Functional Roles of Migratory Waterbirds

Josh Nightingale

Universidade Federale do Rio Grande do Sul

& Erasmus Mundus
International Master in Applied Ecology

Questions

- Community assembly in same environments from different species pools
  - Is there evidence of consistency?
  - i.e., environmental determinism

Questions

- Functional equivalence of summer and winter migrants?
- Functional roles of migratory vs resident species?
- Differences between habitats in functions supported?

Approach

- Functional roles of migratory vs resident species?
  - PCoA scores from Gower distance matrix
    - Compare between migrants and residents
    - Difference between pairs of migrants vs. random pairs

Approach

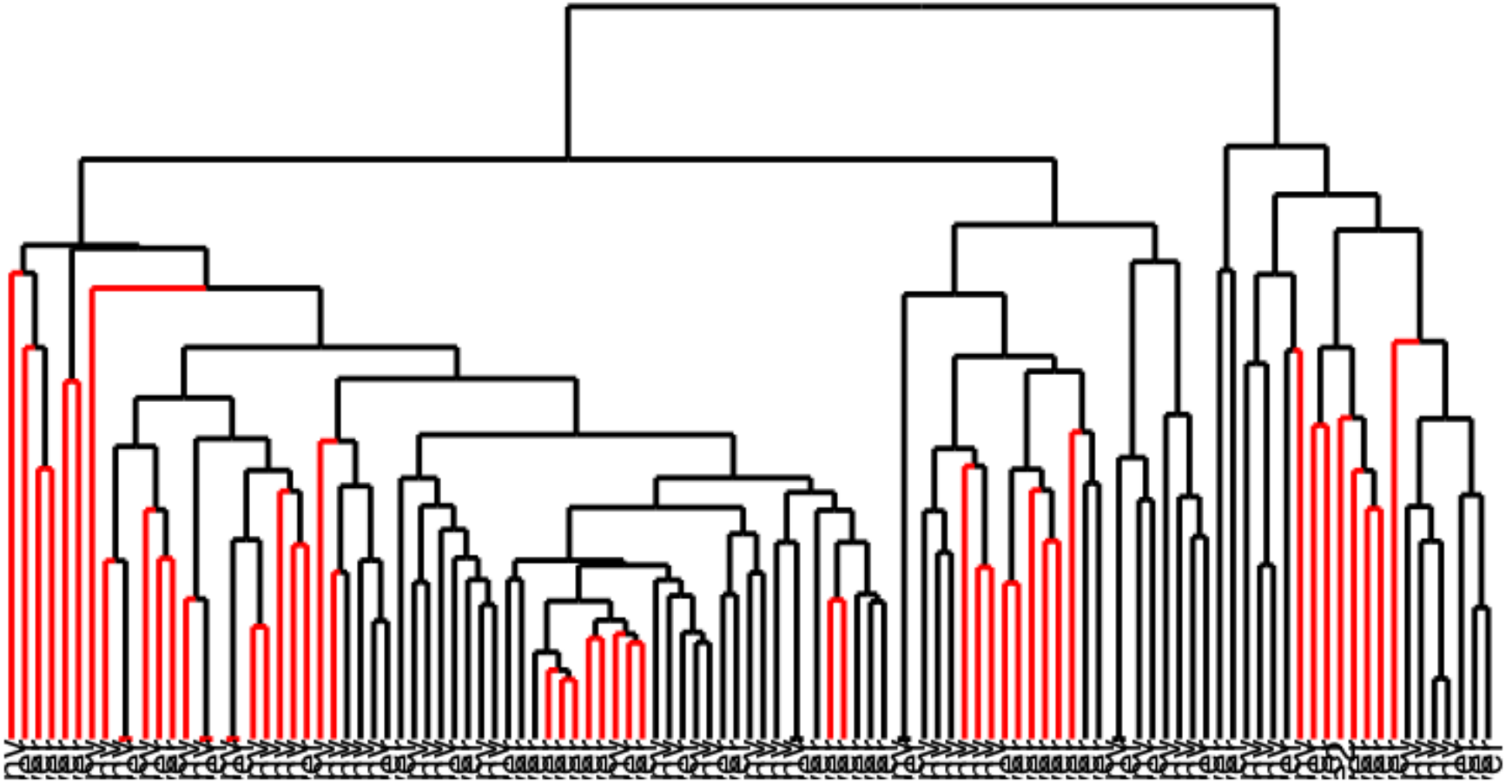
- Functional equivalence of summer and winter migrants?
  - Hierarchical clustering of species and trait data (using Gower distance)
  - Variance partitioning of ß-variation

