

Supplementary material

Appendix 1

Species	Subfamily	Foraging mode	Region	Size
<i>Eopsaltria australis</i>	Eopsaltriinae	ground-pouncing	Australia	1.3
<i>Eopsaltria griseogularis</i>	Eopsaltriinae	ground-pouncing	Australia	1.3
<i>Gennaedryas placens</i>	Eopsaltriinae	ground-pouncing	New Guinea	1.4
<i>Heteromyias albispecularis</i>	Eopsaltriinae	ground-pouncing	Australia	1.6
<i>Melanodryas cucullata</i>	Eopsaltriinae	ground-pouncing	Australia	1.3
<i>Melanodryas vittata</i>	Eopsaltriinae	ground-pouncing	Tasmania Island	1.4
<i>Peneothello bimaculata</i>	Eopsaltriinae	ground-pouncing	New Guinea	1.4
<i>Peneothello cryptoleuca</i>	Eopsaltriinae	ground-pouncing	Indonesia	1.3
<i>Peneothello cyanus</i>	Eopsaltriinae	ground-pouncing	New Guinea	1.4
<i>Peneothello sigillatus</i>	Eopsaltriinae	ground-pouncing	New Guinea	1.4
<i>Peneothello pulverulenta</i>	Eopsaltriinae	ground-pouncing	Australo-Papuan	1.3
<i>Poecilodryas brachyura</i>	Eopsaltriinae	sallying	Indonesia	1.4
<i>Poecilodryas cerviniventris</i>	Eopsaltriinae	ground-pouncing	Australia	1.3
<i>Poecilodryas hypoleuca</i>	Eopsaltriinae	sallying	New Guinea	1.3
<i>Poecilodryas superciliosa</i>	Eopsaltriinae	ground-pouncing	Australia	1.3
<i>Plesiodryas albonotata</i>	Eopsaltriinae	sallying	New Guinea	1.6
<i>Quoyornis georgianus</i>	Eopsaltriinae	ground-pouncing	Australia	1.3
<i>Tregellasia capito</i>	Eopsaltriinae	ground-pouncing	Australia	1.1
<i>Trellasia leucops</i>	Eopsaltriinae	ground-pouncing	Australo-Papuan	1.2
<i>Drymodes brunneopygia</i>	Drymodinae	ground-dwelling	Australia	1.5
<i>Drymodes superciliaris</i>	Drymodinae	ground-dwelling	Australia	1.7
<i>Cryptomicroeca flaviventris</i>	Microecinae	ground-pouncing	New Caledonia	1.1
<i>Devioeca papuana</i>	Microecinae	sallying	New Guinea	1.2
<i>Kempiella flavovirescens</i>	Microecinae	sallying	New Guinea	1.2
<i>Kempiella griseoiceps</i>	Microecinae	sallying	Australo-Papuan	1
<i>Microeca fascinans</i>	Microecinae	ground-pouncing	Australo-Papuan	1.2
<i>Microeca flavigaster</i>	Microecinae	ground-pouncing	Australo-Papuan	1.1
<i>Microeca hemixantha</i>	Microecinae	ground-pouncing	Indonesia	1.1
<i>Monachella muelleriana</i>	Microecinae	sallying	New Guinea	1.4
<i>Pachycephalopsis hattamensis</i>	Pachycephalopsinae	sallying	Indonesia	1.5
<i>Pachycephalopsis poliosoma</i>	Pachycephalopsinae	sallying	New Guinea	1.6
<i>Eugerygone rubra</i>	Petroicinae	sallying	New Guinea	0.9
<i>Petroica archboldi</i>	Petroicinae	ground-pouncing	Indonesia	1.2
<i>Petroica australis</i>	Petroicinae	ground-pouncing	New Zealand	1.5
<i>Petroica bivittata</i>	Petroicinae	sallying	New Guinea	1
<i>Petroica goodenovii</i>	Petroicinae	ground-pouncing	Australia	1
<i>Petroica macrocephala</i>	Petroicinae	ground-pouncing	New Zealand	1.1
<i>Petroica multicolor</i>	Petroicinae	sallying	Solomon Islands	1.1
<i>Petroica phoenicea</i>	Petroicinae	ground-pouncing	Australia	1.1
<i>Petrodica rodinogaster</i>	Petroicinae	ground-pouncing	Australia	1

<i>Petroica rosea</i>	Petroicinae	sallying	Australia	0.9
<i>Petroica traversi</i>	Petroicinae	ground-pouncing	New Zealand	1.4

Table A1. List of Petroicidae species included in the present study including information on subfamily at which they belong, foraging mode, geographic area and (log) body size.

