

Title: First fossil frog from Antarctica: implications for Eocene high latitude climate conditions and Gondwanan cosmopolitanism of Australobatrachia

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Figure S1. 3D models of ilia of *Pipa parva* (a), *Syncopa antenori* (b), *Brachycephalus albolineatus* (c), *Eleutherodactylus glaphycompus* (d), *Hypodactylus araiodactylus* (e), *Craugastor brocci* (f), *Gastrotheca peruana* (g), *Ceratophrys aurita* (h), *Proceratophrys boiei* (i), *Rhinoderma darwinii* (j), *Telmatobius marmoratus* (k), *Cycloramphus asper* (l), *Hylodes asper* (m). Collection numbers of each specimen are listed in Table S1.

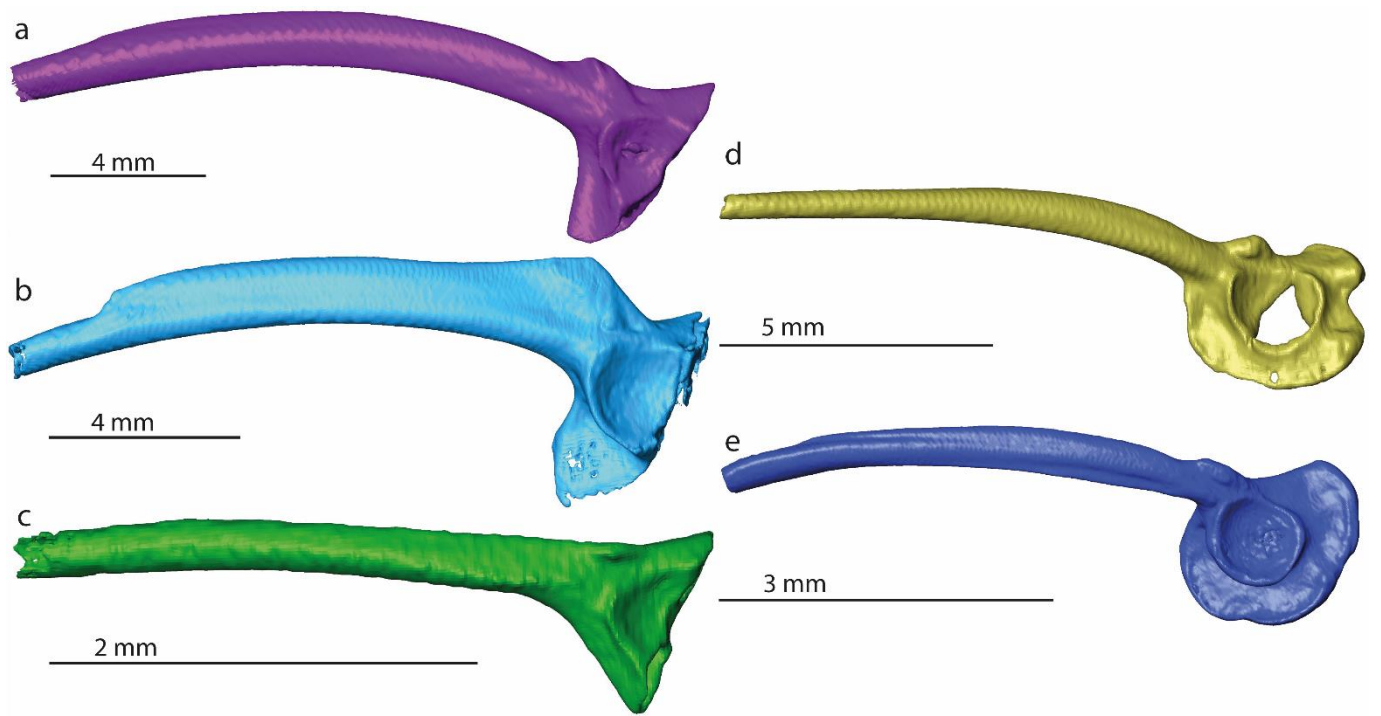


Figure S2. 3D models of ilia of *Alsodes nodosus* (a), *Leptodactylus validus* (b), *Allophryne ruthveni* (c), *Centrolene buckleyi* (d), *Dendrobates tinctorius* (e). Collection numbers of each specimen are listed in Table S1.

