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ETHYLENE DICHLORIDE

Report on the clinical-chemistry results after 3 months
inhalatory exposure

First Report

Milan September 1976

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The following is the report on the clinical chemistry data obtained after 3 months of exposure of rats to inhalatory Ethylene Dichloride (ECD) . Animal (Sprague-Dawley rat of both sexes) were treated in Bologna by Dr. Maltoni according to his protocol employing 4 levels of exposure , i.e. 250, 50, 10 and 5 ppm. Controls (of the same strain and age) caged in similar conditions , breathed only air . Blood samples were obtained by heart puncture of ether-anesthetized animals: the samples were coded and read blindly, the code being broken only after tests performance . Animal Nos. 801-810 correspond to female controls and Nos. 847-853 to male controls; Nos. 1-8 to females and Nos. 46-53 to males exposed to 250 ppm ECD (hereafter called group 1) . Rat Nos. 201-208 were female and 246-253 were males exposed to 50 ppm ECD (group 2) ; Nos. 401-408 were female and 446-453 were males , exposed to 10 ppm ECD (group 3); Nos. 601-608 were females and Nos. 646-653 were males exposed to 5 ppm ECD (group 4) . The selection of the animals, numbering etc were performed in Bologna , this group having performed the analysis on the samples submitted . The following analysis : BNU ; SGOT, Bilirubin, Alk.phosphatase , LDH, Inorganic P, Total Protein; Cholesterol and Albumin were performed on a SMA 12 Technicon autoanalyzer; Hemoglobin, Hematocrit, mean erythrocyte volume, erythrocyte and total leukocyte numbers were performed by aid of a SMA 7 Technicon autoanalyzer. Platelet number were evaluated by aid of a Coulter Counter LTD ; protein and lipoprotein electrophoresis were performed on cellulose acetate strips and stained with Ponceau 5 and Sudan Schwartz B respectively ; leukocyte percentage was evaluated microscopically after Eosin-Methylene Blue staining . Blood glucose was estimated enzymatically with the aid of a Geansaec-Rotoleder apparatus : Cl^- and Na^+ concentrations were determined with a Chloride Meter electrode and a Unicam Atomic absorption apparatus respectively .

Groups reversed.
STATISTICAL ANALYSES should be done by Sex

In this report, the data of male and female animals were grouped since at preliminary analysis no significant differences were found between sexes .

Statistical significance of the data (which are presented as means $\pm$ one standard error) was evaluated by means of Duncan's multiple range test .

Results obtained can be summarized as follows :

1. BUN : no statistically significant differences were observed either between control and treated animals nor between the animals differently treated with ECD (Table 1) .
2. Blood Glucose : a tendency towards a lowering in values was present in groups 1 and 3 ; considering that there is no clear dose-responsiveness in these changes, these modifications are of dubious biological significance (Table 2) .
3. Bilirubin : no significant differences could be detected .
4. Serum total protein levels : statistically, the only significant differences was observed between Control and Group 3 (ECD 10 ppm) animals ; its biological significance as such is again of dubious importance .
5. Serum albumin levels : a tendency towards an increase in albumin levels in the exposed animals in comparison to control was observed ; this tendency appeared moreover negatively correlated with the level of exposure . In fact Controls were significantly different from treated rats of Groups 2,3 and 4 but not of Group 1 ; in addition Group 1 was different from Groups 2,3 and 4 and the Group 2 from Groups 3 and 4, whereas no differences were present between Groups 3 and 4 in this parameter .

6. SGOT : no significant differences could be detected between control and ECD treated animals .
7. LDH : significant increases in serum LDH were observed in ECD exposed rats , changes being roughly dose related. The biological significance of these modifications remains to be determined .
8. Cholesterol : Rats exposed to 5 and 10 ppm ECD appeared to show lower levels than animals treated with 250 ppm . The biological significance of this difference appears to be dubious .
9. Uric acid : significant decreases in uric acid levels were detected in all groups of rats exposed to ECD . The magnitude of the effect was apparently inversely related to the ECD dose .
10. Alkaline phosphatase : levels of this enzyme appeared to be significantly lower in animals exposed to 250 and 50 ppm than control .
11. Plasma chilonicrons : a significant decrease in plasma levels was observed in animals exposed to 5 ppm .
12. Alfa-lipoproteins : statistically significant differences were only observed among ECD treated groups and their biological significance is rather dubious .
13. Beta-lipoproteins : Significant reductions were observed in group 2 (50 ppm) and 4 (5 ppm), however the lack of a dose-response relationship casts some doubts on their significance .
14. Pre alfa lipoproteins : a significant increase was detected in groups exposed to 50, 10 and 5 ppm , without a clear dose response relationship .
15. Pre beta lipoproteins : No significant differences were found between controls and Group 1, the differences being present only between Group 1 and 2, 1 and 4 and Groups 3 and 4 .

16. Beta/Alfa lipoprotein ratio : a significant reduction was found in groups 2 and 4 as consequence of a lower beta lipoprotein level (see Table 13) .
17. Percent serum albumin : a significant, roughly dose related increase in percent albumin was present.
18. Alfa 1 globulins : no apparent effects of ECD treatment were seen .
19. Alfa 2 globulins : all ECD treated groups showed alfa 2 globulins levels lower than control. No dose-response effects could be identified .
20. Beta Globulins : increased beta globulins levels were found in rats exposed to the lowest ECD dose .
21. Gamma globulins : a borderline ($p < 0.05$) reduction was observed only in group 1 (250 ppm) .
22. Na⁺ concentrations : a slight, although significant increase in Na⁺ levels was found in rats exposed to 250 ppm .
23. Ca⁺⁺ concentrations : Ca⁺⁺ levels were either increased (group 2) or decreased (group 4) . The significance of this data is questionable .
24. Cl⁻ concentrations : no effects of ECD treatment .
25. Inorganic P : The decrease in P levels detected in group 3 is of dubious biological significance .
26. Leucocyte number : Leukocyte number appear to be increased following exposure to ECD, the effects being inversely related to the dose .
27. Hematocrit : Although a tendency toward as increase in HT was present in group 1, the difference with controls was not significant so that the only statistical difference was between Group 1 and 4 .

28. Haemoglobin concentration : modifications of haemoglobin levels are of borderline statistical significance ($p < 0.05$) and of doubtful biological meaning .

29 and 30 . Erythrocyte numbers and mean erythrocyte volume :

no apparent effects of ECD treatment .

31. Platelet numbers : although the values were lowered in all treated groups in respect to controls, without a dose-response relation, none of the differences were statistically significant.

34. Segmented neutrophilic leukocytes : The statistical difference found between groups 3 and 4 is of questionable biologic value .

36. Lymphocytes : The slight although statistically significant difference between groups 2 and 4 is probably of restricted value .

32, 33, 35 and 37 : No significant effects of this ECD exposure on basophilic and eosinophilic leukocytes, monocytes and non segmented neutrophils was found .

Comment: Although changes in some parameters were observed in ECD-exposed animals (e.g. LDH, uric acid, alk. phosphatase, etc.) , the significance of these modifications from control values appears at this time difficult to assess considering the frequent lack of dose-responsiveness in the changes observed and/or the discordant results in parameters evaluating the activity of the same organ . Accordingly no real coherent picture can yet be proposed. The data of the next testing period are thus needed to assess the significance, if any, of the modifications so far recorded.

Table 1 - BUN values in control and ECD-exposed rats .

