

Table 1 Hematology of rats treated orally with 2-tert-butylphenol in twenty-eight-day repeat dose toxicity test

Sex	Administration period					Recovery period			
	Dose level (mg/kg)	0	4	20	100	500	0	100	500
Male									
Number of animals	6	6	6	6	6	6	6	6	6
RBC ($\times 10^9/\mu\text{L}$)	749.8 \pm 34.4	727.5 \pm 26.7	735.3 \pm 30.3	732.2 \pm 15.0	755.0 \pm 27.0	789.5 \pm 27.5	784.7 \pm 19.1	801.2 \pm 11.7	
Hemoglobin (g/dL)	14.50 \pm 0.40	14.70 \pm 0.51	14.38 \pm 0.64	14.72 \pm 0.33	14.85 \pm 0.35	14.85 \pm 0.52	14.95 \pm 0.38	15.05 \pm 0.23	
Hematocrit (%)	41.97 \pm 0.98	41.95 \pm 1.24	41.77 \pm 1.24	42.52 \pm 1.39	43.32 \pm 1.65	41.97 \pm 1.63	42.30 \pm 0.82	42.23 \pm 0.80	
MCV (fL)	56.02 \pm 1.72	57.70 \pm 2.02	56.85 \pm 2.15	58.05 \pm 1.07	57.38 \pm 1.85	53.18 \pm 1.28	53.93 \pm 1.14	52.78 \pm 2.17	
MCH (pg)	19.38 \pm 0.61	20.23 \pm 0.74	19.57 \pm 0.86	20.10 \pm 0.11	19.67 \pm 0.57	18.82 \pm 0.55	19.05 \pm 0.54	18.82 \pm 0.81	
MCHC (%)	34.55 \pm 0.45	35.03 \pm 0.73	34.42 \pm 0.52	34.63 \pm 0.52	34.32 \pm 0.68	35.40 \pm 0.54	35.35 \pm 0.48	35.62 \pm 0.28	
Reticulocyte (%)	30.92 \pm 4.15	30.97 \pm 3.46	30.17 \pm 4.28	28.70 \pm 3.41	31.23 \pm 2.08	24.42 \pm 2.39	25.10 \pm 1.81	25.07 \pm 4.61	
Platelet ($\times 10^9/\mu\text{L}$)	94.87 \pm 8.62	88.67 \pm 6.55	94.57 \pm 10.00	90.17 \pm 18.19	88.75 \pm 5.19	92.92 \pm 7.71	93.08 \pm 11.59	91.80 \pm 11.00	
PT (sec)	13.58 \pm 0.21	13.65 \pm 0.45	13.13 \pm 0.26	13.27 \pm 0.30	13.28 \pm 0.29	14.32 \pm 0.42	14.62 \pm 0.43	14.32 \pm 0.22	
APTT (sec)	16.10 \pm 1.04	15.85 \pm 1.18	16.23 \pm 0.58	15.30 \pm 1.98	16.32 \pm 1.77	17.00 \pm 0.89	16.87 \pm 1.26	16.93 \pm 0.99	
WBC ($\times 10^9/\mu\text{L}$)	108.18 \pm 21.35	119.88 \pm 34.28	97.73 \pm 20.91	99.72 \pm 19.94	116.25 \pm 20.30	102.17 \pm 12.82	101.43 \pm 8.46	124.02 \pm 13.87*	
Differential leukocyte counts (%)									
Lymphocytes	84.8 \pm 6.0	86.3 \pm 6.3	87.8 \pm 4.0	88.7 \pm 4.5	86.2 \pm 4.2	85.3 \pm 4.6	85.2 \pm 4.4	87.5 \pm 3.7	
Neutrophils									
Segmented	9.7 \pm 5.3	8.7 \pm 5.1	7.5 \pm 3.0	6.7 \pm 3.4	8.5 \pm 3.2	8.0 \pm 3.2	9.5 \pm 4.0	7.8 \pm 3.4	
Band	0.0 \pm 0.0	0.3 \pm 0.5	0.3 \pm 0.5	0.2 \pm 0.4	0.3 \pm 0.5	0.5 \pm 0.5	0.3 \pm 0.5	0.2 \pm 0.4	
Eosinophils	0.3 \pm 0.5	0.5 \pm 1.2	0.3 \pm 0.5	0.5 \pm 0.5	0.3 \pm 0.5	1.3 \pm 1.0	1.2 \pm 0.8	0.7 \pm 0.8	
Basophils	0.0 \pm 0.0	0.0 \pm 0.0	0.0 \pm 0.0	0.0 \pm 0.0	0.0 \pm 0.0	0.0 \pm 0.0	0.0 \pm 0.0	0.0 \pm 0.0	
