

# What Is a Species?

(a) Endangered species



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(b) Not endangered



## “Hybrid vigor”: Liger

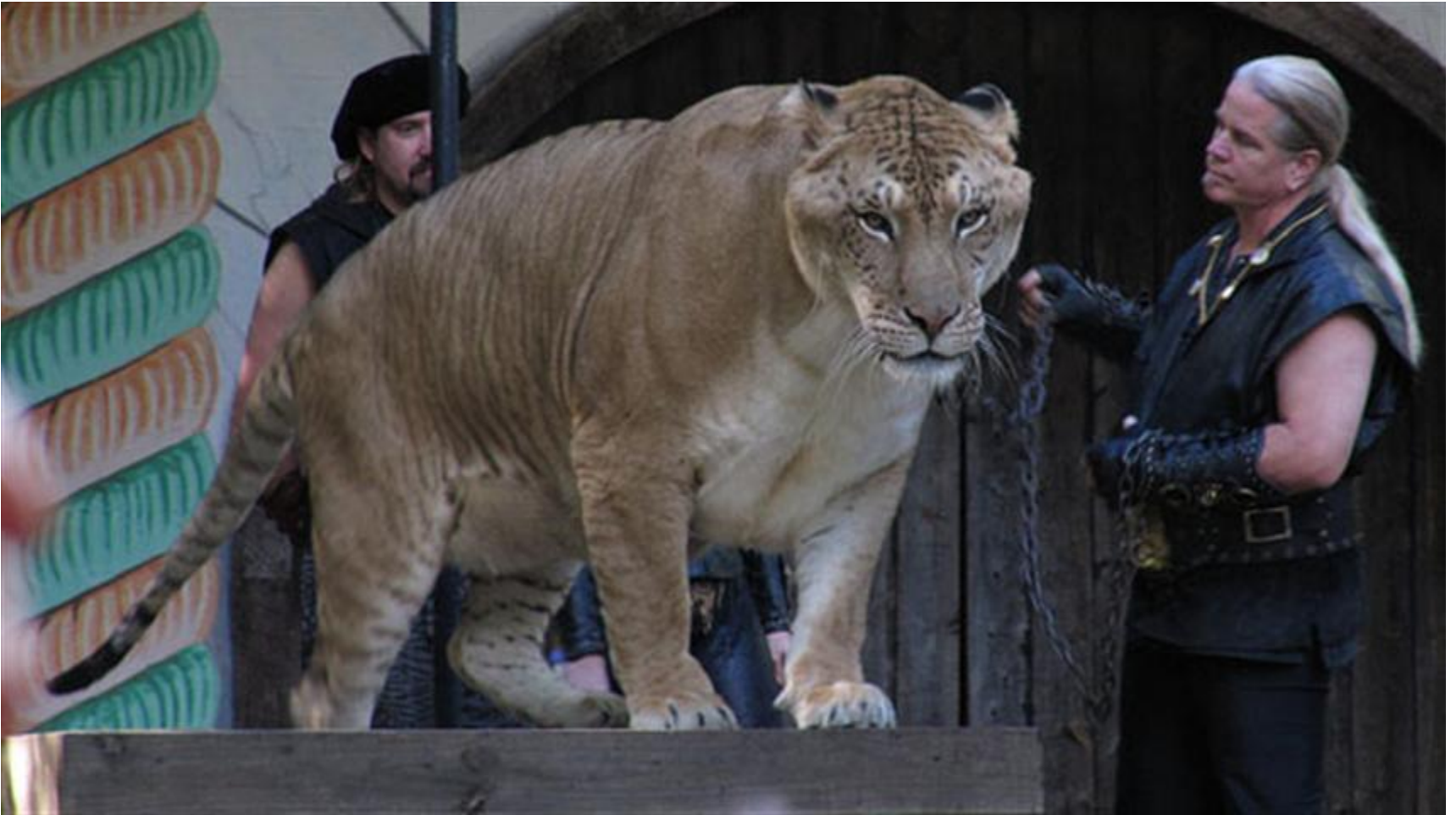


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Figure 18.2



## “Hybrid vigor”: Liger



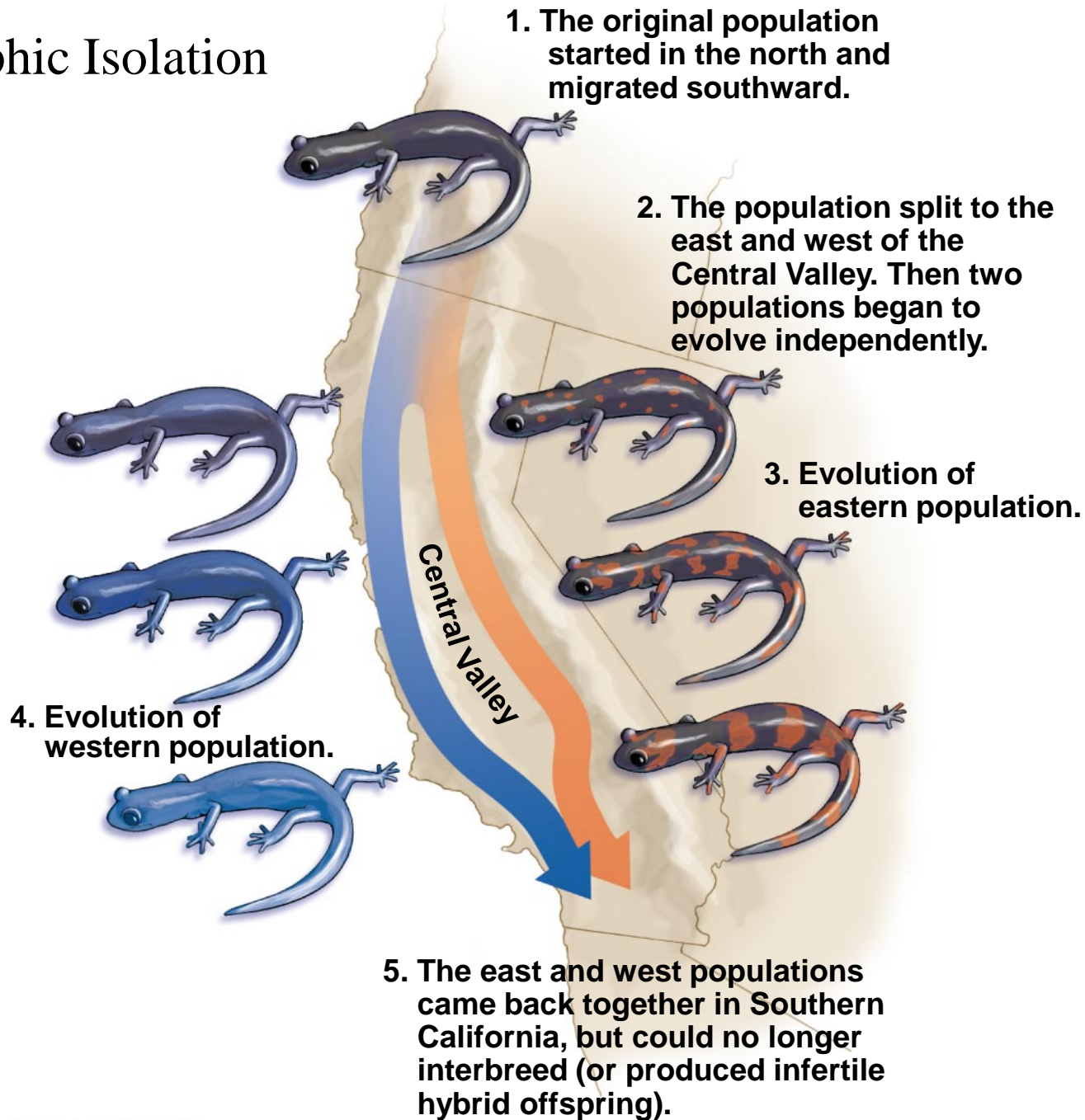
## “Hybrid vigor”: Liger







# Geographic Isolation



# Hybrid Inviability or Infertility



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Figure 18.5



Table 18.1

## Reproductive Isolating Mechanisms

### Extrinsic isolating mechanism



#### Geographic isolation

Individuals of two populations cannot interbreed if they live in different places (the first step in allopatric speciation).

### Intrinsic isolating mechanisms



#### Ecological isolation

Even if they live in the same place, they can't mate if they don't come in contact with one another.



