

**Table S2.** Nucleotide compositions of different genomic regions in *Toxocara vitulorum* and other nematodes reported within Ascaridida

Species		ALL	PCGs	tRNA	rRNA	3rd	cytb	cox1	cox2	cox3	nad1	nad2	nad3	nad4	nad4L	nad5	nad6	atp6
<i>Ascaridia</i> sp. GHL-2013	A+T%	67.100	66.150	66.880	67.580	67.000	65.310	65.790	64.050	66.180	65.400	69.420	66.670	67.150	70.040	65.590	69.650	66.670
	A-T skew	-0.398	-0.463	-0.170	-0.262	-0.433	-0.444	-0.373	-0.391	-0.517	-0.487	-0.511	-0.504	-0.438	-0.487	-0.528	-0.558	-0.492
	G+C%	32.900	33.850	33.120	32.420	32.900	34.690	34.210	35.960	33.830	34.600	30.580	33.330	32.850	29.950	34.410	30.350	33.340
	G-C skew	0.562	0.576	0.541	0.516	0.587	0.539	0.446	0.555	0.535	0.601	0.711	0.841	0.505	0.816	0.679	0.727	0.578
<i>Anisakis sim- plex</i> (s.l)	A+T%	71.200	69.540	71.900	76.070	71.800	67.880	66.120	66.950	66.320	68.160	73.290	75.300	69.910	76.730	72.060	71.260	70.670
	A-T skew	-0.357	-0.429	-0.174	-0.242	-0.421	-0.442	-0.413	-0.372	-0.492	-0.462	-0.442	-0.407	-0.421	-0.371	-0.414	-0.516	-0.401
	G+C%	28.800	30.460	28.090	23.930	28.400	32.120	33.880	33.050	33.680	31.840	26.720	24.700	30.090	23.280	27.940	28.730	29.330
	G-C skew	0.319	0.310	0.316	0.380	0.359	0.303	0.270	0.359	0.318	0.317	0.354	0.518	0.227	0.333	0.308	0.296	0.386
<i>Anisakis sim- plex</i> (s.s)	A+T%	70.745	69.660	69.750	76.100	71.198	66.670	66.110	67.090	66.890	67.930	73.870	75.590	69.350	78.450	73.010	72.640	70.500
	A-T skew	-0.362	-0.430	-0.182	-0.237	-0.415	-0.455	-0.409	-0.369	-0.487	-0.452	-0.456	-0.409	-0.421	-0.374	-0.411	-0.519	-0.409
	G+C%	29.255	30.340	30.250	23.910	28.802	33.340	33.890	56.650	33.110	32.080	26.120	24.400	30.650	21.560	27.000	27.360	29.500
	G-C skew	0.326	0.316	0.342	0.389	0.372	0.292	0.266	0.621	0.336	0.302	0.394	0.537	0.220	0.400	0.321	0.361	0.412
<i>Ascaridia colum- bae</i>	A+T%	71.100	70.240	71.170	71.830	71.900	68.670	68.770	67.390	69.940	67.920	72.360	72.030	71.920	76.960	72.610	73.100	70.350
	A-T skew	-0.280	-0.331	-0.079	-0.172	-0.252	-0.336	-0.269	-0.305	-0.405	-0.382	-0.377	-0.264	-0.303	-0.317	-0.328	-0.415	-0.390
	G+C%	28.900	29.750	28.830	28.170	28.000	31.330	31.220	32.610	30.060	32.080	27.640	27.970	28.070	23.040	27.390	26.900	29.650
	G-C skew	0.453	0.456	0.474	0.465	0.436	0.426	0.328	0.471	0.464	0.552	0.528	0.745	0.360	0.680	0.520	0.572	0.469
<i>Ascaridia galli</i>	A+T%	71.500	70.330	73.390	72.840	72.800	69.020	67.440	68.830	70.600	68.260	74.260	70.830	72.420	76.960	72.170	74.250	40.040
	A-T skew	-0.415	-0.479	-0.192	-0.279	-0.484	-0.470	-0.397	-0.403	-0.506	-0.539	-0.530	-0.588	-0.468	-0.437	-0.502	-0.585	-0.113
