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APPENDICES

APPENDIX A

Fungal Culture Media

Potato Dextrose Agar

Potato	200 g
Dextrose	20 g
Agar	20 g
Distilled water add to	1000 ml

Stained Solution

Acetic acid	5%
Lactophenol	1%

Destained solution

Acetic acid	5%

APPENDIX B
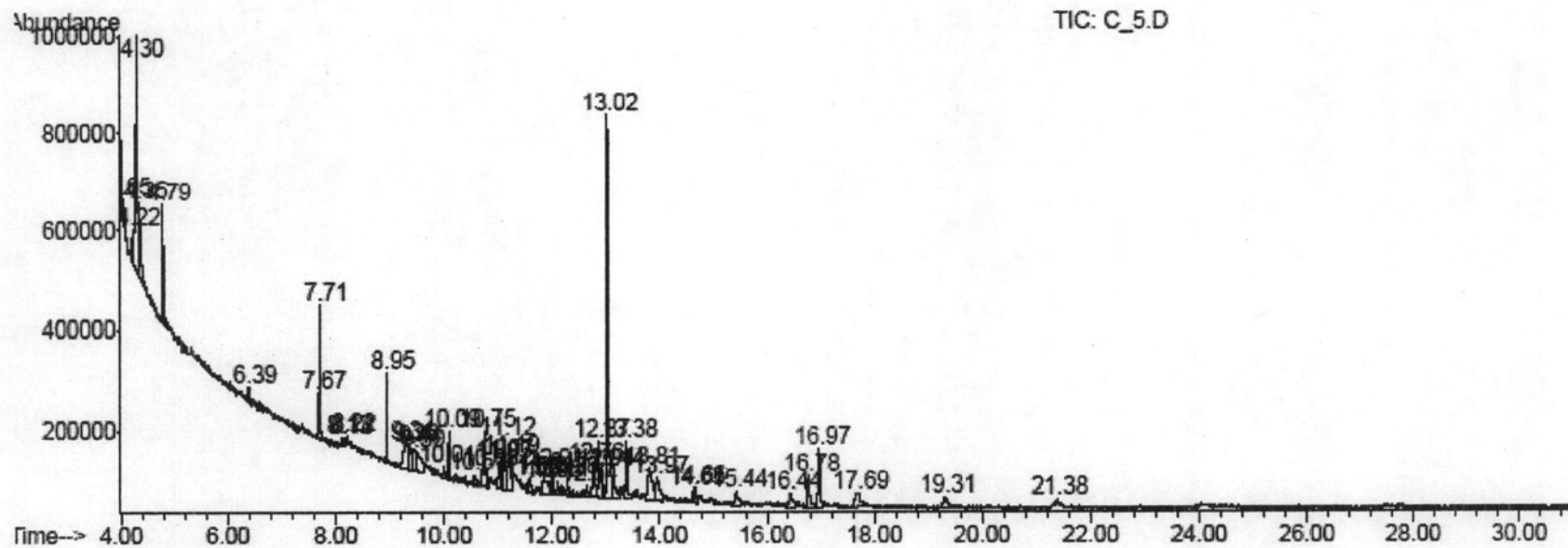
Fig. 1B Chromatogram of Fraction 3

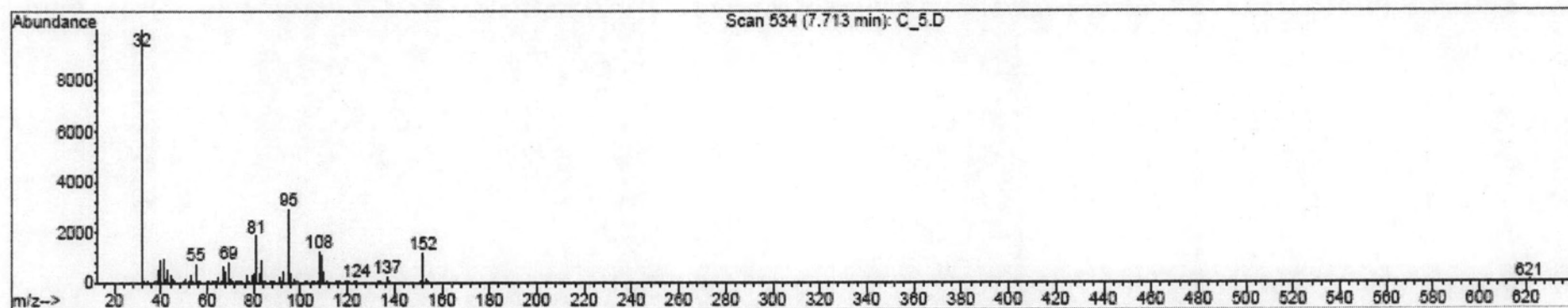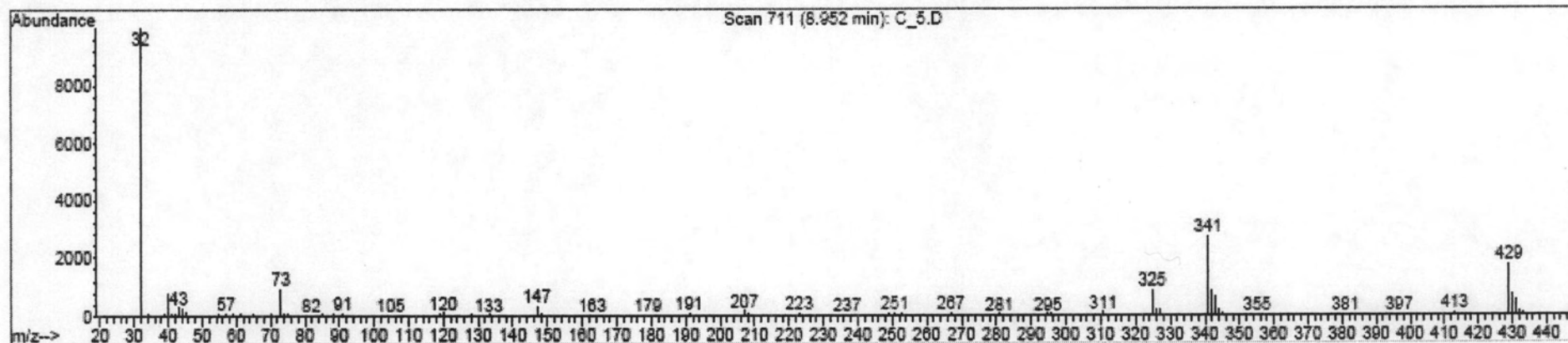**Fig. 2B** Chromatogram of camphor

