

**Supplementary Table 1.** *Xenodacnis parina* morphological measurements. Individual information indicating population, data source [(a) Cajas National Park live individuals, (b) data from Bond & de Schauensee (1939), Museo de Zoología de la Universidad del Azuay (MZUA), Museo Ecuatoriano de Ciencias Naturales (MECN), Museo de Zoología, Pontificia Universidad Católica del Ecuador (QCAZ), Museo de Historia Natural Javier Prado (UNMSM, MUSA), and the Corbidi collection (CORBIDI)], age (A, adult; Y, juvenile; U, unknown), and sex (M, males; F, females; U, unknown), with each individual measurement in millimeters (mm) and body mass in grams (g).

Subspecies	Source	Prov./State	Age	Sex	Exposed culmen	Bill depth	Bill width	Wing chord	Tail	Tarsus	Body mass
Ecuador	a	Azuay	Y	U				75	54	25.63	15.0
Ecuador	a	Azuay	A	F				70	56	25.84	16.0
Ecuador	a	Azuay	A	F				70	53	26.83	16.0
Ecuador	a	Azuay	A	F				73	53	27.6	16.0
Ecuador	a	Azuay	A	F				74	55	27.9	16.0
Ecuador	a	Azuay	A	F				75	54	25.4	16.0
Ecuador	a	Azuay	A	F				73	54	27.7	17.0
Ecuador	a	Azuay	A	F				73	54	26.83	17.0
Ecuador	a	Azuay	A	F				74	56	27.53	17.0
Ecuador	a	Azuay	A	F				76	53	27.7	17.0
Ecuador	a	Azuay	A	F				77	58	27.38	18.0
Ecuador	a	Azuay	A	M				74	58	30.2	18.0
Ecuador	a	Azuay	A	M				82	60	28.2	19.0
Ecuador	a	Azuay	A	M				82	62	27.9	19.0
Ecuador	a	Azuay	Y	U				75	56	27.43	19.0
Ecuador	a	Azuay	A	M				80	58	29.6	19.5
Ecuador	a	Azuay	A	F				73	54	26.14	20.0
Ecuador	a	Azuay	A	M				79	58	27.64	20.0
Ecuador	a	Azuay	A	M				80	56	27.9	20.0
Ecuador	a	Azuay	A	M				81	61	28.07	20.0
Ecuador	a	Azuay	A	M				82	59	27.49	20.0
Ecuador	a	Azuay	A	M				80	60	27.9	21.0
Ecuador	a	Azuay	A	M				80	63	27.71	21.0
Ecuador	a	Azuay	A	F				78	58	27.15	
Ecuador	a	Azuay	Y	U				76	58	26.45	
Ecuador	a	Azuay	Y	F	7.9	4.2	4.6	74.5	60	23.5	17.1
Ecuador	a	Azuay	A	F	8.2	4	4.9	73	60	26.5	18.0
Ecuador	a	Azuay	A	F	8.2	3.8	4.8	76	60	26.9	19.1
Ecuador	a	Azuay	Y	M	8.2	4.1	5.5	77	62	28.7	19.1
Ecuador	a	Azuay	Y	M	8.3	4.1	4.7	75	61	26.5	19.9
Ecuador	a	Azuay	A	M	8.3	4.2	4.9	79	63	29.1	21.0
Ecuador	a	Azuay	A	F	7.9	4.3	5.4	76	63	26.3	21.2
Ecuador	a	Azuay	A	M	7.6	4.3	4.3	75	64	28.3	21.2
Ecuador	a	Azuay	Y	M	7.8	4.3	4.7	78	61	27	21.2