	G+C%	28.400	29.680	26.600	27.160	27.100	30.970	32.570	31.180	29.400	31.730	25.750	29.170	27.590	23.040	27.830	25.750	29.970
	G-C skew	0.486	0.496	0.489	0.467	0.587	0.450	0.360	0.484	0.525	0.525	0.640	0.816	0.443	0.760	0.572	0.661	0.463
<i>Ascaris lumbricoides</i>	A+T%	71.684	70.110	70.550	76.570	72.813	66.890	66.980	68.530	69.110	69.070	72.390	72.610	69.110	76.070	72.740	74.250	70.670
	A-T skew	-0.384	-0.474	-0.192	-0.284	-0.443	-0.504	-0.459	-0.378	-0.497	-0.489	-0.532	-0.500	-0.497	-0.438	-0.455	-0.511	-0.443
	G+C%	28.316	29.890	29.450	23.440	27.187	33.100	33.010	31.470	30.890	30.920	27.600	27.380	30.890	23.930	27.250	25.750	29.330
	G-C skew	0.440	0.450	0.401	0.467	0.554	0.455	0.394	0.464	0.400	0.422	0.562	0.761	0.400	0.750	0.472	0.446	0.500
<i>Ascaris lumbricoides</i>	A+T%	71.823	70.020	71.120	74.410	72.899	68.850	66.860	68.960	68.880	69.640	72.870	72.610	70.000	76.490	72.680	73.790	71.170
	A-T skew	-0.385	-0.473	-0.179	-0.214	-0.450	-0.497	-0.456	-0.369	-0.501	-0.490	-0.532	-0.500	-0.484	-0.430	-0.457	-0.520	-0.447
	G+C%	28.177	29.990	28.880	25.590	27.101	31.150	33.150	31.040	31.120	30.360	27.130	27.380	30.000	23.500	27.320	26.210	28.830
	G-C skew	0.446	0.456	0.424	0.407	0.493	0.479	0.392	0.456	0.406	0.441	0.589	0.761	0.355	0.746	0.474	0.456	0.526
<i>Ascaris</i> sp.(cA.)	A+T%	71.700	69.980	70.910	74.290	74.700	68.490	67.160	68.810	68.850	69.420	72.750	72.610	70.240	76.920	72.430	73.790	71.500

Genomic and Phylogenetic Analysis of Ascaris and Baylisascaris Species																		
Species		Genomic Metrics				Phylogenetic Support				Genomic Metrics				Phylogenetic Support				Overall Score
		A-T skew	G+C%	G-C skew	GC Content	Posterior Prob.	Bootstrap	SH-Like	Bayesian	A-T skew	G+C%	G-C skew	GC Content	Posterior Prob.	Bootstrap	SH-Like	Bayesian	
Ascaris sp.(gA.)	A-T skew	-0.386	-0.473	-0.177	-0.214	-0.473	-0.503	-0.454	-0.376	-0.495	-0.492	-0.531	-0.500	-0.484	-0.422	-0.458	-0.520	-0.445
	G+C%	28.200	30.010	29.090	25.710	25.700	31.520	32.850	31.190	31.140	30.580	27.250	27.380	29.750	23.080	27.570	26.210	28.500
	G-C skew	0.447	0.455	0.423	0.405	0.525	0.480	0.390	0.468	0.389	0.438	0.582	0.761	0.361	0.741	0.469	0.456	0.532
	A+T%	71.900	70.060	70.880	74.280	72.500	68.580	66.970	68.950	69.240	69.420	72.980	72.610	70.330	76.070	72.620	73.790	71.330
Ascaris suum	A-T skew	-0.385	-0.473	-0.178	-0.213	-0.352	-0.501	-0.453	-0.373	-0.498	-0.495	-0.532	-0.500	-0.484	-0.438	-0.456	-0.520	-0.444
	G+C%	28.200	29.940	29.120	25.660	27.600	31.420	33.040	31.050	30.760	30.590	27.010	27.380	29.670	23.930	27.390	26.210	28.660
	G-C skew	0.447	0.456	0.418	0.413	0.384	0.478	0.382	0.465	0.406	0.446	0.596	0.761	0.364	0.750	0.470	0.456	0.523
