

Appendix S4: Dispersal rate scalers for BioGeoBEARS Adapted from Toussaint et al. (2017). Dispersal rate scaling matrices used in the BioGeoBEARS (Matzke, 2013) analyses from the oldest time slice to the newest (TS1 to TS3). A matrix of dispersal rate scalers relative to potential geographic barriers is given for each of the three time slices: ~80 to 40 Ma, 40 to 20 Ma and 20 Ma to present. Four symbols are used to indicate the kind of barrier between the selected ranges. Regions are abbreviated as follows: A = Andean-Argentinian, B = Neotropical, C = Southern Africa, D = African, E = Madagascan, F = Northern Australia, G = Malesian, H = Indian-Indochinese, I = Neozelandic-Patagonian and J = Eurasiatic (see Carta et al., 2022; Figure 1).

TS1: 80-40 Ma

	A	B	C	D	E	F	G	H	I	J
A	-	1	0.5	0.5	0.05	0.05	0.5	0.05	1	0.05
B	→	-	0.5	0.75	0.05	0.05	0.05	0.05	0.05	0.05
C	×	×	-	1	0.25	0.05	0.5	0.5	0.05	0.05
D	×	×	→	-	0.25	0.05	0.5	0.5	0.05	0.05
E	×	×	×	×	-	0.05	0.05	0.75	0.05	0.05
F	×	×	×	×	×	-	0.5	0.05	1	0.05
G	×	×	×	×	×	×	-	1	0.05	1
H	×	×	×	×	×	×	→	-	0.05	1
I	→	×	×	×	×	→	×	×	-	0.05
J	×	×	×	×	×	×	→	→	×	-

TS2: 40-20 Ma

	A	B	C	D	E	F	G	H	I	J
A	-	1	0.5	0.5	0.05	0.05	0.5	0.05	1	0.05
B	→	-	0.5	0.5	0.05	0.05	0.5	0.05	0.05	0.05
C	×	×	-	1	0.25	0.05	0.05	0.05	0.05	0.05
D	×	×	→	-	0.75	0.5	0.05	0.5	0.05	0.25
E	×	×	×	×	-	0.5	0.5	0.5	0.05	0.05
F	×	×	×	×	×	-	0.75	0.05	1	0.05
G	×	×	×	×	×	×	-	1	0.5	0.5
H	×	×	×	×	×	×	→	-	0.05	1
I	→	×	×	×	×	→	×	×	-	0.05
J	×	×	×	×	×	×	×	→	×	-

TS3: 20-0 Ma

	A	B	C	D	E	F	G	H	I	J
A	-	1	0.5	0.5	0.05	0.5	0.5	0.05	1	0.05
B	→	-	0.5	0.5	0.05	0.05	0.05	0.05	0.05	0.05
C	×	×	-	1	0.75	0.05	0.05	0.05	0.5	0.05
D	×	×	→	-	0.25	0.5	0.5	0.5	0.05	0.25
E	×	×	×	×	-	0.5	0.5	0.5	0.5	0.5
F	×	×	×	×	×	-	0.75	0.25	1	0.05
G	×	×	×	×	×	×	-	0.75	0.25	0.25
H	×	×	×	×	×	×	×	-	0.25	1
I	×	×	×	×	×	→	×	×	-	0.05
J	→	×	×	×	×	×	×	→	×	-

→ No barrier × Terrestrial barrier × Small water barrier × Large water barrier

Toussaint, E. F. A., Bloom, D., & Short, A. E. Z. (2017). Cretaceous West Gondwana vicariance shaped giant water scavenger beetle biogeography. *Journal of Biogeography*, 44(9), 1952-1965. <https://doi.org/10.1111/jbi.12977>

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