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|  | 28 August 2025  Ian G. Brennan  Research School of Biology  +61 0437 208 347  ian.brennan@anu.edu.au |

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Dear Editors of Ecology Letters

We would like to submit the attached manuscript, *Generalists link peaks in the shifting adaptive landscape of Australia’s dragon lizards* for consideration as a Letter in *Ecology Letters*.

Our paper addresses a fundamental question in biology: how do new ecologies and morphologies develop? We have long used the adaptive landscape as a way to identify and cluster species into adaptive zones following the ideas of G.G. Simpson. However, it has remained difficult to explain how new regions of the adaptive landscape become populated. Using a novel high-dimensional morphological dataset paired with genome-scale genetic data we find evidence for the pivotal role generalist species play in connecting disparate adaptive peaks. Our investigation of the lizard body plan suggests that transitions among specialist morphologies (e.g. arboreality, burrowing) are facilitated by generalist ancestors acting as intermediaries. This generalist-to-specialist transition provides a key pathway for explaining how ecological opportunity can result in adaptive radiation. We believe our framework and findings will be of broad interest to the biological community as it highlights the interplay between ecology and adaptive landscape dynamics.

On behalf of myself and coauthors, we thank you for your time and consideration,

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