Table A2. Wearsheaf index (w) values computed to measure quantitatively the strength of convergence in a) ground-pouncing and b) sallying species of Petroicidae. The p -value and jackknived 95% confidence interval (CI) for each trait are also shown. Significant results (strong convergence) are denoted in bold.

Phenotypic trait	Wearsheaf index (w)	p -value	95% CI
(a) Ground-pouncing ($n = 27$)			
PC1	1.19	0.021	1.13-1.29
PC2	0.95	0.364	0.91-0.98
PC3	1.00	0.152	0.97-1.04
(b) Sallying ($n = 13$)			
PC1	1.01	0.247	0.96-1.11
PC2	1.32	0.616	1.24-1.48
PC3	1.11	0.427	1.05-1.24

Figure A1. Relationship between relative bill size and relative tarsus length for 44 species of Australasian robins. This graph illustrates the morphological differences between *Amalocichla* species (ground robins; green circles), which were excluded from the present study, and the remaining Petroicidae species (black circles).

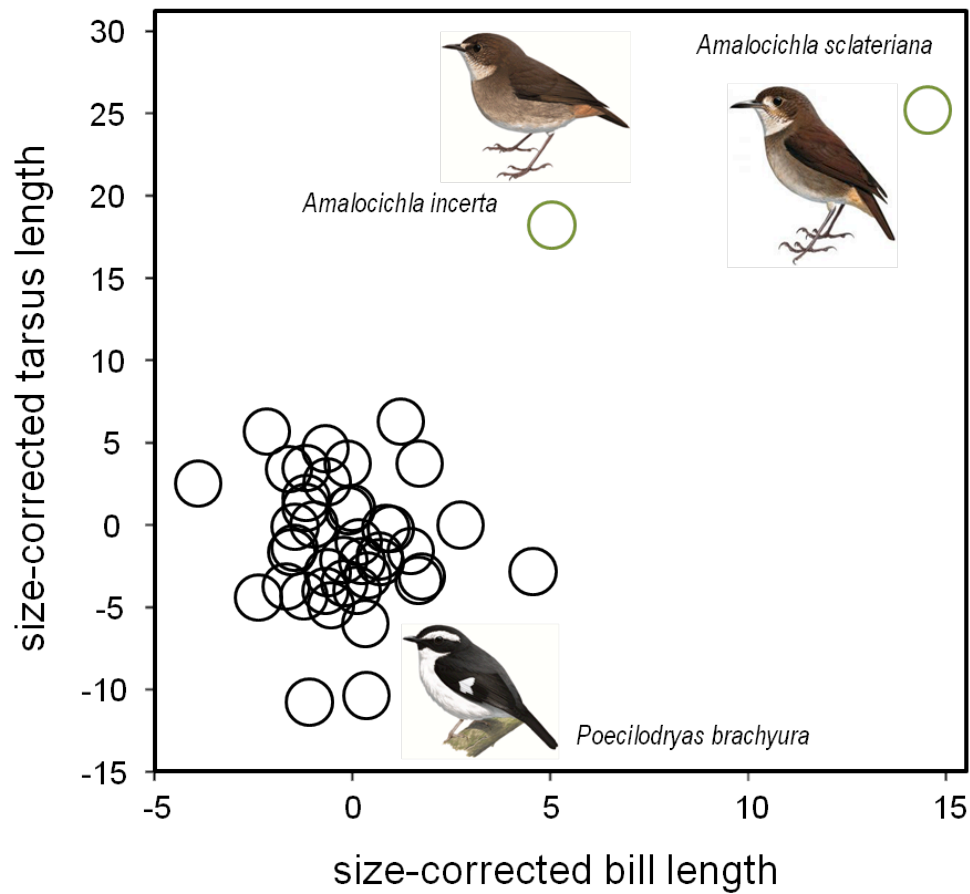


Figure A2. Logarithmic plot of LTT for Australian robins. The numbered circles denote key geological-climatic events in Australia from the Eocene. [1]: complete separation of Australia from Antarctica and first signs of early aridification; [2]: beginning of “mild Miocene”; warm-wet conditions (contraction of rainforests and expansion of sclerophyll) and [3]: end of “mild Miocene”; onset of major aridification.