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	mg %	Rat No.	mg %	Rat No.	mg %	Rat No.	mg %	Rat No.	mg %
801	24	601	20	401	11	201	10	1	16
803	18	602	15	402	15	202	15	2	18
805	19	603	18	403	15	203	18	3	10
808	24	604	26	404	12	204	21	4	16
809	15	605	21	405	12	205	23	5	20
810	18	606	17	406	12	206	19	6	21
847	21	608	19	407	15	207	14	7	21
848	18	646	21	408	15	208	21	8	22
849	15	647	17	446	22	246	21	46	13
850	15	648	18	447	21	247	18	47	12
851	15	649	17	448	18	248	16	48	16
853	16	650	16	449	20	249	15	49	13
		651	15	450	18	250	19	51	14
		652	16	451	18	251	18	52	18
		653	15	452	21	252	16	53	16
				453	19	253	17		

$\bar{X}$ 18.17
+ S.E. 0.96

$\bar{X}$ 18.07
+ S.E. 0.77

$\bar{X}$ 16.05
+ S.E. 0.90

$\bar{X}$ 17.56
+ S.E. 0.80

$\bar{X}$ 16.40
+ S.E. 0.93

No statistically significant differences were found between any group .

Table 2 - Serum Glucose in Control and ECD-exposed rats .

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	mg %	Rat No.	mg%	Rat No.	mg%	Rat No.	mg%	Rat No.	mg %
803	152	601	88	401	136	201	137	1	123
804	106	602	145	402	119	202	116	2	145
805	150	603	103	403	108	203	103	3	104
807	108	604	101	404	100	204	88	4	105
808	141	605	105	405	155	205	145	5	133
809	86	606	130	406	127	206	105	6	115
810	120	607	109	407	132	207	110	7	107
847	122	608	87	408	128	208	136	8	110
848	158	646	101	446	139	246	108	46	108
849	91	647	113	447	122	247	105	47	124
850	83	648	125	448	121	248	91	48	107
851	125	649	115	450	116	249	74	49	110
852	100	650	128	451	146	250	128	51	112
853	108	651	95	452	124	251	75	52	120
		652	115			253	91		
$\bar{X}$	118.86		11.12		126.53		107.56		116.07
+S.E.	6.64		3.95		3.61		5.29		2.96

Statistical analysis : Group 2 vs 3 : $P < 0.01$; Group 1 vs 2 : $P < 0.05$

Table 3 - Serum Bilirubin levels in Control and ECD-exposed rats

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	mg %	Rat No.	mg %	Rat No.	mg %	Rat No.	mg %	Rat No.	mg %
801	0.6	601	0.6	401	1.2	201	0.5	1	0.8
803	0.6	602	0.9	402	0.7	202	0.6	2	0.4
805	0.3	603	1.5	403	0.6	203	0.4	3	0.4
808	0.6	604	0.9	404	1.2	204	0.3	4	0.5
809	0.6	605	1.7	405	0.4	205	0.4	5	0.9
810	1.8	606	0.9	406	0.6	206	0.3	6	1.6
847	0.9	608	0.9	407	0.5	207	0.6	7	1.5
848	0.9	646	0.9	408	0.9	208	0.6	8	1.6
849	1.2	647	1.1	446	0.7	246	0.6	46	0.3
850	0.9	648	0.6	447	0.6	247	0.6	47	0.5
851		649	0.6	448	0.7	248	0.8	48	0.7
853	0.9	650	0.6	449	1.2	249	0.6	49	0.7
		651	0.9	450	1.5	250	1.2	51	2.0
		652	0.6	451	0.6	251	0.7	52	1.2
		653	0.9	452	0.7	252	1.8	53	0.7
				453	0.9	253	1.5		
$\bar{X}$	0.82		0.91		0.81		0.72		0.92
+S.E.	0.12		0.08		0.08		0.11		0.14

No statistical significant differences were found between the groups .

Table 4 - Serum total protein levels in Control and ECD-exposed rats .

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	g %	Rat No.	g %	Rat No.	g %	Rat No.	g %	Rat No.	g %
801	8.5	601	7.8	401	7.6	201	5.7	1	7.4
803	6.4	602	6.9	402	7.2	202	7.1	2	7.0
805	6.6	603	8.0	403	7.5	203	6.9	3	6.3
808	7.2	604	8.0	404	7.8	204	7.3	4	6.3
809	6.9	605	8.4	405	7.0	205	7.2	5	7.2
810	7.5	606	7.2	406	0.3	206	0.3	6	8.1
847	6.6	608	7.5	407	7.5	207	6.6	7	7.7
848	6.6	646	6.9	408	7.2	208	7.9	8	7.6
849	7.8	647	7.2	446	7.0	246	6.5	46	6.7
850	7.6	648	7.0	447	6.6	247	6.4	47	6.0
851	8.7	649	6.5	448	7.5	248	6.6	48	6.5
853	6.3	650	6.4	449	6.9	249	6.6	49	7.1
		651	7.0	450	8.1	250	6.4	51	6.9
		652	6.6	451	6.6	251	6.5	52	6.5
		653	7.0	452	6.6	252	7.3	53	6.7
				453	6.6	253	6.4		
$\bar{X}$	7.23	$\bar{X}$	7.23	$\bar{X}$	7.13	$\bar{X}$	6.77	$\bar{X}$	6.93
$\pm$ S.E.	0.23	$\pm$ S.E.	0.15	$\pm$ S.E.	0.13	$\pm$ S.E.	0.13	$\pm$ S.E.	0.13

Statistical analysis : group 3 vs C : $p < 0.05$

Table 5 - Serum albumin levels in Control and ECD-exposed rats .

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	g %	Rat No.	g %	Rat No.	g %	Rat No.	g %	Rat No.	g %
801	3.3	601	4.8	401	3.7	201	6.7	1	7.5
803	3.2	602	3.1	402	3.4	202	7.6	2	7.4
805	3.0	603	4.1	403	3.4	203	7.4	3	7.3
808	3.3	604	3.6	404	3.8	204	6.9	4	7.2
809	3.3	605	3.9	405	3.2	205	7.3	5	7.3
810	3.6	606	3.7	406	3.0	206	7.2	6	7.9
847	3.0	608	3.5	407	3.5	207	7.4	7	7.7
848	2.8	646	3.0	408	3.3	208	7.7	8	7.6
849	1.8	647	3.3	446	2.9	246	6.9	46	5.6
850	2.9	648	2.9	447	3.0	247	6.7	47	6.3
851	3.7	649	2.9	448	7.5	248	6.7	48	6.8
853	3.0	650	3.1	449	6.9	249	6.6	49	5.9
		651	3.0	450	6.9	250	6.7	51	6.8
		652	2.9	451	6.6	251	6.7	52	6.9
		653	3.0	452	6.7	252	7.2	53	7.9
				453	6.5	253	6.9		

$\bar{X}$ 3.08
+ S.E. 0.14

3.33
+0.12

4.37
+ 0.51

7.04
+ 0.09

7.07
+ 0.18

Statistical analysis : Group C vs 4 : $P < 0.001$; Group 1 vs 4 : $P < 0.001$; Group 2 vs 4 : $p < 0.001$; Groups C Vs. 3 : $P < 0.001$
Group 1 vs 3 : $P < 0.001$; Group 2 vs 3 : $p < 0.001$; Group C vs 2 : $p < 0.005$; Group 1 vs 2 : $P < 0.005$.

Table 6 - Serum SGOT levels in Control and ECD-exposed rats .