Monocytes	5.2 \pm 2.3	4.2 \pm 4.1	4.0 \pm 1.8	4.0 \pm 1.9	4.7 \pm 2.9	4.8 \pm 3.0	3.8 \pm 1.9	3.8 \pm 2.2	
Female									
Number of animals	6	6	6	6	6	6	6	6	6
RBC ($\times 10^9/\mu\text{L}$)	710.0 \pm 24.7	687.3 \pm 17.7	737.0 \pm 30.6	719.7 \pm 22.6	720.8 \pm 8.8	727.5 \pm 56.5	751.8 \pm 39.6	760.7 \pm 12.8	
Hemoglobin (g/dL)	14.30 \pm 0.68	14.08 \pm 0.45	14.83 \pm 0.48	14.55 \pm 0.16	14.20 \pm 0.31	14.23 \pm 1.14	14.80 \pm 0.96	14.83 \pm 0.30	
Hematocrit (%)	40.40 \pm 1.42	40.02 \pm 1.06	41.70 \pm 1.59	40.92 \pm 0.75	40.42 \pm 1.34	39.15 \pm 2.96	41.27 \pm 2.55	41.77 \pm 0.78	
MCV (fL)	56.93 \pm 1.45	58.23 \pm 1.45	56.58 \pm 1.01	56.90 \pm 1.00	56.07 \pm 2.15	53.83 \pm 1.26	51.90 \pm 2.37	51.90 \pm 0.74	
MCH (pg)	20.13 \pm 0.94	20.48 \pm 0.57	20.12 \pm 0.50	20.23 \pm 0.50	19.68 \pm 0.53	19.57 \pm 0.56	19.72 \pm 0.97	19.52 \pm 0.35	
MCHC (%)	35.40 \pm 0.85	35.20 \pm 0.32	35.60 \pm 0.64	35.60 \pm 0.44	35.15 \pm 0.48	36.33 \pm 0.43	35.87 \pm 0.46	35.52 \pm 0.70	
Reticulocyte (%)	24.10 \pm 2.10	26.37 \pm 3.70	21.40 \pm 1.65	21.98 \pm 1.81	21.65 \pm 4.78	24.02 \pm 8.95	22.20 \pm 3.54	29.78 \pm 6.62	
Platelet ($\times 10^9/\mu\text{L}$)	87.27 \pm 10.11	84.45 \pm 9.46	82.60 \pm 4.73	88.33 \pm 9.14	91.28 \pm 13.28	80.62 \pm 17.41	77.03 \pm 8.13	84.95 \pm 7.41	
PT (sec)	14.18 \pm 0.34	14.12 \pm 0.48	13.85 \pm 0.65	13.93 \pm 0.69	13.77 \pm 0.61	15.18 \pm 0.72	14.68 \pm 1.05	14.83 \pm 0.39	
APTT (sec)	13.95 \pm 1.03	13.87 \pm 1.64	12.62 \pm 0.56	13.77 \pm 1.05	14.28 \pm 0.52	14.87 \pm 1.10	14.43 \pm 2.09	13.32 \pm 1.46	
WBC ($\times 10^9/\mu\text{L}$)	84.30 \pm 22.91	77.23 \pm 13.45	75.02 \pm 4.33	72.82 \pm 9.93	78.90 \pm 5.55	83.28 \pm 25.86	104.20 \pm 11.67	91.72 \pm 15.45	
Differential leukocyte counts (%)									
Lymphocytes	88.0 \pm 3.3	85.8 \pm 4.3	89.3 \pm 3.9	83.8 \pm 7.3	86.5 \pm 3.1	84.3 \pm 6.3	87.0 \pm 4.7	85.2 \pm 3.9	
Neutrophils									
Segmented	7.7 \pm 3.2	6.3 \pm 2.3	6.0 \pm 3.0	10.5 \pm 7.3	8.5 \pm 2.2	8.5 \pm 6.4	5.5 \pm 3.4	8.3 \pm 3.4	
Band	0.2 \pm 0.4	0.5 \pm 0.8	0.2 \pm 0.4	0.0 \pm 0.0	0.8 \pm 1.0	0.0 \pm 0.0	0.2 \pm 0.4	0.2 \pm 0.4	
Eosinophils	0.8 \pm 1.2	1.8 \pm 1.8	0.5 \pm 0.8	0.7 \pm 0.5	1.2 \pm 1.5	0.7 \pm 1.2	1.5 \pm 1.0	1.0 \pm 0.6	
Basophils	0.0 \pm 0.0	0.0 \pm 0.0	0.0 \pm 0.0	0.0 \pm 0.0	0.0 \pm 0.0	0.0 \pm 0.0	0.0 \pm 0.0	0.0 \pm 0.0	
Monocytes	3.3 \pm 1.8	5.5 \pm 2.7	4.0 \pm 3.2	5.0 \pm 1.8	3.0 \pm 2.4	6.5 \pm 2.9	5.8 \pm 2.3	5.3 \pm 3.7	