Table S1. List of South American and Australian frog species and families used for comparison with the Antarctic fossil. The Latin name of each species is linked to the corresponding website of Morphosource. Collection numbers and CT-scanning configurations (resolution, voltage, amperage, watts) are indicated according to the information in www.morphosource.com¹.

Family	Species	Figures	Collection numbers	resolution (mm)	voltage (kv)	amperage (μ a)	watts (W)
Pipidae	Pipa parva	Fig. S1a	M13107 / uf:herp:64234	0.04627829	120	200	24
Microhylidae	Syncope antenori	Fig. S1b	M25194 / uf:herp:68008	0.01379663	80	150	12
Calyptocephalellidae	Calyptocephalella gayi	Fig. 3a-e	M13105 / cas:sua:10082	0.03469723	80	150	12
	Telmatobufo venustus	Fig. 3f-h	M22061 / ku:kuh:161438	0.04773114	70	200	14
Myobatrachidae	Myobatrachus gouldii	Fig. 3i	M25636 / mcz:herp:a-139543	0.02741526	80	200	16
Limnodynastidae	Limnodynastes convexiusculus	Fig. 3j	M25462 / cas:herps:121263	0.03570469	70	200	14
Brachycephalidae	Brachycephalus albolineatus	Fig. S1c	M10212 / MHNCI:10295	0.00788364	60	175	10.5
Eleutherodactylidae	Eleutherodactylus glaphycompus	Fig. S1d	M10883 / UF:herp:56811	0.02484263	100	200	N/A
	Hypodactylus araiodactylus	Fig. S1e	M13313 / uf:40764:40764	0.01756294	100	250	N/A
Craugastoridae	Craugastor brocci	Fig. S1f	M25277 / mvz:herp:264248	0.03366066	90	200	18
Hemiphractidae	Gastrotheca peruana	Fig. S1g	M28912 / uf:herp:65783	0.04537322	100	150	15
Ceratophryidae	Ceratophrys aurita	Fig. S1h	M10735 / cas:herp:84998	0.006687342	120	200	24
Odontophrynidae	Proceratophrys boiei	Fig. S1i	M13988 / CM-H-45986	0.02879781	130	220	286
Rhinodermatidae	Rhinoderma darwini	Fig. S1j	M13975 / uf:herp:62022	0.026411	100	150	150
Telmatobiidae	Telmatobius marmoratus	Fig. S1k	M25465 / cas:herp:152217	0.02721782	125	150	18.75
Cycloramphinae	Cycloramphus asper	Fig. S1l	M13198 / cm:herps:68338	0.04225985	130	220	28.6
Hylodidae	Hylodes asper	Fig. S1m	M18125 / cm:herps:45975	0.03172522	130	200	N/A
Alsodidae	Alsodes nodosus	Fig. S2a	M18658 / cm:herps:63864	0.04678505	140	250	35
Leptodactylidae	Leptodactylus validus	Fig. S2b	M18245 / uf:herp:103920	0.03359499	100	200	20
Allophrynidae	Allophryne ruthveni	Fig. S2c	M12630 / cas:herp:257677	0.01428861	80	120	N/A
Centroledinae	Centrolene buckleyi	Fig. S2d	M9218 / uf:herp:30579	0.03331138	100	200	N/A
Dendrobatidae	Dendrobates tinctorius	Fig. S2e	M25692 / ypm:vz:ypm hera 010610	0.01084585	60	180	10.8
Ranidae	²						
Bufonidae	²						
Hylidae	²						

