Evolving in a tangled world

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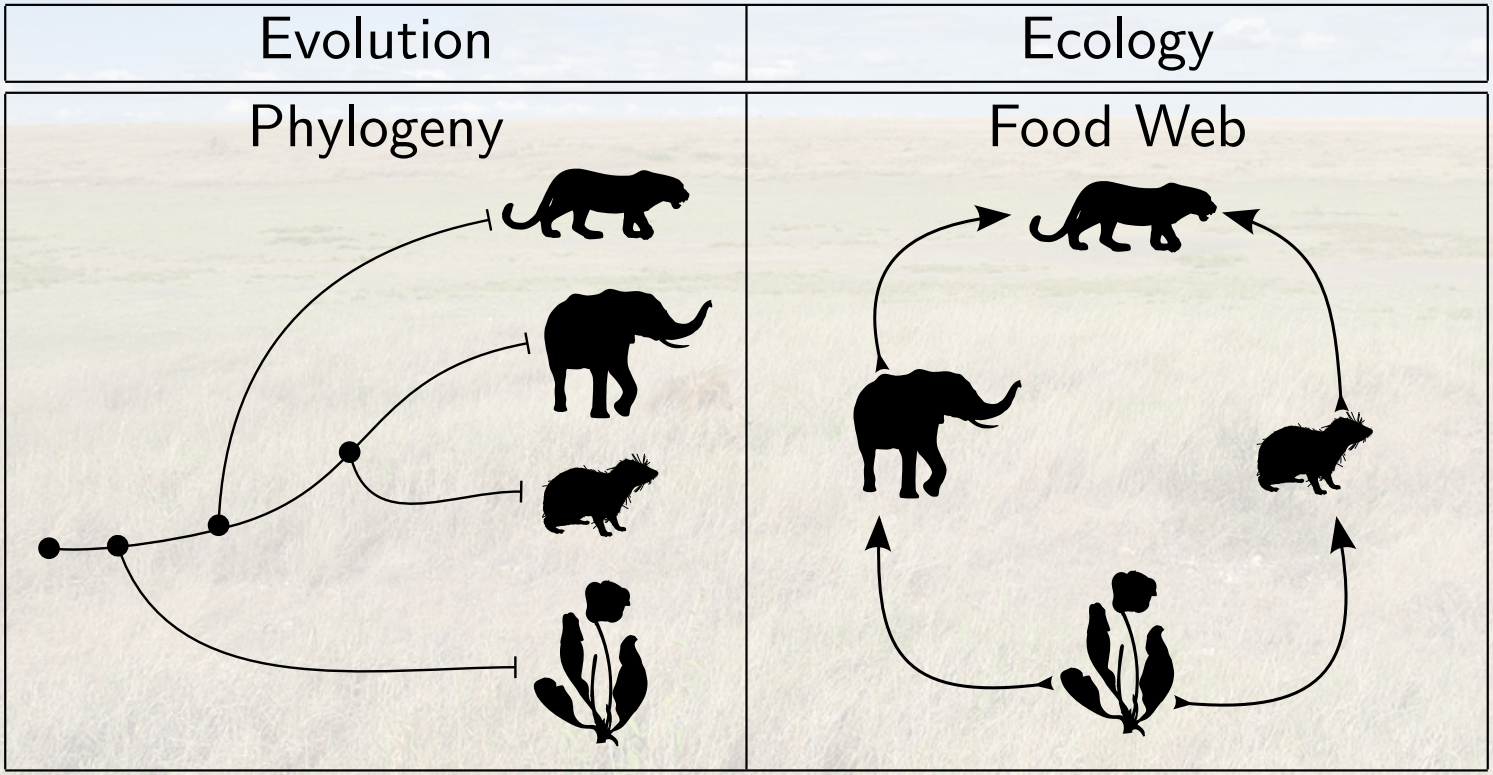
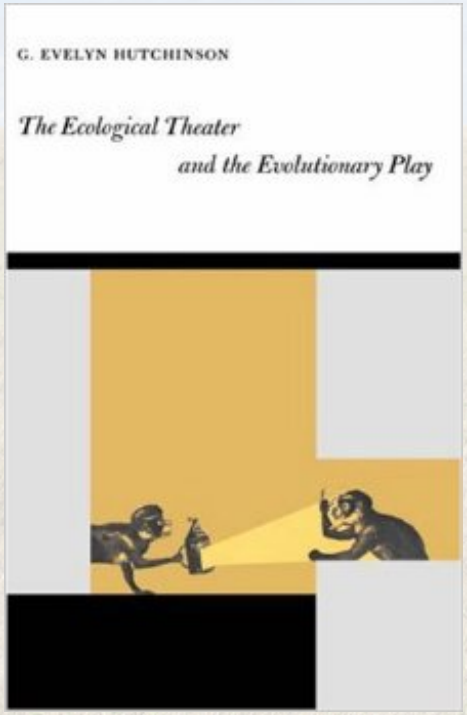
Species are entangled

