Evolutionary biology is often divided into two parts: the study of natural selection and other processes that act within populations and the study of speciation and other processes that effect the diversity of life. A similar but not exactly equivalent dichotomy would be between microevolution and macroevolution. The reason why it is not an exact equivalent is because macroevolution connotes the gross-scale pageant of life. Speciation seems right at the boundary between micro- and macroevolution.

In Paper 1, you wrote about adaptation. You may have dealt with several species or a phylogeny as a means of statistical replication, but according to the assignment the differences between the species were not the focus of attention. Now for Paper 2, I want you to work on explaining the origin of diversity. It should be a paper about speciation in the loosest sense. You may write about any of the following:

- the origin of reproductive isolating barriers
- the role of diversifying selection
- character displacement
- host shifts
- pollinator shifts
- coadapted gene complexes
- macromutations that kick off evolution to an alternative niche
- the role of sexual selection in diversification
- the role of climate change in causing geographic isolation
- genetic correlations (pleiotropy) causing speciation

Or you may write about any other factor that plays a role in evolutionary diversification. Many of these evolutionary mechanisms involve natural selection but they all involve something more than just vanilla-flavored natural selection. Write about that thing that is something more.

You’ll need to do this in the context of a particular type of organism. You are allowed to end up writing about any kind of organism (yucaas, song birds, weevils, cichlid fishes, moon jellies, whatever). However, it is likely you’ll need to explain how the biology of that kind of organism interacts with your mechanism-of-diversification. What does the organism bring to the evolutionary process? In other words, how might prior evolutionary innovations have affected subsequent diversification? This could be a secondary topic in your paper that you should not shy away from.

As before, please discuss at least three papers. They should all be scholarly works, such as original research or critical reviews. The same journals are helpful:

- Evolution
- Proceedings of the Royal Society of London, Series B
- Trends in Ecology and Evolution
- Annual Review of Ecology and Systematics
- American Naturalist (but be careful – some articles may be mathematical)
- Journal of Evolutionary Biology (not in our library)

You may also be led into journals that are more about the systematics of your group of organisms (Annals of the Entomological Society of America, Journal of Mammalogy, The Bryologist).

The paper is supposed to be on an evolutionary mechanisms leading to diversification. One danger to be wary of is that there are a huge number of papers on the patterns of diversification (“Phylogenetic reconstruction of the Abcaceae?”). Don’t waste a lot of time trying to read these articles, at least not until your paper is well on its way to being written and you’re just trying to look up some background information. Many phylogeny articles don’t have much on evolutionary processes, and I want you to write about the processes, only using patterns as evidence and as background. Make sure you paper is about processes. How did your species come to be different and distinct?

All the old rules apply. Edit it down to about 1000 words.