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Short Title: XXX

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Data Archiving: Data are available on DRYAD (doi:10.5061/dryad.xwdbrv1f6 (Tejero-Cicuéndez et al.

2021b)). R-scripts are found in the Supplemental Information.

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Abstract

asdf

Introduction

some general paragraph on the evolution of phenotypic diversity

when organisms colonize new and unique habitats, they are subjected to novel ecological selection pressures in those habitats. Often these selective pressures elicit changes in body form, as organisms adapt to their new habitats (examples: some comment on ecomorphs, etc.). .... leads to so-called ecomorphs, with such well known examples in Anolis lizards, cichlid fishes, etc. It follows that ... Some comment on the fact that clades living in diverse ecological conditions often display greater diversity in form and function (REFS).

However, while the above patterns have been well documented in a variety of vertebrate taxa, what remains less known is how allometry plays a role in this phenotypic diversification. We know that XYZPDQ (about allometry). Then links to diversity..

The Afro-Arabian geckos in the genus *Pristurus* afford the opportunity to elucidate the interdigitating effects of allometry and habitat specialization on clade-level patterns of phenotypic diversity. Prior work on this system (Tejero-Cicuéndez et al. 2021a) has revealed that ... (sentence or 2 about your prior study, getting to diversity and ... Importantly, ... something about habitat. .... What remains unexamined however, is XYZPDQ...

In this study, we ...

Materials and Methods

Data

Phylogenetic, ecological, phenotypic.... (describe briefly). Data from (Tejero-Cicuéndez et al. 2021a).

Statistical Analyses

To test the hypothesis...

- Mancova body ~ SVL*hab.gp
  - PW of slopes, and inspected reg. coefficients to identify biological trends
  - Visualized multivariate regressions via regression scores (sensu Drake and Klingenberg 2008) and predicted lines (sensu Adams and Nistri 2010)
- Examine allometry phylogenetically.

  - PLS of head vs. SVL and limb vs SVL. Obtained scores on 1st axis for each.
  - within-species regressions of Head.sc ~ SVL & limb.sc ~ SVL; obtained regression coefficients (slopes)
  - mapped slopes on phylogeny under BM and generated traitgrams to identify changes in allometric relationships across the phylogeny
- Finally, to link allometric patterns with trends in phenotypic diversification we obtained size-standardized species means, following procedures in H TC paper (residuals from phylo-regressions of traits on SVL, residuals). We then performed an ordination to obtain a phylomorphospace, where habitat types and species could be observed.

Results

Discussion

References

Adams, D. C., and A. Nistri. 2010. Ontogenetic convergence and evolution of foot morphology in european cave salamanders (family: plethodontidae). BMC Evolutionary Biology 10:1–10. BioMed Central.

Drake, A. G., and C. P. Klingenberg. 2008. The pace of morphological change: Historical transformation of skull shape in st bernard dogs. Proceedings of the Royal Society B: Biological Sciences 275:71–76.

Tejero-Cicuéndez, H., M. Simó-Riudalbas, I. Menéndez, and S. Carranza. 2021a. Ecological specialization, rather than the island effect, explains morphological diversification in an ancient radiation of geckos. Proceedings of the Royal Society B: Biological Sciences 288:20211821.

Tejero-Cicuéndez, H., M. Simó-Riudalbas, I. Menéndez, and S. Carranza. 2021b. Ecological specialization, rather than the island effect, explains morphological diversification in an ancient radiation of geckos. Dryad digital repository. (Doi:10.5061/dryad.xwdbrv1f6).

Figures

Figure 1. Linear Measures

Figure 2. Plot of regression scores and predicted lines representing the relationship between linear body measurements and size (SVL). Individuals occupying differing habitats are denoted by distinct colors as: rock (beige), ground (dark purple), and tree (magenta).

Figure 3. Traitgrams showing the evolution of body size (SVL) through time mapped on the phylogenetic tree of *Pristurus*. Colors represent evolutionary mapping of

colored by (A) mapped by the discrete categories of presence in Socotra or the continent (left) and by ecological specialization (right).