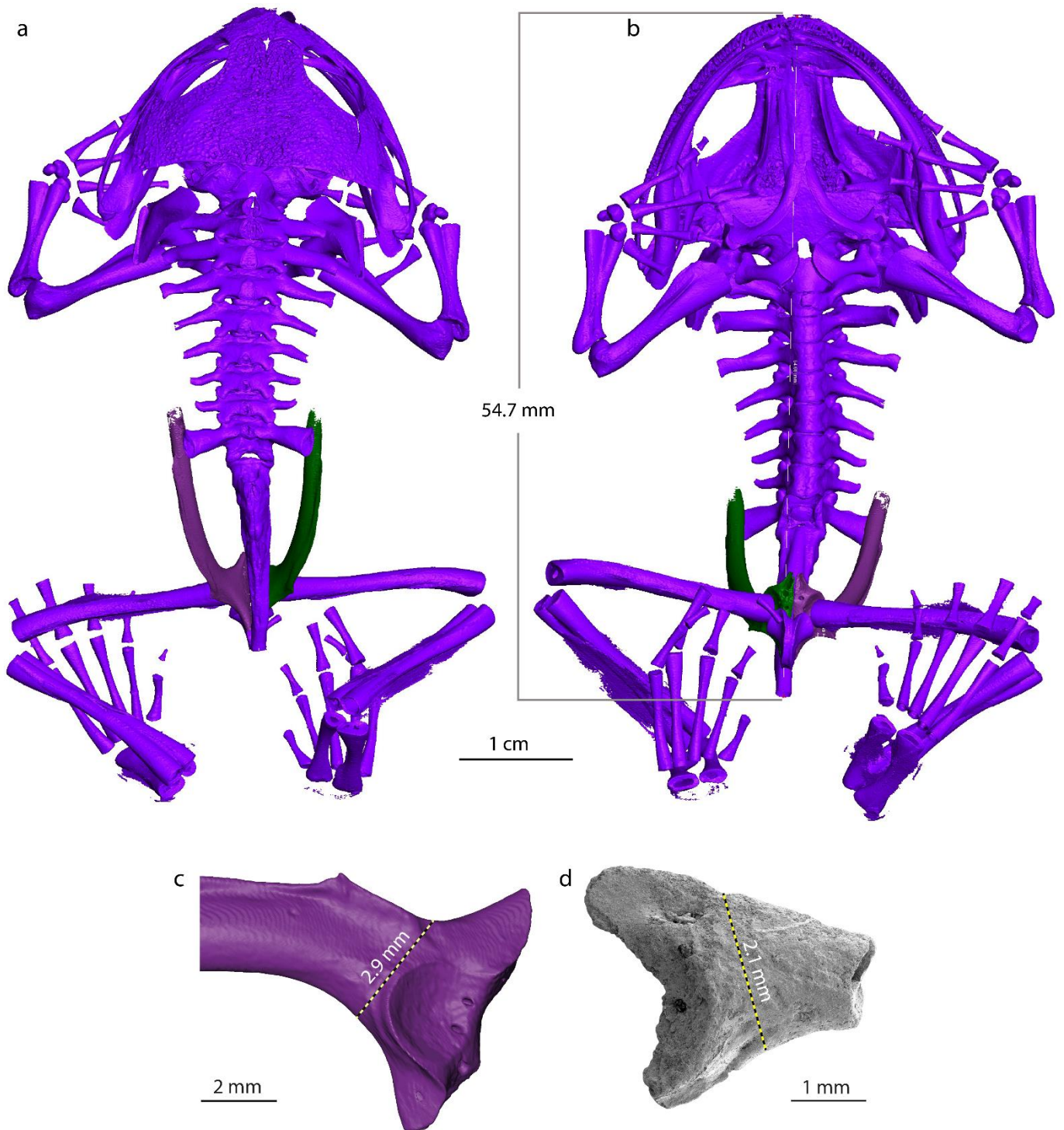


Figure S3. a-c 3D reconstruction of *Calyptocephalella gayi* ([M13105](https://www.morphosource.com/1) / cas:sua:10082 from [www.morphosource.com](http://www.morphosource.com/1)¹). Body of *C. gayi* with indication of the measured value of the snout-vent length in dorsal (a) and ventral (b) views, as well as the left ilium of the same individual in lateral view (c). (d) Antarctic ilium (NRM-PZ B282) in lateral view. The measured distance of the height of the transition from the iliac shaft and ilial body is indicated by a black-yellow line with the corresponding numerical value.

