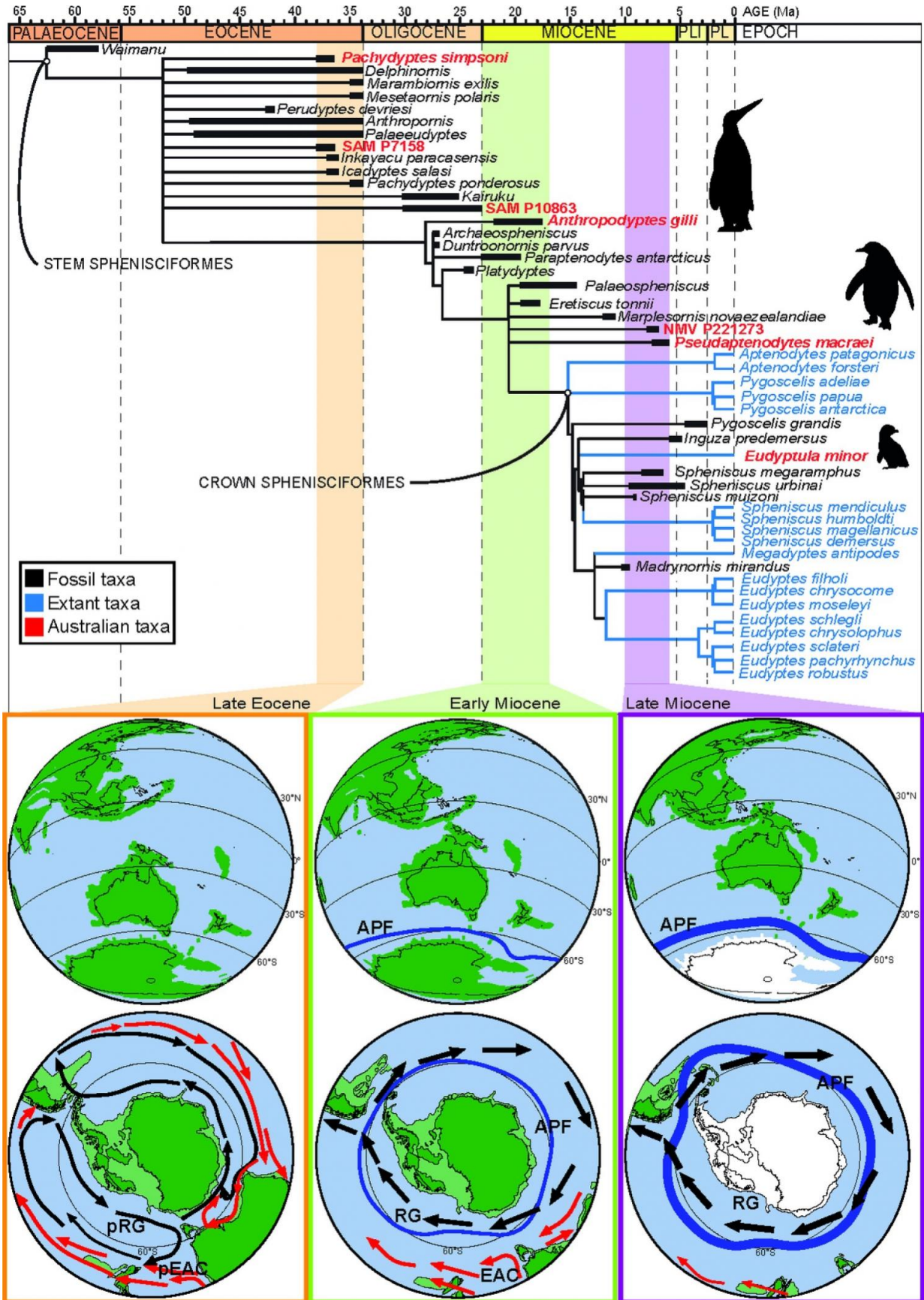


# **Fossils may reveal 20-million-year history of penguins in Australia**

April 26 2016

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Stratigraphically calibrated phylogeny of Sphenisciformes correlated with tectonic movements and changing ocean circulation in the southern hemisphere showing how: (1) the Australian taxa are dispersed across the phylogeny temporally; (2) the Australian continent becomes progressively more isolated from other southern continents; and (3) a strengthened ACC (indicated by the black arrows) provides a new dispersal vector to Australia despite the presence of a strengthening Antarctic Polar Front (APF).

The bottom palaeomaps are based on reconstructions in Lawver & Gahagan [9]. Penguin silhouettes show overall trend for decreasing body size in penguin evolution: Top, archaic giant stem penguin taxa; middle medium-sized stem penguin taxa; bottom, smaller crown penguin taxa (silhouette credit: Fir0002/Flagstaffotos (original photo), John E. McCormack, Michael G. Harvey, Brant C. Faircloth, Nicholas G. Crawford, Travis C. Glenn, Robb T. Brumfield & T. Michael Keesey, used under a CC BY 3.0 Attribution Unported Licence (<http://creativecommons.org/licenses/by/3.0/>)).

Palaeoceanographic reconstructions after [9,72-74]. Palaeoceanographic abbreviations: EAC = East Australian Current, pEAC = palaeo-East Australian Current, pRG = palaeo-Ross Sea Gyre/Tasman Current, RG = Ross Sea Gyre. The relative strength of the ACC and APF is shown by thickening arrows and lines through time. Black arrow = cold currents, red arrows = warm currents. Credit: Park et al.

Multiple dispersals of penguins reached Australia after the continent split from Antarctica, including 'giant penguins' that may have lived there after they went extinct elsewhere, according to a study published April 26, 2016 in the open-access journal *PLOS ONE* by Travis Park from Monash University, Australia, and colleagues.

Penguin evolution in Australia following the continent's pre-historic split from Antarctica is not well-understood, but the fossil record shows that Australia was

home to a number of penguin [species](#). Only the little penguin remains today, and pre-Quaternary evidence of this species and its ancestors in Australia is lacking. To update our understanding of Australian penguin evolutionary history, the authors of the study analysed recently collected penguin fossils and compared them to known species, including now-extinct 'giant [penguins](#),' and presented a new phylogenetic tree in the context of biogeographical events on the Australian continent.

The authors propose that Australia's unique biogeographical history allowed for multiple dispersals of penguins to the continent during the Cenozoic or Age of Mammals, and that ancestors of the modern little penguins arrived in Australia with the help of a strengthened Antarctic Circumpolar Current.

While evolutionary trees are constructed as best estimates based on sometimes-limited fossil records, the authors suggest these findings shed new insights into the evolutionary trajectory of penguins in Australia.

**More information:** Park T, Fitzgerald EMG, Gallagher SJ, Tomkins E, Allan T (2016) New Miocene Fossils and the History of Penguins in Australia. *PLoS ONE* 11(4): e0153915. [DOI: 10.1371/journal.pone.0153915](https://doi.org/10.1371/journal.pone.0153915)

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