Figure 4. Phylomorphospace

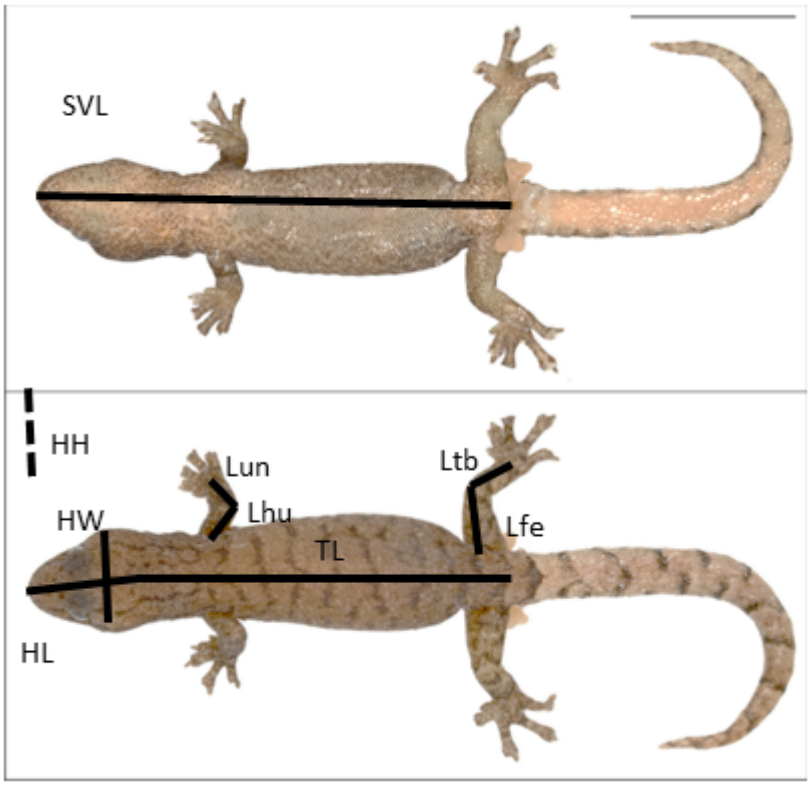

Figure 1: asdf.

