200a UPDATE: How you learned to love pyrate, python, and anaconda

Dear Class,

Here is what you need to do to complete the pyrate lab.

1. make sure you have R installed
2. install python **2.7**, numpy, and scipy. The anaconda install will do this for you but there are many other ways to get these libraries as well.
3. run the ursidae data set `Ursidae_PyRate.py`. You will need to prepare this file from Ursidae.txt using the extract.ages function from the `pyrate_utilities.r` package.
4. Plot the speciation rate, extinction rate, and net diversification rate using pyrate's plot function.
5. Describe the diversification rate history of ursids given these plots.
6. Make a table with the probabilities of 1-5 rate models for speciation and extinction for this data set. What is the most probable model of speciation and what is the most probable model of extinction for ursids?
7. **Extra Challenge** Try running the covariate model in pyrate to test for a relationship between body size evolution and ursid diversification.
    1. look for `cov_sp` and `cov_ex` in the `mcmc.log` file
    2. use tracer to plot these parameters and add them to your report
    3. What does your analysis suggest about the influence of size on ursid diversification?
8. Email your report with figures and interpretations to me **in PDF format** by Monday Nov 2 before class.

More pyrate at 2:00 Friday?

Please self-organize and let me know if you are interested in going through pyrate tomorrow (Friday) at 2:00 PM. I can find us a space and Daniele has offered to work with you if there is interest.

See you then!

Mike