Predictions

- Functional equivalence of summer and winter migrants?
  - Hierarchical clustering of species and trait data (using Gower distance)
    - Species data clusters within seasons
    - Functional data within habitats
  - Variance partitioning of ß-variation
    - Species data varies more by seasons
    - Functional data varies more by habitat

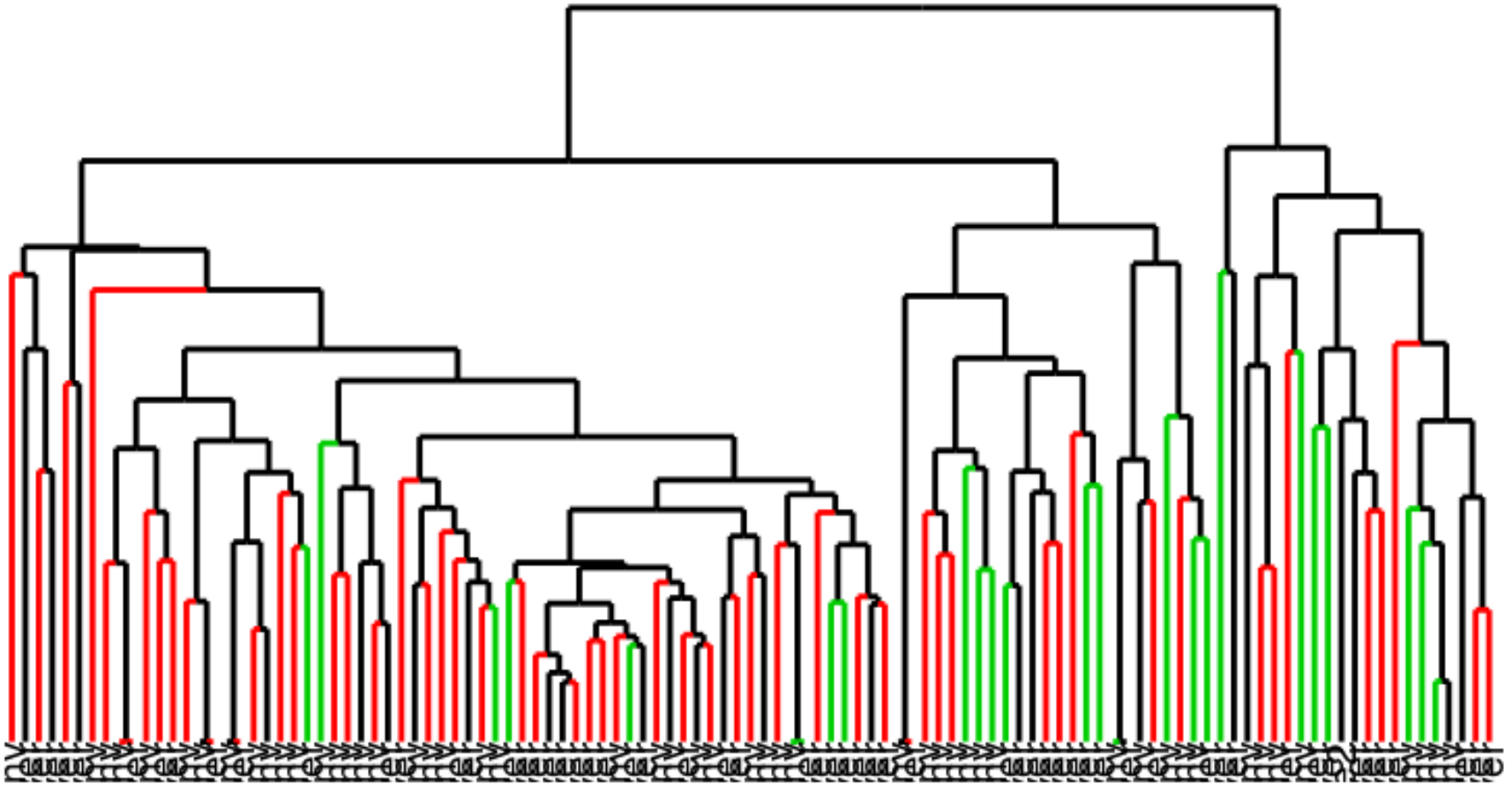
Species data

- By season