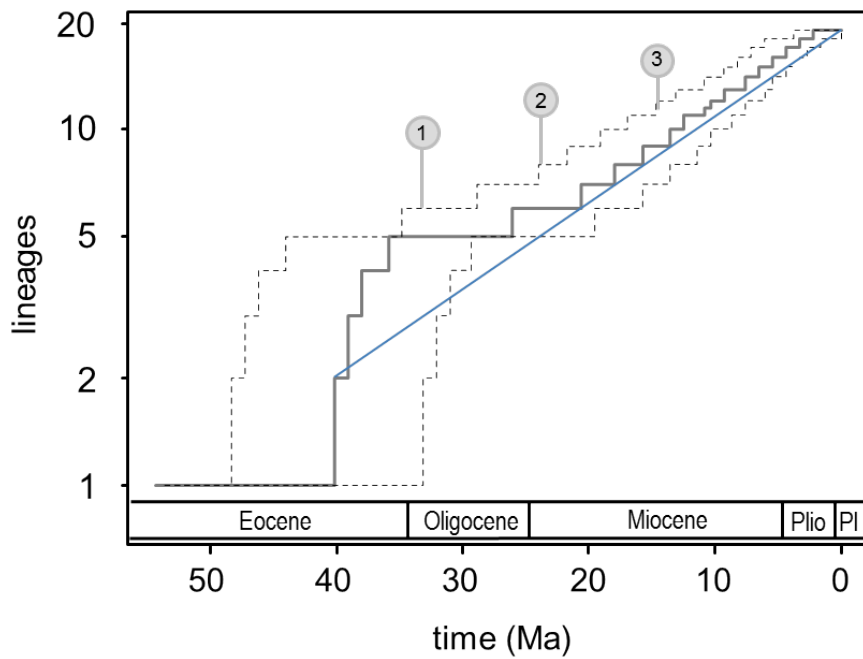


Figure A3. Histogram of the distribution of bootstrapped Wheatsheaf index values computed to examine the level of morphological convergence (in terms of tail length and tarsus length, i.e., PC1) for ground-pouncing in Australasian robins. The calculated Wheatsheaf index observed in our dataset (black arrow) is shown along with its jackknifed 95% confidence interval.

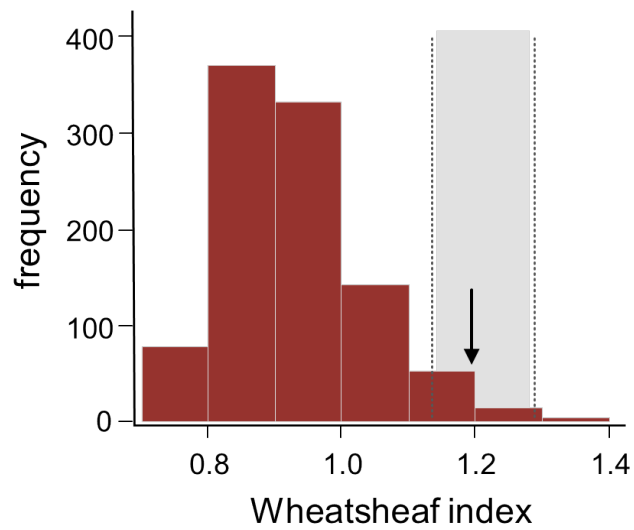


Figure A4. Relationship between the first principal component (PC1) and mean annual temperature in Australasian robins represented in the form of (left) raw data and (right) standardized phylogenetic independent contrasts (PICs). Note that annual temperature correlates positively with annual precipitation in this region ($r = 0.31$, $p = 0.043$). See the main text.