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	mU/ml	Rat No.	mU/ml	Rat No.	mU/ml	Rat No.	mU/ml	Rat No.	mU/ml
801	78	601	131	401	171	201	96	1	126
803	105	602	159	402	99	202	159	2	90
805	84	603	168	403	87	203	132	3	118
808	102	604	135	404	150	204	107	4	92
809	129	605	195	405	100	205	100	5	141
810	216	606	132	406	132	206	111	6	264
847	97	608	107	407	100	207	117	7	180
848	93	646	129	408	102	208	126	8	237
849	96	647	171	446	126	246	159	46	102
850	144	648	129	447	135	247	108	47	106
851	153	649	135	448	117	248	147	48	108
853	96	650	126	449	106	249	114	49	108
		651	204	450	108	250	156	51	150
		652	115	451	116	251	144	52	159
		653	136	452	141	252	216	53	113
				453	156	253	207		
$\bar{X}$	116.08		144.80		121.63		137.44		159.6
+ S.E.	11.28		7.32		6.00		8.95		13.4

No statistically significant differences were found between the groups .

Table 7 - Serum LDH levels in Control and ECD-exposed rats .

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	nU/ml	Rat No.	nU/ml	Rat No.	nU/ml	Rat No.	nU/ml	Rat No.	nU/ml
801	300	601	1290	401	1230	201	900	1	1020
803	720	602	1350	402	660	202	1200	2	300
805	280	603	1380	403	570	203	1200	3	590
808	420	604	1050	404	1200	204	840	4	620
809	600	605	1440	405	990	205	870	5	690
810	950	606	1110	406	500	206	750	6	1230
847	1050	608	810	407	650	207	1020	7	1140
848	900	646	1080	408	660	208	1320	8	1320
849	930	647	1440	446	1290	246	1500	46	670
850	960	648	1560	447	1380	247	1110	47	1000
851	1270	649	1590	448	1620	248	1290	48	1060
853	900	650	1380	449	1330	249	1300	49	760
		651	1490	450	1020	250	1140	51	1110
		652	1380	451	1440	251	1350	52	1110
		653	1320	452	1310	252	1560	53	790
				453	162	253	1150		
$\bar{X}$	771.67		1311.33		1091.87		1160.00		894.00
$\pm$ S.E.	89.80		54.96		94.49		58.81		73.8

Statistical analysis : Group C 1 : $P < 0.001$; Group 4 vs 1 : $P < 0.001$; Group 2 vs 1 : $P < 0.005$;
 Group C vs 3 : $P < 0.005$; Group 3 vs 4 : $P < 0.05$; Group 3 Vs 2 : $P < 0.05$

Table 8 - Serum cholesterol levels in Control and ECD-exposed rats.

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
at No.	mg %	Rat No.	mg %	Rat No.	mg %	Rat No.	mg %	Rat No.	mg %
801	165	601	120	401	125	201	110	1	90
802	105	602	105	402	120	202	110	2	100
803	75	603	145	403	105	203	95	3	100
804	-	604	150	404	120	204	90	4	90
805	105	605	150	405	120	205	105	5	110
807	-	606	120	406	110	206	90	6	120
808	105	607	-	407	110	207	120	7	110
809	105	608	130	408	110	208	120	8	110
810	105	646	110	446	105	246	110	46	90
847	90	647	135	447	90	247	105	47	90
848	120	648	115	448	110	248	90	48	90
849	90	649	95	449	120	249	80	49	90
850	115	650	105	450	130	250	90	51	120
851	150	651	105	451	115	251	105	52	135
852	-	652	105	452	125	252	115	53	135
853	105	653	125	453	125	253	105		
$\bar{X}$	110.38		121.00		115.00		102.61		105.33
S.E.	4.58		2.54		2.92		4.21		

SL 070434 Statistical analysis: group 3 vs 1: p 0.005; group 4 vs 1: p 0.05

Table 9 - Uric acid serum levels in Control and ECD-exposed rats.

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	mg %	Rat No.	mg %	Rat No.	mg %	Rat No.	mg %	Rat No.	mg %
801	10.2	601	3.9	401	2.4	201	2.7	1	3.0
802	-	602	3.8	402	2.8	202	2.7	2	2.8
803	3.6	603	3.6	403	2.9	203	2.6	3	2.7
804	-	604	3.6	404	2.7	204	2.4	4	2.7
805	5.7	605	3.5	405	2.7	205	2.6	5	2.7
807	-	606	3.3	406	2.5	206	2.4	6	3.1
808	4.8	607	-	407	2.6	207	2.4	7	3.3
809	4.2	608	3.1	408	2.7	208	2.5	8	3.4
810	4.2	646	3.0	446	2.7	246	2.7	46	3.1
847	3.9	647	3.6	447	2.7	247	2.9	47	3.0
848	4.5	648	3.4	448	2.8	248	2.7	48	2.7
849	3.9	649	3.0	449	2.8	249	2.7	49	2.7
850	3.9	650	2.4	450	2.7	250	2.9	51	3.0
851	4.6	651	2.4	451	2.5	251	3.0	52	3.0
852	-	652	2.4	452	2.7	252	2.8	53	3.0
853	3.6	653	2.1	453	2.9	253	2.9		
$\bar{X}$	4.76		3.14		2.69		2.68		2.99
S.E.	0.52		0.15		0.03		0.05		0.09

Statistical analysis: group C vs 3: p 0.001; group C vs 2: p 0.001; group C vs 4: p 0.001; group C vs 1: p 0.001.

Table 10 - Serum levels of alkaline phosphatase in Control and ECD-exposed rats .

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	mU/ml	Rat No.	mU/ml	Rat No.	mU/ml	Rat No.	mU/ml	Rat No.	mU/ml
801	150	601	78	401	122	201	68	1	108
802	-	602	90	402	156	202	169	2	64
803	144	603	57	403	127	203	66	3	72
804	-	604	60	404	84	204	79	4	62
805	150	605	69	405	66	205	74	5	102
807	-	606	57	406	75	206	64	6	75
808	96	607	-	407	102	207	132	7	120
809	84	608	55	408	60	208	63	8	126
810	84	646	74	446	150	246	180	46	28
847	180	647	120	447	144	247	117	47	155
848	108	648	71	448	120	248	120	48	124
849	160	649	75	449	120	249	128	49	181
850	246	650	130	450	102	250	135	51	186
851	174	651	138	451	120	251	162	52	126
852	-	652	123	452	117	252	210	53	119
853	130	653	102	453	114	253	138		
X	142.17	86.60		119.19		119.06		111.87	
+ S.E.	3.45	7.43		7.10		11.60		9.87	

Statistical analysis : Group C vs 1 : $P < 0.001$: Group C vs 2 : $P < 0.05$

SL 070435A

Table 11 - Plasma chylomicrons in Control and ECD-exposed rats .

