



## Unravelling the history of Neotropical plant diversification

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### A recommendation of

Pirie MD, Maas PJM, Wilschut RA, Melchers-Sharrott H, Chatrou LW. 2017. **Parallel diversifications of *Crematosperma* and *Mosannonna* (Annonaceae), tropical rainforest trees tracking Neogene upheaval of the South American continent.** *BioRxiv*, 141127, ver. 3 of 28<sup>th</sup> September 2017. doi: [10.1101/141127](https://doi.org/10.1101/141127)

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South American rainforests, particularly the Tropical Andes, have been recognized as the hottest spot of plant biodiversity on Earth, while facing unprecedented threats from human impact [1,2]. Considerable research efforts have recently focused on unravelling the complex geological, bioclimatic, and biogeographic history of the region [3,4]. While many studies have addressed the question of Neotropical plant diversification using parametric methods to reconstruct ancestral areas and patterns of dispersal, Pirie *et al.* [5] take a distinct, complementary approach. Based on a new, near-complete molecular phylogeny of two Neotropical genera of the flowering plant family Annonaceae, the authors modelled the ecological niche of each species and reconstructed the history of niche differentiation across the region. The main conclusion is that, despite similar current distributions and close phylogenetic distance, the two genera experienced rather distinct processes of diversification, responding differently to the major geological events marking the history of the region in the last 20 million years (Andean uplift, drainage of Lake Pebas, and closure of the Panama Isthmus).

As a researcher who has not personally worked on Neotropical biogeography, I found this paper captivating and especially enjoyed very much reading the Introduction, which sets out the questions very clearly. The strength of this paper is the near-complete diversity of species the authors were able to sample in each clade and the high-quality data compiled for the niche models. I would recommend this paper as a nice example of a phylogenetic study aimed at unravelling the detailed history of Neotropical plant diversification. While large,

synthetic meta-analyses of many clades should continue to seek general patterns [4,6], careful studies restricted on smaller, but well controlled and sampled datasets such as this one are essential to really understand tropical plant diversification in all its complexity.

## References

- [1] Antonelli A, and Sanmartín I. 2011. Why are there so many plant species in the Neotropics? *Taxon* 60, 403–414.
- [2] Mittermeier RA, Robles-Gil P, Hoffmann M, Pilgrim JD, Brooks TB, Mittermeier CG, Lamoreux JL and Fonseca GAB. 2004. Hotspots revisited: Earths biologically richest and most endangered ecoregions. CEMEX, Mexico City, Mexico 390pp.
- [3] Antonelli A, Nylander JAA, Persson C and Sanmartín I. 2009. Tracing the impact of the Andean uplift on Neotropical plant evolution. *Proceedings of the National Academy of Science of the USA* 106, 9749–9754. doi: [10.1073/pnas.0811421106](https://doi.org/10.1073/pnas.0811421106)
- [4] Hoorn C, Wesselingh FP, ter Steege H, Bermudez MA, Mora A, Sevink J, Sanmartín I, Sanchez-Meseguer A, Anderson CL, Figueiredo JP, Jaramillo C, Riff D, Negri FR, Hooghiemstra H, Lundberg J, Stadler T, Särkinen T and Antonelli A. 2010. Amazonia through time: Andean uplift, climate change, landscape evolution, and biodiversity. *Science* 330, 927–931. doi: [10.1126/science.1194585](https://doi.org/10.1126/science.1194585)
- [5] Pirie MD, Maas PJM, Wilschut R, Melchers-Sharrott H and Chatrou L. 2017. Parallel diversifications of *Crematosperma* and *Mosannonna* (Annonaceae), tropical rainforest trees tracking Neogene upheaval of the South American continent. *bioRxiv*, 141127, ver. 3 of 28th Sept 2017. doi: [10.1101/141127](https://doi.org/10.1101/141127)
- [6] Bacon CD, Silvestro D, Jaramillo C, Tilston Smith B, Chakrabartye P and Antonelli A. 2015. Biological evidence supports an early and complex emergence of the Isthmus of Panama. *Proceedings of the National Academy of Science of the USA* 112, 6110–6115. doi: [10.1073/pnas.1423853112](https://doi.org/10.1073/pnas.1423853112)

## Appendix

Reviews by Hervé Sauquet and Thomas Couvreur: <http://dx.doi.org/10.24072/pci.evolbiol.100033>