Ecuador	a	Azuay	A	M	8.3	4.3	5.5	79	66	28.3	21.4
Ecuador	MECN3214	Azuay	Y	M	9	3.9	4.2	74	61.5	28	18.6
Ecuador	MECN3216	Azuay	A	M	8.2	3.9	4	81.5	67.7	30.6	22.3
Ecuador	MECN4597.1	Azuay	A	M	8.4	3.71	3.84	70.1	56.52	26.18	22.3
Ecuador	MECN4750	Azuay	Y	M	8.2	4	3.8	77	66.2	26.5	20.0
Ecuador	MECN4750.6	Azuay	A	M	8.34	3.62	3.76	67.7	54.06	25.48	
Ecuador	MECN4751	Azuay	A	M	9.4	4.4	4.6	81	66.3	28.8	
Ecuador	MECN4752	Azuay	A	F	8.1	3.7	3.8	73	57.8	27.5	
Ecuador	MECN9198	Chimborazo	A	F	9	3.7	4.5	70	55	28.5	17.5
Ecuador	MECN9199	Chimborazo	A	F	9	3.9	4.5	72	62	27	14.5
Ecuador	MZUA.AV.000013	Azuay	A	M	7.97	4.17	4.83	81	65	27.8	
Ecuador	MZUA.AV.000037	Azuay	A	F	8	4.2	4.6	74	55	25.6	
Ecuador	MZUA.AV.000047	Azuay	A	F	6.99	3.84	4.53	71	57	25.98	
Ecuador	QCAZ 4624	Azuay	A	M	8.2	4.3	5	81.5	65	28.9	23.1
Ecuador	QCAZ 4625	Azuay	A	F	7.9	4.4	4.6	75	60	26.7	18.0
<i>X. p. bella</i>	b	Amazonas	A	F				68.5			
<i>X. p. bella</i>	b	Amazonas	A	F				74			
<i>X. p. bella</i>	b	Amazonas	A	M	8			75.5	60	23.5	
<i>X. p. bella</i>	b	Amazonas	A	M				76.5			
<i>X. p. bella</i>	CORBIDI AB-001665	Ancash	A	M	7.4	3.99	3.43	69	58	24	11.2
<i>X. p. parina</i>	b	Cuzco	A	F				58			
<i>X. p. parina</i>	b	Cuzco	A	F				58			
<i>X. p. parina</i>	b	Cuzco	A	M				61.5			
<i>X. p. parina</i>	b	Cuzco	A	M				66.5			
<i>X. p. parina</i>	CORBIDI AB-011863	Cuzco	A	M	8.05	3.65	3.34	63	53	22.84	11.1
<i>X. p. parina</i>	MUSA1381	Arequipa	A	M	8.1	3.5	3.6	71	60	23.9	
<i>X. p. parina</i>	MUSA1687	Arequipa	A	M	8.2	3.7	3.8	72	60	23	
<i>X. p. parina</i>	MUSA2131	Arequipa	A	M	8.3	3.4	3.6	72	58	23.2	11.0
<i>X. p. parina</i>	MUSA2132	Arequipa	Y	M	7.9	3.4	3.6	66	57	23.8	12.0
<i>X. p. parina</i>	MUSA2254	Arequipa	Y	U	7.3			64	55	21.4	10.0
<i>X. p. parina</i>	MUSA3608	Arequipa	Y	U	8	3.2	3.6	67	56	22.7	
<i>X. p. parina</i>	MUSA369	Cusco	A	M	6.8	3.4	3.4	63	53	21.1	10.0
<i>X. p. parina</i>	MUSA370	Arequipa	Y	M	8.2					23.6	14.5
<i>X. p. parina</i>	MUSA3715	Arequipa	A	M	7.5	3.4	3.2	72	60	22.5	
<i>X. p. parina</i>	MUSA3716	Arequipa	A	M	7.7	3.6	3.6	67	59	24.9	
<i>X. p. parina</i>	MUSA3736	Arequipa	Y	M	7.2	3	3.5	67	56	22.7	10.6
<i>X. p. parina</i>	MUSA375	Arequipa	A	M	8.4	3.7	3.9	72	60	24.14	
<i>X. p. parina</i>	MUSA381	Cusco	A	F	7.9			62	55	21	8.0
<i>X. p. parina</i>	MUSA383	Arequipa	Y	F	8.8	3.4	3.3	66	55		
<i>X. p. parina</i>	MUSA638	Arequipa	A	M	7.8	3.5	3.8	71	57	24	
<i>X. p. parina</i>	MUSA997	Arequipa	A	F	8.9	3.5	3.9	66	56	22.1	9.0
<i>X. p. petersi</i>	b	Ancash	A	F				71			
<i>X. p. petersi</i>	b	Ancash	A	F				71			
<i>X. p. petersi</i>	b	Ancash	A	F				75			
<i>X. p. petersi</i>	b	Ancash	A	M				78			