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	mg %	Rat No.	mg %	Rat No.	mg %	Rat No.	mg %	Rat No.	mg %
801	6.8	601	13.4	401	8.8	201	8.0	1	5.0
802	10.5	602	10.2	402	8.1	202	10.0	2	6.2
803	8.9	603	9.7	403	9.3	203	9.1	3	4.0
804	6.0	604	8.3	404	9.0	204	12.1	4	8.6
805	9.0	605	9.5	405	8.1	205	8.0	5	7.0
807	5.0	606	8.9	406	7.0	206	9.3	6	4.7
808	4.9	607	9.9	407	9.8	207	8.9	7	6.7
809	12.5	608	5.2	408	10.0	208	8.8	8	9.0
810	8.4	646	4.2	446	7.7	246	8.0	46	8.5
847	11.6	647	9.8	447	7.0	247	6.5	47	5.0
848	10.6	648	9.1	448	7.0	248	6.3	48	8.9
849	9.7	649	8.5	449	8.1	249	5.0	49	8.1
850	8.1	650	4.6	450	9.9	250	8.1	51	5.2
851	8.0	651	8.7	451	9.2	251	9.0	52	6.7
852		652	6.9	452	7.9	252	7.4	53	10.0
853	5.2	653	9.4	453	8.0	253	4.4		
$\bar{X}$	8.41	8.52	8.43	8.06	6.91				
+S.E.	0.60	0.58	0.26	0.47	0.48				

Statistical analysis : Group 1 vs 4 : $P < 0.05$; Group C vs 4 : $P < 0.005$; Group 2 vs 4 : $P < 0.05$.

Table 12 - Percent concentrations of alpha-lipoproteins in Control and ECD-exposed rats .

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	mg %	Rat No.	mg %	Rat No.	mg %	Rat No.	mg %	Rat No.	mg %
801	23.5	601	12.1	401	29.5	201	15.0	1	20.9
802	15.4	602	12.7	402	22.5	202	16.9	2	20.9
803	13.9	603	16.0	403	17.8	203	14.8	3	27.5
804	16.5	604	18.6	404	18.3	204	20.2	4	17.9
805	20.5	605	15.5	405	24.5	205	18.1	5	22.4
807	22.1	606	15.9	406	25.3	206	22.6	6	24.7
808	25.6	607	15.8	407	20.4	207	16.2	7	25.5
809	23.0	608	16.5	408	19.3	208	17.8	8	26.0
810	27.0	646	24.5	446	26.3	246	16.9	46	20.8
847	17.3	647	28.1	447	21.1	247	17.0	47	25.2
848	21.6	648	23.5	448	21.0	248	14.7	48	20.6
849	10.0	649	25.5	449	20.7	249	16.1	49	21.9
850	17.7	650	12.6	450	18.7	250	20.7	51	18.5
851	13.8	651	11.1	451	19.8	251	22.1	52	18.7
852		652	12.0	452	22.5	252	20.3	53	24.9
853	18.2	653	9.0	453	23.1	253	19.1		
$\bar{X}$	19.41		16.84		21.93		18.03		22.41
+ S.E.	1.35		1.43		0.80		0.64		0.78

Statistical analysis : Group 1 vs 4 : $P < 0.001$; Group 3 vs 4 : $P < 0.01$; Group 1 vs 2 : $P < 0.01$
 Group 2 vs 3 : $P < 0.05$

Table 13 - Percent concentrations of Beta-Lipoproteins in Control and ECD-exposed rats .

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	mg %	Rat No.	mg %	Rat No.	mg %	Rat No.	mg %	Rat No.	mg %
801	37.6	601	42.4	401	18.9	201	39.5	1	33.3
802	49.8	602	41.7	402	33.3	202	39.3	2	33.7
803	40.5	603	45.7	403	41.4	203	38.0	3	33.0
804	49.7	604	42.2	404	42.4	204	35.4	4	43.0
805	36.4	605	42.3	405	30.2	205	34.6	5	36.5
807	38.1	606	41.9	406	32.0	206	33.9	6	38.4
808	32.1	607	34.3	407	31.9	207	36.5	7	28.8
809	34.8	608	35.9	408	32.5	208	38.5	8	31.1
810	38.2	646	27.1	446	31.4	246	39.6	46	36.0
847	40.6	647	31.0	447	38.9	247	36.6	47	34.1
848	38.5	648	32.4	448	31.5	248	38.4	48	34.5
849	36.7	649	26.8	449	34.5	249	39.9	49	28.9
850	41.8	650	48.6	450	37.9	250	37.8	51	37.0
851	31.2	651	41.0	451	30.8	251	29.3	52	29.9
852		652	44.0	452	30.0	252	36.1	53	28.3
853	45.9	653	50.6	453	30.2	253	36.2		
X	39.46		39.23		32.95		36.85		33.77
+ S.E.	1.43		1.80		1.40		0.68		1.05

Statistical analysis : Group C vs 2 : $P < 0.05$; Group C vs 4 : $P < 0.05$;
 Group 1 vs 2 : $P < 0.005$; Group 1 vs 4 : $P < 0.01$; Group 2 vs 3 : $P < 0.05$

Table 14 - Percent concentrations of pre-alpha-lipoproteins in Control and ECD-exposed rats

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	mg %	Rat No.	mg %	Rat No.	mg %	Rat No.	mg %	Rat No.	mg %
801	5.0	601	7.2	401	13.8	201	8.4	1	12.7
802	4.7	602	5.7	402	13.2	202	8.1	2	15.4
803	6.2	603	5.4	403	6.7	203	10.7	3	11.6
804	6.4	604	4.7	404	7.9	204	7.3	4	10.1
805	5.9	605	4.5	405	10.5	205	10.2	5	9.7
807	9.7	606	7.6	406	12.0	206	8.6	6	11.3
808	7.6	607	5.7	407	10.8	207	8.8	7	14.3
809	7.9	608	6.8	408	11.9	208	8.8	8	11.2
810	6.2	646	7.6	446	11.6	246	9.3	46	14.3
847	7.7	647	6.7	447	13.4	247	9.7	47	10.5
848	3.2	648	8.5	448	11.0	248	7.4	48	11.5
849	5.0	649	12.1	449	10.4	249	8.4	49	15.5
850	5.1	650	8.3	450	8.6	250	10.9	51	1.3
851	6.1	651	9.7	451	12.9	251	13.7	52	12.7
852		652	9.4	452	11.5	252	13.5	53	11.5
853	9.9	653	5.7	453	19.9	253	9.2		
$\bar{X}$	6.44		7.22		11.61		9.56		12.22
+S.E.	0.48		0.51		0.74		0.47		0.43

Statistical analysis : Group C vs 4 : $P < 0.01$; Group 1 vs 4 : $P < 0.01$; Group 3 vs 4 : $P < 0.05$; Group C vs 2 : $P < 0.01$;
 Group 2 vs 1 : $P < 0.001$; Group 2 vs 3 : $P < 0.05$; Group 1 vs 3 : $P < 0.05$; Group C vs 5 : $P < 0.001$,

Table 15 - Concentrations of prebeta lipoproteins in Control and ECD-exposed rats .

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	mg %	Rat No.	mg %	Rat No.	mg %	Rat No.	mg %	Rat No.	mg %
801	26.9	601	24.9	401	29.1	201	29.4	1	28.1
802	19.6	602	29.5	402	23.1	202	27.3	2	26.7
803	29.5	603	23.2	403	24.3	203	28.7	3	24.5
804	21.2	604	26.2	404	22.1	204	26.9	4	20.4
805	28.1	605	29.2	405	27.0	205	29.4	5	24.6
807	25.3	606	25.6	406	24.2	206	25.5	6	20.9
808	30.1	607	35.1	407	26.8	207	30.3	7	24.8
809	16.7	608	36.5	408	26.3	208	27.2	8	23.1
810	20.2	646	36.5	446	23.9	246	26.3	46	20.7
847	24.9	647	24.3	447	27.0	247	30.2	47	25.4
848	26.3	648	26.4	448	29.7	248	33.2	48	24.3
849	39.1	649	26.9	449	26.4	249	30.9	49	27.6
850	27.6	650	25.9	450	24.6	250	24.8	51	28.5
851	40.5	651	29.3	451	26.0	251	26.5	52	26.8
852		652	28.5	452	28.8	252	22.9	53	25.3
853	20.3	653	26.2	453	29.3	253	32.0		
$\bar{X}$	26.42		28.39		26.16		28.22		24.78
+ S.E.	1.74		1.05		0.58		0.69		0.67

Statistical analysis : Group 1 vs 4 $P < 0.01$; Group 4 vs 3 : $P < 0.05$; Group 1 vs 2 : $P < 0.05$

Table 16 -

Lipoproteins ration in Control and ECD-exposed rats.

