

**Table S3.** Nucleotide composition and skewness comparison of different elements of the four mitogenomes.

Regions	Species	Size (bp)	A%	T%	C%	G%	AT(%)	GC(%)	AT skew	GC skew
PCGs	<i>A. lineatus</i>	10,908	33.0	42.0	12.9	12.1	75.0	25.0	-0.120	-0.035
	<i>A. yunnanensis</i>	10,902	33.0	41.8	13.0	12.1	74.8	25.1	-0.117	-0.035
	<i>G. genistae</i>	10,920	33.1	43.9	11.4	11.6	77.0	23.0	-0.140	0.010
	<i>T. longivalvulatus</i>	10,911	32.0	43.2	12.5	12.3	75.2	24.8	-0.148	-0.009
1st codon position	<i>A. lineatus</i>	3,636	35.5	37.1	11.4	16.1	72.6	27.5	-0.022	0.170
	<i>A. yunnanensis</i>	3,634	36.1	36.4	11.7	15.8	72.5	27.5	-0.004	0.151
	<i>G. genistae</i>	3,640	36.2	37.8	10.7	15.3	74.0	26.0	-0.021	0.178
	<i>T. longivalvulatus</i>	3,637	35.8	37.4	11.1	15.7	73.2	26.8	-0.022	0.172
2nd codon position	<i>A. lineatus</i>	3,636	20.3	47.7	18.0	14.0	68.0	32.0	-0.403	-0.123
	<i>A. yunnanensis</i>	3,634	20.6	47.7	17.8	13.9	68.3	31.7	-0.398	-0.123
	<i>G. genistae</i>	3,640	20.5	48.2	17.4	14.0	68.7	31.4	-0.402	-0.109
	<i>T. longivalvulatus</i>	3,637	20.8	47.8	17.2	14.2	68.6	31.4	-0.394	-0.097
3rd codon position	<i>A. lineatus</i>	3,636	43.3	41.3	9.4	6.1	84.6	15.5	0.024	-0.215
	<i>A. yunnanensis</i>	3,634	42.4	41.2	9.7	6.7	83.6	16.4	0.013	-0.180
	<i>G. genistae</i>	3,640	42.7	45.7	6.1	5.5	88.4	11.6	-0.035	-0.045
	<i>T. longivalvulatus</i>	3,637	39.6	44.3	9.2	7.0	83.9	16.2	-0.056	-0.138
Control region	<i>A. lineatus</i>	1,940	40.5	39.3	10.1	10.2	79.8	20.3	0.003	0
	<i>A. yunnanensis</i>	570	44.4	46.3	4.7	4.6	90.7	9.3	-0.019	0
	<i>G. genistae</i>	1,633	37.5	34.2	5.9	22.4	71.7	28.3	0.584	0
	<i>T. longivalvulatus</i>	1,099	44.5	39.3	7.2	9.0	83.8	16.2	0.112	0
tRNAs	<i>A. lineatus</i>	1,413	40.3	38.7	8.6	12.3	79.0	20.9	0.021	0.176
	<i>A. yunnanensis</i>	1,415	39.4	39.2	9.1	12.4	78.6	21.5	0.003	0.151
	<i>G. genistae</i>	1,402	39.9	39.9	7.9	12.2	79.8	20.1	0.000	0.213
	<i>T. longivalvulatus</i>	1,393	40.0	38.9	8.9	12.2	78.9	21.1	0.014	0.156

Table S3. Cont.

rRNAs	<i>A. lineatus</i>	1,986	30.7	48.0	7.8	13.4	78.7	21.2	-0.220	0.265
	<i>A. yunnanensis</i>	1,898	31.9	47.0	8.0	13.1	78.9	21.1	-0.192	0.240
	<i>G. genistae</i>	1,910	32.4	47.5	7.3	12.8	79.9	20.1	-0.189	0.276
	<i>T. longivalvulatus</i>	1,370	31.1	45.8	8.4	14.7	76.9	23.1	-0.191	0.274
Full genome	<i>A. lineatus</i>	16,218	45.3	31.1	14.4	9.2	76.4	23.6	0.186	-0.218
	<i>A. yunnanensis</i>	14,755	45.3	31.0	14.5	9.2	76.3	23.7	0.186	-0.220
	<i>G. genistae</i>	15,829	43.0	34.0	12.0	10.9	77.0	22.9	0.117	-0.045
	<i>T. longivalvulatus</i>	15,325	44.2	32.7	13.6	9.6	76.9	23.2	0.150	-0.169