**GCB - SUBMISSION QUESTIONS**

1. What is the scientific question you are addressing?

How is tetrapod species relatedness geographically distributed and what evolutionary or ecological processes underlie this global pattern?

Species relatedness is measured as residual phylogenetic diversity (residual PD): the residuals of the regression between phylogenetic diversity and species richness.

2. What is/are the key finding(s) that answers this question?

Patterns of species relatedness are heterogeneous across tetrapods, but some patterns are coincidental for all clades: low residual PD in South America (species closely related), high residual PD in Africa. Recent speciation contributes to this pattern, and climate affects endotherms and ectotherms differently. Time is not related to residual PD.

3. Why is this work important and timely?

This is the first study, to our knowledge, comparing global tetrapod species relatedness. Besides its implication for conservation, our evolutionary perspective enables a comprehensive exploration of the processes shaping these patterns and serves as a reference for studying similar questions at other taxonomic and geographic scales.

4. Does your paper fall within the scope of GCB; what biological AND global change aspects does it address?

It addresses the phylogenetic relatedness of tetrapod species at a global scale, which is an informative aspect of the generative processes of biodiversity (speciation, extinction, dispersal) and allows for the analysis of the links between these processes and environmental changes shaping the evolutionary and ecological history of these clades.

5. What are the three most recently published papers that are relevant to this question? This information will assist the Editors in selecting reviewers.

Mishler, B. D. Spatial phylogenetics. *Journal of Biogeography* **50**, 1454–1463 (2023).

Vasconcelos, T., O’Meara, B. C. & Beaulieu, J. M. Retiring “Cradles” and “Museums” of Biodiversity. The American Naturalist 199, 195–204 (2022).

Fritz, S. A. & Rahbek, C. Global patterns of amphibian phylogenetic diversity. Journal of biogeography 39, 1373–1382 (2012).

Davies, T. J. & Buckley, L. B. Phylogenetic diversity as a window into the evolutionary and biogeographic histories of present-day richness gradients for mammals. Philosophical Transactions of the Royal Society B: Biological Sciences 366, 2414–2425 (2011).

Earl et al. 2021.

Tucker et al. 2017.