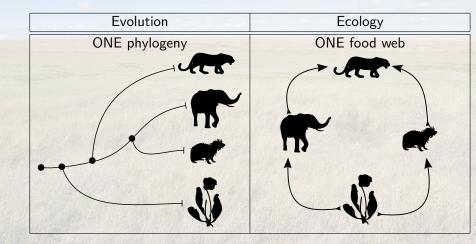
### Stochasticity and Evolution in Food Webs

Giulio Dalla Riva University of Canterbury, NZ

Granada Seminar June 16, 2015

### species ARE related



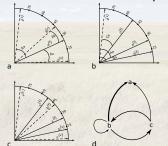
# Evolution in/of Ecology

Evolution shaped the stochastic backbones of Food Webs

[Two images: Serengeti and Weddell]

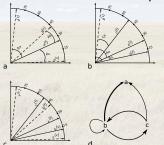
#### Food Webs embedded

► Random Dot Product Graphs



#### Food Webs embedded

► Random Dot Product Graphs



► Phylogenetic vs. Observed traits

 $\mathit{vcv}\left(\hat{X}|\ \mathsf{evolutionary\ model}\right)\ \mathsf{vs.}\ \mathit{vcv}\left(X\right)$ 

► There is phylogenetic signal

- ► There is phylogenetic signal
- ► It is quite weak

- ► There is phylogenetic signal
- ► It is quite weak
- ► It saturates with dimensionality

- ► There is phylogenetic signal
- ► It is quite weak
- ► It saturates with dimensionality
- ► Fine wirings may be deceiving

- ► There is phylogenetic signal
- ► It is quite weak
- ► It saturates with dimensionality
- ► Fine wirings may be deceiving
- ► Evolutionary model is inadequate

# (Not a) Conclusion

► Spoiler 1: Evolutionary distinctiveness vs. Web Centrality

## (Not a) Conclusion

- ► Spoiler 1: Evolutionary distinctiveness vs. Web Centrality
- Spoiler 2: An ecological informed model of species evolution maybe it's (almost) there.

#### 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; ...

Funds by the Allan Wilson Centre for Molecular Ecology and Evolution.

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