	A+T%	71.812	70.450	70.790	76.250	73.270	68.850	66.730	68.810	70.010	73.790	73.460	72.610	70.330	76.070	72.740	73.790	71.000
Ascaris suum	A-T skew	-0.385	-0.473	-0.188	-0.284	-0.436	-0.503	-0.455	-0.372	-0.500	-0.520	-0.526	-0.500	-0.484	-0.438	-0.455	-0.520	-0.441
	G+C%	28.188	29.540	29.200	23.750	26.730	31.140	33.270	31.190	29.980	26.210	26.540	27.380	29.670	23.930	27.250	26.210	29.000
	G-C skew	0.452	0.465	0.418	0.465	0.539	0.491	0.387	0.459	0.434	0.456	0.607	0.761	0.364	0.750	0.472	0.456	0.506
	A+T%	72.000	70.360	71.960	76.740	71.500	68.400	66.710	68.820	70.440	69.530	72.990	73.810	70.980	76.500	72.940	72.640	71.340
Ascaris suum	A-T skew	-0.383	-0.470	-0.183	-0.280	-0.371	-0.505	-0.449	-0.380	-0.490	-0.483	-0.529	-0.484	-0.478	-0.441	-0.448	-0.513	-0.449
	G+C%	28.100	29.490	28.040	23.260	28.300	31.610	33.230	31.180	29.550	30.470	27.010	26.190	29.030	23.500	27.070	27.360	28.670
	G-C skew	0.452	0.460	0.434	0.462	0.456	0.481	0.378	0.477	0.427	0.436	0.596	0.772	0.367	0.782	0.459	0.395	0.535
	A+T%	70.455	68.410	69.580	71.990	70.895	67.930	65.520	65.670	67.450	66.210	70.970	43.460	69.020	76.490	70.350	77.010	67.500
Baylisascaris pro-cyonis	A-T skew	-0.377	-0.483	-0.167	-0.229	-0.447	-0.508	-0.453	-0.420	-0.502	-0.498	-0.543	-0.178	-0.470	-0.419	-0.469	-0.504	-0.491
	G+C%	29.545	31.580	30.420	28.000	29.105	32.070	34.470	34.330	32.560	33.790	29.030	56.540	30.980	23.500	29.650	22.990	32.500
	G-C skew	0.449	0.466	0.383	0.434	0.524	0.476	0.397	0.483	0.392	0.464	0.608	0.842	0.354	0.746	0.498	0.480	0.549
	A+T%	68.622	66.730	68.330	71.240	68.595	64.410	64.190	63.660	66.020	66.100	70.030	72.620	67.560	70.940	68.710	73.330	67.340
Baylisascaris schroederi	A-T skew	-0.384	-0.486	-0.172	-0.318	-0.351	-0.506	-0.447	-0.416	-0.523	-0.484	-0.546	-0.484	-0.497	-0.482	-0.495	-0.549	-0.490
	G+C%	31.378	33.270	31.660	28.760	31.405	35.600	35.810	36.340	33.990	33.910	29.980	27.380	32.440	29.060	31.290	26.670	32.670
	G-C skew	0.457	0.475	0.445	0.509	0.325	0.462	0.402	0.488	0.425	0.466	0.620	0.717	0.348	0.706	0.500	0.431	0.592
	A+T%	69.446	67.220	67.520	70.690	68.043	65.490	65.080	64.520	66.930	65.640	70.620	71.720	68.300	73.940	69.400	72.870	66.500
Baylisascaris transfuga	A-T skew	-0.375	-0.478	-0.174	-0.230	-0.446	-0.490	-0.443	-0.415	-0.494	-0.473	-0.527	-0.452	-0.493	-0.457	-0.489	-0.539	-0.489
	G+C%	30.554	32.780	32.480	29.310	31.957	34.500	34.920	35.480	33.080	34.370	29.390	28.270	31.710	26.070	30.600	27.130	33.500
	G-C skew	0.447	0.463	0.401	0.432	0.444	0.456	0.397	0.508	0.409	0.447	0.605	0.642	0.348	0.705	0.505	0.390	0.552
	A+T%	71.246	70.630	71.730	75.180	72.377	70.570	68.650	69.830	69.720	68.040	72.840	70.960	72.110	75.640	72.040	73.610	67.670
