

Study Guide for Exam 3

Tuesday, April 16, 2019

This study guide will grow with a new section added after each lecture, so please revisit it often! Pace your studying so that you master each set of concepts before the next lecture.

Tuesday, March 12: Introduction to natural selection

- What are the three ingredients required for natural selection?
- What is the result of natural selection?
- When does natural selection not lead to evolution?
- What is the difference between viability and fecundity?
- Define fitness (Darwinian fitness, not physical fitness)
- Does “survival of the fittest” accurately describe natural selection? Why or why not?
- What tends to happen to populations of daisies that become established on small islands?
- Why did soapberry bugs in Florida evolve smaller beaks whereas those in south-central US evolved larger beaks?

Thursday, March 14: Natural selection at a single locus

- What gene controls bony armor in threespine sticklebacks? Is it dominant? If so, which allele is dominant?
- Threespine stickleback populations evolve when they become permanently trapped in inland freshwater lakes. Describe the typical evolutionary change that happens in these freshwater stickleback populations.
- What is a selective sweep? What is meant when the term “hitchhiking” is used in the context of a selective sweep?
- How does the G allele from the PtFT2 locus benefit European aspen living in the northern half of Sweden?
- What’s the difference between the phrases “selected for” and “selected against”?
- Is it possible for a trait to become fixed in a population when it is not the underlying cause of fitness differences? (Hint: consider Fig. 3.14 in the textbook.)
- Why did the dark melanic allele evolve to near fixation in British peppered moths? Why did the light colored allele evolve to near fixation in recent decades?