

Barcelona 28th of November 2022

Dear Professor Barrett,
Editor-in-Chief, *Proceedings of the Royal Society B*

We are excited to submit our manuscript titled “**Evolution along allometric lines of least resistance: Morphological differentiation in *Pristurus* geckos**” for consideration as a Research article in *Proceedings of the Royal Society B*.

We believe our work is of general interest for evolutionary biologists and ecologists because we address the role of different factors in shaping the morphological diversity across multiple ecological contexts. Furthermore, our object of study is the gecko genus *Pristurus* from Afro-Arabia, which was the subject of a previous paper recently published in *Proceedings B* describing its morphological differentiation and evolutionary rates in the context of the island effect and ecological specialization¹.

After revealing that morphological evolution in this genus was driven by ecological specialization rather than by the colonization of insular environments, in this new paper we investigate in more detail the mechanisms shaping that habitat-based differentiation of body size and shape. In particular, we address the role of allometry and phenotypic integration in generating the patterns of morphological diversity in a phylogenetic context, testing for differences in allometric trends and integration levels among the different habitats that this clade utilizes. Our results broadly show that selective pressures act differently in species exploiting different habitats through different allometric trajectories and integration patterns, which leads to similar body shapes in species with different body sizes and ecological characteristics. Another interesting result is the congruence between allometric trends at the individual and the species levels (i.e., static and evolutionary allometry, respectively).

The kind of analyses we present here are, in our opinion, very relevant to understanding how adaptive processes operate and shape the evolutionary dynamics of particular clades. Ecomorphological patterns are fairly well understood for a large number of taxa, but the specific mechanisms through which such patterns originate are not so commonly addressed in the literature. Methodological and theoretical developments in the fields of allometry and integration allow us to look at ecologically-based morphological diversity through a more nuanced lens to discern the processes underlying observed evolutionary patterns. Moreover, while allometric studies usually focus on either evolutionary or static allometry, here, thanks to the extensive morphological dataset on *Pristurus*, we were able to explore both levels, closing the gap and providing insights into the relationship between the two.

We are confident that our manuscript will be of great interest both to the community of evolutionary ecologists and to biologists focused on morphology. Overall, our results get us closer to understand how and why the evolutionary patterns unfold as they do across the tree of life and, therefore, we believe it is a perfect fit for *Proceedings B*.

All authors have agreed to the content of the manuscript and its conclusions, and the paper is not under consideration elsewhere.

Sincerely,
Héctor Tejero-Cicuéndez



References

1. Tejero-Cicuéndez et al. *Proceedings B* 288, 20211821 (2021).

Edifici CMIMA
Psseig Marítim de la Barceloneta 37-49
08003 Barcelona

Tel: 93 230 95 07
FAX: 93 230 95 55

Edifici PRBB
Doctor Aiguader 88
08003 Barcelona

Tel: 93 316 0805
FAX: 93 316 09 01