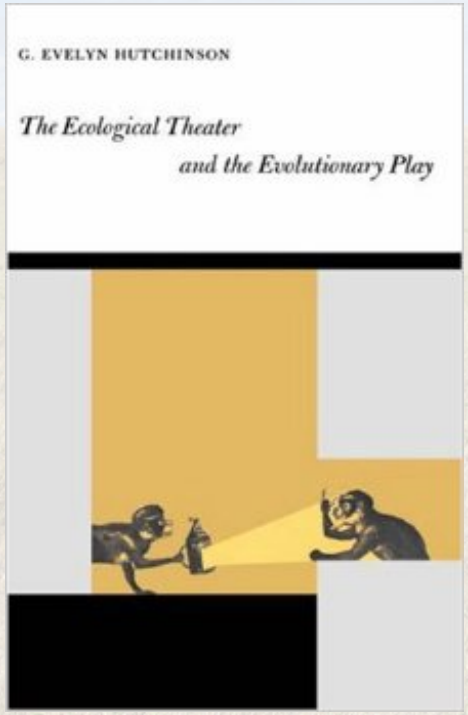


the Theater and the Play



Ecology and Evolution occur on different time scales?

the Theater and the Play



Well, maybe, when evolution is really fast...

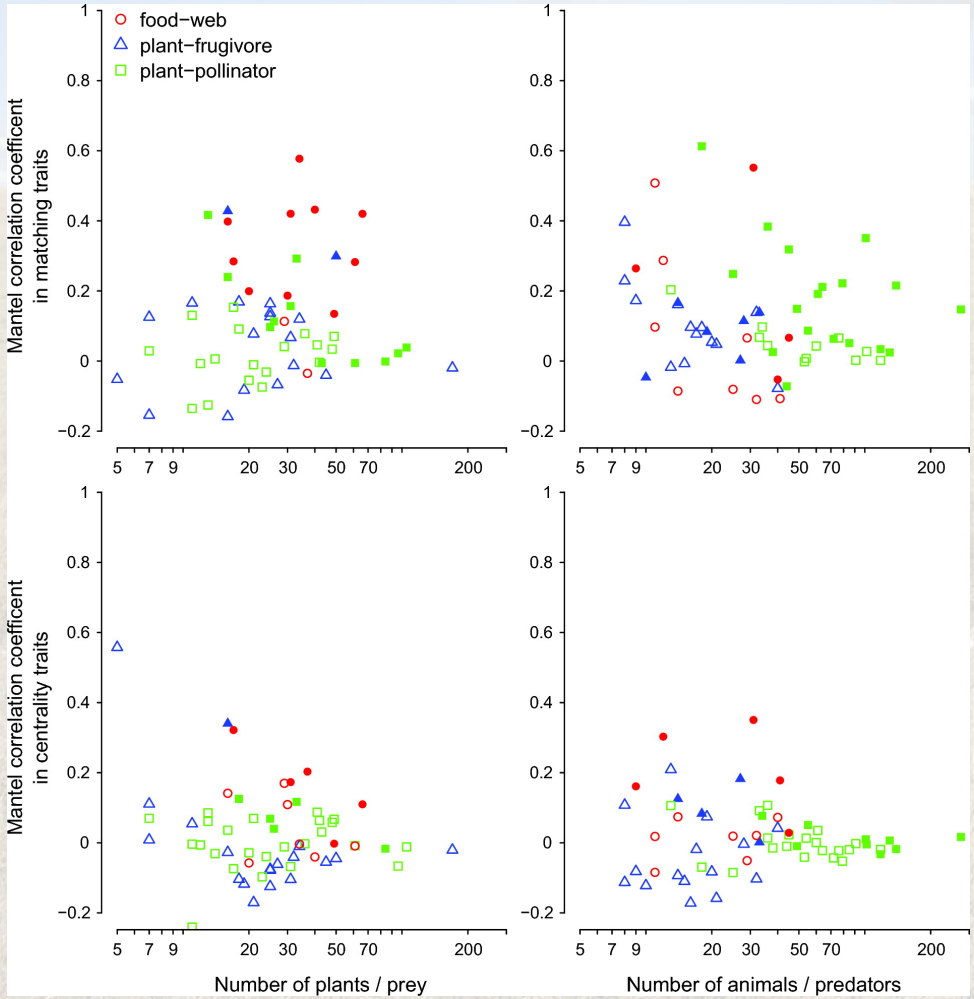
A Web on a Tree

It's hard to fit a Web on a Tree because of all the fine wirings.

Courtesy of Erik Moncada

A Web on a Tree

And you don't always get something out of it.



Rohr & Bascompte, Am Nat 184, 5 (2014)

A Metric Space on a Tree

What if we could do without the wiring?

[Two images: Serengeti and Weddell]