Heterakis be-ramporia	A-T skew	-0.318	-0.376	-0.122	-0.259	-0.308	-0.362	-0.284	-0.317	-0.416	-0.413	-0.427	-0.409	-0.391	-0.424	-0.396	-0.434	-0.360
	G+C%	28.754	29.370	28.270	24.820	27.623	29.430	31.350	30.170	30.290	31.960	27.160	29.040	27.890	24.360	27.960	26.390	32.330
	G-C skew	0.462	0.474	0.449	0.561	0.485	0.392	0.314	0.419	0.500	0.500	0.624	0.815	0.423	0.684	0.570	0.632	0.381
	A+T%	69.842	69.310	70.760	74.110	72.407	68.880	67.820	67.250	68.320	65.750	72.600	70.960	70.490	72.220	70.270	74.080	67.840
Heterakis galli-narum	A-T skew	-0.336	-0.395	-0.151	-0.284	-0.338	-0.377	-0.272	-0.355	-0.412	-0.462	-0.444	-0.460	-0.400	-0.456	-0.429	-0.469	-0.388
	G+C%	30.158	30.690	29.240	25.890	27.593	31.120	32.190	32.760	31.690	34.240	27.410	29.040	29.520	27.780	29.720	25.920	32.160

Genomic and Nucleotide Composition Metrics																		
Species	Metric	GC Content (%)	AT Content (%)	GC Skew	AT Skew	GC Bias	AT Bias	GC Skew	AT Skew	GC Bias	AT Bias	GC Skew	AT Skew	GC Bias	AT Bias	GC Skew	AT Skew	GC Bias
<i>Parascaris equorum</i>	G-C skew	0.449	0.462	0.475	0.539	0.437	0.430	0.284	0.482	0.448	0.513	0.541	0.753	0.377	0.662	0.562	0.590	0.427
	A+T%	70.250	70.770	69.950	73.920	69.400	69.020	73.970	66.520	69.400	69.970	74.170	69.640	69.350	76.070	70.280	72.180	70.340
	A-T skew	0.384	-0.393	-0.152	-0.295	-0.366	-0.446	-0.518	-0.368	-0.490	-0.449	-0.483	-0.513	-0.451	-0.416	-0.436	-0.503	-0.498
	G+C%	29.800	29.230	30.040	26.070	30.200	30.980	26.030	33.480	30.590	30.020	25.830	30.360	30.650	23.930	29.710	27.820	29.670
<i>Parascaris univale</i>	G-C skew	0.450	0.455	0.413	0.530	0.490	0.409	0.411	0.504	0.413	0.445	0.550	0.725	0.305	0.750	0.499	0.388	0.517
	A+T%	70.575	69.270	69.840	72.340	71.336	69.230	65.580	66.380	69.270	69.860	74.350	69.640	71.060	76.070	70.670	72.640	70.340
	A+T%	-0.385	-0.449	-0.156	-0.222	-0.443	-0.449	-0.423	-0.366	-0.477	-0.451	-0.481	-0.513	-0.471	-0.416	-0.445	-0.506	-0.498
	A-T skew	29.425	30.730	30.160	27.660	28.664	30.770	34.420	33.620	30.720	30.130	25.640	30.360	28.940	23.930	29.330	27.360	29.670
<i>Pseudoterranova azarasi</i>	G+C%	0.454	0.471	0.432	0.448	0.481	0.407	0.415	0.498	0.398	0.447	0.551	0.725	0.309	0.750	0.508	0.428	0.517
	A+T%	70.711	69.420	71.530	75.240	69.963	67.520	64.970	67.090	68.800	68.270	73.880	72.920	70.250	76.730	70.830	74.710	69.500
	A-T skew	-0.369	-0.439	-0.151	-0.258	-0.352	-0.433	-0.422	-0.359	-0.457	-0.483	-0.443	-0.478	-0.437	-0.393	-0.440	-0.514	-0.424
	G+C%	29.289	30.580	28.470	24.760	30.037	32.480	35.030	32.900	31.200	31.730	26.120	27.080	29.760	23.270	29.170	25.290	30.500
<i>Pseudoterranova cattani</i>	G-C skew	0.342	0.347	0.345	0.435	0.363	0.291	0.297	0.351	0.339	0.307	0.412	0.671	0.284	0.519	0.368	0.491	0.366