Values are expressed as Mean \pm S.D.Significantly different from 0 mg/kg group; * p <0.05

Table 2 Blood chemistry of rats treated orally with 2-tert-butylphenol in twenty-eight-day repeat dose toxicity test

Sex	Administration period					Recovery period			
	Dose level (mg/kg)	0	4	20	100	500	0	100	500
Male									
Number of animals	6	6	6	6	6	6	6	6	6
GOT (U/L)	83.3±12.6	71.2±7.9	74.5±5.0	67.0±15.3	68.8±8.3	91.5±13.1	91.0±8.9	80.0±11.1	
GPT (U/L)	42.3±10.1	40.7±5.4	42.0±6.6	33.5±1.5	38.7±4.3	35.2±4.6	32.5±4.4	31.0±4.2	
γ-GT (U/L)	0.2±0.4	0.3±0.5	0.2±0.4	0.3±0.8	0.3±0.5	0.2±0.4	0.0±0.0	0.2±0.4	
ALP (U/L)	1151.7±273.9	887.2±150.4*	936.8±116.2	763.5±157.0**	813.7±111.4**	704.8±54.9	738.8±85.8	560.7±75.6**	
Total bilirubin (mg/dL)	0.00±0.00	0.00±0.00	0.00±0.00	0.00±0.00	0.00±0.00	0.02±0.04	0.00±0.00	0.00±0.00	
Urea nitrogen (mg/dL)	12.13±1.66	12.35±2.45	12.97±2.14	13.23±2.63	12.65±1.36	16.40±2.37	16.33±3.07	17.27±1.80	
Creatinine (mg/dL)	0.40±0.00	0.40±0.00	0.40±0.00	0.38±0.08	0.38±0.04	0.45±0.05	0.45±0.05	0.45±0.05	
Glucose (mg/dL)	151.3±13.7	151.8±7.4	145.3±8.1	150.2±13.2	152.5±8.7	146.3±11.0	141.0±3.5	139.3±9.7	
Total chol. (mg/dL)	66.0±8.3	65.7±9.0	62.7±5.9	71.8±8.5	73.0±6.0	57.3±5.7	62.8±6.8	66.3±9.1	
Triglyceride (mg/dL)	104.0±76.8	81.2±34.7	60.3±18.5	89.7±36.9	71.2±37.5	114.8±43.3	98.8±33.5	104.8±48.4	
Total protein (g/dL)	6.42±0.21	6.53±0.20	6.53±0.20	6.58±0.32	6.67±0.23	6.75±0.45	6.78±0.26	6.87±0.42	
Albumin (g/dL)	3.33±0.08	3.38±0.04	3.35±0.08	3.35±0.10	3.42±0.12	3.38±0.08	3.38±0.12	3.38±0.15	
A/G ratio	1.083±0.038	1.075±0.060	1.055±0.045	1.040±0.057	1.052±0.052	1.015±0.103	0.995±0.067	0.975±0.059	
Calcium (mg/dL)	9.45±0.19	9.55±0.33	9.48±0.31	9.53±0.29	9.57±0.34	9.95±0.49	9.97±0.21	9.98±0.46	
Inorganic phos. (mg/dL)	8.52±0.17	8.33±0.71	8.67±0.62	8.23±0.49	8.22±0.39	8.75±0.33	8.37±0.27	8.50±0.37	
Na (mmol/L)	143.7±1.4	143.0±1.3	143.8±1.0	143.8±0.4	143.3±0.5	143.5±0.5	143.2±0.8	143.8±1.2	