Food Webs embedded

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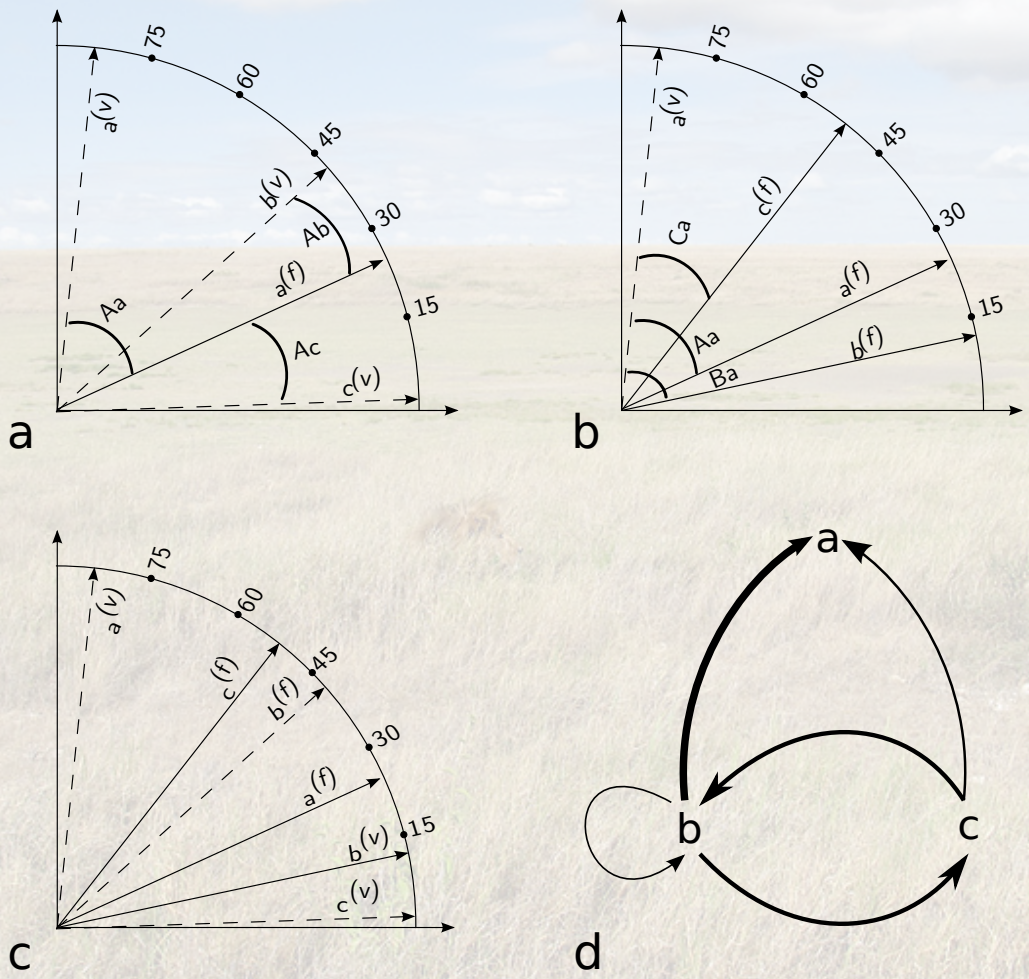