	A+T%	71.075	69.850	71.830	75.130	69.800	66.600	65.550	68.520	69.580	68.610	74.350	75.300	70.000	75.860	71.840	73.790	70.670
	A-T skew	-0.362	-0.431	-0.155	-0.251	-0.289	-0.433	-0.423	-0.351	-0.441	-0.439	-0.437	-0.431	-0.435	-0.409	-0.439	-0.489	-0.434
	G+C%	28.925	30.150	28.470	24.870	30.100	33.390	34.460	31.490	30.410	31.390	25.650	24.700	30.000	24.140	28.160	26.210	29.330
<i>Pseudoterranova krabbei</i>	G-C skew	0.336	0.350	0.333	0.418	0.289	0.348	0.319	0.348	0.313	0.299	0.392	0.687	0.263	0.572	0.354	0.403	0.432
	A+T%	70.343	68.960	71.160	70.230	69.171	41.380	64.720	66.950	67.630	68.270	73.520	75.000	69.410	74.570	70.450	73.560	69.830
	A-T skew	-0.352	-0.445	-0.147	-0.124	-0.324	-0.114	-0.441	-0.357	-0.463	-0.470	-0.460	-0.445	-0.436	-0.410	-0.448	-0.500	-0.446
	G+C%	29.657	31.050	28.830	29.770	30.829	33.940	35.280	33.050	32.380	31.730	26.480	25.000	30.410	25.440	29.540	26.440	30.160
<i>Pseudoterranova bulbosa</i>	G-C skew	0.343	0.355	0.313	0.244	0.350	0.358	0.342	0.345	0.306	0.300	0.446	0.690	0.267	0.491	0.342	0.426	0.414
	A+T%	71.240	69.930	71.270	75.630	69.776	66.150	65.920	67.810	68.800	68.500	74.110	74.410	70.400	76.290	72.230	75.860	71.170
	A-T skew	-0.363	-0.435	-0.152	-0.239	-0.283	-0.435	-0.446	-0.353	-0.438	-0.451	-0.439	-0.448	-0.427	-0.401	-0.439	-0.491	-0.438
	G+C%	28.760	30.070	28.730	24.370	30.224	33.850	34.070	32.190	31.200	31.500	25.890	25.600	29.590	23.700	27.780	24.140	28.830
<i>Toxascaris leonine</i>	G-C skew	0.345	0.357	0.335	0.425	0.310	0.341	0.352	0.381	0.297	0.309	0.379	0.674	0.269	0.527	0.359	0.409	0.457
	A+T%	71.537	70.220	71.150	74.790	72.453	69.140	67.430	68.240	69.400	68.500	73.220	73.810	70.000	74.360	71.680	74.480	71.160
	A-T skew	-0.387	-0.475	-0.165	-0.312	-0.387	-0.490	-0.449	-0.409	-0.508	-0.468	-0.485	-0.492	-0.475	-0.437	-0.480	-0.549	-0.471
	G+C%	28.463	29.780	28.850	25.210	27.547	30.870	32.580	31.760	30.600	31.500	26.780	26.190	30.000	25.640	28.320	25.520	28.840
<i>Toxascaris leonine</i>	G-C skew	0.458	0.475	0.420	0.480	0.443	0.473	0.393	0.469	0.447	0.433	0.628	0.772	0.382	0.700	0.491	0.477	0.572
	A+T%	71.100	70.100	70.990	74.250	71.800	68.950	66.600	67.670	68.360	67.470	71.560	71.720	70.080	76.920	72.120	75.400	70.330
	A-T skew	-0.378	-0.469	-0.164	-0.326	-0.421	-0.473	-0.446	-0.412	-0.493	-0.498	-0.503	-0.494	-0.462	-0.389	-0.479	-0.531	-0.474
	G+C%	29.000	29.880	29.010	25.760	28.300	31.050	33.400	32.330	31.640	32.540	28.440	28.280	29.920	23.080	27.880	24.600	29.670
<i>Toxocara canis</i>	G-C skew	0.428	0.460	0.411	0.474	0.442	0.412	0.381	0.469	0.416	0.465	0.600	0.705	0.348	0.666	0.456	0.495	0.528
