Accepted Manuscript

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PII: S1342-937X(16)30282-9
DOI: doi: 10.1016/j.gr.2016.12.006
Reference: GR 1726

To appear in: *Gondwana Research*

Received date: 14 October 2016
Revised date: 5 December 2016
Accepted date: 19 December 2016

Please cite this article as: van den Ende, Conrad, White, Lloyd T., van Welzen, Peter C., The existence and break-up of the Antarctic land bridge as indicated by both amphi-Pacific distributions and tectonics, *Gondwana Research* (2016), doi: 10.1016/j.gr.2016.12.006

The existence and break-up of the Antarctic land bridge as indicated by both amphi-Pacific distributions and tectonics

Short title: Antarctic land bridge explained by distributions and tectonics

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Abstract

Amphi-Pacific disjunct distributions between South America and Australasia are correlated with the breakup and changing palaeo-climate of Gondwana. For a long period, with a temperate climate, Antarctica formed a land bridge between Australia and South America, allowing species to disperse/vicariate between both continents. Dated phylogenies in the literature, showing sister-clades with a distribution disjunction between South America and Australia, were used for the correlation. The initiation of the Antarctic Circumpolar Current, and a change to a colder Antarctic climate is associated with the opening of the Drake Passage between South America and Antarctica at c. 30 Ma, and the final separation of Australia and Antarctica along the South Tasman Rise at c. 45 Ma. The distribution data highlighted the existence of a "southern disjunct distribution" pattern, which may be the