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
at No.	ratio	Rat No.	ratio	Rat No.	ratio	Rat No.	ratio	Rat No.	ratio
801	1.6	601	3.5	401	0.6	201	2.6	1	0
802	3.2	602	3.2	402	1.4	202	2.3	2	1.6
803	2.9	603	2.8	403	2.3	203	2.5	3	1.2
804	3.0	604	2.2	404	2.3	204	1.7	4	2.4
805	1.7	605	2.7	405	1.2	205	1.9	5	1.6
807	1.7	606	2.6	406	1.2	206	1.5	6	1.5
808	1.2	607	2.1	407	1.5	207	2.2	7	1.1
809	1.2	608	2.1	408	1.6	208	2.1	8	1.2
810	1.4	646	1.1	446	1.1	246	2.3	46	1.7
847	2.3	647	1.1	447	1.8	247	2.1	47	1.3
848	1.7	648	1.3	448	1.5	248	2.6	48	1.6
849	3.6	649	1.0	449	1.6	249	2.4	49	1.3
850	2.3	650	3.8	450	2.0	250	1.8	51	2.0
851	2.2	651	3.6	451	1.5	251	1.5	52	1.6
852	-	652	3.6	452	1.3	252	1.1	53	1.1
853	2.5	653	5.6	453	1.3	253	1.8		
$\bar{X}$	2.17		2.64		1.51		2.01		1.52
S.E.	0.19		0.31		0.11		0.11		0.09

Statistical analysis: group 1 vs 4: p 0.001; group 3 vs 1: p 0.01; group C vs 2: p 0.01; group C vs 4: p 0.01

Table 17 - Percent serum albumin in Control and ECD-exposed rats.

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	%	Rat No.	%	Rat No.	%	Rat No.	%	Rat No.	%
801	35.3	601	48.5	401	52.5	201	50.5	1	50.5
802	41.8	602	42.9	402	55.7	202	47.6	2	50.7
803	43.8	603	47.6	403	52.3	203	48.7	3	48.1
804	41.5	604	49.5	404	52.2	204	44.7	4	59.4
805	47.9	605	45.0	405	44.3	205	49.1	5	37.3
807	43.2	606	52.1	406	52.3	206	45.6	6	43.8
808	47.2	607	44.0	407	50.4	207	46.5	7	42.9
809	48.8	608	44.3	408	46.2	208	45.5	8	39.6
810	48.3	646	46.9	446	45.3	246	42.2	46	25.3
847	40.9	647	45.6	447	50.2	247	44.2	47	48.7
848	39.8	648	43.3	448	42.5	248	45.1	48	44.0
849	36.6	649	44.4	449	43.5	249	45.5	49	29.6
850	40.6	650	44.1	450	40.2	250	42.7	51	41.8
851	30.8	651	44.3	451	41.6	251	45.0	52	41.9
852	-	652	48.8	452	45.1	252	42.2	53	42.3
853	42.7	653	48.8	453	40.6	253	43.8		
$\bar{X}$	40.48		46.26		47.18		45.56		42.39
S.E.	2.93		0.67		1.25		0.61		1.91

Statistical analysis: group C vs 2: p 0.005; group 2 vs 4: p 0.01; group C vs 1: p 0.01; group C vs 3: p 0.05

Table 18-Serum alfa globulins content in Control and ECD-exposed rats.

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	%	Rat No.	%	Rat No.	%	Rat No.	%	Rat No.	%
S01	15.1	601	19.1	401	17.3	201	15.7	1	14.1
S02	15.7	602	19.0	402	12.1	202	17.5	2	13.1
S03	20.2	603	17.2	403	17.6	203	18.8	3	14.9
S04	16.7	604	16.0	404	17.0	204	15.3	4	12.9
S05	18.2	605	16.0	405	14.4	205	14.9	5	18.8
S07	14.6	606	17.2	406	12.7	206	16.2	6	17.1
S08	13.0	607	16.5	407	13.2	207	16.3	7	17.4
S09	12.5	608	17.8	408	14.4	208	15.4	8	14.7
S10	13.9	646	14.5	446	16.2	246	20.3	46	28.1
S47	22.0	647	16.8	447	13.2	247	19.2	47	19.0
S48	22.7	648	17.7	448	20.4	248	16.2	48	19.4
S49	18.2	649	19.4	449	16.8	249	13.5	49	14.2
S50	19.4	650	17.5	450	13.4	250	11.4	51	14.8
S51	14.4	651	18.3	451	20.3	251	16.0	52	22.7
S52	-	652	18.3	452	16.6	252	15.5	53	20.0
S53	18.8	653	17.8	453	17.4	253	14.4		
$\bar{X}$	17.03		17.44		15.81		16.04		17.41
S.E.	0.83		0.32		0.64		0.55		1.06

No statistically significant differences were found between the groups.

Table 19 - Serum alfa 2 globulins content in Control and ECD-exposed rats

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	%	Rat No.	%	Rat No.	%	Rat No.	%	Rat No.	%
801	11.5	601	9.8	401	10.8	201	9.9	1	9.1
802	14.2	602	12.0	402	9.8	202	9.0	2	9.3
803	12.7	603	12.3	403	7.8	203	9.7	3	8.9
804	18.2	604	8.6	404	9.2	204	8.5	4	11.1
805	11.6	605	14.0	405	9.2	205	9.4	5	12.6
807	15.5	606	11.7	406	9.6	206	9.6	6	13.0
808	11.0	607	15.2	407	10.1	207	12.2	7	12.6
809	12.3	608	13.1	408	11.3	208	10.4	8	13.4
810	15.8	646	11.8	446	11.7	246	10.7	46	15.4
847	12.0	647	12.4	447	12.9	247	11.0	47	11.1
848	13.9	648	14.8	448	10.7	248	12.9	48	8.8
849	16.2	649	10.8	449	11.5	249	10.6	49	10.5
850	11.7	650	9.2	450	14.1	250	17.3	51	15.6
851	-	651	12.9	451	10.7	251	14.0	52	10.6
852	-	652	10.7	452	11.1	252	10.3	53	8.8
853	13.3	653	10.7	453	15.3	253	13.9		
X	13.56		11.88		10.99		11.21		11.36
s.e.	0.58		0.47		0.47		0.58		0.60

Statistical analysis: group C 2: p 0.005; group C 3: p 0.01; C 4: p 0.01; C 1: p 0.05

Table 20 - Serum beta globulins content in Control and ECD-exposed rats.

