**Proceedings of the National Academy of Sciences**

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**Editorial Board**

**Object:** Cover letter for article submission in PNAS

April 4th, 2024

Dear Editorial Board and Editors,

On the behalf of all co-authors, I am pleased to submit a manuscript entitled “Müllerian mimicry in Neotropical butterflies: One mimicry ring to bring them all, and in the jungle bind them” for consideration for publication as an original research article in PNAS.

In this study, we investigate the importance of positive interactions in driving species niche evolution and shaping biodiversity patterns and community composition at large spatial scale. We explore this topic using Müllerian mimicry in Neotropical butterflies, an emblematic example of mutualistic interactions between defended prey species, as a textbook case-study. We focus on the highly diverse nymphalid tribes of Heliconiini and Ithomiini, which were instrumental in the discovery and formalization of mimicry by Bates (1862) and Müller (1879). Despite 85 My of independent evolutionary histories, many species in the two tribes share similar warning wing patterns across the Neotropics.

Leveraging decades of fieldwork observations and museum collections, we show that phenotypically similar species present striking broadscale associations in spatial distributions and climatic niche evolution both within and between tribes, thereby providing new empirical support for Müller’s historical model of mimicry at a continental scale. Furthermore, our comparative phylogenetic analyses suggest that co-mimetic species within and between tribes have converged towards similar climatic niche, thus further reinforcing their co-occurrence.

Our findings emphasize the traditionally overlooked importance of intraguild positive interactions in ecology and evolution, by illustrating how they can shape large scale distribution patterns and drive species niche convergence even across evolutionarily distant lineages. As such, we believe our study will appeal to a wide audience interested in community ecology, evolutionary biology, biogeography, and conservation biology, and that it may be suitable for publication in your journal. We thank you for your time and consideration and look forward to hearing from you.

Sincerely yours,

Maël Doré

