

Supplementary Data 3—Minor and trace element content (ppm) of vertebrate fossils and host rock from Z4 bed, Zambrana site. See stratigraphic position of Z4-M1, Z4-O, and Z4-V samples in Iriarte et al. (2003, fig. 3). n.q. = no quantified data as ppm.

Z4	1	2	3	4	5	6	7	8	9	10	11	12	SED	12-sed	Z4-M1	Z4-V	Z4-O
Ba	228.4	878.54	237.14	299.88	317.26	296.43	307.62	642.62	2854.62	324	765.91	395.69		48.62	131.67	175.88	337.16
Ce	100.82	7042.55	1181.71	1274.59	957.18	1410.84	1494.28	5290.88	1683.12	1669.7	5929.92	1283.03		73.49	78.49	81.83	105.31
Co	2.61	4.4	2.41	0.86	2.44	2.15	1.97	4.54	2.6	1.75	3.4	2.69		2.24	3.1	3.03	4.44
Cr	35.19	10.46	16.6	21.84	13.84	28.8	35.96	43.07	38.15	31.02	13.45	14.36		8.26	67.27	76.74	186.82
Cu	n.q.	n.q.	n.q.	n.q.	32.75	n.q.	n.q.	n.q.	n.q.	n.q.	n.q.	11.7		20.25	n.q.	n.q.	n.q.
Dy	61.13	119.62	82.69	86.86	46.51	97.79	107.16	132.84	114.62	111.89	117.39	77.57		3.68	4.08	4.09	5.77
Eu	19.8	44.46	25.81	25.85	13.35	29.96	31.62	47.03	37.05	35.22	42.76	22.61		1.18	2.65	2.66	2.95
Ga	4.97	5.63	4.41	2.67	3.71	6.23	5.23	15.59	26.93	4.91	10.26	3.67		2.36	9.42	11.43	27.05
Gd	93.8	246.49	132.23	130.1	101.43	158.07	162.25	253.69	180.94	183.1	229.88	142.22		5.32	n.q.	n.q.	2.31
Ho	12.17	22.17	15.54	15.94	7.7	17.87	19.75	25.64	23.35	19.91	20.84	13.29		0.01	3.03	3.07	3.35
La	499.59	988.64	535.14	590.54	560.32	607.63	645.42	954.67	732.86	739.81	925.06	721.93		46.13	15.22	15.65	28.83
Lu	4.9	8.85	5.45	5.6	1.46	6.3	7.19	10.68	9.6	6.33	8.11	2.57		0.11	3.07	3.16	3.28
Nd	448.92	1001.88	579.39	612.12	401.43	707.61	743.79	1133.83	794.47	814.97	971.2	613.75		28.08	13.6	13.93	25.64
Ni	79.42	20.73	30.17	22.37	36.76	15.7	21.26	23.8	30.28	30.99	18.15	52.07		39.99	38.37	14.66	29.31
Pb	20.83	73.1	32.71	19.6	5.52	38.98	81.53	74.65	44.06	36.92	62.11	7.13		4.3	9.62	11.4	17.73
Pr	110.46	287.09	141.7	148.81	95.81	170.63	179.71	271.05	193.7	197.38	273.61	136.98		16.22	5.75	5.83	9.06
Sm	84.74	219.16	115.55	119.17	60.08	139.39	150.09	220.14	157.08	158.28	214.23	101.99		4.76	5.53	5.46	7.36
Th	4.76	35.73	6.91	2.88	2.57	9.14	16.96	37.02	13.28	12.83	29.36	2.03		1.32	8.07	9.11	15.96
Tb	12.63	26.51	16.37	16.96	8.66	19.16	20.53	28.11	23.76	21.84	25.49	14.65		0.28	2.24	2.29	2.51
Tm	5.17	9.22	5.98	6.23	1.71	7.02	7.81	11.1	10.16	7.12	8.63	3.07		n.q.	2.73	2.8	2.91
U	1374.61	327.21	1187.65	570.14	997.17	680.21	388.99	723.82	588.03	576.72	306.33	862.51		60.96	101.26	33.39	70.68
V	627.51	274.75	262.64	293.24	204.81	367.54	316.72	482.19	586.72	461.25	303.81	800.93		218.89	716.84	182.57	373.94
Y	365.79	530.99	449.5	502.65	421.12	521.99	596.34	660.82	614.71	601.03	525.59	466.49		18.54	15.09	14.83	22.93
Yb	16.34	28.8	20.58	21.68	10.5	26.46	31.78	37.36	31.4	27.37	27.79	17.87		0.92	3.31	3.63	4.61
Zn	102.6	152.58	121.19	133.51	120.15	202.84	92.62	186.07	485.67	82.92	142.55	42.63		454.8	91.34	88.11	100.9
Zr	358.76	182.84	174.17	3.3	8.6	281.54	262.3	187.98	155.22	78.66	149.38	7.23		2.69	194.39	577.11	686.46

1-5, limb bones; 6, crocodylian dermal scute; 7-10, turtle shell plates; 11, mammalian tooth; 12, indeterminate bone fragment; Z4-M1, Z4-O, and Z4-V, sediment samples of the Z4 bed; 12-sed, host rock sediment sample taken from the fossil 12.