Madrid, December 18, 2023

Dear Dr Geoffrey North
Editor-in-Chief, *Current Biology*

We would be grateful if you would consider the accompanying manuscript entitled "**Geographic patterns of living tetrapod diversity reveal the signature of global diversification dynamics**", for publication as an Article in *Current Biology*.

In recent years, advances in quantitative comparative methods and an increasing availability of large-scale datasets have bolstered our knowledge of global patterns of vertebrate biodiversity. However, our understanding of the evolutionary processes generating the uneven geographic distribution of biodiversity in modern ecosystems is still incipient.

In this study, we evaluate the links between diversification dynamics, environmental factors, and geographic patterns of species richness in the four main groups of living terrestrial vertebrates (amphibians, squamates, birds, and mammals)—which encompass more than 36,000 living species and span the last 350 million years of vertebrate evolution. Specifically, our approach integrates species richness and phylogenetic relatedness across geographic areas for more than 75% of extant tetrapod species to evaluate the generative evolutionary processes shaping modern day patterns of terrestrial vertebrate diversity. This study is the first of its kind in quantitatively comparing these patterns across major tetrapod clades.

Our results reveal common geographic regions with higher or lower phylogenetic diversity than expected across all tetrapod groups (in Africa and South America, respectively), as well as a widespread effect of recent speciation rates but a negligible effect of clade age. Furthermore, environmental variables differentially affect endotherm and ectotherm lineages. Our study contributes a completely novel global perspective of the generative processes of tetrapod biodiversity which could potentially guide the application of conservation measures and stimulate future studies focused on specific clades.

Our methodology, results and conceptual perspectives are relevant for macroecologists and evolutionary biologists working in the origination and preservation of current biodiversity, as evidenced by the interest generated from the submitted preprint of this article. The phylogenetic dimension of biodiversity also bears implications for conservation prioritisation and strategy, since preserving evolutionary history, and not only hotspots of species richness, has become a priority in the face of the challenges imposed by ongoing loss of biodiversity.

In selecting potential peer reviewers for our manuscript, we recommend well-recognised researchers that have made significant contributions to the study of evolutionary patterns and processes during the last decade. Prof. Erin Saupe (University of Oxford, UK), who has an extensive background exploring the spatio-temporal dynamics of diversity gradients. Dr Sara Varela (University of Vigo, Spain), whose research focuses on the relationship between biodiversity and the environment from a macroecological perspective. Prof. Catalina Pimiento (University of Zurich, Switzerland), whose main research topic is how past diversification dynamics have shaped current biodiversity. Additionally, Prof. Rampal Etienne (University of Groningen, The Netherlands), Dr Alexander Skeels (Australian National University, Australia), and Dr R. Alexander Pyron (The George Washington University, USA), all of whom study macroevolutionary patterns implementing phylogenetic comparative methods.

All authors have agreed to the content of the manuscript and its conclusions, and the paper is not under consideration elsewhere (please note that it has been recently posted in the preprint server *bioRxiv*: https://doi.org/10.1101/2023.11.03.565445).

Yours sincerely,

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