

CHAPTER 24

THE ORIGIN OF SPECIES

Learning objectives

What Is a Species?

1. Define Ernst Mayr's biological species concept.
2. Distinguish between prezygotic and postzygotic reproductive barriers.
3. Describe five prezygotic reproductive barriers and give an example of each.
4. Explain a possible cause for hybrid breakdown.
5. Explain how hybrid breakdown maintains separate species even if fertilization occurs.
6. Describe some limitations of the biological species concept.
7. Define and distinguish among the following: ecological species concept, phylogenetic species concept, and morphological species concept.

Modes of Speciation

8. Distinguish between allopatric and sympatric speciation.
9. Define allopatric speciation. Describe the mechanisms that may lead to genetic divergence of isolated gene pools.
10. Explain how reproductive barriers evolve. Describe an example of the evolution of a prezygotic barrier and the evolution of a postzygotic barrier.
11. Define sympatric speciation and explain how polyploidy can cause reproductive isolation.
12. Distinguish between autopolyploid and an allopolyploid speciation and describe examples of each.
13. Explain how habitat differentiation has led to sympatric speciation in North American maggot flies.
14. Explain how sexual selection has led to sympatric adaptive radiation in the cichlids of Lake Victoria. Explain how the process of speciation may be reversing, due to pollution in this lake.

Hybrid Zones

15. Define the term 'hybrid zone'. Describe the three outcomes for hybrid zones over time.
16. Describe examples that illustrate rapid and gradual speciation events.
17. Explain how a small number of genetic changes may lead to speciation in plants and animals.