Climatic niche evolution on oceanic archipelagos

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At biome scales considered to be highly conserved and can shape large scale biogeographic patterns

However, niche evolution at small scales can extraordinarily rapid

Crisp et al 2009
Can we simultaneously explain patterns of climatic niche and contemporary biogeographic patterns within clades, using information on their evolutionary and biogeographic history?
Islands
Hawaiian lineages

Viola

Silverswords

Psychotria
Biogeography of speciation

In-situ

Dispersal
Conclusions

❖ Founder-event dispersal mediated cladogenesis is not associated with higher magnitude of niche change

❖ but statistical power limited for some clades!

❖ Other considerations

❖ island ontogeny; climatic profile; extinction; life history traits?
Thank you!

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Future directions and caveats

❖ More fine-scale climatic data (but ideally requires high-quality geo-referenced collections locality data)
❖ Extinction
❖ Different colonisation histories
  ❖ Inter-clade interactions
  ❖ Island ontogenetic differences
❖ Phylogenetic uncertainty
Habitat shifts and biogeography

- Biogeography and niche evolution are intricately linked
- Probability of niche / habitat shift
  - Relative geographic opportunity
  - Relative intrinsic evolutionary lability
- Ecological interactions with incumbent species