K (mmol/L)	4.48±0.19	4.43±0.22	4.45±0.24	4.32±0.17	4.43±0.12	4.47±0.19	4.57±0.21	4.47±0.25	
Cl (mmol/L)	99.5±1.0	98.8±1.0	99.0±0.9	99.2±1.5	98.2±1.2	98.8±1.5	99.2±1.0	100.0±1.3	
Female									
Number of animals	6	6	6	6	6	6	6	6	6
GOT (U/L)	66.8±7.4	67.8±7.7	74.7±19.4	67.5±10.3	74.8±19.1	72.2±12.9	70.0±8.9	70.5±11.4	
GPT (U/L)	24.8±3.9	26.3±5.3	25.7±5.0	23.8±3.3	22.5±3.2	28.3±2.3	27.2±4.8	27.7±4.4	
γ-GT (U/L)	0.0±0.0	0.2±0.4	0.2±0.4	0.2±0.4	0.2±0.4	0.0±0.0	0.2±0.4	0.3±0.5	
ALP (U/L)	512.3±180.8	551.5±170.5	487.8±134.2	530.5±110.9	396.0±100.0	316.3±97.6	325.3±37.3	394.0±170.3	
Total bilirubin (mg/dL)	0.00±0.00	0.00±0.00	0.00±0.00	0.00±0.00	0.00±0.00	0.02±0.04	0.00±0.00	0.00±0.00	
Urea nitrogen (mg/dL)	13.85±1.39	14.02±1.80	12.65±2.65	14.23±3.34	12.83±1.75	17.20±2.29	17.73±2.28	17.55±1.31	
Creatinine (mg/dL)	0.48±0.04	0.47±0.05	0.47±0.05	0.45±0.05	0.45±0.08	0.53±0.05	0.53±0.05	0.55±0.05	
Glucose (mg/dL)	151.2±6.0	162.5±11.9	162.0±13.5	160.7±6.6	155.5±11.9	148.0±5.9	147.8±10.6	149.5±9.4	
Total chol. (mg/dL)	64.2±6.5	61.0±8.1	62.3±10.8	70.0±7.5	76.0±8.3	83.2±12.9	75.5±9.6	78.5±8.9	
Triglyceride (mg/dL)	16.0±5.8	15.0±7.3	32.0±25.3	21.3±11.2	24.7±10.2	51.0±50.2	31.2±14.2	52.3±48.1	
Total protein (g/dL)	6.67±0.25	6.53±0.16	6.53±0.30	6.72±0.22	6.68±0.42	7.07±0.58	7.15±0.28	7.02±0.26	
Albumin (g/dL)	3.48±0.15	3.42±0.10	3.47±0.12	3.52±0.08	3.58±0.19	3.53±0.29	3.58±0.10	3.52±0.08	
A/G ratio	1.093±0.043	1.098±0.050	1.133±0.066	1.102±0.048	1.158±0.056	1.000±0.027	1.007±0.053	1.008±0.066	
Calcium (mg/dL)	9.12±0.19	9.07±0.12	9.27±0.16	9.12±0.16	9.12±0.29	9.88±0.17	9.85±0.30	9.82±0.38	
Inorganic phos. (mg/dL)	7.63±0.29	7.52±0.26	7.63±0.41	7.45±0.39	7.17±0.22	7.43±0.55	7.88±0.38	7.37±0.32	
Na (mmol/L)	142.8±0.8	142.3±1.0	142.5±1.0	142.5±1.0	141.7±0.8	143.0±1.3	143.0±1.3	142.0±1.1	
K (mmol/L)	4.05±0.31	4.05±0.29	4.17±0.16	3.92±0.21	4.05±0.22	4.07±0.33	4.03±0.26	4.07±0.10	
Cl (mmol/L)	101.2±1.0	101.0±1.3	100.2±1.3	99.7±1.2	100.0±1.8	100.5±2.0	100.8±1.5	99.8±2.6	