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	%	Rat No.	%	Rat No.	%	Rat No.	%	Rat No.	%
801	15.6	601	13.7	401	10.6	201	12.0	1	17.0
802	17.8	602	14.2	402	12.2	202	13.7	2	15.1
803	15.5	603	12.5	403	10.9	203	13.6	3	19.5
804	12.8	604	14.7	404	12.5	204	15.0	4	15.5
805	13.0	605	14.0	405	17.8	205	14.5	5	17.6
807	15.9	606	11.9	406	15.9	206	16.2	6	16.1
808	15.9	607	15.0	407	15.0	207	15.1	7	15.8
809	13.8	608	14.3	408	16.7	208	16.4	8	20.0
810	13.4	646	16.2	446	18.1	246	17.4	46	23.7
847	17.7	647	14.8	447	14.8	247	18.4	47	20.5
848	16.1	648	15.7	448	17.1	248	18.3	48	19.3
849	16.5	649	17.3	449	18.6	249	15.5	49	22.2
850	15.1	650	19.0	450	18.9	250	17.8	51	17.7
851	10.5	651	16.3	451	19.5	251	14.0	52	18.2
852	-	652	16.7	452	17.8	252	22.5	53	19.6
853	13.3	653	15.2	453	17.5	253	17.2		
X	14.86	15.09		15.87		16.10		18.48	
S.E.	0.52	0.45		0.73		0.63		0.65	

SL 070444 statistical analysis: group C 4: p 0.001; group 1 4: p 0.001; group 2 4: p 0.005; group 3 4: p 0.01

Table 21 - Serum gamma globulins in Control and ECD-exposed rats.

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	%	Rat No.	%	Rat No.	%	Rat No.	%	Rat No.	%
801	22.5	601	9.4	401	8.8	201	11.8	1	9.1
802	10.9	602	11.7	402	10.2	202	12.6	2	11.4
803	9.1	603	10.1	403	11.6	203	9.8	3	10.1
804	10.5	604	11.4	404	9.6	204	17.1	4	10.4
805	10.0	605	11.1	405	14.2	205	12.2	5	15.0
807	10.7	606	7.5	406	10.2	206	13.1	6	10.7
808	12.9	607	10.0	407	10.9	207	11.4	7	11.3
809	12.5	608	10.7	408	10.6	208	12.0	8	13.3
810	11.4	646	10.4	446	9.3	246	9.5	46	7.5
847	7.5	647	10.5	447	8.8	247	7.3	47	11.0
848	7.9	648	9.1	448	12.0	248	8.0	48	10.0
849	11.8	649	8.7	449	9.4	249	15.7	49	-
850	13.3	650	10.4	450	14.2	250	11.2	51	10.4
851	11.9	651	9.0	451	10.8	251	11.1	52	8.3
852	-	652	6.0	452	10.5	252	10.5	53	9.4
853	12.2	653	8.4	453	9.8	253	10.9		
$\bar{X}$	11.67		9.65		10.68		11.51		10.56
S.E.	0.89		0.38		0.41		0.62		0.51

Statistical analysis: group c 1: p 0.05

Table 22 - Na⁺ concentrations in Control and ECD-exposed rats.

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	mEq/ml	Rat No.	mEq/ml	Rat No.	mEq/ml	Rat No.	mEq/ml	Rat No.	mEq/ml
801	132	601	147	401	144	201	144	1	141
802	144	602	150	402	129	202	144	2	144
803	150	603	144	403	150	203	141	3	139
804	139	604	141	404	147	204	141	4	141
805	141	605	144	405	139	205	139	5	144
807	141	606	144	406	141	206	141	6	139
808	139	607	144	407	144	207	144	7	141
809	137	608	147	408	144	208	147	8	147
810	139	646	147	446	139	246	150	46	144
847	141	647	150	447	147	247	141	47	141
848	141	648	141	448	141	248	139	48	144
849	147	649	144	449	141	249	137	49	147
850	147	650	147	450	139	250	134	51	144
851	-	651	147	451	141	251	144	52	141
852	147	652	141	452	147	252	150	53	137
853	144	653	144	453	144	253	147		
$\bar{X}$	141.93		145.13		142.31		142.69		142.27
S.E.	1.20		0.72		1.21		1.11		0.75

Statistical analysis: group C 1: p 0.01

Table 23 - Ca^{++} concentrations in Control and ECD-exposed rats.

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	mEq/ml	Rat No.	mEq/ml	Rat No.	mEq/ml	Rat No.	mEq/ml	Rat No.	mEq/ml
801	10.5	601	8.4	401	9.3	201	6.3	1	8.4
802	-	602	8.1	402	9.0	202	8.5	2	8.3
803	7.8	603	9.2	403	9.3	203	8.1	3	7.1
804	-	604	8.5	404	9.9	204	8.7	4	7.1
805	9.0	605	8.9	405	9.3	205	8.1	5	8.3
807	-	606	8.9	406	8.4	206	7.5	6	8.2
808	8.7	607	-	407	9.3	207	8.7	7	8.1
809	8.7	608	8.9	408	9.0	208	9.1	8	8.1
810	7.8	646	8.5	446	9.4	246	8.4	46	8.9
847	8.4	647	8.5	447	9.3	247	8.3	47	7.5
848	8.4	648	8.4	448	9.5	248	8.5	48	7.8
849	9.0	649	8.6	449	9.0	249	7.6	49	7.8
850	9.0	650	8.4	450	9.1	250	7.2	51	7.5
851	7.0	651	8.7	451	9.0	251	8.1	52	7.8
852	-	652	8.7	452	8.7	252	8.2	53	7.8
853	7.8	653	9.2	453	8.7	253	7.5		
$\bar{x}$	8.51		8.66		9.13		8.05		7.91
S.E.	0.25		0.08		0.09		0.17		0.13

Statistical analysis: group 1 3: p 0.005 ; group C v.s. 4: p 0.01; group 1 v.s. 4: p 0.001; group 2 v.s. 3: p 0.001;
group 2 v.s. 4: p 0.001; group C v.s. 2: p 0.01; group 1 v.s. 2: p 0.01

Table 24 - Cl^- concentrations in Control and ECD-exposed rats.

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	mEq/ml	Rat No.	mEq/ml	Rat No.	mEq/ml	Rat No.	mEq/ml	Rat No.	mEq/ml
801	100	601	101	401	105	201	101	1	106
802	102	602	106	402	104	202	104	2	105
803	103	603	107	403	102	203	102	3	104
804	107	604	104	404	104	204	103	4	105
805	102	605	105	405	103	205	108	5	102
807	108	606	104	406	102	206	105	6	106
808	105	607	107	407	102	207	104	7	106
809	100	608	102	408	105	208	103	8	107
810	106	646	102	446	103	246	105	46	102
847	104	647	103	447	104	247	102	47	104
848	105	648	105	448	103	248	104	48	105
849	107	649	101	449	105	249	102	49	103
850	101	650	101	450	105	250	106	51	106
851	-	651	102	451	102	251	103	52	102
852	104	652	100	452	104	252	105	53	104
853	98	653	101	453	104	253	105		
X	103.47		103.18		103.56		103.87		104.37
S.E.	0.76		0.57		0.29		0.45		0.41

SL No statistically significant differences were found between the groups.