Fig. 3B Chromatogram of 2, 4 – Bis (dimethylbenzyl) - 6 - *t*- butylphenol
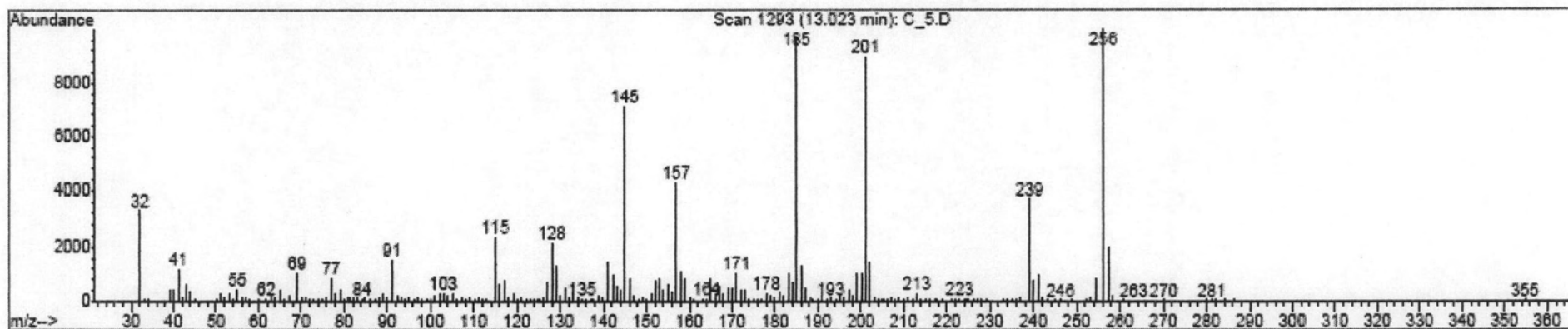
Fig. 4B Chromatogram of 6-oxohuperzine A
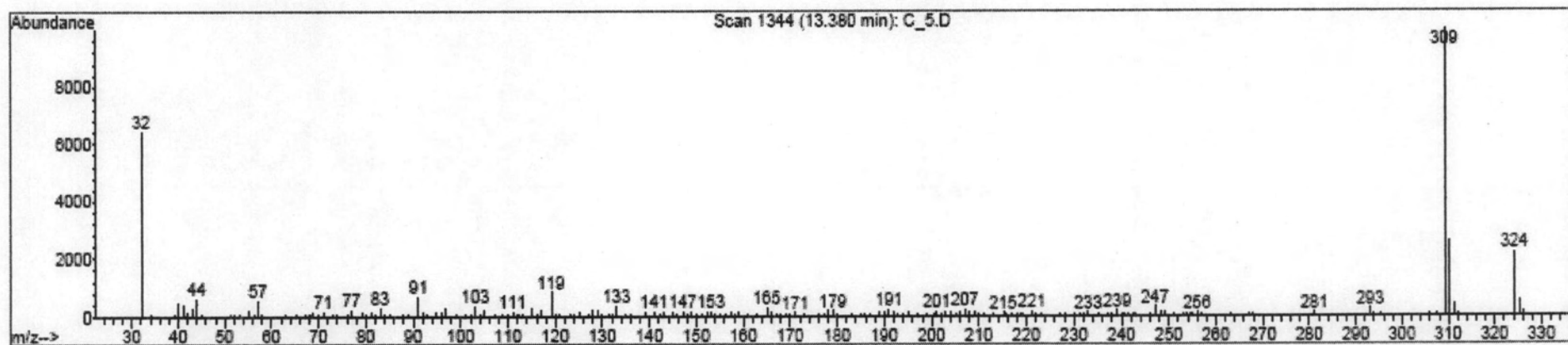
Fig. 5B Chromatogram of 2,6-Diphenyl-1,7-dihydrodipyrrolo [2,3-b:3',2'-E] pyridine
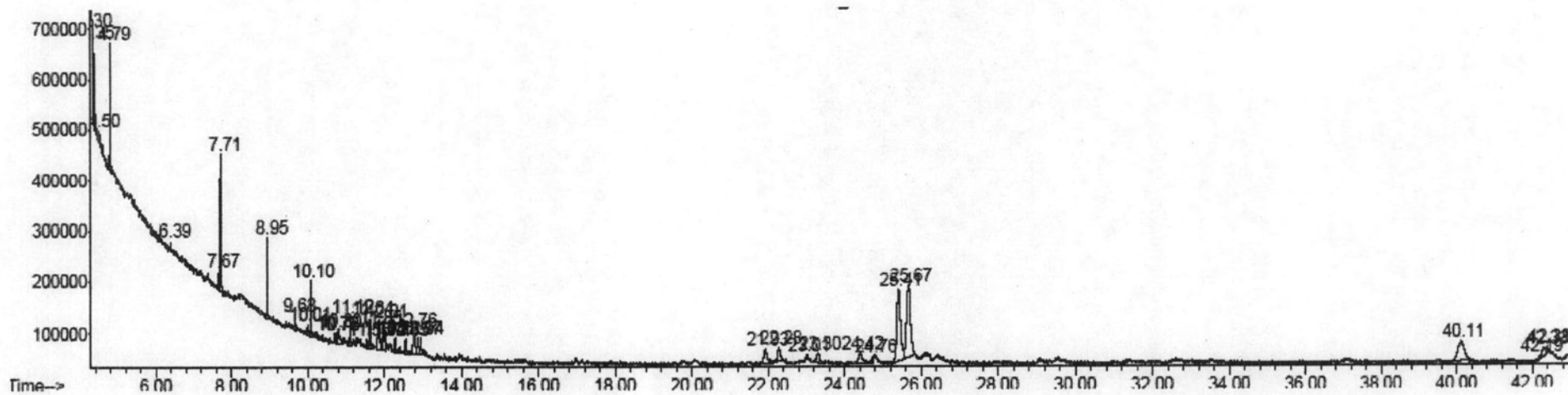
Fig. 6B Chromatogram of Fraction 4
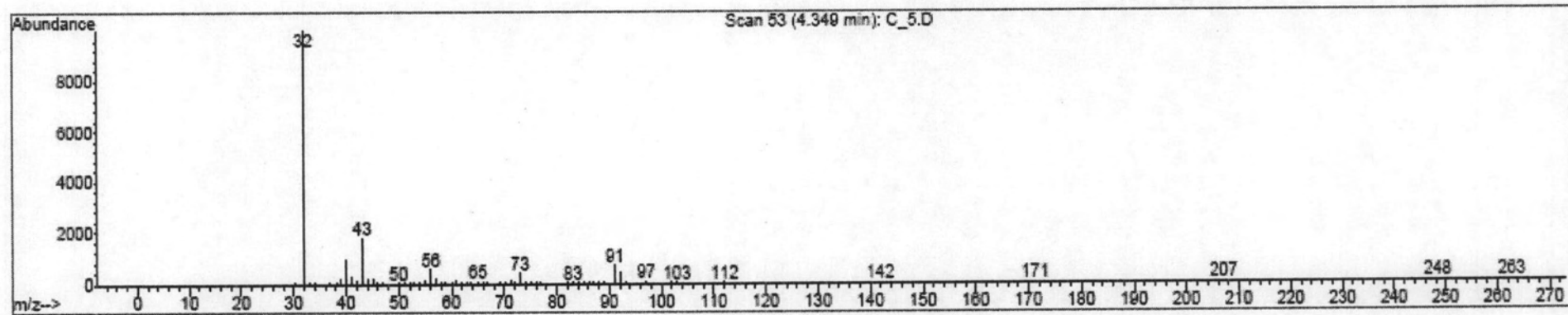
Fig. 7B Chromatogram of 2-methylpropyl ester
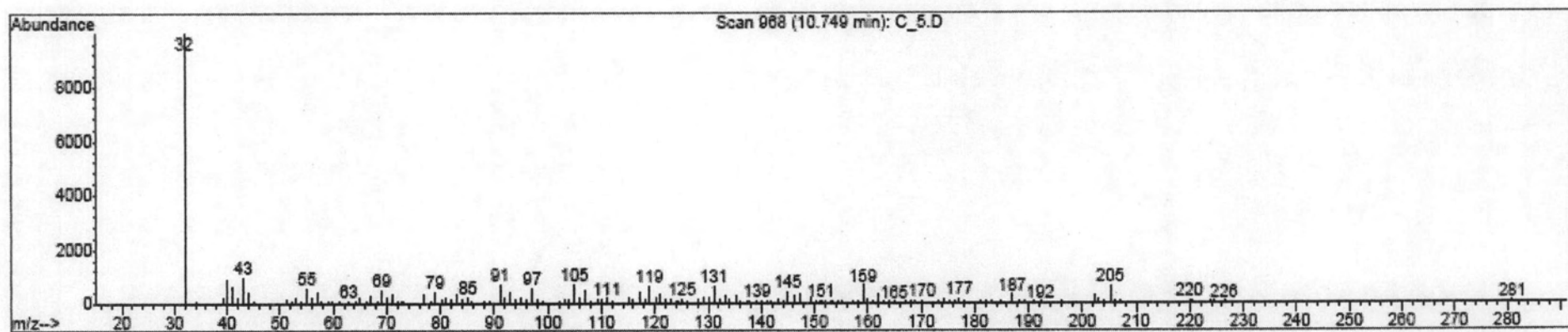
Fig. 8B Chromatogram of 1H-Cycloprop[e]azulen-7-ol

