 1 = Control
Group 2 = Solvent Control (Ethanol)
Group 3 = Treatment 0.2 mg/L

ANOVA for growth rate in weight in month 3

----- O N E W A Y -----

Variable WEIGHT3
By Variable TGROUP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	1571.4045	785.7023	19.5006	.0000
Within Groups	41	1651.9346	40.2911		
Total	43	3223.3391			

Multiple Range Tests: Duncan test with significance level .05

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 4.4884 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3
RANGE	2.86	3.00

(*) Indicates significant differences which are shown in the lower triangle

		G	G	G
		r	r	r
		p	p	p
		3	1	2
Mean	TGROUP			
13.4042	Grp 3			
23.9100	Grp 1	*		
26.6200	Grp 2	*		

Group 1 = Control
Group 2 = Solvent Control (Ethanol)
Group 3 = Treatment 0.2 mg/L

ANOVA for growth rate in length in month 4

----- O N E W A Y -----

Variable LENGTH
By Variable CONC.

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	33.6216	16.8108	12.7762	.0000
Within Groups	41	53.9475	1.3158		
Total	43	87.5691			

Multiple Range Tests: Duncan test with significance level .05

The difference between two means is significant if
MEAN(J)-MEAN(I) >= .8111 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3
RANGE	2.86	3.00

(*) Indicates significant differences which are shown in the lower triangle

		G	G	G
		r	r	r
		p	p	p
		3	1	2
Mean	TGROUP			
10.5471	Grp 3			
11.1785	Grp 1			
12.7295	Grp 2	*	*	

Group 1 = Control
Group 2 = Solvent Control (Ethanol)
Group 3 = Treatment 0.2 mg/L

ANOVA for growth rate in weight in month 4

----- O N E W A Y -----

Variable WEIGHT
By Variable CONC.

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	2253.2434	1126.6217	18.66 56	.0000
Within Groups	41	2474.6866	60.3582		
Total	43	4727.9300			

Multiple Range Tests: Duncan test with significance level .05

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 5.4936 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3
RANGE	2.86	3.00

(*) Indicates significant differences which are shown in the lower triangle

```
                 G G G
                 r r r
                 p p p

                 3 1 2
   Mean      TGROUP

 20.2958    Grp 3
 27.9300    Grp 1     *
 37.9800    Grp 2     * *
```

Group 1 = Control
Group 2 = Solvent Control (Ethanol)
Group 3 = Treatment 0.2 mg/L

ANOVA for growth rate in length in month 5

----- O N E W A Y -----

Variable LENGTH
By Variable CONC.

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	32.0024	16.0012	14.0268	.0000
Within Groups	41	46.7710	1.1408		
Total	43	78.7733			

Multiple Range Tests: Duncan test with significance level .05

The difference between two means is significant if
MEAN(J)-MEAN(I) >= .7552 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3
RANGE	2.86	3.00

(*) Indicates significant differences which are shown in the lower triangle

		G G G r r r p p p 3 2 1
Mean	TGROUP	
13.5817	Grp 3	
15.0390	Grp 2	*
15.4940	Grp 1	*

Group 1 = Control
Group 2 = Solvent Control (Ethanol)
Group 3 = Treatment 0.2 mg/L

ANOVA for growth rate in weight in month 5

----- O N E W A Y -----

Variable WEIGHT
By Variable CONC.

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	6400.3123	3200.1561	35.8538	.0000
Within Groups	41	3659.4793	89.2556		
Total	43	10059.7916			

Multiple Range Tests: Duncan test with significance level .05

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 6.6804 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3
RANGE	2.86	3.00

(*) Indicates significant differences which are shown in the lower triangle

		G	G	G
		r	r	r
		p	p	p
		3	2	1
Mean	TGROUP			
39.3917	Grp 3			
56.6000	Grp 2	*		
68.0700	Grp 1	*	*	

Group 1 = Control
Group 2 = Solvent Control (Ethanol)
Group 3 = Treatment 0.2 mg/L

ANOVA for growth rate in length of control group among 5 month period

----- O N E W A Y -----

Variable Length of Control Group
By Variable Month

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	4	633.0717	158.2679	154.9034	.0000
Within Groups	45	45.9774	1.0217		
Total	49	679.0491			

Multiple Range Tests: Duncan test with significance level .05

The difference between two means is significant if
MEAN(J)-MEAN(I) >= .7147 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5
RANGE	2.85	3.00	3.09	3.16

(*) Indicates significant differences which are shown in the lower triangle

Mean	Month	G r p 1	G r p 2	G r p 3	G r p 4	G r p 5
5.3535	Grp 1					
6.8830	Grp 2	*				
10.6800	Grp 3	*	*			
11.1785	Grp 4	*	*			
15.4940	Grp 5	*	*	*	*	