Table 25 - Inorganic P concentrations in Control and ECD-exposed rats

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	mEq/ml	Rat No.	mEq/ml	Rat No.	mEq/ml	Rat No.	mEq/ml	Rat No.	mEq/ml
801	9.9	601	9.6	401	9.0	201	5.9	1	5.7
802	-	602	9.0	402	9.3	202	7.5	2	6.9
803	8.1	603	9.1	403	8.9	203	8.1	3	6.9
804	-	604	9.3	404	9.9	204	7.6	4	5.8
805	8.1	605	9.9	405	9.0	205	6.8	5	8.4
807	-	606	8.7	406	8.0	206	7.0	6	9.7
808	7.2	607	-	407	7.8	207	9.3	7	9.0
809	8.1	608	8.3	408	8.9	208	7.5	8	9.7
810	9.3	646	9.5	446	9.6	246	8.0	46	11.1
847	7.8	647	12.5	447	10.6	247	7.6	47	8.4
848	7.5	648	8.4	448	9.0	248	8.8	48	8.1
849	11.4	649	9.6	449	9.1	249	7.6	49	7.2
850	10.5	650	9.6	450	13.5	250	8.6	51	9.3
851	9.4	651	9.6	451	9.1	251	6.9	52	8.4
852	-	652	8.1	452	10.7	252	7.2	53	7.1
853	7.8	653	9.3	453	9.0	253	9.1		
X	8.76		9.37		9.46		7.71		8.11
S.E.	0.38		0.26		0.33		0.22		0.39

Statistical analysis: group C v.s. 3: p 0.01; group 4 v.s. 1: p 0.01; group 3 v.s. 2: p 0.001; group 2 v.s. 4: p 0.005
group 1 v.s. 3: p 0.001

Table 26 - Leukocyte numbers in Control and ECD-exposed rats.

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	(x 10 ³)	Rat No.	(x 10 ³)	Rat No.	(x 10 ³)	Rat No.	(x 10 ³)	Rat No.	(x 10 ³)
801	8.0	601	6.4	401	9.2	201	17.2	1	8.6
802	5.2	602	5.2	402	21.2	202	14.2	2	11.6
803	7.8	603	6.0	403	10.0	203	10.0	3	18.8
804	4.4	604	8.0	404	10.4	204	22.0	4	10.6
805	9.6	605	13.2	405	9.0	205	12.0	5	17.8
807	5.2	606	9.0	406	12.0	206	14.6	6	17.0
808	7.2	607	6.8	407	5.8	207	13.4	7	19.6
809	5.6	608	9.6	408	10.8	208	12.6	8	16.0
810	6.4	646	10.0	446	15.6	246	21.0	46	17.6
847	13.4	647	8.0	447	21.8	247	15.4	47	15.2
848	12.0	648	7.4	448	17.2	248	14.8	48	15.6
849	9.6	649	12.4	449	14.0	249	17.0	49	25.4
850	9.8	650	12.0	450	7.6	250	13.0	51	12.6
851	9.4	651	11.6	451	20.4	251	17.4	52	16.0
852	12.6	652	13.6	452	12.6	252	17.8	53	14.4
853	8.8	653	7.4	453	21.6	253	12.8		
X	8.44	9.16		13.70		15.36		15.79	
S.E.	0.68	0.67		1.33		0.80		1.05	

Statistical analysis: group 1 vs 2: p 0.01; group C vs 2: p 0.005; group 1 vs 3: p 0.001; group C vs 4: p 0.001; group 1 vs 4: p 0.001; group C vs 3: p 0.001.

Table 27 - Hematocrit value in Control and ECD-exposed rats

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	%	Rat No.	%	Rat No.	%	Rat No.	%	Rat No.	%
801	40	601	46	401	36	201	43	1	37
802	43	602	47	402	41	202	41	2	38
803	42	603	41	403	38	203	38	3	40
804	44	604	46	404	41	204	36	4	42
805	41	605	46	405	36	205	40	5	38
807	29	606	39	406	40	206	38	6	35
808	39	607	48	407	38	207	44	7	39
809	41	608	46	408	41	208	46	8	38
810	39	646	46	446	47	246	47	46	43
847	-	647	37	447	40	247	47	47	44
848	40	648	48	448	45	248	41	48	41
849	48	649	46	449	39	249	46	49	45
850	48	650	41	450	40	250	-	51	38
851	35	651	49	451	46	251	44	52	45
852	47	652	-	452	44	252	46	53	44
853	43	653	38	453	49	253	37		
X	41.27		44.27		41.31		42.27		40.33
S.E.	1.27		1.02		0.96		0.99		0.90

Statistical analysis: group 1 vs 4: p 0.01

Table 28 - Hemoglobin concentration in Control and ECD-exposed rats.

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	%	Rat No.	%	Rat No.	%	Rat No.	%	Rat No.	%
801	13.4	601	14.8	401	14.2	201	15.0	1	14.8
802	14.2	602	15.4	402	14.8	202	14.8	2	14.0
803	14.8	603	14.8	403	13.8	203	14.0	3	14.8
804	14.2	604	14.6	404	15.0	204	13.8	4	14.6
805	13.2	605	15.6	405	13.8	205	14.4	5	14.2
807	13.6	606	14.6	406	15.0	206	14.0	6	15.6
808	14.0	607	15.4	407	14.6	207	15.0	7	14.6
809	13.6	608	15.6	408	15.0	208	14.8	8	14.2
810	14.6	646	15.2	446	15.2	246	15.4	4	15.0
847	14.6	647	14.2	447	16.0	247	16.0	47	15.6
848	14.2	648	15.4	448	15.8	248	15.2	48	14.4
849	16.0	649	15.4	449	15.0	249	15.8	49	16.0
850	15.4	650	14.8	450	14.6	250	15.0	51	15.2
851	14.4	651	15.4	451	15.6	251	15.6	52	16.0
852	15.4	652	15.8	452	15.0	252	15.6	53	15.8
853	14.4	653	15.0	453	16.0	253	15.2		
$\bar{X}$	14.44		15.13		14.96		14.98		14.99
S.E.	0.20		0.11		0.17		0.16		0.18

Statistical analysis: group C vs 2: p 0.05; group C vs 3: p 0.05; group C vs 1: p 0.005; group C vs 4: p 0.05

Table 29 - Erythrocyte numbers in Control and ECD-exposed rats.

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	(x 10 ⁶)	Rat No.	(x 10 ⁶)	Rat No.	(x 10 ⁶)	Rat No.	(x 10 ⁶)	Rat No.	(x 10 ⁶)
801	5.7	601	6.9	401	6.9	201	6.2	1	7.3
802	6.8	602	6.9	402	7.2	202	7.3	2	-
803	7.3	603	6.9	403	6.8	203	-	3	6.5
804	6.5	604	7.0	404	-	204	7.4	4	-
805	6.4	605	7.4	405	6.8	205	6.8	5	7.4
807	6.3	606	6.9	406	-	206	6.5	6	7.3
808	6.2	607	7.4	407	7.2	207	7.2	7	7.2
809	6.4	608	7.4	408	-	208	7.2	8	6.8
810	7.0	646	7.1	446	7.1	246	-	46	6.9
847	6.9	647	6.8	447	6.9	247	-	47	-
848	6.8	648	7.4	448	6.5	248	7.3	48	-
849	7.4	649	7.3	449	6.8	249	6.9	49	6.2
850	7.5	650	7.1	450	7.3	250	6.7	51	7.1
851	7.2	651	-	451	-	251	7.5	52	7.3
852	7.0	652	-	452	-	252	-	53	7.5
853	7.0	653	-	453	6.2	253	6.3		
X	6.78		7.11		6.88		6.94		7.05
S.E.	0.12		0.06		0.19		0.13		0.12

No statistically significant differences were found between the groups.

Table 30 - Mean erythrocyte volume in Control and ECD-exposed rats.