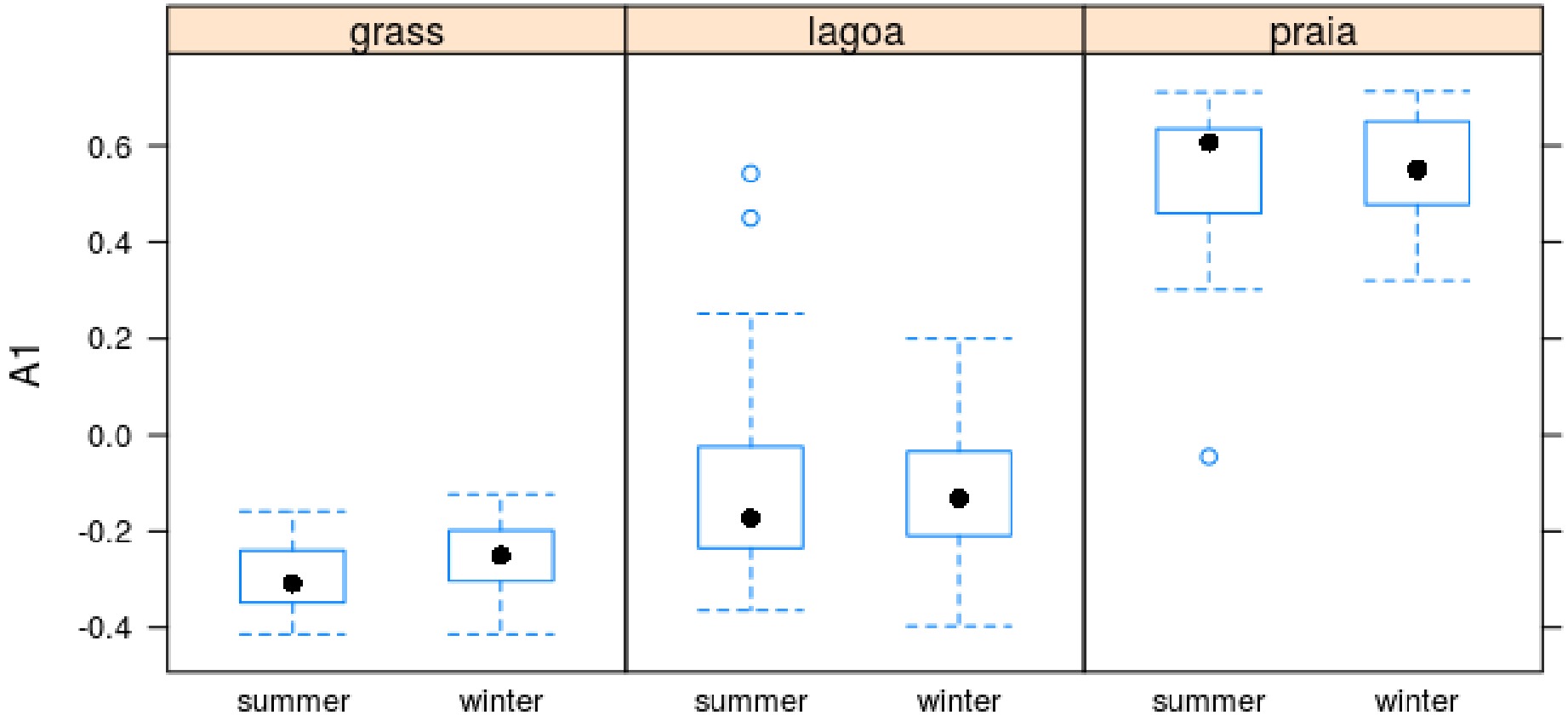


Species data

- By habitat

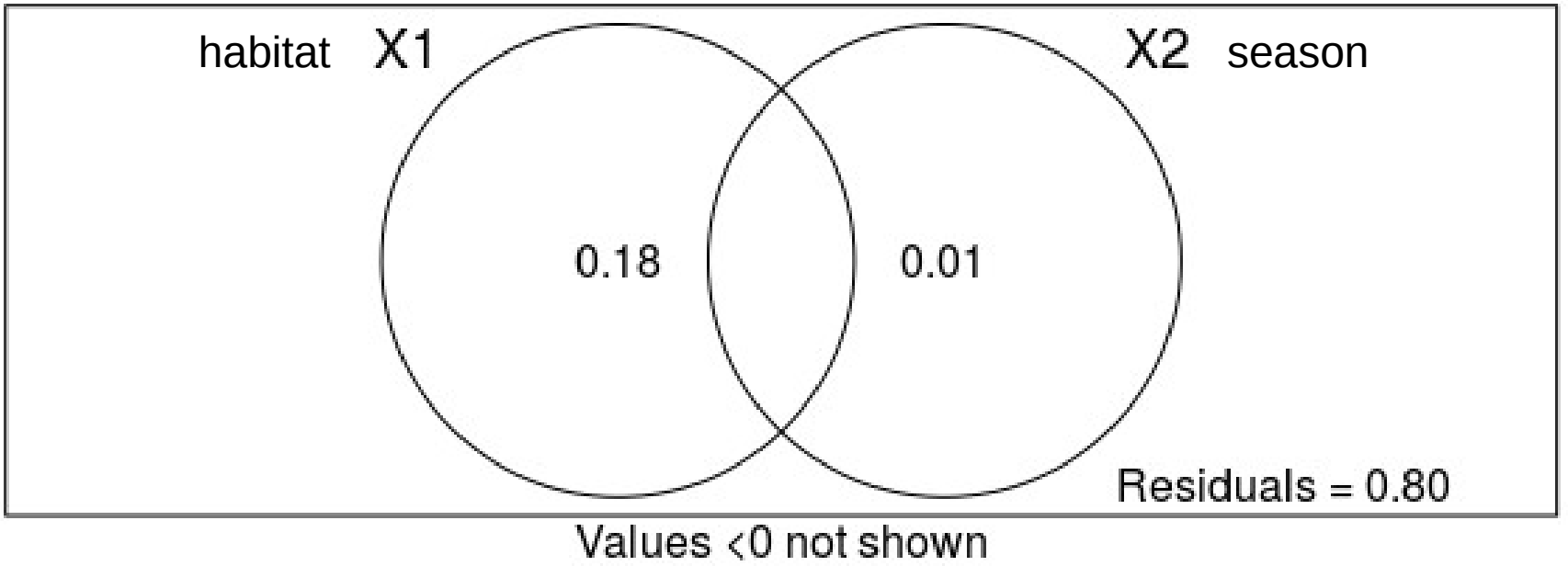


Species data



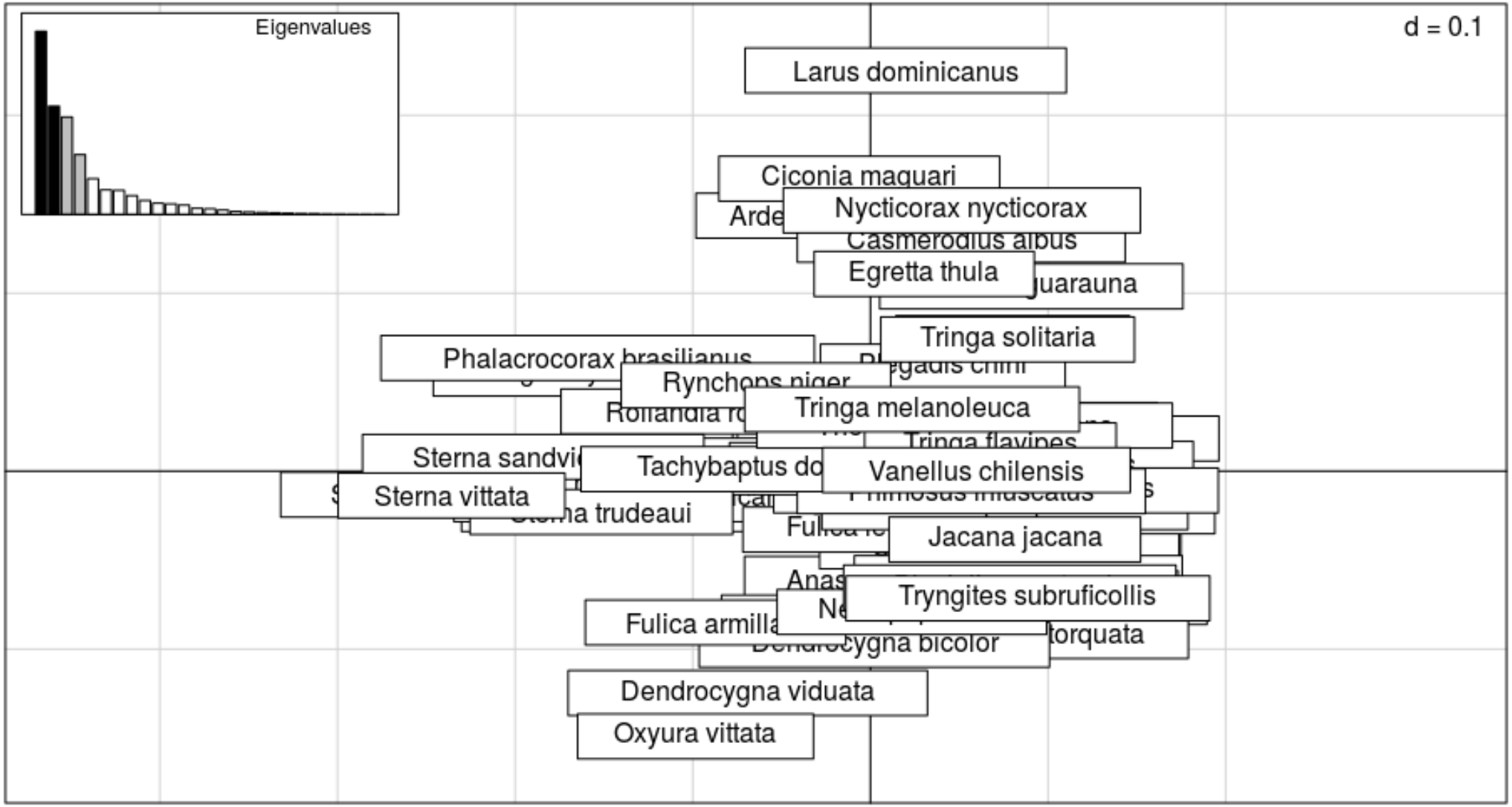
Presence/absence

Species data



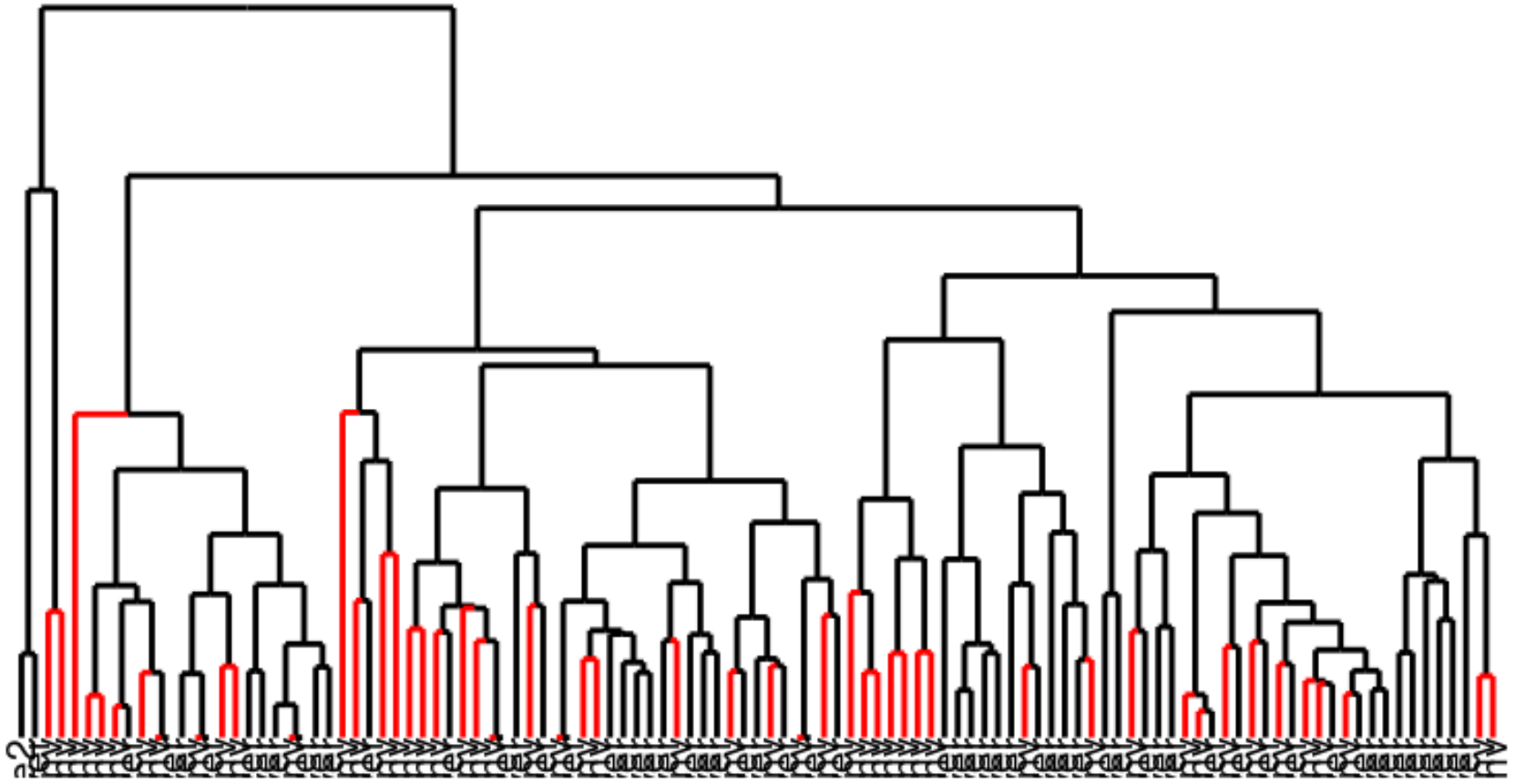