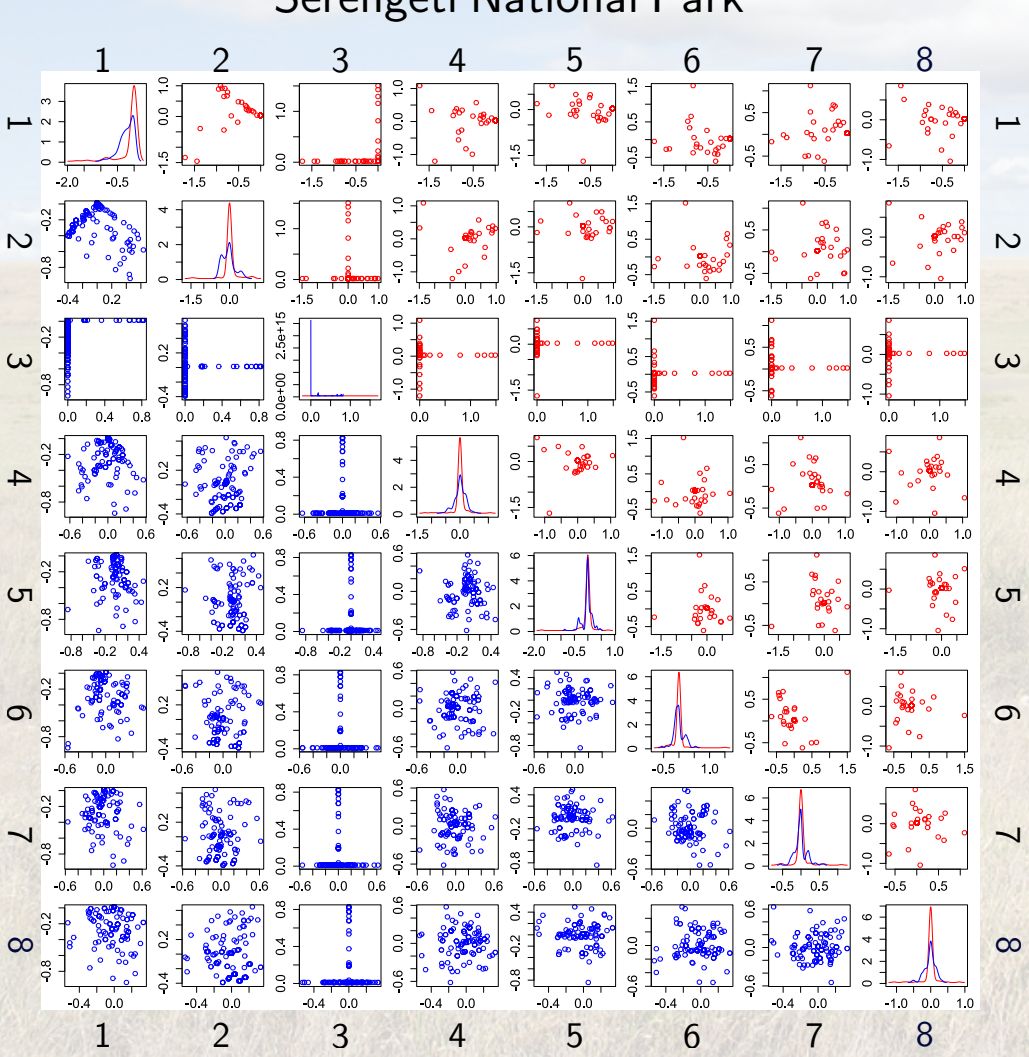
- SVD(Adjacency) gives $\mathbb{T}_{out}$ and $\mathbb{T}_{in}$