#### Temporal isolation

Even if they come in contact, they can't mate if they breed at different times.



#### Behavioral isolation

Even if they breed at the same time, they will not mate if they are not attracted to one another.



#### Mechanical isolation

Even if they attract one another, they cannot mate if they are not physically compatible.



#### Gametic isolation

Even if they are physically compatible, an embryo will not form if the egg and sperm do not fuse properly.



#### Hybrid inviability or infertility

Even if fertilization occurs successfully, the offspring may not survive, or if it survives, may not reproduce (e.g., mule).



Behavioral Isolation:

“Spider mating dance”

“Peacock spider”

[Peacock spider mating behavior](#)

[Video with sound](#)

[Greater sage grouse](#)

[Bowerbird](#)

# Mechanical Isolation: Various genitalia

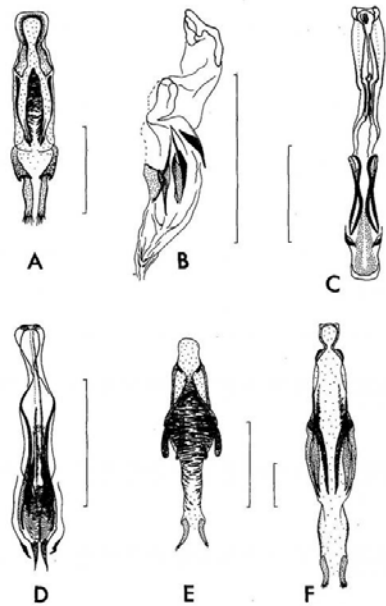
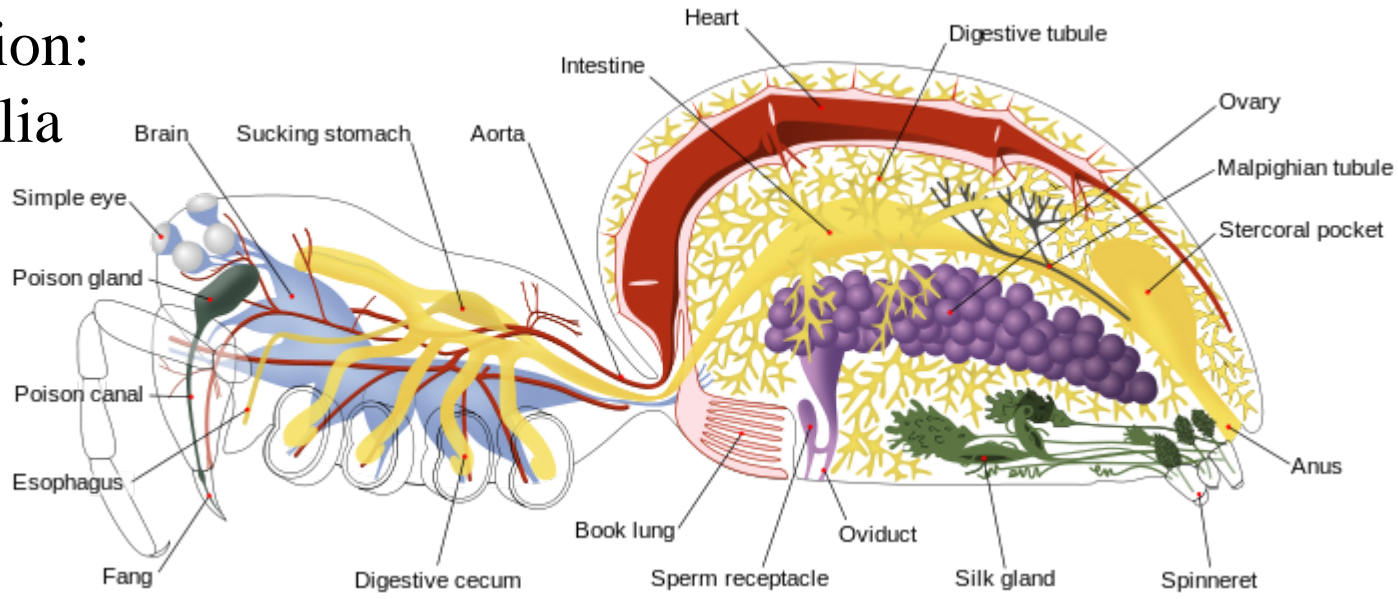
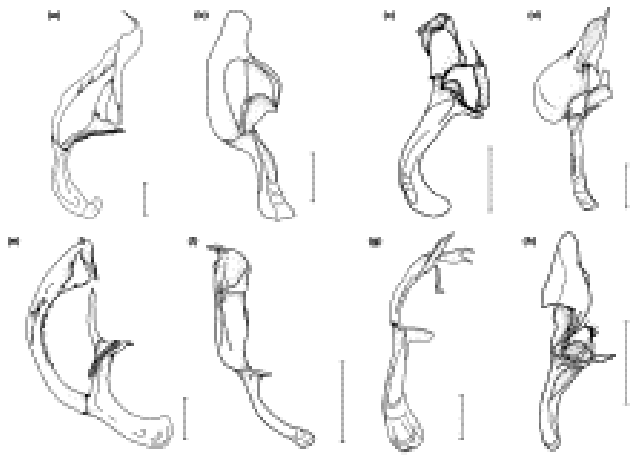