APPENDIX C

APPENDIX C

************ P R O B I T   A N A L Y S I S ***********

Fraction1

DATA Information

    5 unweighted cases accepted.
    0 cases rejected because of missing data.
    0 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 14 iterations.
Optimal solution found.

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

	Regression Coeff.	Standard Error	Coeff./S.E.
CONC	-.00036	.06927	-.00526

Intercept	Standard Error	Intercept/S.E.
-1.28092	.14269	-8.97696

Pearson Goodness-of-Fit Chi Square = 1.578 DF = 3 P = .664

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	100.0	9.7	10.011	-.341	.10011
1.00	100.0	9.0	10.005	-1.005	.10005
2.00	100.0	13.3	9.998	3.332	.09998
2.70	100.0	9.0	9.994	-.994	.09994
3.00	100.0	9.0	9.992	-.992	.09992

Confidence Limits for Effective CONC

Prob	CONC	95% Confidence Limits Lower	Upper
.01	.	.	.
.02	.	.	.
.03	.	.	.
.04	.	.	.
.05	.	.	.
.06	.	.	.
.07	.	.	.
.08	.	.	.
.09	1.324947+164	.	.
.10	54.80640	.	.
.15	.00000	.	.
.20	.00000	.	.
.25	.00000	.	.
.30	.00000	.	.
.35	.00000	.	.
.40	.00000	.	.
.45	.00000	.	.
.50	.00000	.	.
.55	.00000	.	.
.60	.00000	.	.
.65	.00000	.	.
.70	.00000	.	.
.75	.00000	.	.
.80	.00000	.	.
.85	.00000	.	.
.90	.00000	.	.

.91 .00000 . .
.92 .00000 . .
.93 .00000 . .
.94 .00000 . .
.95 .00000 . .
.96 .00000 . .
.97 .00000 . .
.98 .00000 . .
.99 .00000 . .

