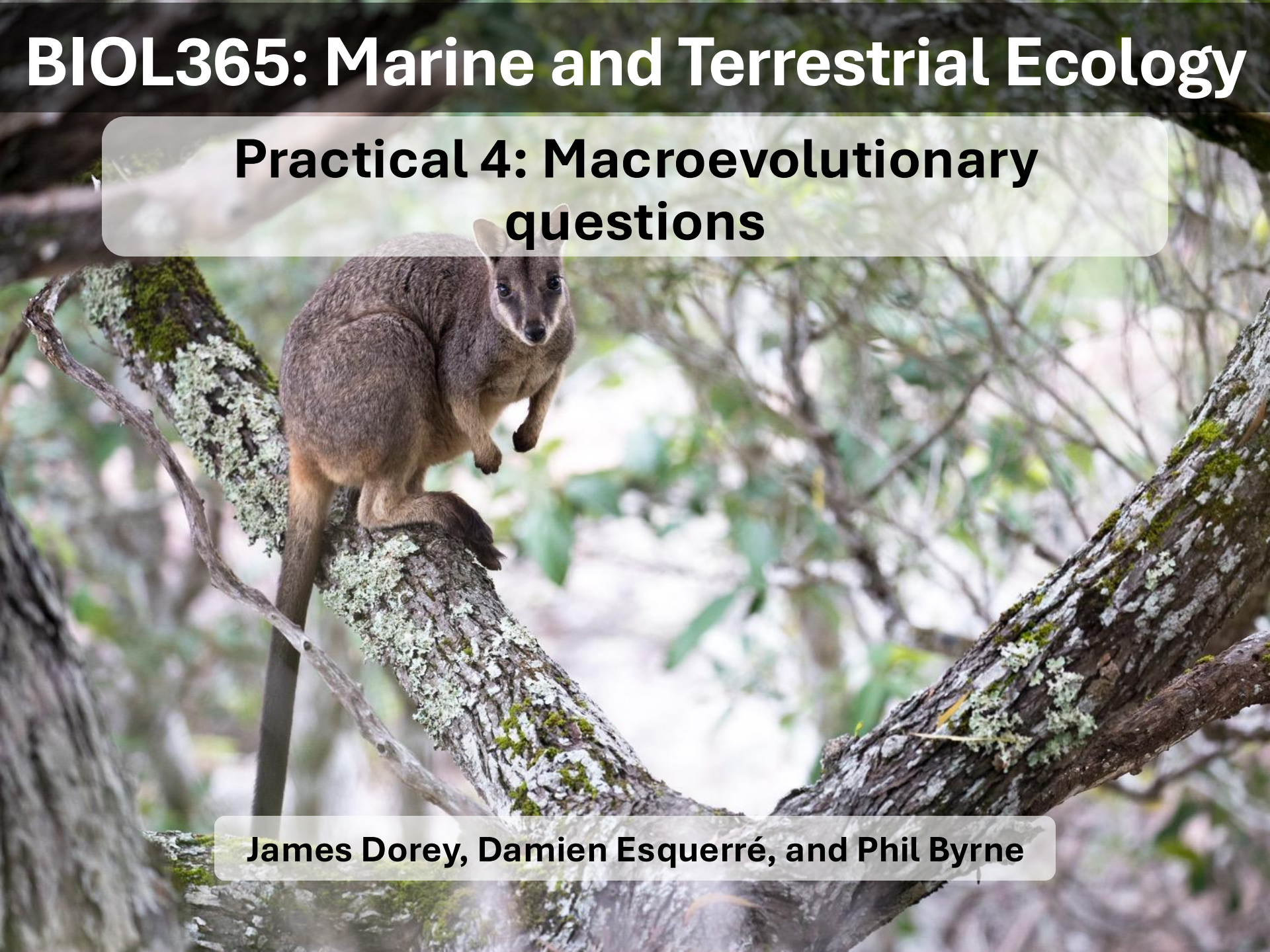
BIOL365: Marine and Terrestrial Ecology

Practical 4: Macroevolutionary questions



James Dorey, Damien Esquerré, and Phil Byrne

What to expect today

1. Script preparation
2. Data management
    1. Genetic data
    2. Trait data
    3. Align the two
3. Phylogenetically independent contrasts
4. Ancestral state reconstructions

Script preparation

- Usually, you will do this every time you open a project
- I feel like people are getting more comfortable here

Data management

- Using the **fasta alignment** from last week
  - A bit more data management magic
  - Re-make our tree
- Read in our **trait data**!
  - Make some summaries by finch species
- Combine the two datasets
  - Some VERY useful (and pretty simple) code here