	A+T%	68.424	67.260	69.340	71.860	68.810	66.220	65.240	65.130	65.240	64.850	70.150	72.730	67.730	71.120	69.480	73.560	68.900

	A-T skew	-0.367	-0.455	-0.156	-0.289	-0.381	-0.462	-0.489	-0.368	-0.489	-0.511	-0.500	-0.458	-0.431	-0.418	-0.438	-0.494	-0.495
	G+C%	31.576	58.390	30.580	27.490	31.190	33.780	34.770	34.870	34.770	35.140	29.620	27.270	32.280	28.880	30.520	26.440	31.110
	G-C skew	0.404	0.676	0.401	0.457	0.517	0.449	0.393	0.438	0.393	0.381	0.472	0.778	0.350	0.522	0.426	0.339	0.484
	A+T%	68.600	67.690	68.510	72.030	69.000	65.760	63.240	64.990	65.370	65.410	70.060	71.720	67.970	68.730	66.860	72.810	70.820
<i>Toxocara canis</i>	A-T skew	-0.362	-0.395	-0.153	-0.293	-0.420	-0.467	-0.429	-0.371	-0.490	-0.503	-0.497	-0.452	-0.433	-0.494	-0.103	-0.500	-0.406
	G+C%	31.400	32.310	31.490	27.970	30.800	34.240	36.760	35.010	34.640	34.590	29.940	28.270	32.030	31.270	33.140	27.190	29.190
	G-C skew	0.401	0.414	0.411	0.448	0.487	0.446	0.379	0.432	0.398	0.384	0.462	0.726	0.345	0.476	0.351	0.322	0.500
	A+T%	69.948	70.820	70.190	71.530	70.188	68.200	64.510	67.510	67.320	67.010	70.980	73.510	68.210	72.850	71.430	74.940	70.230
<i>Toxocara cati</i>	A-T skew	-0.363	-0.406	-0.135	-0.219	-0.466	-0.430	-0.415	-0.312	-0.466	-0.477	-0.506	-0.449	-0.445	-0.432	-0.434	-0.479	-0.476
	G+C%	30.052	29.190	29.800	28.470	29.812	31.800	35.480	32.480	32.690	32.990	29.030	26.490	31.790	27.160	28.570	25.060	29.770
	G-C skew	0.392	0.500	0.387	0.404	0.349	0.397	0.339	0.403	0.355	0.396	0.510	0.730	0.304	0.524	0.416	0.413	0.461
	A+T%	68.900	68.150	70.290	70.050	68.900	65.130	64.390	65.120	66.020	66.670	71.680	71.730	67.310	72.850	70.100	74.940	69.400
<i>Toxocara malay-siensi</i>	A-T skew	-0.370	-0.396	-0.116	-0.345	-0.422	-0.473	-0.422	-0.382	-0.475	-0.471	-0.488	-0.411	-0.437	-0.467	-0.455	-0.491	-0.494
	G+C%	31.200	31.850	29.720	29.950	30.600	34.870	35.610	34.880	33.990	33.330	28.320	28.270	32.680	27.150	29.890	25.060	30.600
	G-C skew	0.410	0.420	0.392	0.440	0.444	0.435	0.354	0.444	0.410	0.389	0.456	0.726	0.338	0.587	0.455	0.413	0.530
	A+T%	69.942	66.930	68.980	72.220	68.116	65.940	65.460	66.240	67.450	64.720	68.280	70.830	66.590	72.850	72.100	71.030	67.060
<i>Toxocara vitulo-rum</i>	A-T skew	-0.370	-0.488	-0.164	-0.315	-0.375	-0.515	-0.440	-0.394	-0.506	-0.526	-0.529	-0.488	-0.482	-0.456	-0.533	-0.540	-0.526
	G+C%	30.058	33.070	30.940	27.780	31.884	34.050	34.540	33.750	32.550	35.280	31.710	29.160	33.420	27.150	27.900	28.970	32.940
	G-C skew	0.445	0.458	0.410	0.426	0.470	0.501	0.359	0.487	0.480	0.422	0.478	0.776	0.406	0.619	0.533	0.397	0.523
	A+T%	68.900	68.150	70.290	70.050	68.900	65.130	64.390	65.120	66.020	66.670	71.680	71.730	67.310	72.850	70.100	74.940	69.400