Homogeneous Subsets (highest and lowest means are not significantly different)

Subset 1

Group	Grp 1
Mean	5.3535

Subset 2

Group	Grp 2
Mean	6.8830

Subset 3

Group	Grp 3	Grp 4
Mean	10.6800	11.1785

Subset 4

Group	Grp 5
Mean	15.4940

Group 1 = 1st Month
Group 2 = 2nd Month
Group 3 = 3rd Month
Group 4 = 4th Month
Group 5 = 5th Month

ANOVA for growth rate in weight of control group among 5 month period

----- O N E W A Y -----

Variable Weight of Control Group
By Variable Month

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	4	27213.4640	6803.366	130.6923	.0000
Within Groups	45	2342.5360	52.0564		
Total	49	29556.0000			

Multiple Range Tests: Duncan test with significance level .05

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 5.1018 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5
RANGE	2.85	3.00	3.09	3.16

(*) Indicates significant differences which are shown in the lower triangle

```
                G G G G G
                r r r r r
                p p p p p

                1 2 3 4 5
Mean     Month

 2.6300  Grp 1
 6.0600  Grp 2
23.9100  Grp 3  * *
27.9300  Grp 4  * *
68.0700  Grp 5  * * * *
```

Homogeneous Subsets (highest and lowest means are not significantly different)

Subset 1

Group	Grp 1	Grp 2
Mean	2.6300	6.0600

Subset 2

Group	Grp 3	Grp 4
Mean	23.9100	27.9300

Subset 3

Group	Grp 5
Mean	68.0700

Group 1	=	1st Month
Group 2	=	2nd Month
Group 3	=	3rd Month
Group 4	=	4th Month
Group 5	=	5th Month

ANOVA for growth rate in length of solvent control group among 5 month period

----- O N E W A Y -----

Variable   Length of Solvent Control Group
By Variable   Month

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	4	651.1401	162.7850	180.5079	.0000
Within Groups	45	40.5817	.9018		
Total	49	691.7219			

Multiple Range Tests: Duncan test with significance level .05

The difference between two means is significant if
MEAN(J)-MEAN(I) >= .6715 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5
RANGE	2.85	3.00	3.09	3.16

(*) Indicates significant differences which are shown in the lower triangle

```
                 G G G G G
                 r r r r r
                 p p p p p

                 1 2 3 4 5
  Mean     GROUP

  5.3410   Grp 1
  7.1905   Grp 2   *
 11.9105   Grp 3   * *
 12.7295   Grp 4   * *
 15.0390   Grp 5   * * * *
```

Homogeneous Subsets (highest and lowest means are not significantly different)

Subset 1

Group	Grp 1
Mean	5.3410

Subset 2

Group	Grp 2
Mean	7.1905

Subset 3

Group	Grp 3	Grp 4
Mean	11.9105	12.7295

Subset 4

Group	Grp 5
Mean	15.0390

Group 1	=	1st Month
Group 2	=	2nd Month
Group 3	=	3rd Month
Group 4	=	4th Month
Group 5	=	5th Month

ANOVA for growth rate in weight of solvent control group among 5 month period

----- O N E W A Y -----

Variable Weight of Solvent Control Group
By Variable Month

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	4	20120.5300	5030.1325	85.0793	.0000
Within Groups	45	2660.5300	59.1229		
Total	49	22781.0600			

Multiple Range Tests: Duncan test with significance level .05

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 5.4370 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5
RANGE	2.85	3.00	3.09	3.16

(*) Indicates significant differences which are shown in the lower triangle

```
                 G G G G G
                 r r r r r
                 p p p p p

                 1 2 3 4 5
 Mean   Month

 2.5900  Grp 1
 6.4100  Grp 2
26.6200  Grp 3   * *
37.9800  Grp 4   * * *
56.6000  Grp 5   * * * *
```

Homogeneous Subsets (highest and lowest means are not significantly different)

Subset 1

Group	Grp 1	Grp 2
Mean	2.5900	6.4100

Subset 2

Group	Grp 3
Mean	26.6200

Subset 3

Group	Grp 4
Mean	37.9800

Subset 4

Group	Grp 5
Mean	56.6000

Group 1	=	1st Month
Group 2	=	2nd Month
Group 3	=	3rd Month
Group 4	=	4th Month
Group 5	=	5th Month

ANOVA for growth rate in length of treatment group among 5 month period

----- O N E W A Y -----

Variable Length of Treatment Group
By Variable Month

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	4	956.9249	239.2312	183.1364	.0000
Within Groups	115	150.2246	1.3063		
Total	119	1107.1495			