Values are expressed as Mean±S.D.

Significantly different from 0 mg/kg group; * $p<0.05$, ** $p<0.01$

Table 3 Urinalysis of rats treated orally with 2-tert-butylphenol in twenty-eight-day repeat dose toxicity test

Dose level (mg/kg)	Sex	Administration period									
		Male					Female				
		0	4	20	100	500	0	4	20	100	500
Number of animals		6	6	6	6	6	6	6	6	6	6
pH	6.0	0	0	0	0	0	0	1	0	0	0
	6.5	0	0	0	0	0	0	1	0	0	0
	7.0	0	0	0	0	0	1	0	0	0	0
	7.5	0	0	0	0	0	0	0	0	1	2
	8.0	2	2	2	2	2	3	2	2	2	1
	8.5	4	4	4	4	4	2	2	4	3	2
	≥9	0	0	0	0	0	0	0	0	0	1
Protein (mg/dL)	-	0	0	0	0	0	2	2	3	2	1
	+/-	1	0	1	0	0	1	1	0	1	3
	30	2	0	2	0	1	2	2	2	2	1
	100	3	6	3	6	5	1	1	1	1	1
	≥300	0	0	0	0	0	0	0	0	0	0
Glucose (g/dL)	-	6	6	6	5	6	6	5	5	6	6
	0.1	0	0	0	1	0	0	1	1	0	0
	0.25	0	0	0	0	0	0	0	0	0	0
	0.5	0	0	0	0	0	0	0	0	0	0
	≥1	0	0	0	0	0	0	0	0	0	0
Ketones (mg/dL)	-	0	0	1	0	0	3	2	3	3	1
	5	3	1	3	3	5	3	3	3	2	4
	15	2	5	2	3	1	0	1	0	1	1
	40	1	0	0	0	0	0	0	0	0	0
	≥80	0	0	0	0	0	0	0	0	0	0
Bilirubin	-	5	3	6	5	4	6	6	6	6	6
	1+	1	3	0	1	2	0	0	0	0	0
	2+	0	0	0	0	0	0	0	0	0	0
	3+	0	0	0	0	0	0	0	0	0	0
Occult blood	-	6	6	6	6	6	6	6	6	6	6
	+/-	0	0	0	0	0	0	0	0	0	0
	1+	0	0	0	0	0	0	0	0	0	0
	2+	0	0	0	0	0	0	0	0	0	0
	3+	0	0	0	0	0	0	0	0	0	0
Urobilinogen (EU/dL)	0.1	4	5	6	6	6	6	6	6	5	4
	1	2	1	0	0	0	0	0	0	1	2

Grade: -:negative, +/-:trace, 1+:slight, 2+:moderate, 3+:severe

Table 4 Absolute and relative organ weights of rats treated orally with 2-tert-butylphenol in twenty-eight-day repeat dose toxicity test