Probit Transformed Responses

Log of CONC
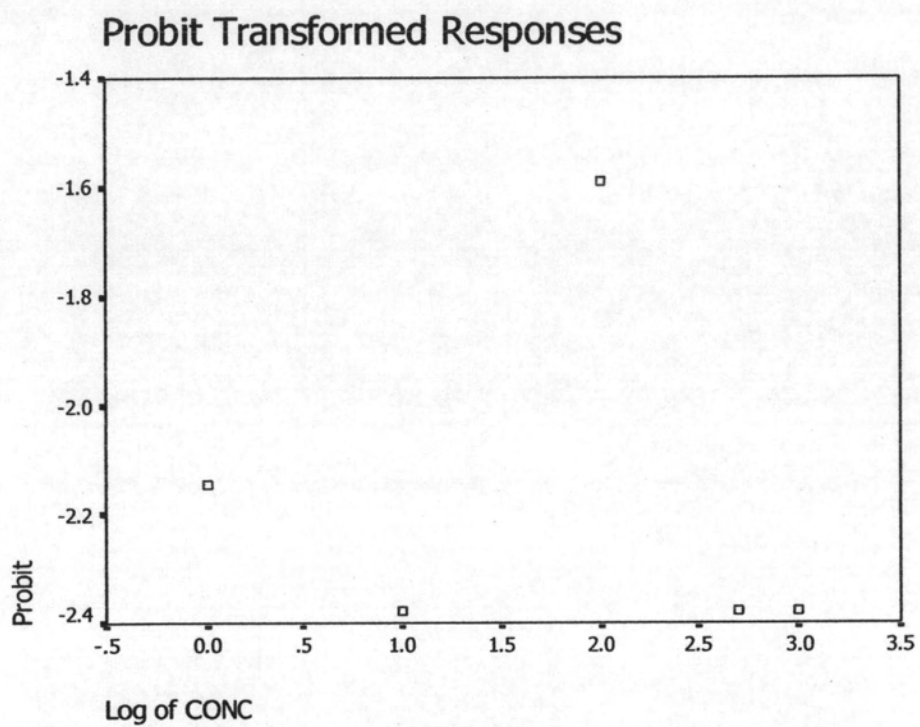
Fraction 2

DATA Information

     5 unweighted cases accepted.
     1 cases rejected because of missing data.
     0 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 14 iterations.
Optimal solution found.

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

	Regression Coeff.	Standard Error	Coeff./S.E.
CONC	.00340	.06837	.04977

Intercept	Standard Error	Intercept/S.E.
-1.27247	.14133	-9.00349

Pearson Goodness-of-Fit Chi Square =   .177 DF = 3 P = .981

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	100.0	10.7	10.160	.510	.10160
1.00	100.0	9.3	10.221	-.891	.10221
2.00	100.0	10.3	10.282	.048	.10282
2.70	100.0	11.0	10.324	.676	.10324
3.00	100.0	10.0	10.343	-.343	.10343

*

Confidence Limits for Effective CONC

		95% Confidence Limits	
Prob	CONC	Lower	Upper
.01	.00000	.	.
.02	2.464702-230	.	.
.03	1.663839-179	.	.
.04	2.871104-141	.	.
.05	3.637877-110	.	.
.06	1.081970E-83	.	.
.07	1.762703E-60	.	.
.08	1.070839E-39	.	.
.09	8.541365E-21	.	.
.10	.00214	.	.
.15	2.332160E+69	.	.
.20	4.174019+126	.	.
.25	5.474638+175	.	.
.30	7.041397+219	.	.
.35	5.266257+260	.	.
.40	3.212049+299	.	.
.45	.	.	.
.50	.	.	.
.55	.	.	.
.60	.	.	.
.65	.	.	.
.70	.	.	.
.75	.	.	.
.80	.	.	.

.85   .   .   .
.90   .   .   .
.91   .   .   .
.92   .   .   .
.93   .   .   .
.94   .   .   .
.95   .   .   .
.96   .   .   .
.97   .   .   .
.98   .   .   .
.99   .   .   .

Probit Transformed Responses

Fraction 3

*********** P R O B I T   A N A L Y S I S ***********
*

DATA Information

> 5 unweighted cases accepted.
> 1 cases rejected because of missing data.
> 0 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 12 iterations.
Optimal solution found.

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

	Regression Coeff.	Standard Error	Coeff./S.E.
CONC	.93428	.07218	12.94291

Intercept	Standard Error	Intercept/S.E.
-1.90887	.15898	-12.00674

Pearson Goodness-of-Fit Chi Square =   33.758   DF = 3   P = .000

Since Goodness-of-Fit Chi square is significant, a heterogeneity
factor is used in the calculation of confidence limits.

Observed and Expected Frequencies

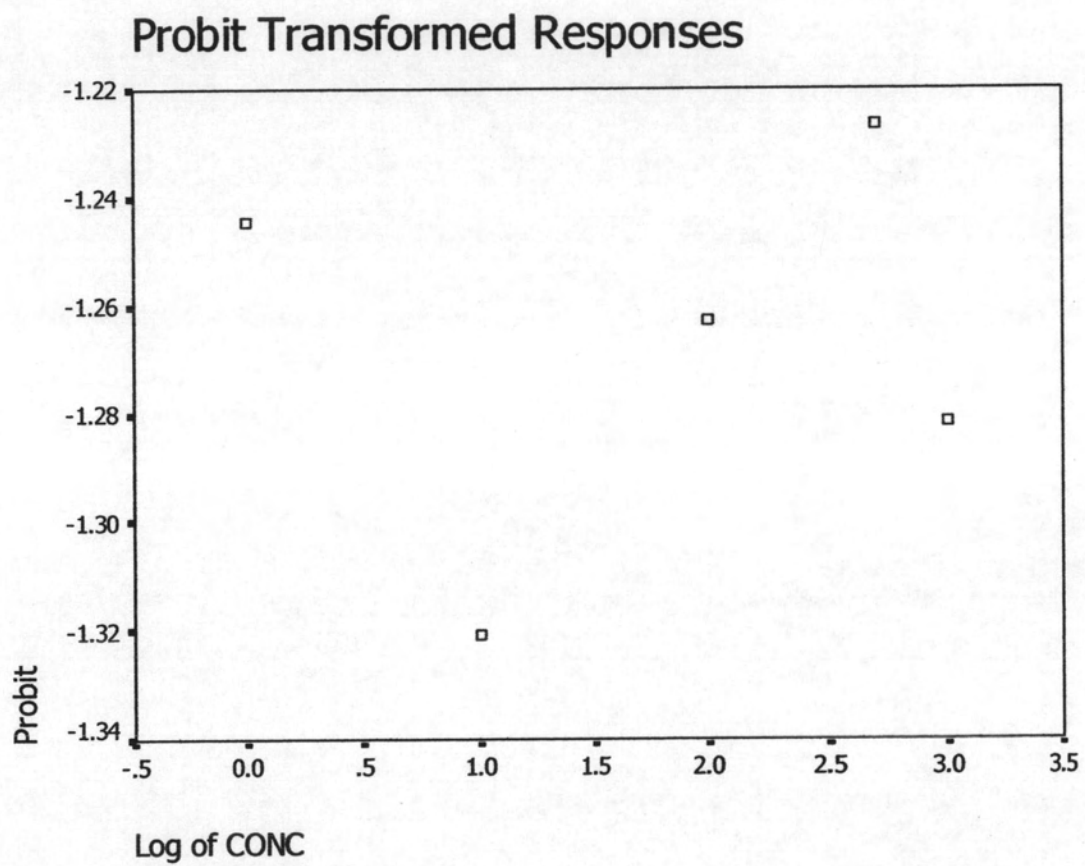| CONC	Number of Subjects	Observed Responses	Expected Responses	Residual	Prob
.00	100.0	9.0	2.814	6.186	.02814
1.00	100.0	11.0	16.488	-5.488	.16488
2.00	100.0	33.7	48.392	-14.722	.48392
2.70	100.0	72.0	72.997	-.997	.72997
3.00	100.0	93.0	81.433	11.567	.81433