Multiple Range Tests: Duncan test with significance level .05

The difference between two means is significant if
MEAN(J)-MEAN(I) >= .8082 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5
RANGE	2.81	2.95	3.04	3.11

(*) Indicates significant differences which are shown in the lower triangle

		G	G	G	G	G
		r	r	r	r	r
		p	p	p	p	p
		1	2	3	4	5
Mean	Month					
5.3321	Grp 1					
7.2250	Grp 2	*				
9.1819	Grp 3	*	*			
10.5471	Grp 4	*	*	*		
13.5817	Grp 5	*	*	*	*	

Homogeneous Subsets (highest and lowest means are not significantly different)

Subset 1

Group Grp 1

Mean 5.3321

Subset 2

Group Grp 2

Mean 7.2250

Subset 3

Group Grp 3

Mean 9.1819

Subset 4

Group Grp 4

Mean 10.5471

Subset 5

Group Grp 5

Mean 13.5817

Group 1	=	1st Month
Group 2	=	2nd Month
Group 3	=	3rd Month
Group 4	=	4th Month
Group 5	=	5th Month

ANOVA for growth rate in weight of treatment group among 5 month period

----- O N E W A Y -----

Variable Weight of Treatment Group
By Variable Month

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	4	19783.4742	4945.8685	177.6712	.0000
Within Groups	115	3201.2771	27.8372		
Total	119	22984.7512			

Multiple Range Tests: Duncan test with significance level .05

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 3.7308 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5
RANGE	2.81	2.95	3.04	3.11

(*) Indicates significant differences which are shown in the lower triangle

```
                 G G G G G
                 r r r r r
                 p p p p p

                 1 2 3 4 5
 Mean     Month

 2.6208   Grp 1
 7.3500   Grp 2  *
13.4042   Grp 3  * *
20.2958   Grp 4  * * *
39.3917   Grp 5  * * * *
```

Homogeneous Subsets (highest and lowest means are not significantly different)

Subset 1

Group	Grp 1
Mean	2.6208

\- - - - - -

Subset 2

Group	Grp 2
Mean	7.3500

\- - - - - -

Subset 3

Group	Grp 3
Mean	13.4042

\- - - - - -

Subset 4

Group	Grp 4
Mean	20.2958

\- - - - - -

Subset 5

Group	Grp 5
Mean	39.3917

\- - - - - -

Group 1	=	1st Month
Group 2	=	2nd Month
Group 3	=	3rd Month
Group 4	=	4th Month
Group 5	=	5th Month

ANOVA for relative weight index in 4th Month

----- O N E W A Y -----

Variable Relative Liver Weigth Index
By Variable Experimental Group

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	.0010	.0005	11.167	.0001
Within Groups	41	.0018	.0000		
Total	43	.0027			

Multiple Range Tests: Duncan test with significance level .05

The difference between two means is significant if
MEAN(J)-MEAN(I) >= .0046 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3
RANGE	2.86	3.00

(*) Indicates significant differences which are shown in the lower triangle

```
              G G G
              r r r
              p p p

              2 1 3
 Mean     GROUP

 .0206   Grp 2
 .0230   Grp 1
 .0311   Grp 3     * *
```

Group 1	=	Control
Group 2	=	Solvent Control
Group 3	=	Treatment

ANOVA for relative weight index in Month 5

----- O N E W A Y -----

Variable Relative Liver Weigth Index
By Variable Experimental Group

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	.000	.0000	.3567	.7376
Within Groups	41	.0019	.0000		
Total	43	.0019			

Variable INDEX
By Variable GROUP

Multiple Range Tests: LSD test with significance level .05

The difference between two means is significant if
MEAN(J)-MEAN(I) >= .0049 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE: 2.86

- No two groups are significantly different at the .050 level

Group 1	=	Control
Group 2	=	Solvent Control
Group 3	=	Treatment

ANOVA for relative weight index in control group between 4th month and 5th month

----- O N E W A Y -----

Variable Month
By Variable Index

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	.0000	.0000	.1796	.6768
Within Groups	18	.0005	.0000		
Total	19	.0005			

ANOVA for relative weight index in solventcontrol group between 4th and 5th month

----- O N E W A Y -----

Variable Month
By Variable Index

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	.0006	.0006	17.7680	.0005
Within Groups	18	.0006	.0000		
Total	19	.0012			

ANOVA for relative weight index in treatment group between 4th and 5th month

----- O N E W A Y -----

Variable Month
By Variable Index

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	.0001	.0001	1.0779	.3046
Within Groups	46	.0028	.0001		
Total	47	.0028			

BIOGRAPHY

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