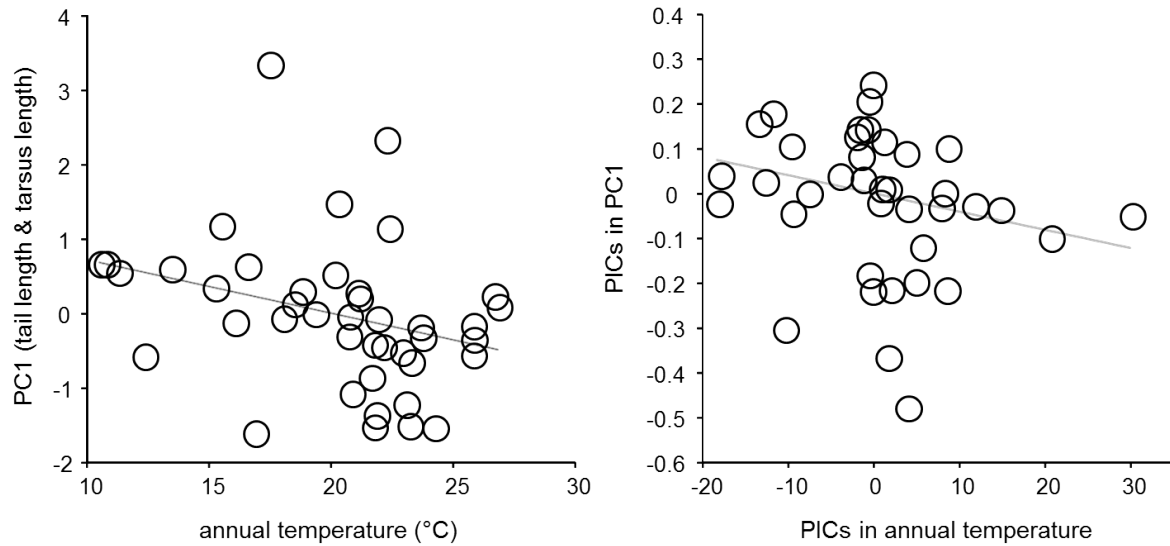


Figure A5. Relationship between the first principal component (PC1) and mean annual precipitation. Colors denote the region in which each species can be found (Australo-Papua region: green; Australia and its offshore islands, including Tasmania: orange; New Zealand: pink; Papua New Guinea: brown; New Caledonia: yellow; West Papua/Indonesia: grey; and Solomon Islands archipelago: blue).

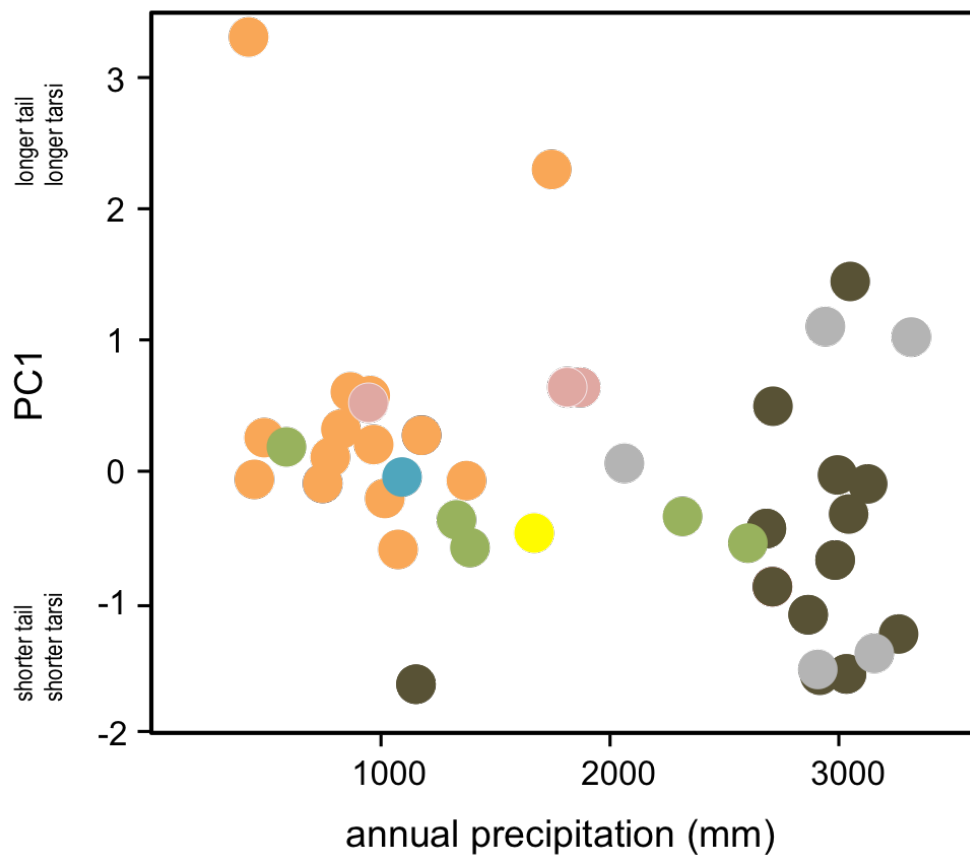


Figure A6. Traitgram showing the projection of the Petroicidae phylogeny into a space defined by annual temperature (C°) (y-axis) and node age, that is, time since divergence from the root (x-axis) for (left) the entire phylogeny and (right) only Australian taxa. The shaded yellow area denotes the beginning of extensive and prolonged aridification at the end of Miocene (11 Mya).