CONTROL.		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	%	Rat No.	%	Rat No.	%	Rat No.	%	Rat No.	%
801	67	601	62	401	49	201	58	1	50
802	60	602	65	402	55	202	56	2	52
803	56	603	57	403	52	203	51	3	54
804	63	604	63	404	56	204	48	4	57
805	60	605	63	405	50	205	54	5	51
807	42	606	54	406	54	206	52	6	44
808	60	607	65	407	51	207	60	7	53
809	61	608	63	408	55	208	62	8	52
810	53	646	63	446	65	246	64	46	58
847	30	647	52	447	55	247	64	47	60
848	56	648	66	448	61	248	56	48	56
849	66	649	66	449	52	249	62	49	60
850	65	650	58	450	55	250	30	51	52
851	47	651	67	451	62	251	60	52	51
852	65	652	28	452	60	252	63	53	59
853	58	653	51	453	67	253	61		
X	56.81	58.94		56.19		56.31		54.60	
S.E.	3.47	2.42		1.34		2.13		1.21	

No statistically significant differences were found between the groups.

Table 31 - Platelet numbers in Control and ECD-exposed rats.

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	(x 10 ³)	Rat No.	(x 10 ³)	Rat No.	(x 10 ³)	Rat No.	(x 10 ³)	Rat No.	(x 10 ³)
801	210	601	69	401	225	201	123	1	101
802	84	602	150	402	83	202	53	2	70
803	78	603	263	403	64	203	86	3	86
804	108	604	88	404	210	204	128	4	110
805	205	605	59	405	142	205	123	5	72
807	55	606	181	406	116	206	158	6	210
808	66	607	53	407	71	207	67	7	157
809	191	608	66	408	105	208	89	8	63
810	198	646	98	446	52	246	121	46	198
847	56	647	127	447	76	247	59	47	61
848	275	648	110	448	39	248	161	48	210
849	122	649	72	449	81	249	106	49	58
850	63	650	136	450	59	250	53	51	60
851	131	651	67	451	310	251	75	52	114
852	365	652	59	452	55	252	107	53	158
853	71	653	131	453	131	253	122		
$\bar{X}$	142.38		108.04		113.69		101.94		115.20
S.E.	22.61		14.05		18.81		8.66		14.70

No statistically significant differences were found between the groups.

Table 32 - Basophilic leukocytes in Control and ECD exposed rats.

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
t No.	%	Rat No.	%	Rat No.	%	Rat No.	%	Rat No.	%
01	0	601	0	401	0	201	0	1	0
02	0	602	0	402	0	202	0	2	1
03	0	603	0	403	0	203	0	3	0
04	0	604	0	404	0	204	0	4	0
05	0	605	0	405	0	205	0	5	0
07	0	606	0	406	0	206	0	6	0
08	0	607	0	407	0	207	0	7	0
09	0	608	0	408	0	208	0	8	0
10	0	646	0	446	0	246	0	46	0
47	0	647	0	447	0	247	0	47	0
48	0	648	0	448	0	248	0	48	0
49	0	649	0	449	0	249	0	49	0
50	0	650	0	450	0	250	0	51	0
51	0	651	0	451	0	251	0	52	0
52	0	652	0	452	0	252	0	53	0
53	0	653	0	453	0	253	0		

Table 33 - Eosinophilic leukocytes in Control and ECD-exposed rats.

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	%	Rat No.	%	Rat No.	%	Rat No.	%	Rat No.	%
801	0	601	0	401	0	201	1	1	2
802	2	602	1	402	1	202	0	2	0
803	0	603	0	403	0	203	0	3	0
804	0	604	0	404	2	204	1	4	0
805	0	605	2	405	0	205	0	5	0
807	0	606	0	406	0	206	0	6	0
808	0	607	0	407	0	207	0	7	0
809	0	608	0	408	1	208	2	8	0
810	0	646	0	446	0	246	0	46	0
847	0	647	1	447	0	247	1	47	0
848	0	648	2	448	0	248	0	48	0
849	0	649	0	449	0	249	3	49	0
850	0	650	0	450	0	250	0	51	2
851	0	651	0	451	0	251	0	52	1
852	0	652	3	452	0	252	1	53	0
853	0	653	0	453	2	253	0		

Table 34 - Sequestered Neutrophilic leukocytes in Control and ECD-exposed rats.

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	%	Rat No.	%	Rat No.	%	Rat No.	%	Rat No.	%
801	18	601	16	401	17	201	14	1	16
802	23	602	19	402	20	202	16	2	19
803	17	603	16	403	21	203	18	3	20
804	20	604	21	404	20	204	19	4	16
805	16	605	22	405	17	205	21	5	17
807	22	606	21	406	19	206	17	6	20
808	18	607	23	407	16	207	19	7	16
809	16	608	17	408	15	208	15	8	22
810	18	646	16	446	20	246	17	46	-
847	17	647	16	447	17	247	19	47	36
848	17	648	23	448	18	248	20	48	20
849	20	649	15	449	18	249	15	49	17
850	20	650	21	450	17	250	14	51	23
851	18	651	22	451	18	251	19	52	20
852	21	652	18	452	16	252	16	53	18
853	18	653	20	453	18	253	22		
X	18.69	19.13		17.94		17.56		20.06	
s.e.	0.52	0.71		0.42		0.61		1.37	

Statistical analysis: group 3,4 : p 0.01

55 - Non requested neutrophilic leukocytes in Control and ECD-exposed rats.

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	%	Rat No.	%	Rat No.	%	Rat No.	%	Rat No.	%
801	0	601	0	401	0	201	2	1	1
802	0	602	0	402	0	202	0	2	0
803	0	603	0	403	1	203	0	3	0
804	0	604	0	404	0	204	0	4	0
805	0	605	0	405	0	205	0	5	1
807	0	606	0	406	0	206	1	6	0
808	0	607	0	407	0	207	0	7	1
809	0	608	0	408	0	208	0	8	0
810	0	646	2	446	0	246	0	46	0
847	0	647	0	447	0	247	0	47	0
848	0	648	0	448	0	248	0	48	0
849	0	649	0	449	0	249	0	49	0
850	1	650	0	450	0	250	0	51	0
851	0	651	0	451	0	251	0	52	0
852	0	652	0	452	0	252	0	53	0
853	0	653	0	453	0	253	0		

Table 50 - Lymphocyte percentages in Control and ECD-exposed rats.

CONTROL		GROUP 1		GROUP 2		GROUP 3		GROUP 4	
Rat No.	%	Rat No.	%	Rat No.	%	Rat No.	%	Rat No.	%
801	81	601	82	401	82	201	83	1	81
802	73	602	80	402	79	202	84	2	80
803	81	603	84	403	76	203	82	3	78
804	80	604	79	404	78	204	80	4	83
805	82	605	76	405	83	205	79	5	82
807	78	606	78	406	81	206	81	6	79
808	82	607	75	407	84	207	78	7	83
809	84	608	81	408	84	208	82	8	78
810	80	646	82	446	80	246	82	46	-
847	82	647	82	447	81	247	80	47	62
848	83	648	75	448	82	248	78	48	80
849	79	649	84	449	82	249	82	49	82
850	79	650	79	450	83	250	86	51	75
851	82	651	77	451	80	251	81	52	79
852	79	652	79	452	84	252	81		80
853	81	653	80	453	80	253	78		
$\bar{X}$	80.38		79.56		81.19		81.06		78.71
S.E.	0.64		0.72		0.57		0.56		1.41

Statistical analysis: group 2 vs 4: p 0.01