Phylogenetically independent contrasts

- Regular regression analysis
- Compare with Phylogenetically independent contrasts (PICs)

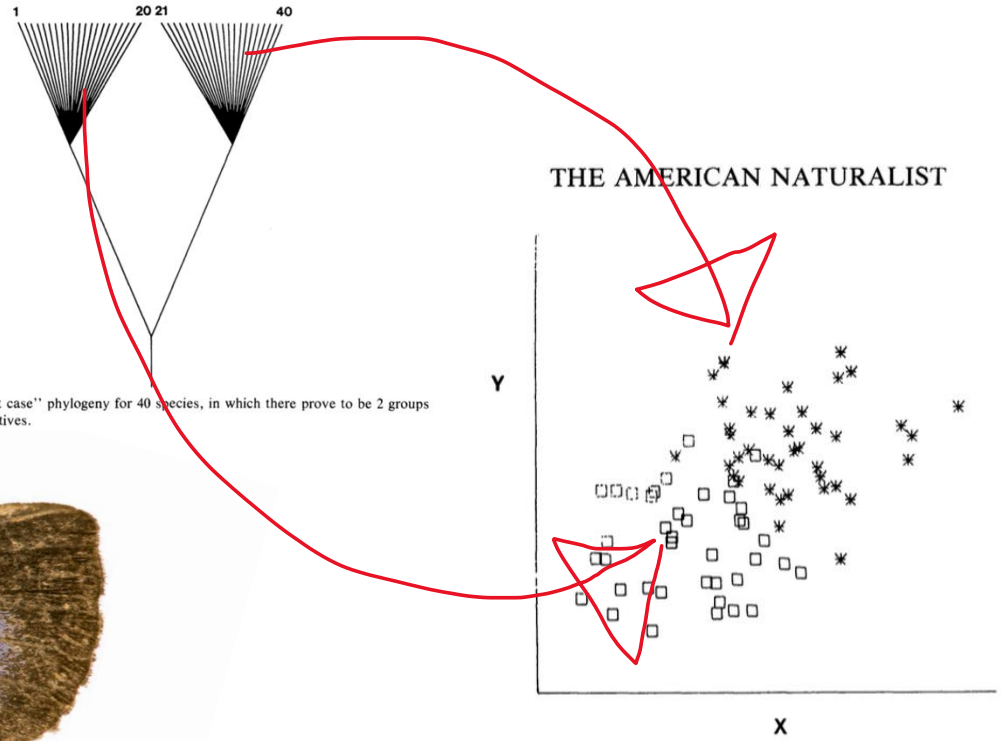


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FIG. 5.—A "worst case" phylogeny for 40 species, in which there prove to be 2 groups each of 20 close relatives.

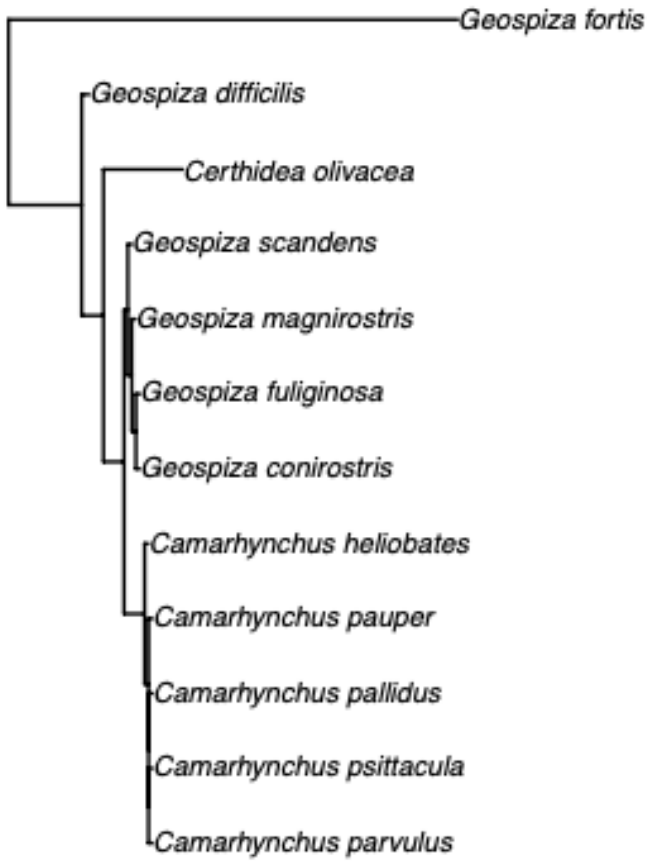
FIG. 7.—The same data set, with the points distinguished to show the members of th monophyletic taxa. It can immediately be seen that the apparently significant relationshi fig. 6 is illusory.