Sex	Administration period					Recovery period		
	0	4	20	100	500	0	100	500
Male								
Number of animals	6	6	6	6	6	6	6	6
Final body weight (g)	395.2±39.1	397.7±30.8	393.7±23.5	386.2±22.8	373.0±33.1	444.0±32.1	437.7±22.1	425.2±17.6
Absolute organ weight								
Brain (g)	2.088±0.060	2.048±0.095	2.105±0.062	2.070±0.085	2.042±0.062	2.138±0.072	2.147±0.064	2.097±0.053
Pituitary (mg)	16.15±1.69	15.82±1.19	16.23±1.63	14.58±1.08	14.50±2.03	15.82±1.48	16.27±1.32	15.95±0.81
Thyroids (mg)	34.40±7.93	31.70±6.86	30.80±4.69	32.57±5.12	28.98±2.42	33.42±3.21	37.08±5.69	31.07±4.11
Thymus (mg)	558.3±82.2	607.0±129.2	609.2±93.6	624.2±69.7	543.7±96.0	509.5±131.6	517.0±122.7	529.5±77.5
Lungs (g)	1.428±0.094	1.497±0.127	1.468±0.083	1.467±0.091	1.420±0.119	1.462±0.063	1.507±0.065	1.427±0.037
Heart (g)	1.300±0.092	1.315±0.150	1.363±0.073	1.390±0.157	1.330±0.100	1.447±0.182	1.432±0.084	1.313±0.082
Liver (g)	16.315±2.977	16.197±2.243	16.137±1.318	16.565±2.089	18.173±1.797	16.235±1.200	15.877±1.076	14.945±1.073
Spleen (g)	0.810±0.114	0.832±0.081	0.845±0.125	0.727±0.107	0.750±0.096	0.855±0.076	0.912±0.083	0.783±0.103
Kidneys (g)	2.735±0.308	2.760±0.352	2.852±0.220	2.850±0.329	2.835±0.155	3.122±0.271	2.965±0.169	2.898±0.165
Adrenals (mg)	47.45±6.67	53.15±8.21	50.38±5.83	51.75±5.64	45.30±8.26	50.60±8.59	53.93±10.89	49.77±1.60
Testes (g)	3.048±0.293	3.058±0.220	3.192±0.247	3.063±0.194	3.177±0.123	3.212±0.180	3.285±0.141	3.123±0.130
Epididymides (g)	0.803±0.050	0.807±0.040	0.783±0.085	0.792±0.065	0.753±0.042	1.118±0.071	1.137±0.054	1.083±0.040
Relative organ weight								
Brain (%)	0.533±0.044	0.517±0.037	0.537±0.031	0.538±0.039	0.550±0.039	0.480±0.023	0.493±0.024	0.495±0.022
Pituitary (×10 ⁻³ %)	4.10±0.45	3.98±0.32	4.12±0.39	3.78±0.21	3.88±0.44	3.55±0.21	3.73±0.38	3.78±0.31
Thyroids (×10 ⁻³ %)	8.72±1.98	7.97±1.47	7.82±0.93	8.50±1.68	7.83±1.14	7.60±1.18	8.47±0.96	7.35±1.18
Thymus (×10 ⁻³ %)	142.20±23.38	151.78±22.87	151.67±21.33	161.42±12.13	145.07±16.57	114.25±24.82	117.90±25.85	124.77±20.02
Lungs (%)	0.365±0.026	0.375±0.020	0.373±0.023	0.382±0.013	0.380±0.014	0.332±0.016	0.343±0.015	0.337±0.015
Heart (%)	0.328±0.023	0.330±0.020	0.345±0.010	0.360±0.022	0.362±0.044	0.327±0.031	0.328±0.031	0.310±0.018
Liver (%)	4.103±0.349	4.058±0.278	4.100±0.227	4.280±0.365	4.870±0.172**	3.660±0.139	3.628±0.118	3.512±0.156
Spleen (%)	0.205±0.015	0.210±0.011	0.215±0.033	0.187±0.023	0.202±0.028	0.193±0.016	0.208±0.020	0.183±0.026
Kidneys (%)	0.692±0.035	0.692±0.043	0.725±0.062	0.740±0.064	0.765±0.071	0.705±0.052	0.678±0.024	0.682±0.034
Adrenals (×10 ⁻³ %)	12.03±1.27	13.40±2.26	12.80±1.24	13.43±1.80	12.13±1.84	11.38±1.63	12.33±2.52	11.72±0.35
Testes (%)	0.777±0.109	0.773±0.092	0.810±0.026	0.793±0.044	0.858±0.085	0.725±0.055	0.753±0.059	0.735±0.052
Epididymides (g)	0.207±0.031	0.203±0.020	0.198±0.013	0.207±0.023	0.203±0.027	0.253±0.019	0.258±0.015	0.255±0.019

Values are expressed as Mean±S.D.