Fig. 1. *Cryptorhynchus* spp., internal sex of male, A, *C. pusillus* (Scholtz); B, *C. pusillus* (Scholtz) and Howel; C, *C. exiguus* (Waltl); D, *C. apudus* (Stål) and Howel; E, *C. areolaris* (Grossi); F, *C. ferrugineus* (Gyllenb.). Scale bars = 0.2 mm.

From beetles



From flies (*Drosophila*)



# Adaptive Radiation

(a) *Drosophila plantibia*



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(b) *Drosophila cyrtoloma*



# Speedy Speciation

(a) *Amphilophus citrinellus*



(b) *Amphilophus zalius*



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# Linnaean System of Classification

Kingdom  
(Animalia)



Phylum  
(Chordata)



Class  
(Mammalia)



Order  
(Carnivora)



Family  
(Felidae)



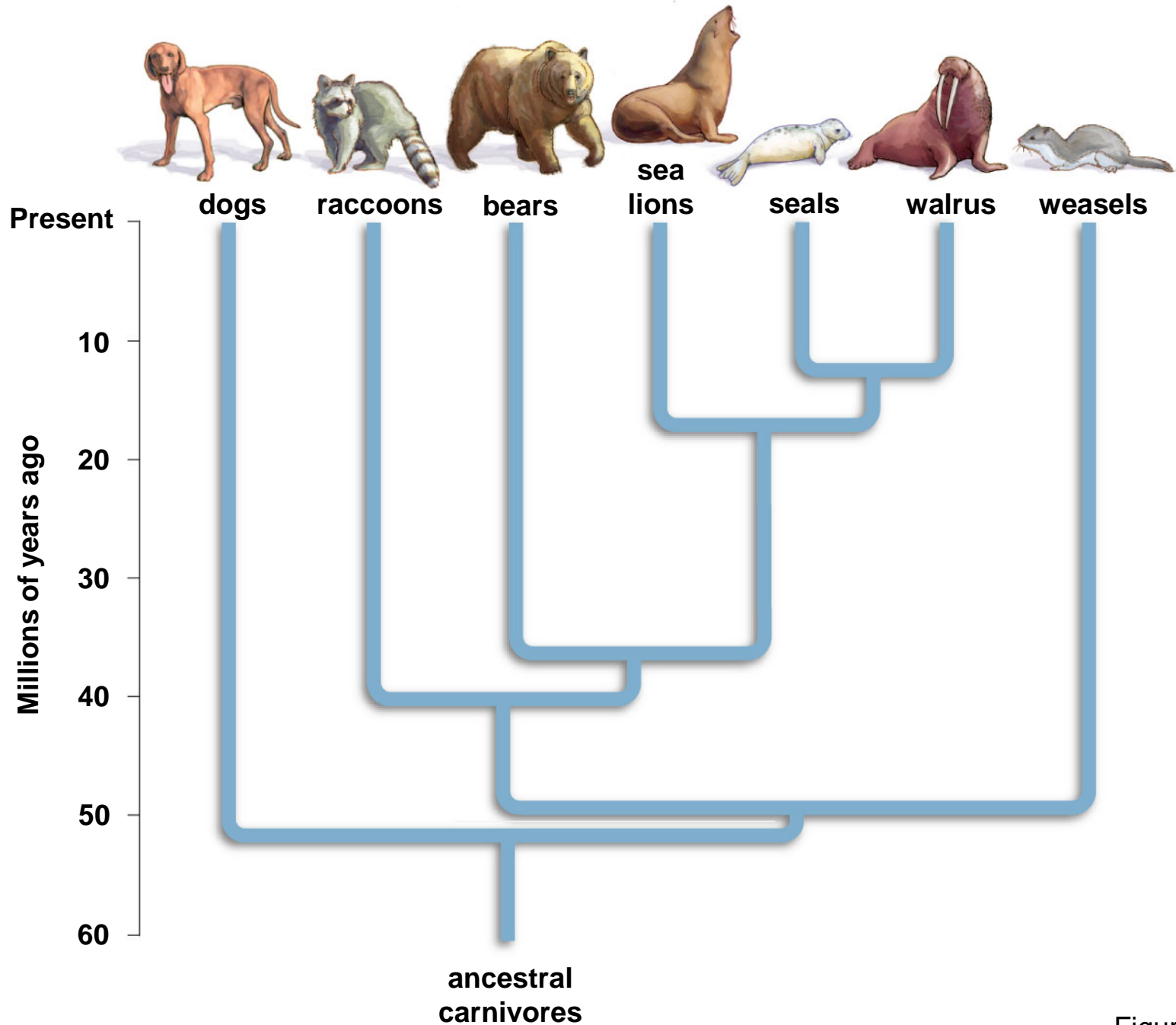
Genus  
(*Felis*)