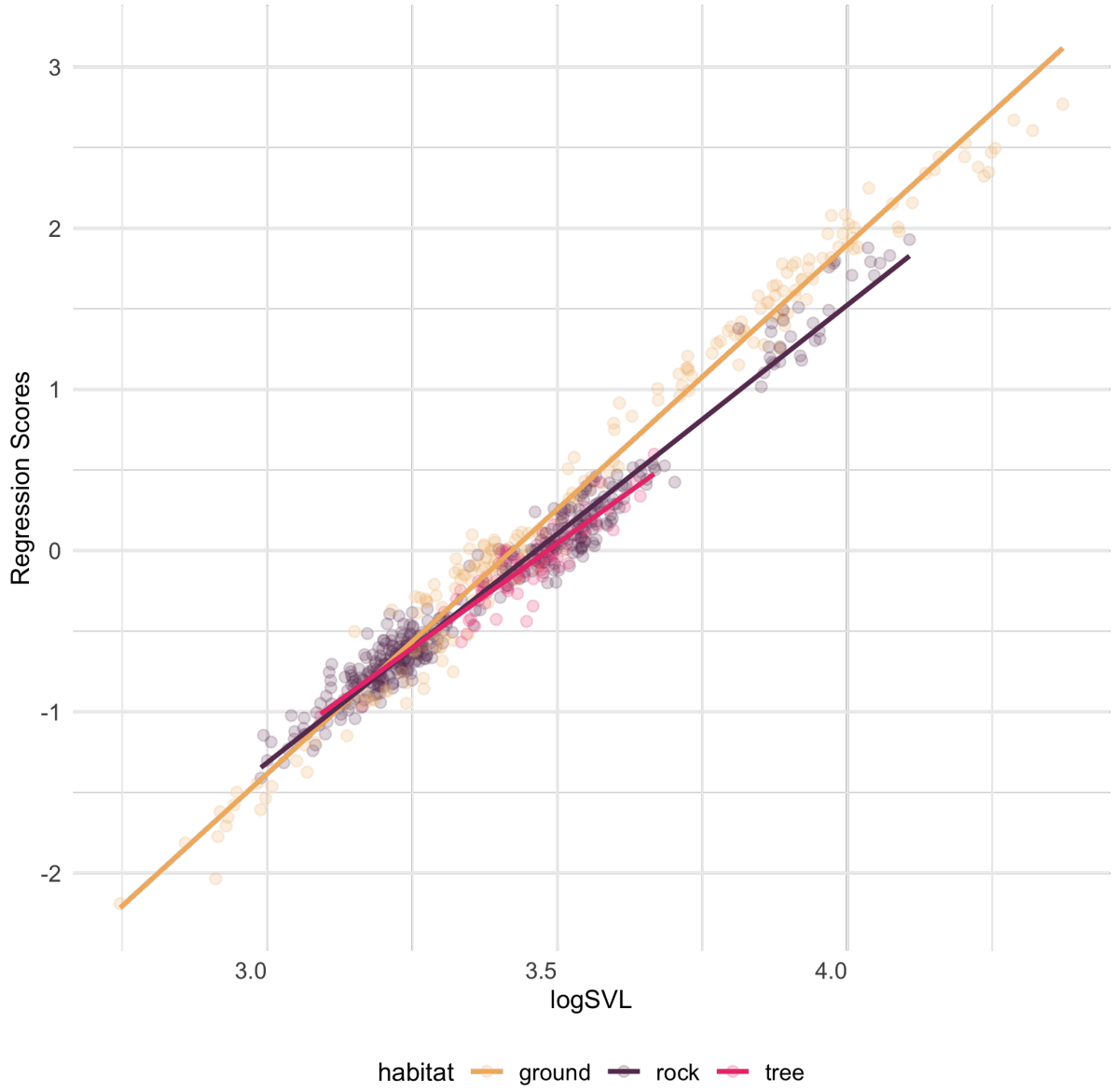

Figure 2: Plot of regression scores and predicted lines representing the relationship body proportions and body size (SVL). Individuals occupying differing habitats are denoted by distinct colors as: rock (beige), ground (dark purple), and tree (magenta).

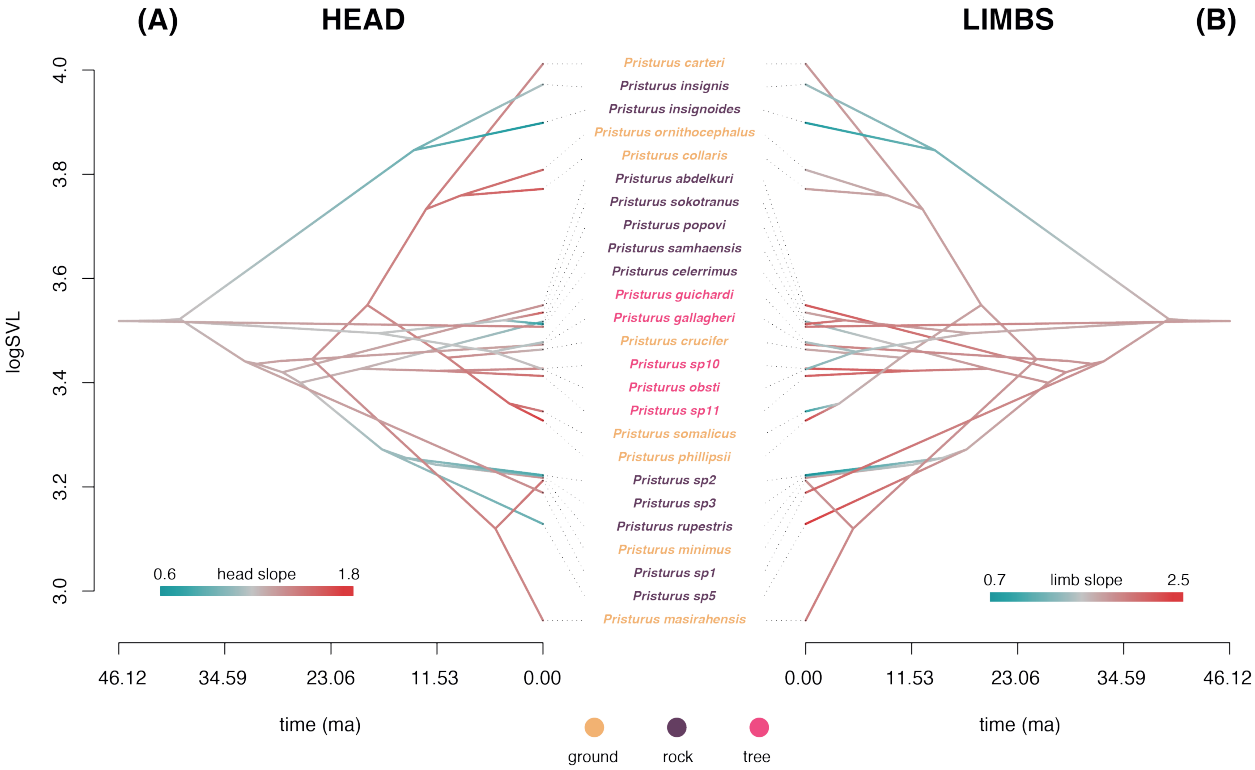
(A)
HEAD
LIMBS
(B)
logSVL
4.0
3.8
3.6
3.4
3.2
3.0
Pristurus carteri
Pristurus insignis
Pristurus insignoides
Pristurus ornithocephalus
Pristurus collaris
Pristurus abdelkuri
Pristurus sokotranus
Pristurus popovi
Pristurus samhaensis
Pristurus celerrimus
Pristurus guichardi
Pristurus gallagheri
Pristurus crucifer
Pristurus sp10
Pristurus obsti
Pristurus sp11
Pristurus somalicus
Pristurus phillipsii
Pristurus sp2
Pristurus sp3
Pristurus rupestris
Pristurus minimus
Pristurus sp1
Pristurus sp5
Pristurus masirahensis
0.6
head slope
1.8
0.7
limb slope
2.5
46.12
34.59
23.06
11.53
0.00
0.00
11.53
23.06
34.59
46.12
time (ma)
time (ma)
ground
rock
tree