Confidence Limits for Effective CONC

		95% Confidence Limits	
Prob	CONC	Lower	Upper
.01	.35740	7.862140E-13	6.32811
.02	.69972	3.485857E-11	9.54961
.03	1.07164	3.840346E-10	12.47768
.04	1.47675	2.324959E-09	15.32372
.05	1.91684	.00000	18.17184
.06	2.39333	.00000	21.06894
.07	2.90764	.00000	24.04708
.08	3.46126	.00000	27.13159
.09	4.05579	.00000	30.34471
.10	4.69293	.00000	33.70750
.15	8.58627	.00004	53.54544
.20	13.87781	.00054	81.09369
.25	20.95122	.00469	122.41244
.30	30.32890	.03051	190.21816
.35	42.72876	.15752	314.58078
.40	59.15307	.65828	575.99409
.45	81.02986	2.22548	1220.28961
.50	110.44502	6.06989	3106.04110
.55	150.53834	13.55228	9657.75941
.60	206.21248	25.68572	36496.80183
.65	285.47757	43.24189	165886.87519
.70	402.19404	67.38279	908925.56035
.75	582.21436	100.45998	6168345.44657
.80	878.96438	147.29544	55358163.7265
.85	1420.65135	218.43841	752691506.481

.90	2599.25293	341.55732 21083160515.0
.91	3007.57651	378.37405 47417504933.8
.92	3524.17578	422.07412 114596679871
.93	4195.19157	475.00585 302998386191
.94	5096.71559	540.80993 899513390484
.95	6363.66222	625.50692 3119236111027
.96	8260.08196	739.96844 1.348288E+13
.97	11382.67457	906.50228 8.182806E+13
.98	17432.76107	1181.34124 9.038673E+14
.99	34130.38122	1777.28069 4.019801E+16

Probit Transformed Responses

Log of CONC
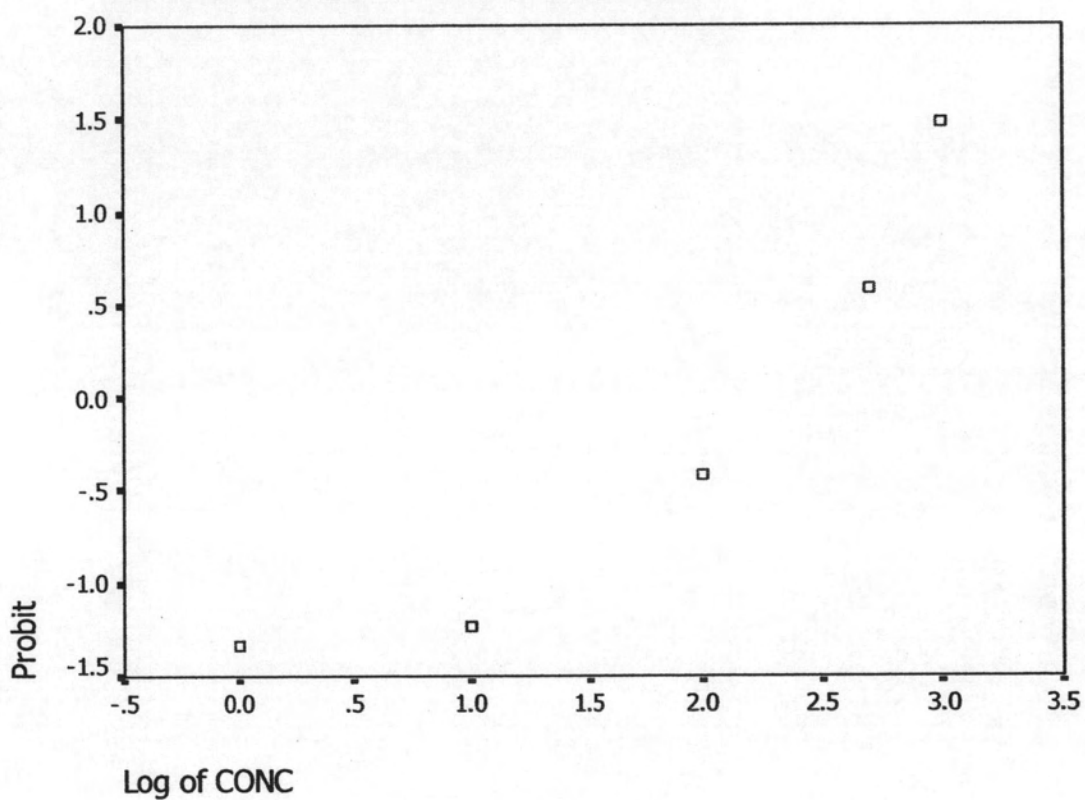
Fraction 4

DATA Information

     5 unweighted cases accepted.
     1 cases rejected because of missing data.
     0 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 11 iterations.
Optimal solution found.