Significantly different from 0 mg/kg group; *p<0.05, **p<0.01

Table 4 (continued)

Sex	Administration period					Recovery period			
	Dose level (mg/kg)	0	4	20	100	500	0	100	500
Female									
Number of animals	6	6	6	6	6	6	6	6	6
Final body weight (g)	242.0±10.3	257.8±21.1	246.0±24.1	243.0±22.7	231.7±9.2	279.8±27.0	264.5±17.2	268.7±31.4	
Absolute organ weight									
Brain (g)	1.913±0.059	1.882±0.079	1.918±0.064	1.907±0.059	1.943±0.074	1.970±0.106	1.937±0.094	1.930±0.026	
Pituitary (mg)	16.35±1.56	18.13±1.58	16.72±2.48	17.13±2.77	16.37±0.85	18.47±3.15	18.92±2.45	20.27±1.66	
Thyroids (mg)	23.67±3.71	23.35±5.20	26.15±3.24	24.98±3.67	25.03±3.97	26.30±3.25	26.13±2.91	24.50±4.26	
Thymus (mg)	586.3±161.7	464.8±39.8	517.3±65.9	534.7±95.7	423.0±59.6	427.0±93.9	481.3±100.3	449.2±55.9	
Lungs (g)	1.078±0.081	1.078±0.121	1.090±0.094	1.083±0.099	1.097±0.072	1.188±0.072	1.145±0.075	1.135±0.077	
Heart (g)	0.860±0.127	0.892±0.100	0.888±0.040	0.838±0.073	0.813±0.072	0.958±0.097	0.898±0.066	0.943±0.056	
Liver (g)	8.863±0.633	9.450±1.121	9.080±1.176	9.062±0.818	9.993±0.726	9.980±1.217	8.830±0.835	9.658±1.347	
Spleen (g)	0.525±0.076	0.543±0.083	0.528±0.055	0.502±0.065	0.548±0.057	0.812±0.531	0.623±0.108	0.605±0.080	
Kidneys (g)	1.648±0.092	1.733±0.062	1.698±0.121	1.722±0.173	1.738±0.099	1.822±0.131	1.768±0.087	1.867±0.117	
Adrenals (mg)	64.10±8.21	66.93±9.72	63.77±6.33	59.32±7.86	54.83±5.97	62.93±8.35	66.10±6.61	65.40±10.75	
Ovaries (mg)	86.03±8.66	90.02±11.12	88.68±23.24	85.88±5.81	81.20±8.98	94.00±13.50	82.98±6.36	97.25±13.88	
Uterus (g)	0.662±0.244	0.550±0.299	0.393±0.067	0.480±0.222	0.580±0.198	0.527±0.291	0.423±0.052	0.485±0.144	
Relative organ weight									
Brain (%)	0.790±0.032	0.733±0.059	0.787±0.089	0.790±0.078	0.840±0.042	0.707±0.042	0.735±0.060	0.728±0.081	
Pituitary (×10 ⁻³ %)	6.75±0.72	7.05±0.77	6.82±0.86	7.08±1.06	7.07±0.61	6.65±1.27	7.20±1.14	7.68±1.39	
Thyroids (×10 ⁻³ %)	9.77±1.32	9.03±1.72	10.63±0.55	10.30±1.20	10.83±1.82	9.48±1.57	9.85±0.80	9.22±1.88	
Thymus (×10 ⁻³ %)	240.97±60.69	180.73±15.00*	211.80±32.15	221.07±40.03	182.67±25.18*	153.03±30.49	181.80±35.74	168.22±22.00	
Lungs (%)	0.443±0.025	0.418±0.019	0.443±0.019	0.445±0.018	0.472±0.021	0.427±0.025	0.433±0.036	0.427±0.037	
Heart (%)	0.357±0.048	0.347±0.026	0.362±0.025	0.347±0.023	0.355±0.027	0.345±0.048	0.340±0.017	0.357±0.056	
Liver (%)	3.663±0.217	3.660±0.204	3.683±0.165	3.737±0.227	4.315±0.304**	3.572±0.361	3.337±0.224	3.588±0.103	
Spleen (%)	0.218±0.026	0.212±0.019	0.215±0.023	0.208±0.024	0.238±0.029	0.295±0.209	0.235±0.033	0.225±0.015	
Kidneys (%)	0.682±0.037	0.675±0.034	0.697±0.078	0.708±0.030	0.752±0.049	0.652±0.036	0.670±0.046	0.703±0.094	
Adrenals (×10 ⁻³ %)	26.50±3.09	26.15±4.52	26.02±2.57	24.40±1.82	23.65±1.88	22.53±2.67	25.00±2.11	24.73±5.58	
Ovaries (×10 ⁻³ %)	35.57±3.44	34.97±3.89	35.80±7.23	35.52±3.09	35.02±3.34	33.55±3.21	31.52±3.37	36.42±5.33	
Uterus (%)	0.273±0.096	0.210±0.101	0.160±0.028	0.198±0.095	0.250±0.091	0.192±0.113	0.160±0.021	0.185±0.061	