Figure 3: xxx.

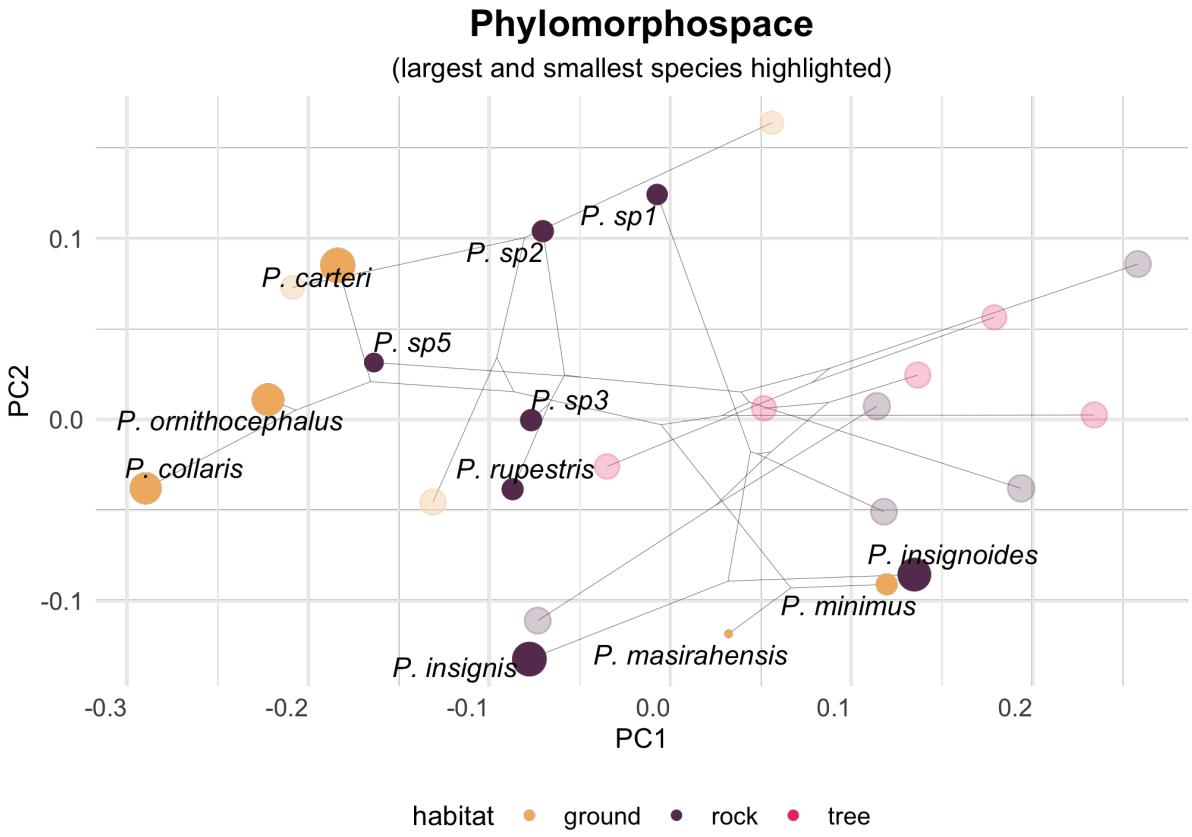

Figure 4: asdf.