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

	Regression Coeff.	Standard Error	Coeff./S.E.
CONC	.66117	.06947	9.51690

Intercept	Standard Error	Intercept/S.E.
-1.87068	.16155	-11.57966

Pearson Goodness-of-Fit Chi Square = 46.145 DF = 3 P = .000

Since Goodness-of-Fit Chi square is significant, a 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	100.0	8.7	3.069	5.601	.03069
1.00	100.0	10.7	11.323	-.653	.11323
2.00	100.0	8.3	29.173	-20.843	.29173
2.70	100.0	42.3	46.565	-4.235	.46565
3.00	100.0	73.0	54.492	18.508	.54492

Confidence Limits for Effective CONC

		95% Confidence Limits	
Prob	CONC	Lower	Upper
.01	.20456	.	.
.02	.52859	.	.
.03	.96540	.	.
.04	1.51877	.	.
.05	2.19564	.	.
.06	3.00472	.	.
.07	3.95606	.	.
.08	5.06085	.	.
.09	6.33141	.	.
.10	7.78115	.	.
.15	18.27165	.	.
.20	36.01018	.	.
.25	64.44757	.	.
.30	108.69559	.	.
.35	176.42750	.	.
.40	279.36499	.	.
.45	435.80559	.	.
.50	675.07459	.	.
.55	1045.70871	.	.
.60	1631.29141	.	.
.65	2583.07637	.	.
.70	4192.67875	.	.
.75	7071.26307	.	.
.80	12655.47003	.	.
.85	24941.68217	.	.

```
.90   58567.88310        .          .
.91   71978.52984        .          .
.92   90049.17999        .          .
.93  115196.90385        .          .
.94  151669.94743        .          .
.95  207559.60977        .          .
.96  300062.13757        .          .
.97  472057.48827        .          .
.98  862153.36192        .          .
.99 2227830.61346        .          .
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Probit Transformed Responses

Scatter plot of Probit (y-axis, ranging from -1.5 to 1.0) versus Log of CONC (x-axis, ranging from -.5 to 3.5).
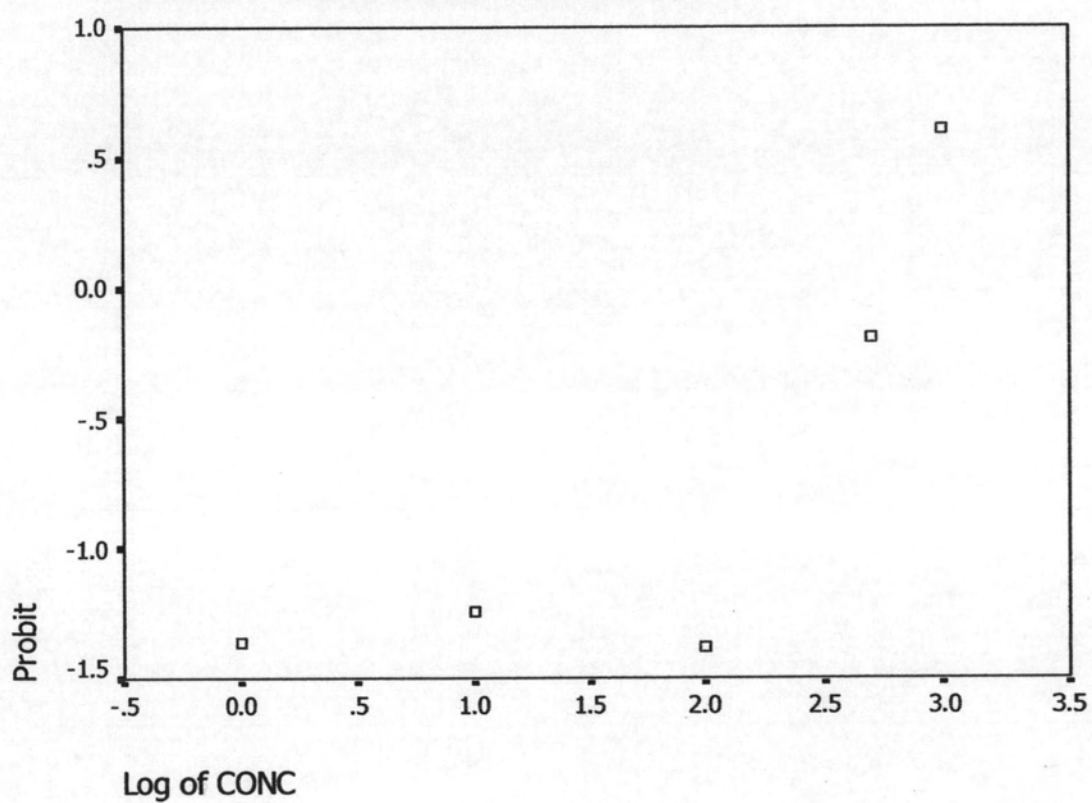
Fraction 5

DATA Information

> 5 unweighted cases accepted.
> 1 cases rejected because of missing data.
> 0 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 11 iterations.
Optimal solution found.

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

	Regression Coeff.	Standard Error	Coeff./S.E.
CONC	.30935	.06729	4.59713

Intercept	Standard Error	Intercept/S.E.
-1.58992	.15306	-10.38772

Pearson Goodness-of-Fit Chi Square =   18.878   DF = 3   P = .000

Since Goodness-of-Fit Chi square is significant, a 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	100.0	9.3	5.593	3.737	.05593
1.00	100.0	8.0	10.017	-2.017	.10017
2.00	100.0	10.0	16.572	-6.572	.16572
2.70	100.0	14.3	22.513	-8.183	.22513
3.00	100.0	38.3	25.403	12.927	.25403

Confidence Limits for Effective CONC

Prob	CONC	95% Confidence Limits Lower	Upper
.01	.00416	.	.
.02	.03167	.	.
.03	.11474	.	.
.04	.30221	.	.
.05	.66437	.	.
.06	1.29897	.	.
.07	2.33837	.	.
.08	3.95837	.	.
.09	6.38885	.	.
.10	9.92659	.	.
.15	61.53970	.	.
.20	262.35791	.	.
.25	910.23589	.	.
.30	2781.78751	.	.
.35	7832.60563	.	.
.40	20917.79511	.	.
.45	54108.52225	.	.
.50	137870.53148	.	.
.55	351299.25309	.	.
.60	908713.53069	.	.
.65	2426814.82521	.	.
.70	6833118.40658	.	.
.75	20882810.3034	.	.
.80	72451727.0879	.	.