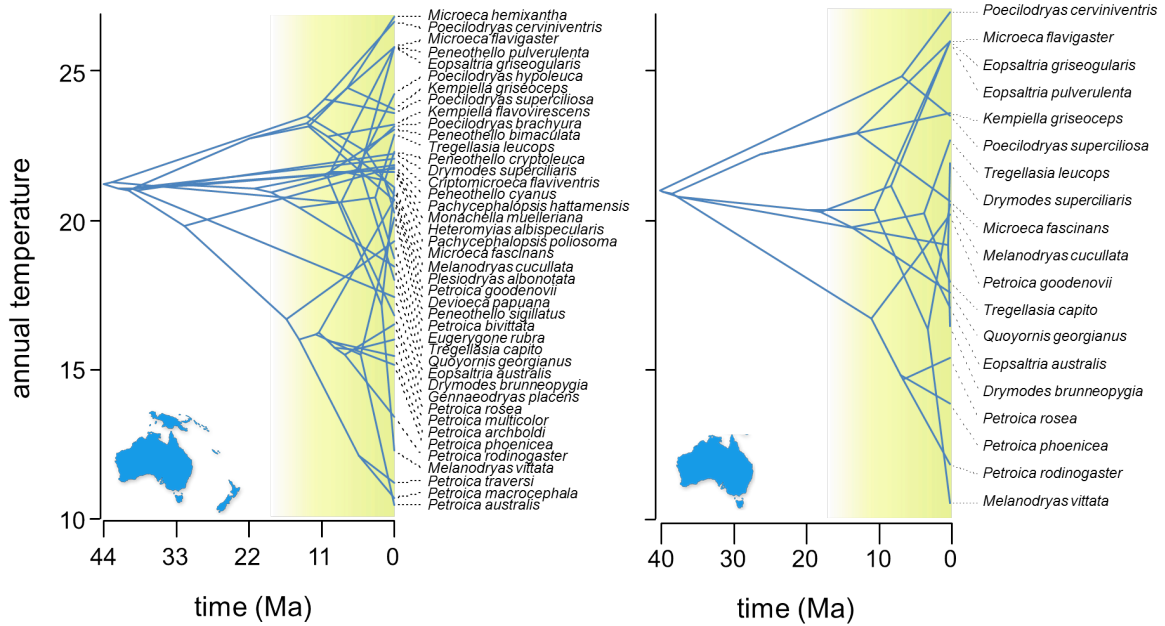


Figure A7. Species range sizes (sum of grid cells in which a species occurs) as function of annual precipitation. The inset shows the same scatterplot after excluding three species (denoted with an arrow; *Microeca fascinans*, *Petroica goodenovii* and *Melanodryas cucullata*) whose range size is more than double that of the remaining species.

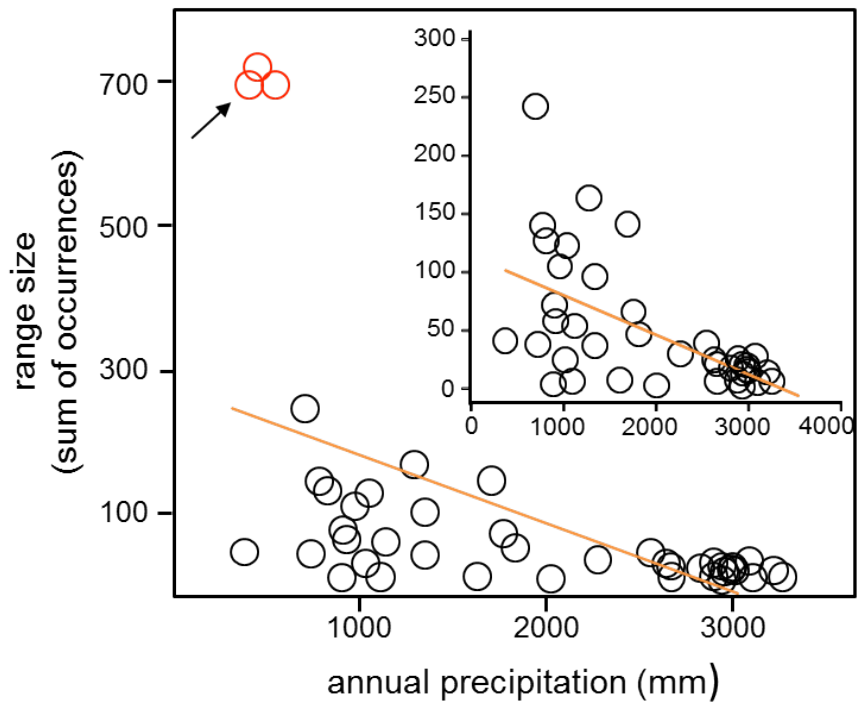


Figure A8. Species richness per 100×100 grid cell as a function of mean annual temperature (top) and mean annual precipitation (bottom).

