

BIOLOGICAL SPECIES CONCEPT

Exercise 2 (Modules 14.2–14.3)

The biological species concept is one of the most useful ways to define a species, but it is not foolproof. Briefly explain why it might be difficult to apply the biological species concept in each of the following situations.

1. Fossils of “Java Man” and “Peking Man” are both thought to represent a single species—*Homo erectus*.
2. A tiger and a lion can interbreed in a zoo and produce a hybrid offspring called a tiglon.
3. Dogs come in many shapes and sizes, from Chihuahuas to Saint Bernards.
4. There are many strains and species of *Streptococcus* bacteria, which reproduce asexually.
5. Among *Clarkia* wildflowers in California, flowers of population A can interbreed and produce fertile offspring when crossed with flowers from population B. Similarly, B can interbreed with C. But A and C cannot successfully interbreed.
6. One bird guide calls flycatchers of the genus *Empidonax* “the bane of bird-watchers.” Several species look so much alike that birders can distinguish them only by their songs.
7. A song sparrow population in Baja, California, is separated from other song sparrows by over a hundred miles of desert.

Exercise 3 (Module 14.3)

Review the reproductive barriers that separate species by categorizing the following examples. State whether each barrier is prezygotic (pre) or postzygotic (post), and then name the specific kind of barrier (such as temporal isolation or reduced hybrid viability) it exemplifies. Table 14.3 is a helpful summary.

Pre or Post	Kind of Barrier	Example
1. _____	_____	The salamanders <i>Ambystoma tigrinum</i> and <i>A. maculatum</i> breed in the same areas. <i>A. tigrinum</i> mates from late February through March. <i>A. maculatum</i> does not start mating until late March or early April.
2. _____	_____	Two species of mice are mated in the lab and produce hybrid offspring, but offspring of the hybrids are sterile.
3. _____	_____	When fruit flies of two particular species are crossed in the lab, their offspring are unable to produce eggs and sperm.
4. _____	_____	A zoologist observed two land snails of different species that were trying to mate with little success because they apparently did not “fit” each other.
5. _____	_____	Male fiddler crabs (genus <i>Uca</i>) wave their large claws to attract the attention of females. Each species has a slightly different wave.
6. _____	_____	When different species of tobacco plants are crossed in a greenhouse, the pollen tube usually bursts before the eggs are fertilized.
7. _____	_____	Blackjack oak (<i>Quercus marilandica</i>) grows in dry woodlands, and scrub oak (<i>Q. ilicifolia</i>) grows in dry, rocky, open areas. Pollen of one species seldom pollinates the other.
8. _____	_____	The tiglon offspring of a lion and a tiger are often weak and unhealthy.