Species  
(*Felis domestica*)

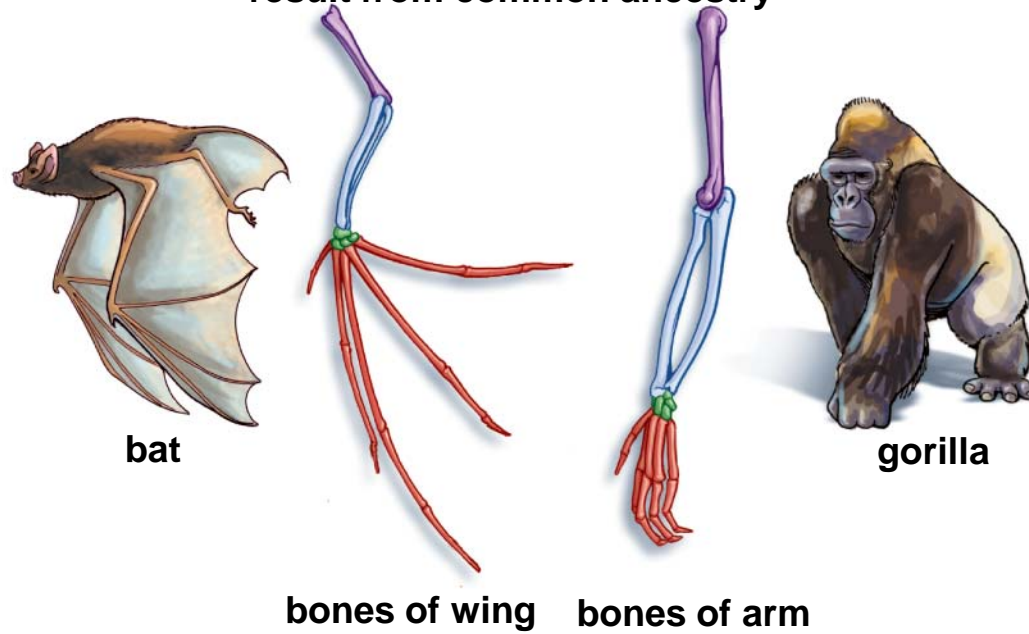


Figure 18.10

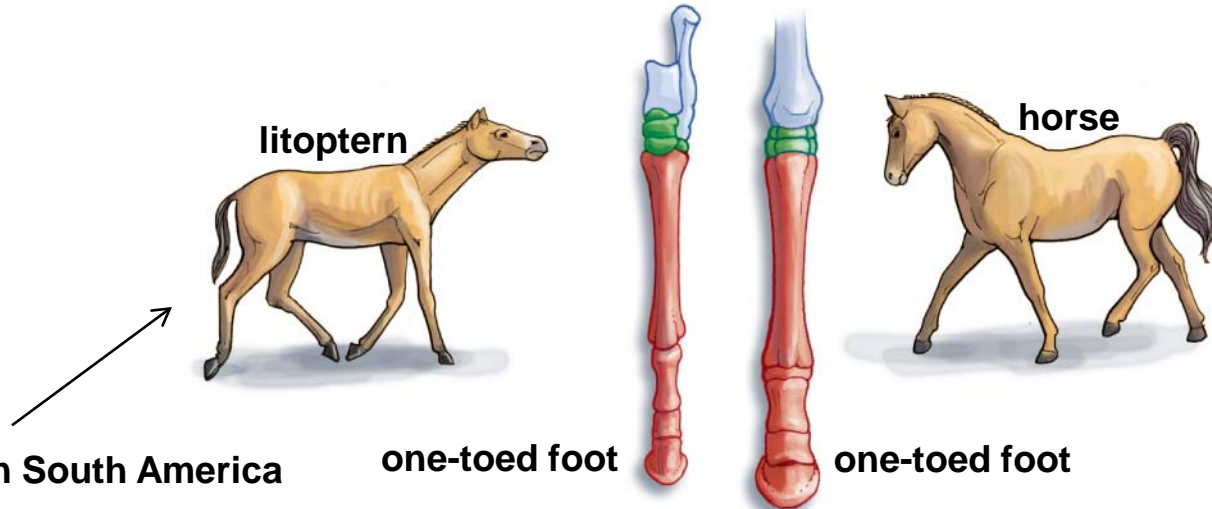




(a) Homology: Common structures in different organisms that result from common ancestry



(b) Analogy: Characters of similar function and superficial structure that have *not* arisen from common ancestry