Log-transformed

Functional variation



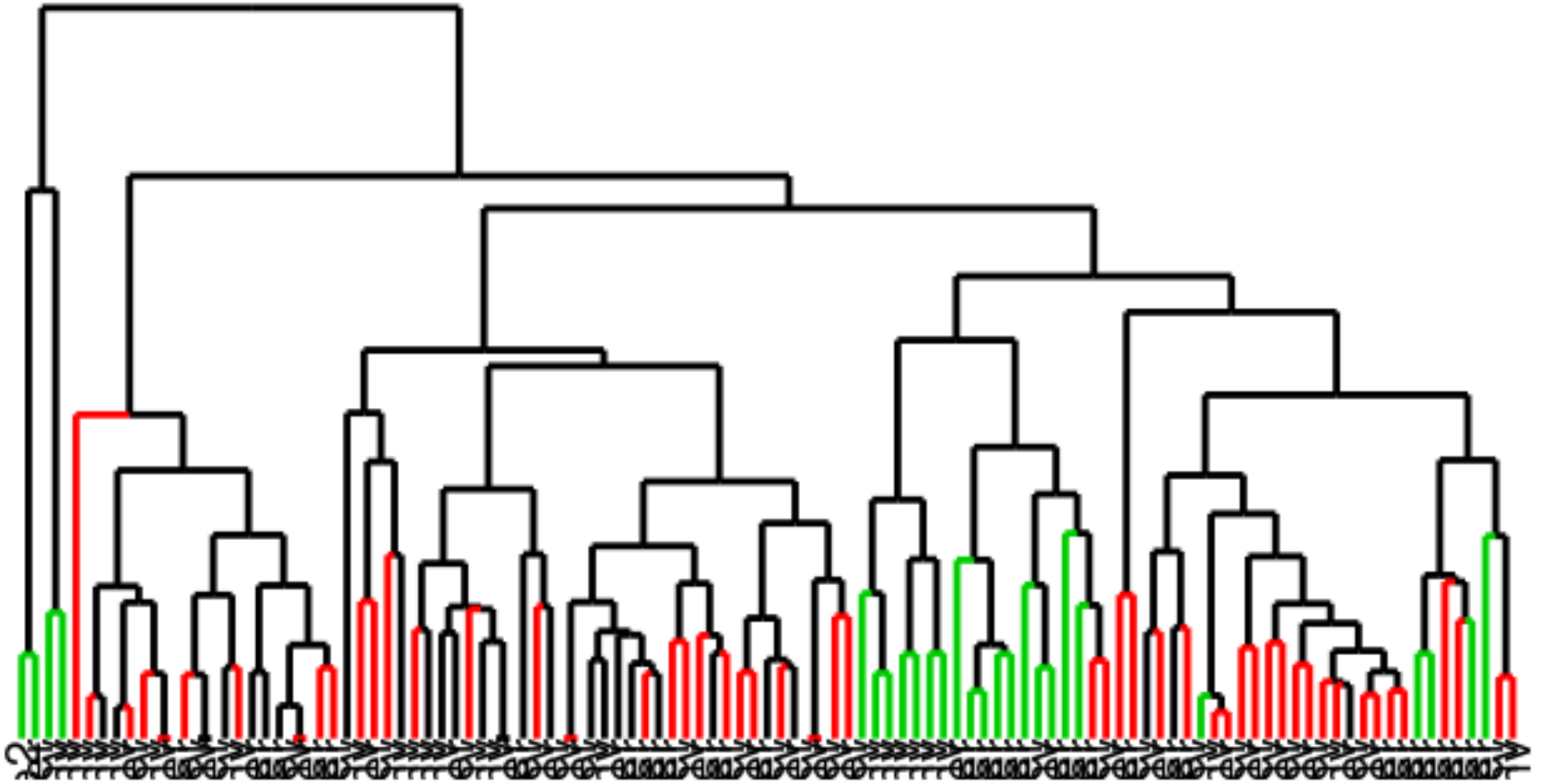
Functional data

- By season

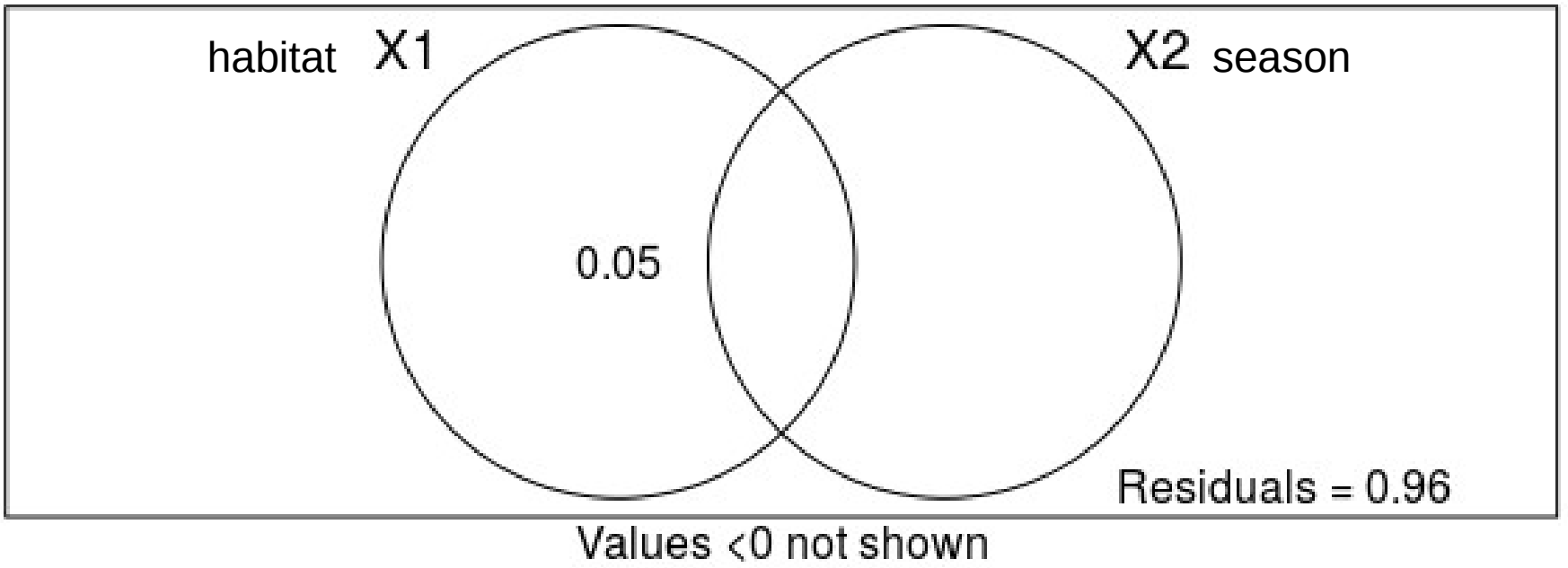


Functional data

- By habitat

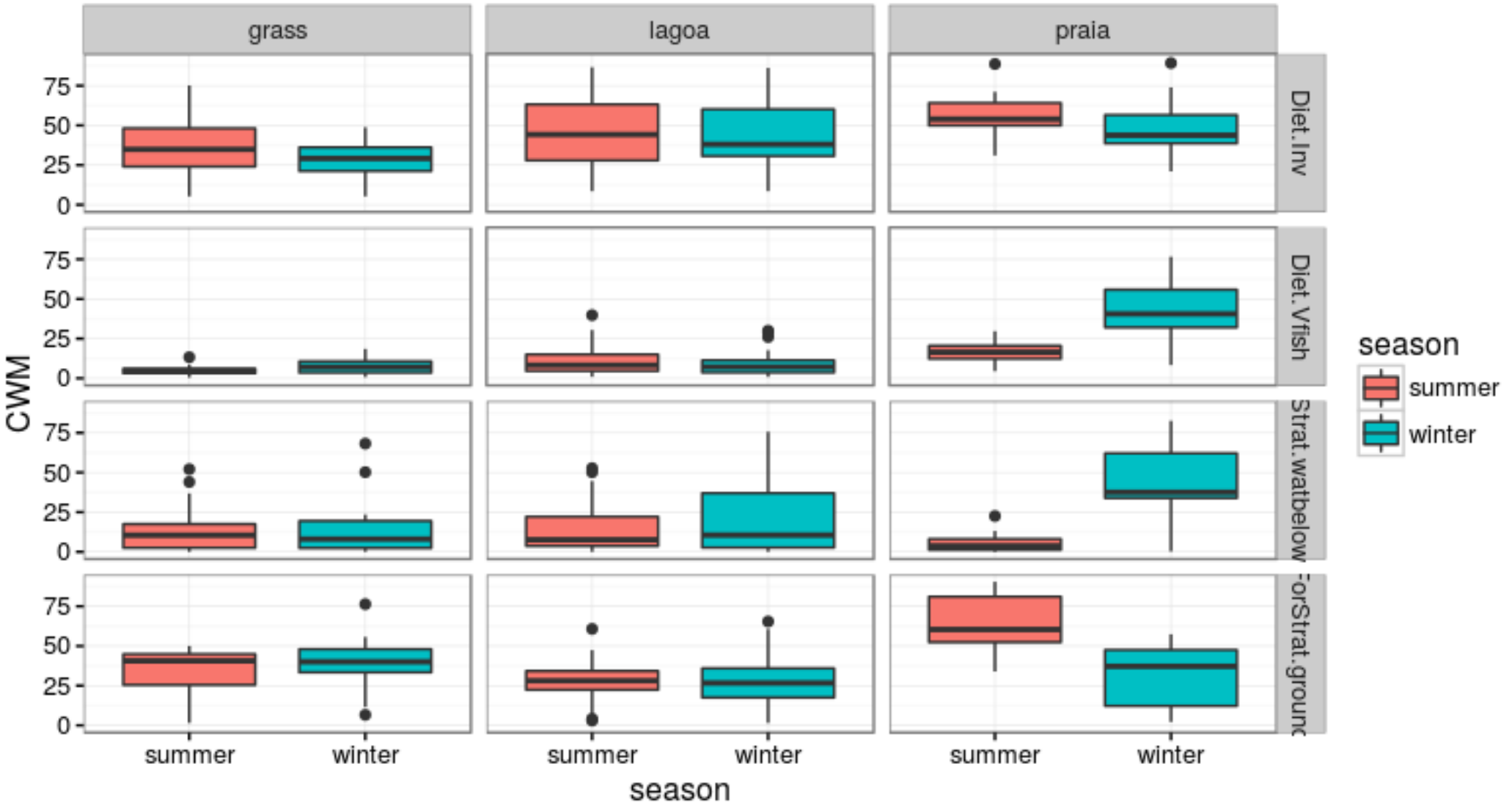


Functional data



Approach

- Differences between habitats in functions supported?
  - Comparison of CWMs


grass
lagoa
praia
Diet.Inv
Diet.Vfish
Strat.watbelow
orStrat.ground
CWM
75
50
25
0
summer
winter
season
season
summer
winter

“Conclusions”

- Signals not very clear visually
  - Need an analytical approach
- Species clearly cluster within habitats more than seasons
  - Migrants a small % of community
- Some evidence of seasonal functional changes

TODO

- Normalize species data within sites?
  - Or use presence/absence?
- Analyse functional groups of species separately
- Seasonality of resident species?
- Temporal trends? (2005-2016)