```
.85 308878387.396        .       .
.90 1914885016.83        .       .
.91 2975229628.66        .       .
.92 4802047634.22        .       .
.93 8128870851.50        .       .
.94 14633385359.7        .       .
.95 28610960477.9        .       .
.96 62898519470.3        .       .
.97  165660398829        .       .
.98  600211414860        .       .
.99 4565541264221        .       .
```

Probit Transformed Responses

Log of CONC
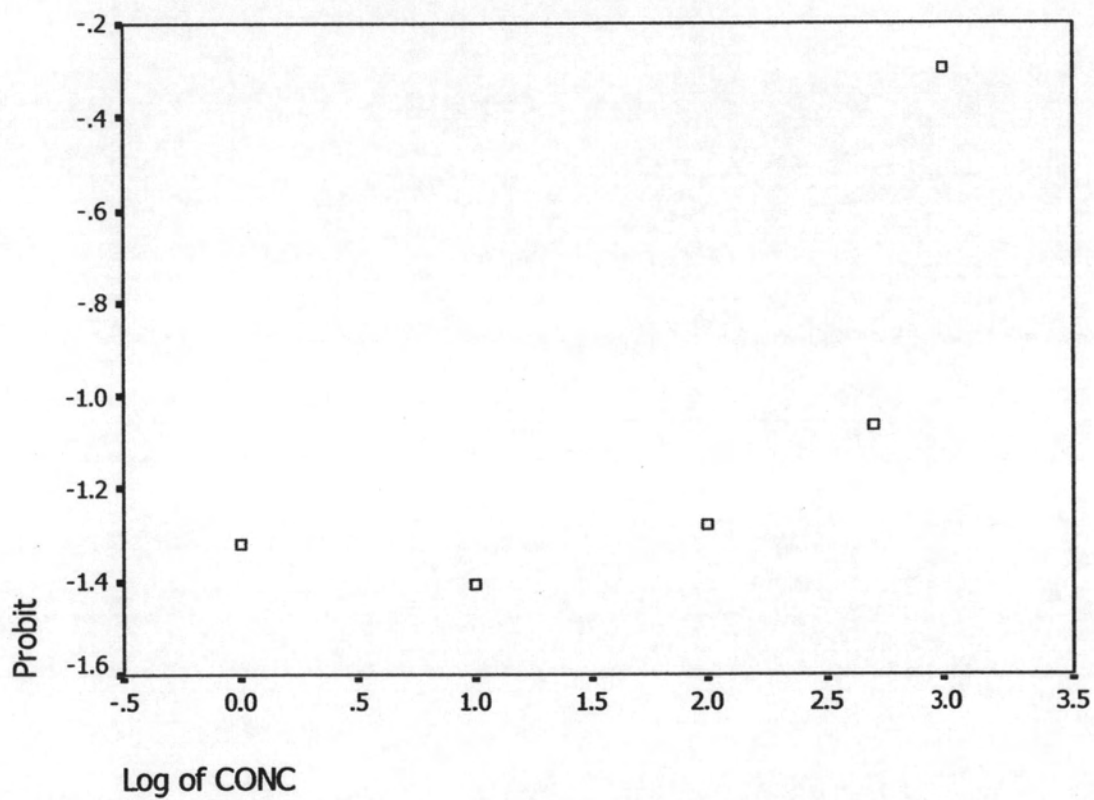
Fraction 6

DATA Information

  5 unweighted cases accepted.
  1 cases rejected because of missing data.
  0 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 11 iterations.
Optimal solution found.

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

  Regression Coeff. Standard Error   Coeff./S.E.

CONC   .41444   .06868   6.03462

            Intercept Standard Error Intercept/S.E.

            -1.69572   .15881   -10.67736

Pearson Goodness-of-Fit Chi Square =   11.303   DF = 3   P = .010

Since Goodness-of-Fit Chi square is significant, a 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	100.0	7.7	4.497	3.173	.04497
1.00	100.0	8.7	10.005	-1.335	.10005
2.00	100.0	11.3	19.302	-7.972	.19302
2.70	100.0	24.7	28.192	-3.522	.28192
3.00	100.0	42.0	32.549	9.451	.32549

Confidence Limits for Effective CONC

		95% Confidence Limits	
Prob	CONC	Lower	Upper
.01	.03009	.	.
.02	.13681	.	.
.03	.35763	.	.
.04	.73683	.	.
.05	1.32657	.	.
.06	2.18818	.	.
.07	3.39358	.	.
.08	5.02684	.	.
.09	7.18593	.	.
.10	9.98467	.	.
.15	38.97390	.	.
.20	115.03542	.	.
.25	291.13824	.	.
.30	670.26431	.	.
.35	1451.54035	.	.
.40	3021.79209	.	.
.45	6142.63319	.	.
.50	12346.95690	.	.
.55	24817.91443	.	.
.60	50449.31620	.	.
.65	105024.53147	.	.
.70	227443.62691	.	.
.75	523625.28985	.	.
.80	1325220.95763	.	.