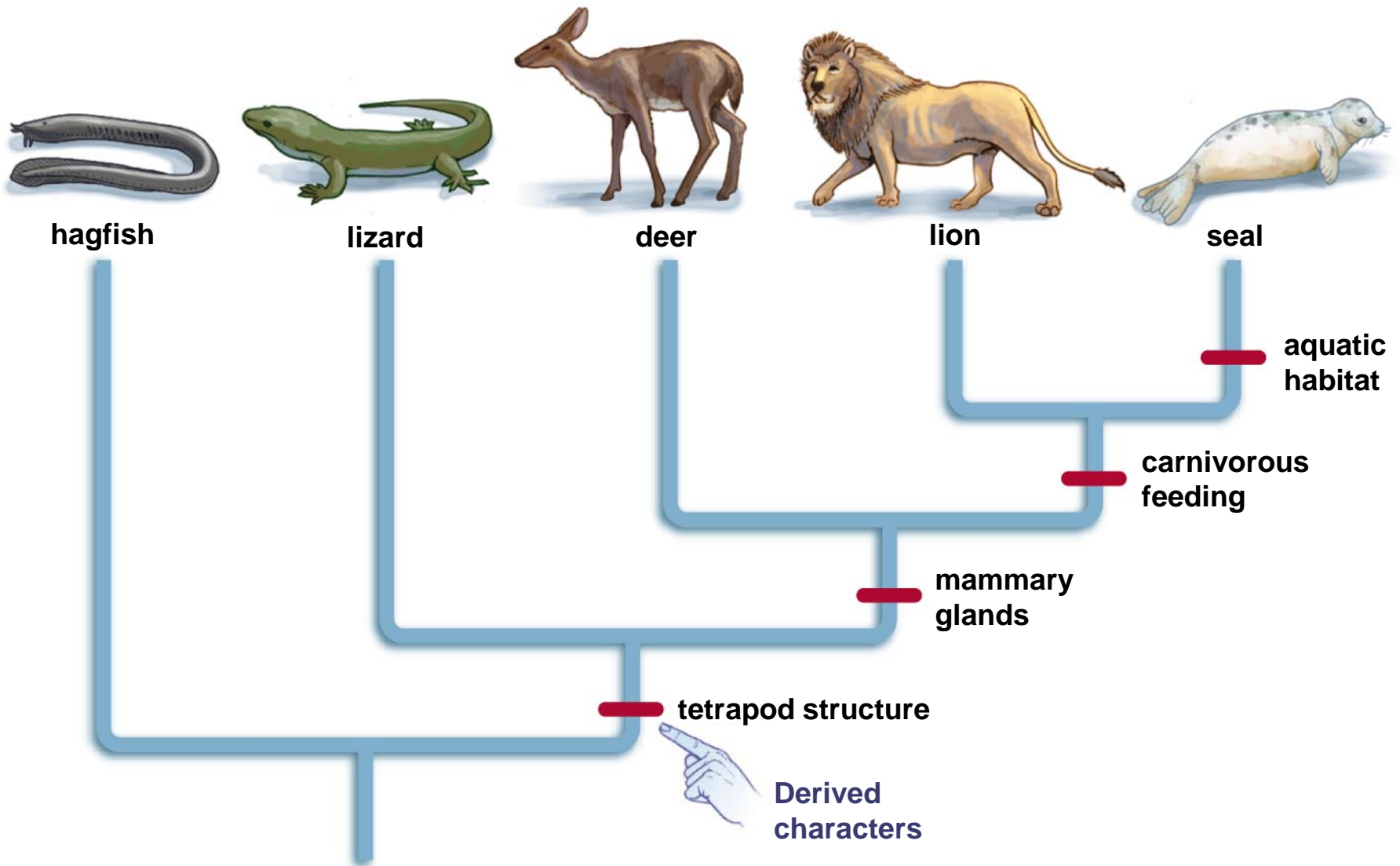


*Smilodon* (mammal) vs. *Thylacosmilus* (marsupial)  
Example of convergent evolution



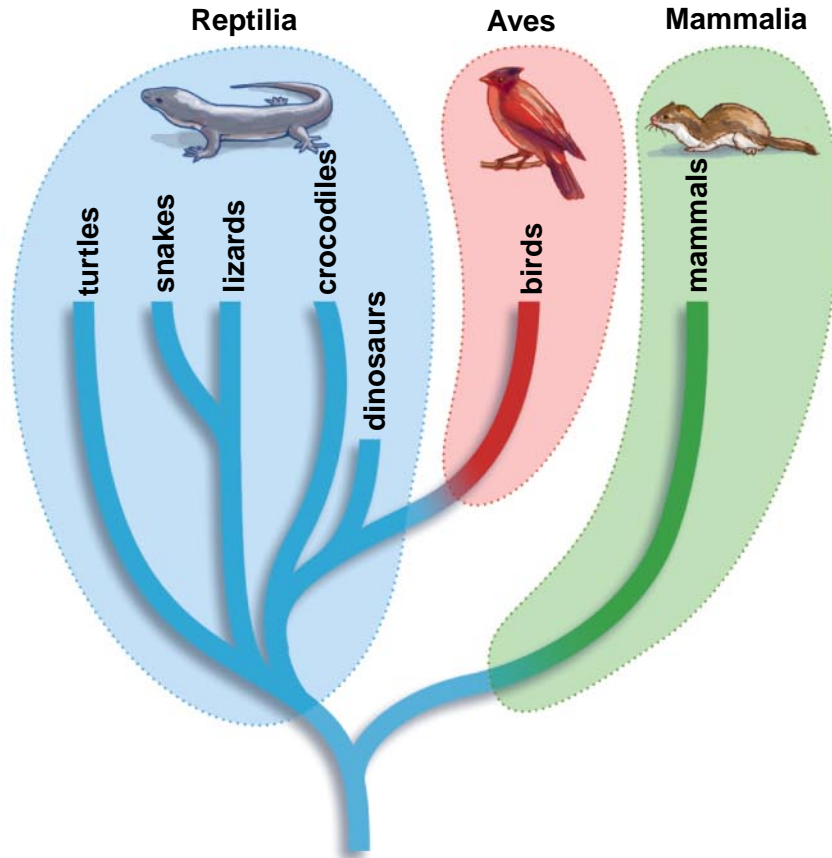


# A Simple Cladogram



# Classical Taxonomy and Cladistics

(a) Classical view of relationships among tetrapods



(b) Cladistic view of relationships among tetrapods