<i>X. p. petersi</i>	b	Ancash	A	M					79			
<i>X. p. petersi</i>	b	Ancash	A	M	9				82.5	66	27	
<i>X. p. petersi</i>	b	Ancash	Y	M					74.5			
<i>X. p. petersi</i>	b	Ancash	Y	M					77.5			
<i>X. p. petersi</i>	CORBIDI AB-001422	Junin	A	F	7.57	3.56	3.19	58	56	20	10.2	
<i>X. p. petersi</i>	CORBIDI AB-001686	Lima	A	F	7.85	3.42	3.01	66	54	20		
<i>X. p. petersi</i>	CORBIDI AB-011862	Junin	A	F	7.16	3.62	2.86	62	53	22.6	9.2	
<i>X. p. petersi</i>	CORBIDI AB-011864	Junin	A	M	7.98	3.73	3.24	60	53	22.64	12.3	
<i>X. p. petersi</i>	CORBIDI AB-011865	Junin	A	M	7.46	3.7	3.11	62		23.65	13.3	
<i>X. p. petersi</i>	MUSA2352	Lima	Y	M	9.2	3.4	4.1	69	60	22.4	12.8	
<i>X. p. petersi</i>	MUSA2353	Lima	A	M	8.7	3.7	4.4	73	64	23.6	12.4	
<i>X. p. petersi</i>	MUSA3012	Lima	A	M	7.6	3.5	3.5	75	61	24.7	13.7	
<i>X. p. petersi</i>	MUSA3016	Lima	A	M	8.4	3.5	3.6	75	62	24.7	12.6	
<i>X. p. petersi</i>	MUSA3246	Lima	Y	M	8.2	3.6	3.9	70	62	21.5	10.8	
<i>X. p. petersi</i>	MUSA371	Ancash	A	M	8.6	3.8	3.6	79	66	22.9	9.5	
<i>X. p. petersi</i>	MUSA372	Ancash	Y	M	8.4			74	63	21.1	12.0	
<i>X. p. petersi</i>	MUSA373	Ancash	A	M	9	4.3	4.5	76	64	22.6		
<i>X. p. petersi</i>	MUSA374	Ancash	A	M	8.4	4.2	3.9	78	66	22.2		
<i>X. p. petersi</i>	MUSA380	Lima	A	F	8.2	3.1	3.2	68	57	22	11.0	

**Supplementary Table 2.** Results from linear models of *Xenodacnis* morphological variables from different subspecies. It includes estimated effects, standard error (SE), t value and associated p-values of seven linear models, one regression for each morphological variable to express the sex and the taxonomic identity.

<b>Body mass (F = 76.14, R2 = 0.8843)</b>	<b>Estimate</b>	<b>SE</b>	<b>t value</b>	<b>Pr(&gt; t )</b>
(Intercept)	17.3	0.33395	51.804	< 2e-16
Sex M	3.0619	0.4551	6.728	1.24E-08
Subspecies <i>X. p. bella</i>	-9.1619	1.45017	-6.318	5.63E-08
Subspecies <i>X. p. parina</i>	-8.8	1.05604	-8.333	3.30E-11
Subspecies <i>X. p. petersi</i>	-7.16667	0.88355	-8.111	7.44E-11
Sex M: Subspecies <i>X. p. bella</i>	NA	NA	NA	NA
Sex M: Subspecies <i>X. p. parina</i>	-0.02857	1.24313	-0.023	0.982
Sex M: Subspecies <i>X. p. petersi</i>	-1.03968	1.04847	-0.992	0.326
<b>Tarsus (F = 47.93, R2 = 0.7853)</b>	<b>Estimate</b>	<b>SE</b>	<b>t value</b>	<b>Pr(&gt; t )</b>
(Intercept)	26.7491	0.2574	103.912	< 2e-16
Sex M	1.283	0.3564	3.6	0.000585
Subspecies <i>X. p. bella</i>	-4.2821	0.8886	-4.819	7.94E-06
Subspecies <i>X. p. parina</i>	-5.1991	0.8917	-5.83	1.50E-07
Subspecies <i>X. p. petersi</i>	-5.5991	0.6563	-8.531	1.73E-12
Sex M: Subspecies <i>X. p. bella</i>	NA	NA	NA	NA
Sex M: Subspecies <i>X. p. parina</i>	0.4737	0.9886	0.479	0.633329
Sex M: Subspecies <i>X. p. petersi</i>	0.8162	0.7829	1.042	0.300725
<b>Tail (F = 8.364, R2 = : 0.3676)</b>	<b>Estimate</b>	<b>SE</b>	<b>t value</b>	<b>Pr(&gt; t )</b>
(Intercept)	56.7182	0.6829	83.059	< 2e-16
Sex M	4.7102	0.9454	4.982	4.36E-06