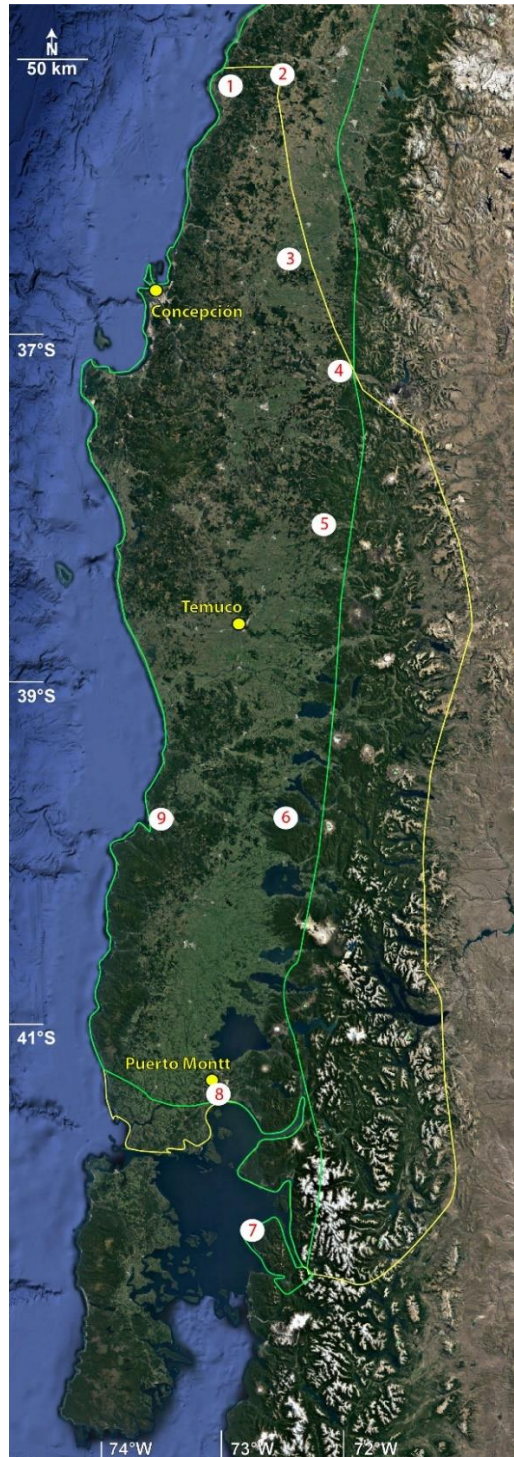


Figure S4. Map showing the area of the sympatric occurrences of *Calyptocephalella gayi* (green line)³ and *Dromiciops gliroides* (yellow line)⁴ with the locations of the climatic stations (white circles). The climatic station numbers correspond to those in Table 2. Map redrawn from an original generated using ArcGIS 10.17.1 (www.esri.com) software, based on the Satellite base map layer in google Maps (Map data ©2019 Google).

References

1. unknown. Morphosource. Available at <https://www.morphosource.org/> (2020).
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3. Veloso, A., Formas, R. J. & Gerson, H. *Calyptocephalella gayi*. The IUCN Red List of Threatened Species (2010).
4. Martin, G. M., Flores, D. & Teta, P. *Dromiciops gliroides*. IUCN Red List of Threatened Species (2015).