```
.85 3911524.27706      .        .
.90 15268135.1108      .        .
.91 21214689.0332      .        .
.92 30326656.0854      .        .
.93 44922290.3746      .        .
.94 69668601.7331      .        .
.95 114918279.666      .        .
.96 206894891.391      .        .
.97 426268486.292      .        .
.98 1114302401.48      .        .
.99 5066998615.28      .        .
```

Probit Transformed Responses

Log of CONC
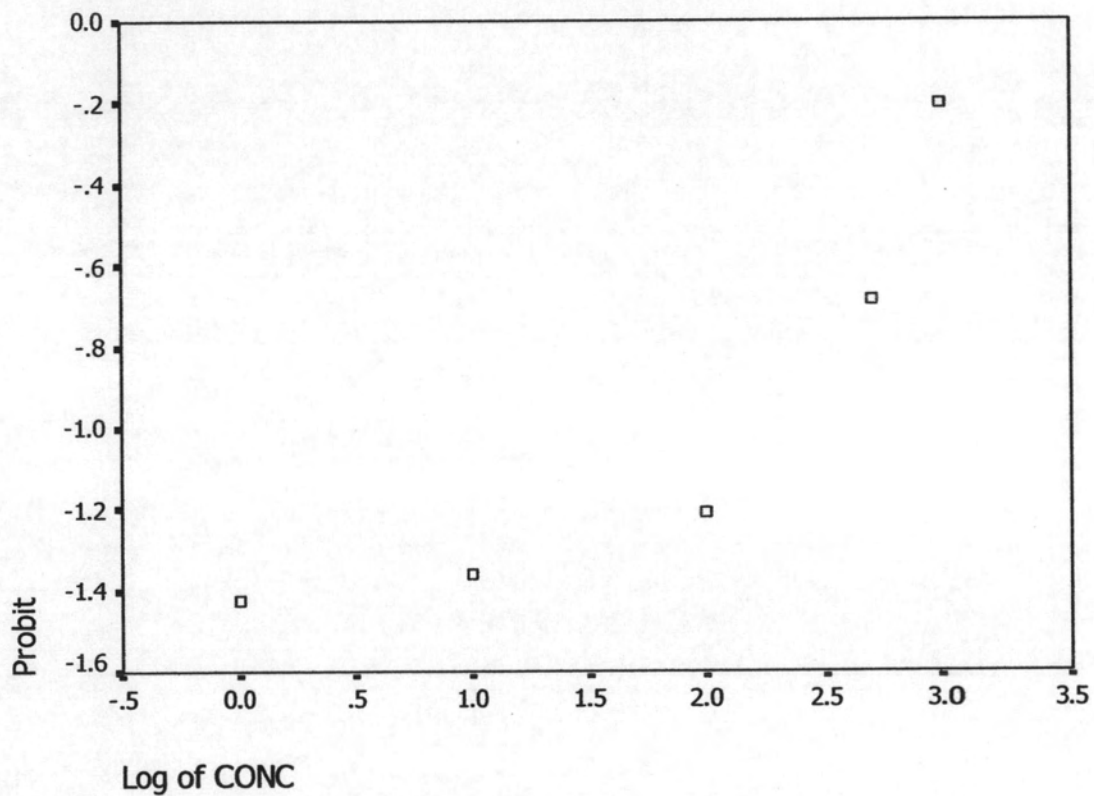
Fraction 7

DATA Information

     5 unweighted cases accepted.
     1 cases rejected because of missing data.
     0 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 14 iterations.
Optimal solution found.

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

	Regression Coeff.	Standard Error	Coeff./S.E.
CONC	.00647	.07154	.09040

Intercept	Standard Error	Intercept/S.E.
-1.36022	.14802	-9.18966

Pearson Goodness-of-Fit Chi Square = .285   DF = 3   P = .963

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	100.0	8.3	8.688	-.358	.08688
1.00	100.0	9.7	8.791	.879	.08791
2.00	100.0	8.0	8.894	-.894	.08894
2.70	100.0	9.7	8.967	.703	.08967
3.00	100.0	8.7	8.999	-.329	.08999

Confidence Limits for Effective CONC

		95% Confidence Limits	
Prob	CONC	Lower	Upper
.01	4.141206-150	.	.
.02	5.842571-108	.	.
.03	3.229207E-81	.	.
.04	4.230881E-61	.	.
.05	9.779821E-45	.	.
.06	8.290486E-31	.	.
.07	1.351854E-18	.	.
.08	.00000	.	.
.09	1024.01627	.	.
.10	1460145258072	.	.
.15	1.160837E+50	.	.
.20	1.537403E+80	.	.
.25	1.068553+106	.	.
.30	1.720751+129	.	.
.35	5.500343+150	.	.
.40	1.400298+171	.	.
.45	7.746358+190	.	.
.50	2.084294+210	.	.
.55	5.608159+229	.	.
.60	3.102398+249	.	.
.65	7.898199+269	.	.
.70	2.524642+291	.	.
.75	.	.	.

.80   .   .   .
.85   .   .   .
.90   .   .   .
.91   .   .   .
.92   .   .   .
.93   .   .   .
.94   .   .   .
.95   .   .   .
.96   .   .   .
.97   .   .   .
.98   .   .   .
.99   .   .   .

Probit Transformed Responses

Log of CONC
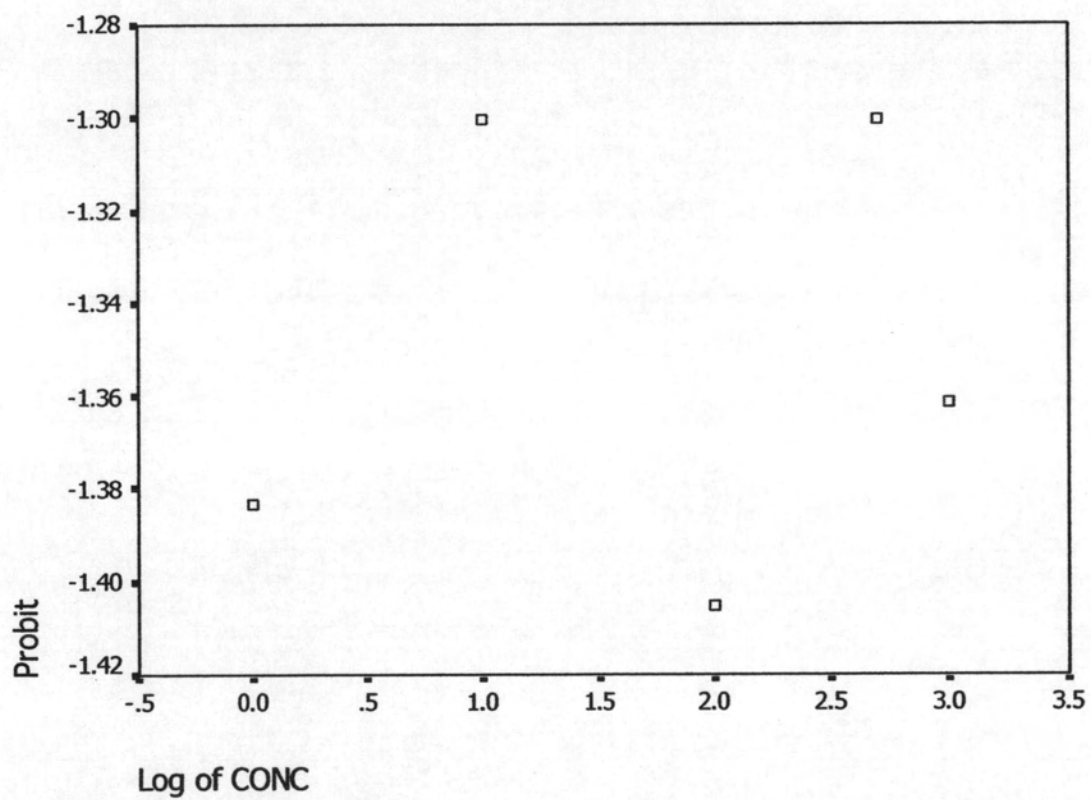
VITA

Chayanee Ot-sup was born on July 13, 1979 in Tak province, Thailand. She obtained a Bachelor Degree of Biology from Faculty of Science, Mahidol University in 2003 and has studied for Master Degree of science Program in Biotechnology at Chulalongkorn University since 2006.