Ancestral states

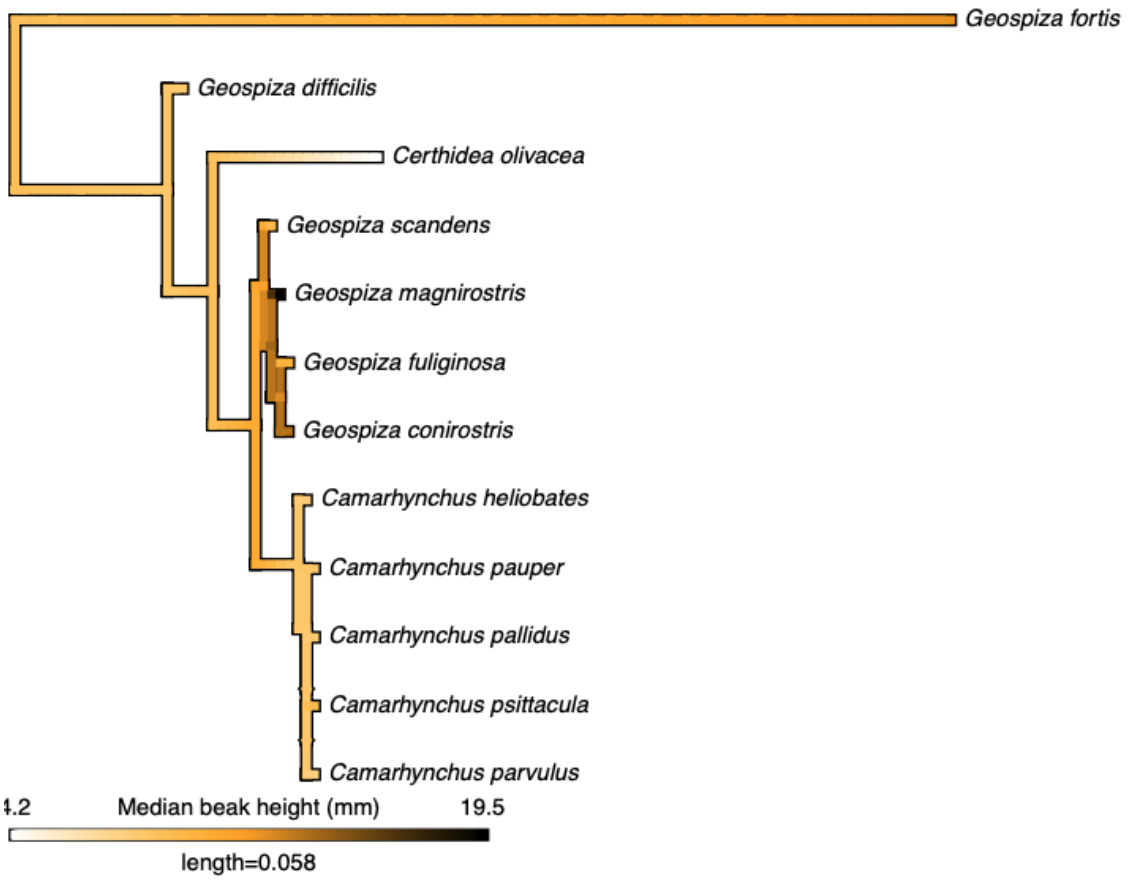
- USE the tree (genetic data) and on that tree…
  - Infer how a trait has changed
  - We are not really identifying parts of the gene[ome] associated with triats

Make a phylogeny

This week:

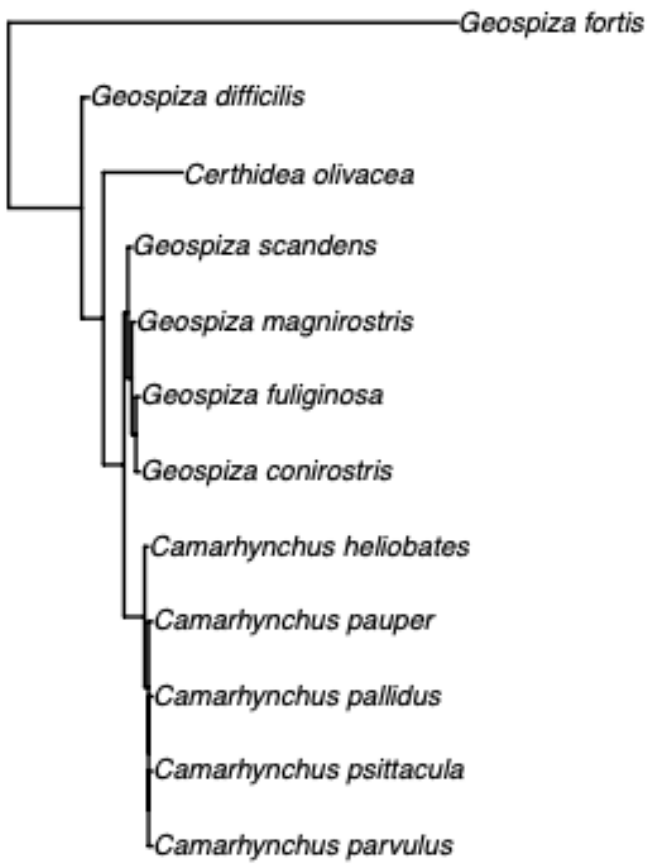


Next week:

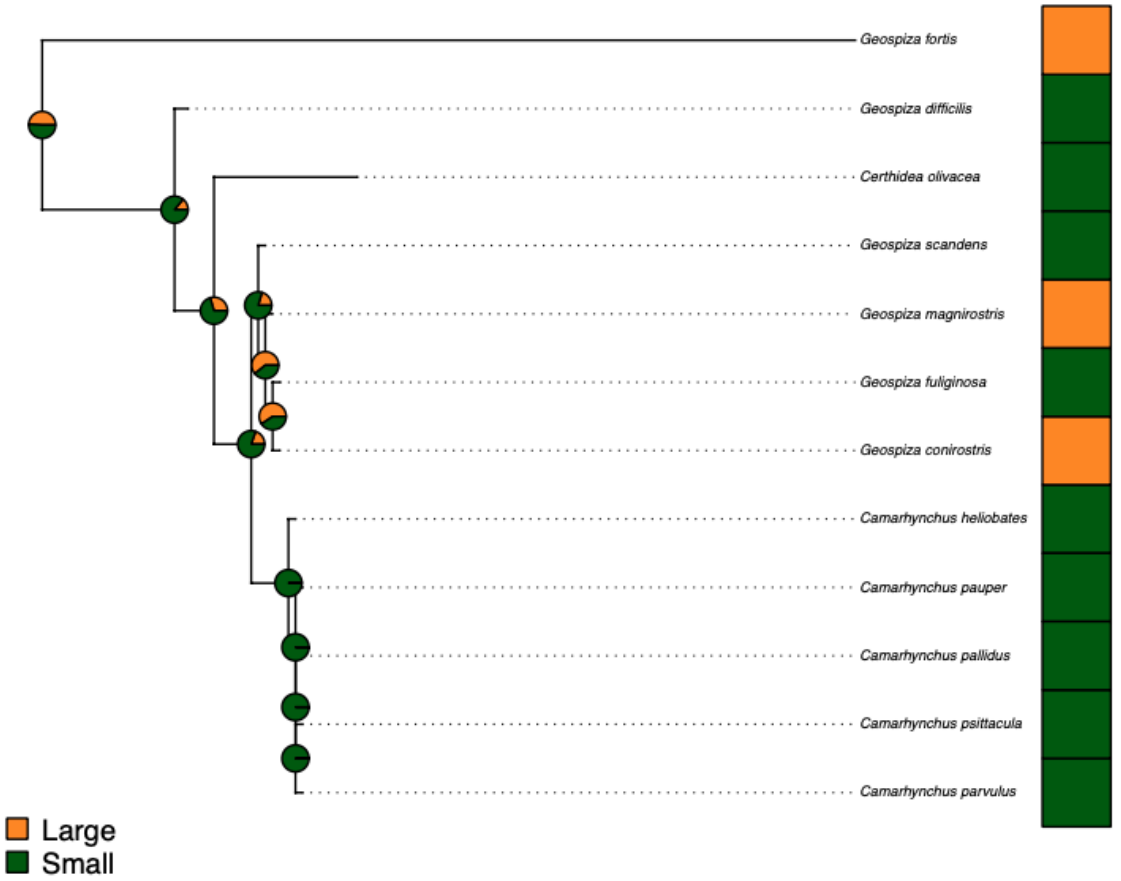


Make a phylogeny

This week:



Next week:



Phylogenetically independent contrasts

- Play with the code
- Remember, you will need to show independence and problem solving for your assignment!
- 5% component due midnight next Friday

Did you finish early?

1. Help your neighbour
2. Work on your assignment and seek help or advice (keeping in mind that others doing the prac might need more help)
3. ???
4. Okay, fine you can go if you've checked with your demonstrator