Does climate limit arboreality in lungless salamanders?

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Introduction

- Arboreality has evolved *at least* 5 times within Plethodontid salamanders. [1]
- Yet no morphological differences separate arboreal and terrestrial species. [1]
- There is minimal range overlap between the two microhabitat types. Preliminary results discovered that 71% of the arboreal species distribution does not overlap with the terrestrial species distribution.

From these observations we tested the following hypotheses:

(***H1***) Terrestrial species do not live in habitats suitable for arboreality

(***H2***) Arboreal species do not live in habitats suitable for terrestrial life

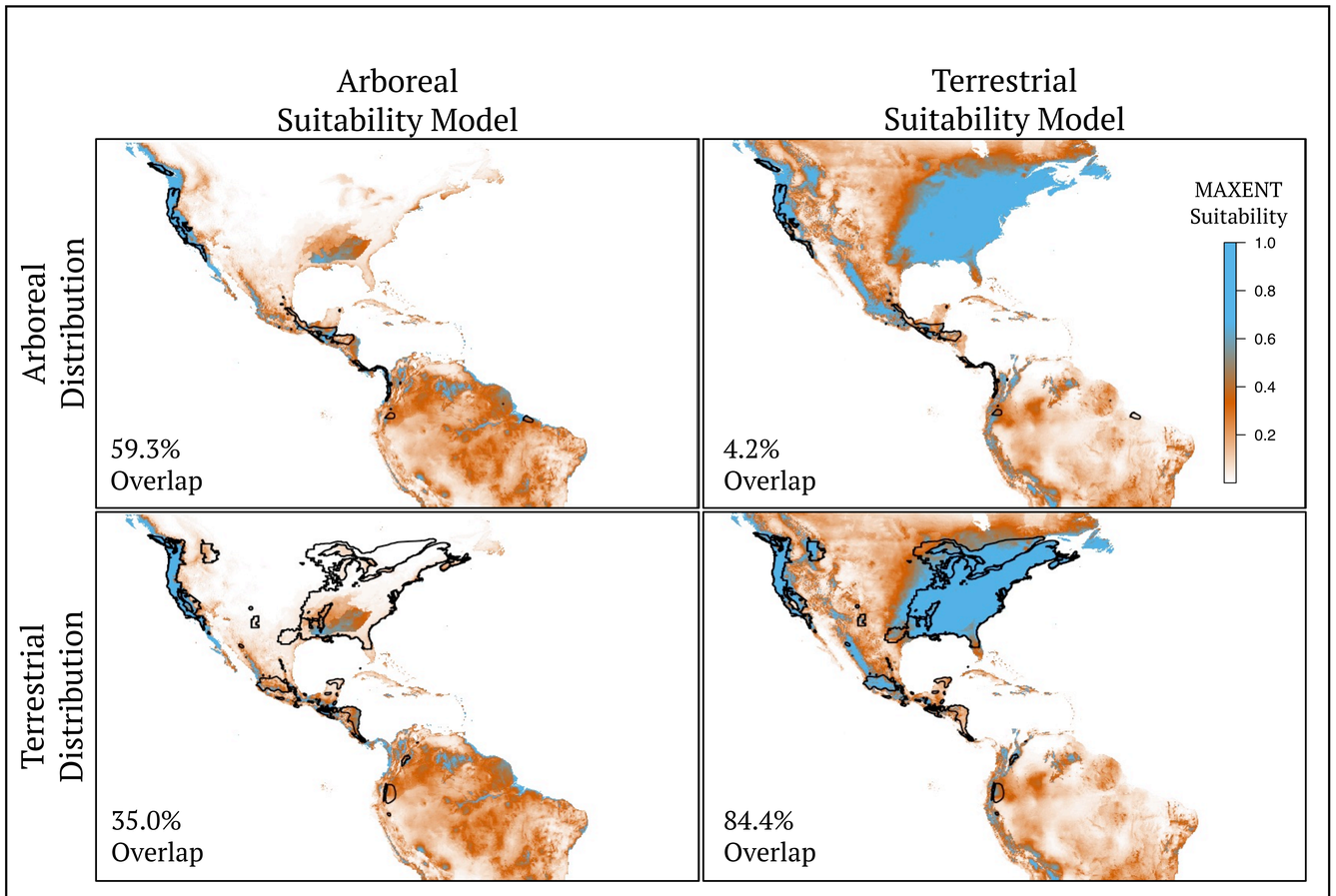
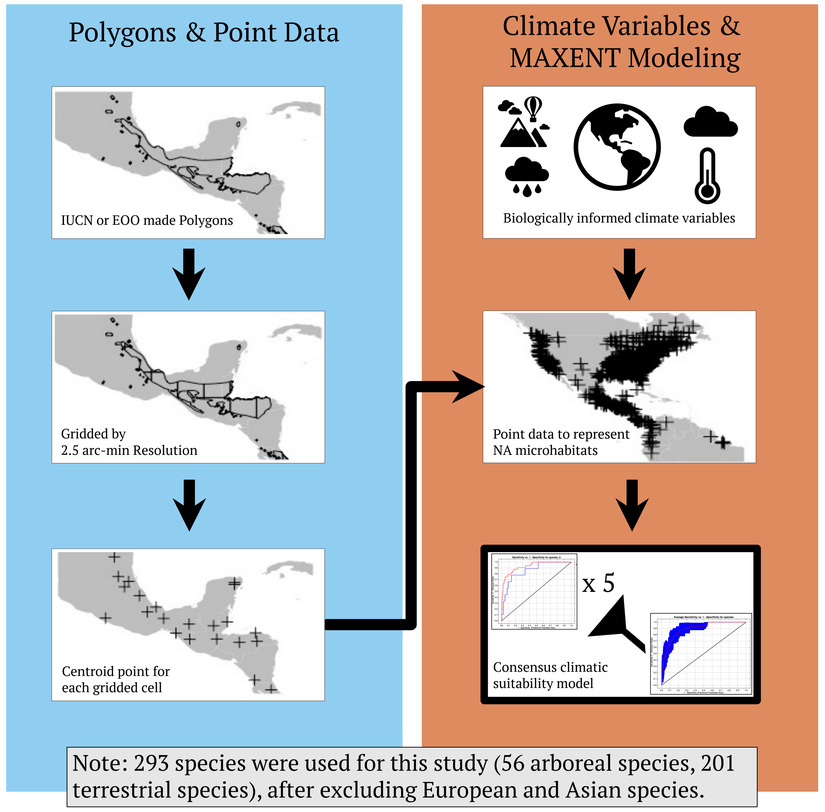


Figure 1. We used environmental niche models (ENM) to evaluate the overlap in species distributions and their corresponding niche models. Blue coloration representing 0.5 suitability, red coloration representing 0.25-0.49 suitability, and white coloration representing 0-0.24 suitability. Models averaged over 5 all with AUC above 0.85.

Materials & Methods



Note: 293 species were used for this study (56 arboreal species, 201 terrestrial species), after excluding European and Asian species.

Conclusions

Despite the broad scale of these climate data, we found:

(***H1***) Little of the terrestrial species distribution is suitable for arboreality (35%)

(***H2***) Even less of the arboreal species distribution is suitable for terrestrial life (4%)

Future Directions

- These results suggest climate may have influenced the macroevolution of arboreality in this family. Further research is needed to elucidate this pattern.
- Understanding the climatic limits of different species can inform future climate projection models. [2]

Acknowledgments & Literature Cited

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