Subspecies <i>X. p. bella</i>	-2.4283	2.3573	-1.03	0.306
Subspecies <i>X. p. parina</i>	-1.3848	1.9713	-0.703	0.485
Subspecies <i>X. p. petersi</i>	-1.7182	1.741	-0.987	0.327
Sex M: Subspecies <i>X. p. bella</i>	NA	NA	NA	NA
Sex M: Subspecies <i>X. p. parina</i>	-2.498	2.2904	-1.091	0.279
Sex M: Subspecies <i>X. p. petersi</i>	2.7444	2.0955	1.31	0.195
<b>Wing chord (F = 14.75, R2 = 0.514)</b>	<b>Estimate</b>	<b>SE</b>	<b>t value</b>	<b>Pr(&gt; t )</b>
(Intercept)	73.6591	0.8993	81.907	< 2e-16
Sex M	4.5409	1.245	3.647	0.000459
Subspecies <i>X. p. bella</i>	-2.4091	3.1153	-0.773	0.441507
Subspecies <i>X. p. parina</i>	-11.6591	2.0898	-5.579	2.89E-07
Subspecies <i>X. p. petersi</i>	-6.3734	1.8304	-3.482	0.000793
Sex M: Subspecies <i>X. p. bella</i>	-2.1242	4.0469	-0.525	0.601028
Sex M: Subspecies <i>X. p. parina</i>	1.4591	2.545	0.573	0.567968
Sex M: Subspecies <i>X. p. petersi</i>	2.0796	2.2812	0.912	0.36457
<b>Exposed culmen (F = 2.576, R2 = 0.1444)</b>	<b>Estimate</b>	<b>SE</b>	<b>t value</b>	<b>Pr(&gt; t )</b>
(Intercept)	8.119	0.1595	50.899	<2e-16
Sex M	0.1817	0.2089	0.87	0.3884
Subspecies <i>X. p. bella</i>	-0.6007	0.3813	-1.575	0.1215
Subspecies <i>X. p. parina</i>	0.4143	0.3321	1.248	0.2179
Subspecies <i>X. p. petersi</i>	-0.424	0.2984	-1.421	0.1616
Sex M: Subspecies <i>X. p. bella</i>	NA	NA	NA	NA
Sex M: Subspecies <i>X. p. parina</i>	-0.8692	0.3868	-2.247	0.0291
Sex M: Subspecies <i>X. p. petersi</i>	0.535	0.3584	1.493	0.1418
<b>Bill_depth (F = 10.23, R2 = 0.5205)</b>	<b>Estimate</b>	<b>SE</b>	<b>t value</b>	<b>Pr(&gt; t )</b>
(Intercept)	4.004	0.077	51.998	< 2e-16
Sex M	0.08886	0.10082	0.881	0.38282
Subspecies <i>X. p. bella</i>	-0.10286	0.25205	-0.408	0.68515
Subspecies <i>X. p. parina</i>	-0.554	0.18862	-2.937	0.00521
Subspecies <i>X. p. petersi</i>	-0.579	0.14406	-4.019	0.00022
Sex M: Subspecies <i>X. p. bella</i>	NA	NA	NA	NA
Sex M: Subspecies <i>X. p. parina</i>	-0.06158	0.21261	-0.29	0.77341
Sex M: Subspecies <i>X. p. petersi</i>	0.22914	0.17583	1.303	0.19914
<b>Bill_width (F = 12.86, R2 = 0.5826)</b>	<b>Estimate</b>	<b>SE</b>	<b>t value</b>	<b>Pr(&gt; t )</b>
(Intercept)	4.623	0.13728	33.675	< 2e-16
Sex M	-0.078	0.17975	-0.434	0.6664
Subspecies <i>X. p. bella</i>	-1.115	0.44937	-2.481	0.01689
Subspecies <i>X. p. parina</i>	-1.023	0.33628	-3.042	0.00391
Subspecies <i>X. p. petersi</i>	-1.558	0.25684	-6.066	2.49E-07
Sex M: Subspecies <i>X. p. bella</i>	NA	NA	NA	NA
Sex M: Subspecies <i>X. p. parina</i>	0.05436	0.37905	0.143	0.8866
Sex M: Subspecies <i>X. p. petersi</i>	0.798	0.31349	2.546	0.01441