Food Webs embedded



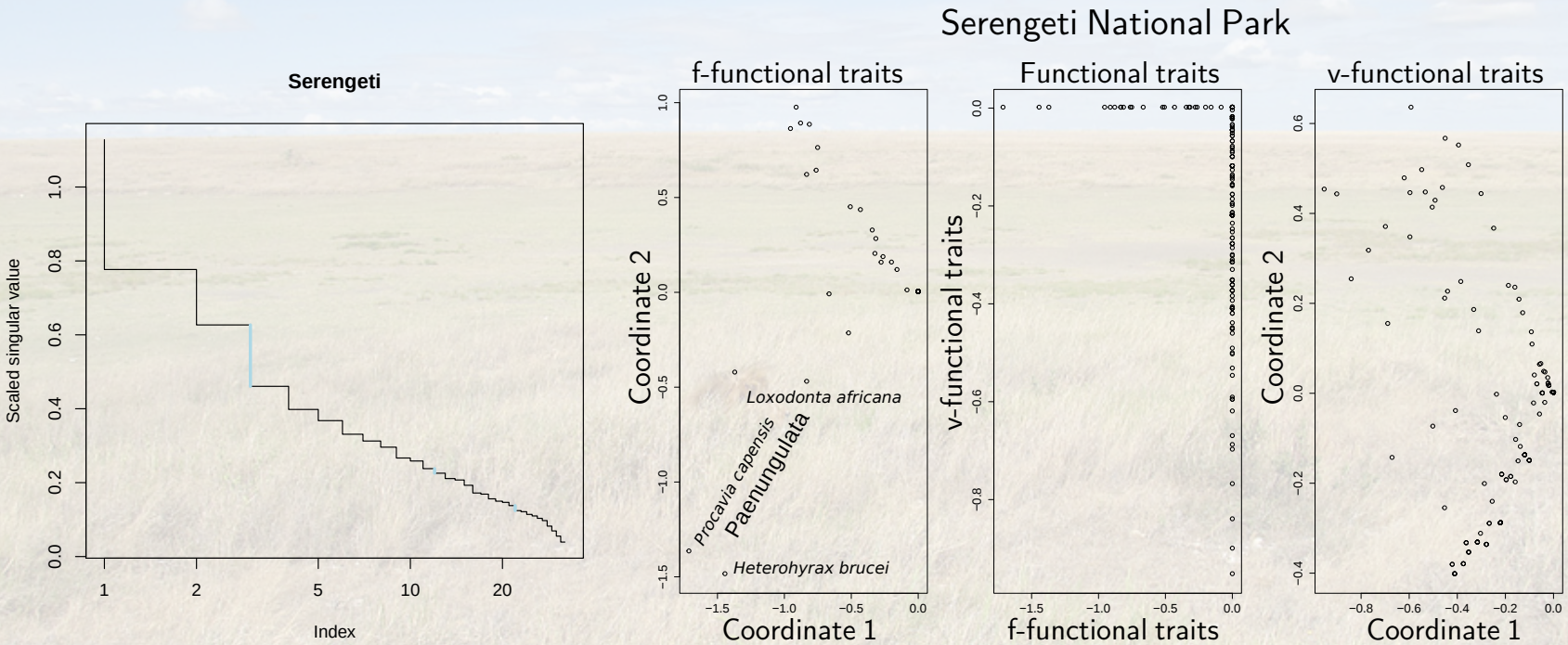
Three species toy model. gvdr & Daniel B. Stouffer, appearing

Food Webs embedded



A Food Web as you've never seen it

Food Webs embedded



SVDS allows helps in choosing a suitable model dimension.

Observed traits vs. Expectation

$$\text{vcv}\left(\hat{x}|\tau, \text{null model}\right) \text{ vs. } \text{vcv}\left(x\right)$$

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- Ornstein-Uhlenbeck (BM + rubber band)

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  $d \in \{2, \ldots, 8\}$
- $\therefore$ "fine wirings" may be deceiving
- Evolutionary model is inadequate

  no interaction effects

(Not a) Conclusion

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- Spoiler 1: Evolutionary distinctiveness vs. Web Centrality
  Do evolutionary unique species play a keystone role in Food Webs?
- Spoiler 2: An ecological informed model of species evolution maybe it's (almost) there.
  I am looking at you, Ornstein and Uhlenbecki ...

Thanks!

Joint work with Daniel B. Stouffer (University of Canterbury)

Many thanks to Mike Steel; Carey Priebe; A. Mooers', D.B. Stouffer's & J. Tylianakis's labs; ...

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By the way, I'm looking for a postdoc.
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