Values are expressed as Mean±S.D.

Significantly different from 0 mg/kg group; **p<0.01

Table 5 Summary of histopathological findings of rats treated orally with 2-tert-butylphenol in twenty-eight-day repeat dose toxicity test

Sex	Organ Finding	Dose level (mg/kg) Number of animals	Administration period					Recovery period		
			0 6	4 6	20 6	100 6	500 6	0 6	100 6	500 6
Male		(Grade)								
Heart	Inflammatory cell infiltration, focal	1+	<6> 2	<0>	<0>	<0>	<6> 2	<0>	<0>	<0>
Spleen	Increase in hematopoietic cell, erythrocytic	1+	<6> 1	<0>	<0>	<0>	<6> 0	<0>	<0>	<0>
Lung	Inflammatory cell infiltration, focal	1+	<0>	<0>	<0>	<0>	<0>	<1> 1	<0>	<0>
Liver	Microgranuloma	1+	<6> 1	<0>	<0>	<0>	<6> 0	<0>	<0>	<0>
	Necrosis, focal	1+	0				1			
Kidney	Basophilic tubule	1+	<6> 2	<0>	<1> 1	<1> 0	<6> 2	<0>	<0>	<0>
	Cyst	1+	3		1	1	1			
	Fibrosis, focal	1+	0		1	0	0			
	Hyaline droplet, tubular epithelium, proximal	1+	5		1	1	5			
	Mineralization, papilla	1+	1		0	0	1			
Epididymis	Inflammatory cell infiltration, lymphocyte, focal	1+	<6> 1	<0>	<0>	<0>	<6> 1	<0>	<0>	<0>
Female		(Grade)								
Spleen	Congestion	1+	<6> 0	<0>	<0>	<0>	<6> 0	<1> 1	<0>	<0>
Lung	Foreign body granuloma	1+	<1> 1	<0>	<0>	<0>	<1> 0	<0>	<0>	<0>
	Inflammatory cell infiltration, focal	1+	0				1			
Liver	Fatty change, hepatocyte, periportal	1+	<6> 1	<0>	<0>	<0>	<6> 1	<0>	<0>	<0>
	Microgranuloma	1+	1				1			
Kidney	Basophilic tubule	1+	<6> 2	<0>	<0>	<0>	<6> 3	<1> 0	<0>	<0>
	Cyst	1+	2				1	0		
	Mineralization, papilla	1+	0				1	0		
	Dilatation, pelvis	1+	0				0	1		
Uterus	Dilatation, lumen	1+	<3> 3	<2> 2	<0>	<1> 1	<2> 2	<1> 1	<0>	<1> 1

<>: Number of animals examined.
Grade; 1+: slight