II. Reproductive Isolation

- A. Prezygotic mechanisms
  1. ecological
  2. behavioral
  3. mechanical
  4. gametic
- B. Postzygotic Mechanisms
  1. developmental
  2. hybrid inviability
  3. hybrid infertility
  4. selection against hybrids

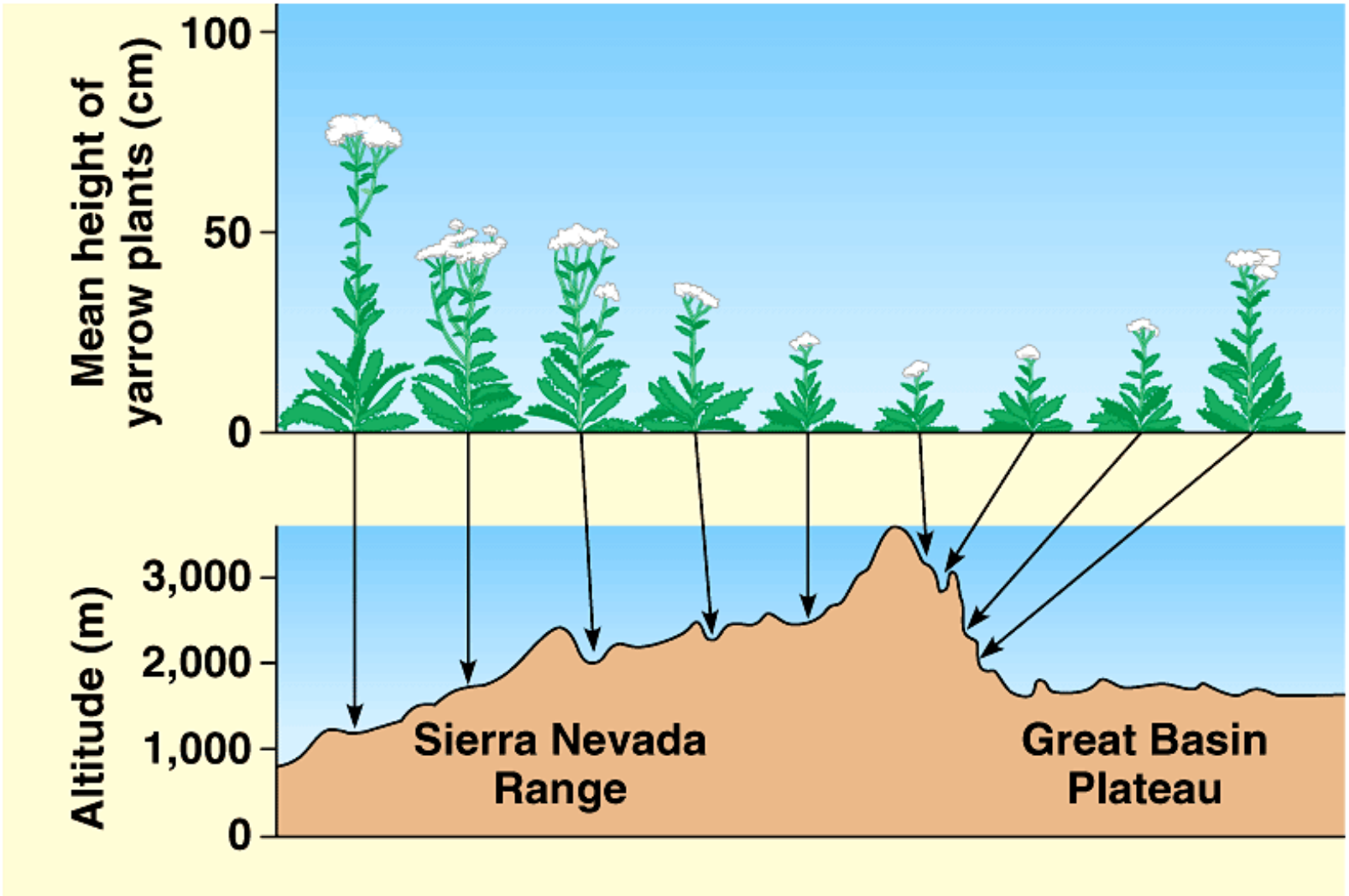
III. Modes of Speciation

- A. Mechanisms of instantaneous speciation
- B. Mechanisms of gradual speciation
- C. Patterns of gradual speciation

Correct answers for problem 6 on the population genetics problem set

6. a) 10.4%
   b) 3.4%
   c) 9.9% Asian, 34.8% Caucasian

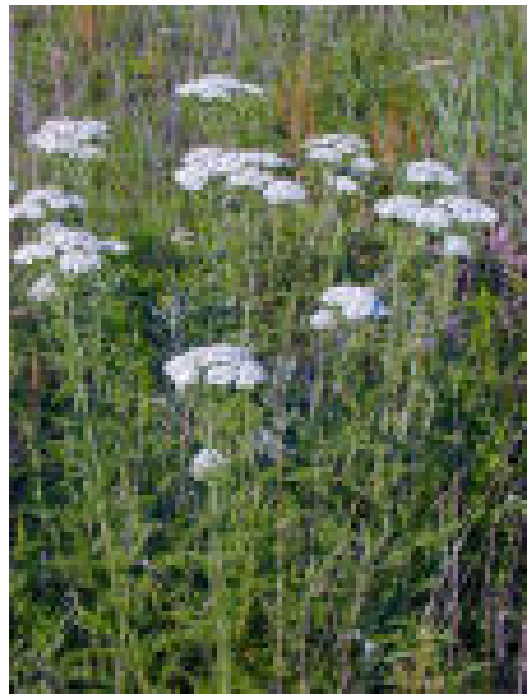
Fig. 23.8: A cline in plant height with altitude



Expected results from reciprocal transplant between low and high elevation sites:

If cline is caused by environment effects:

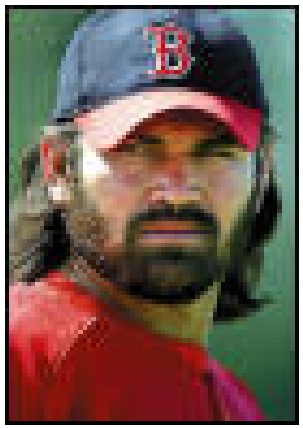
		FROM	
		Low	high
TO	Low	tall	tall
	High	short	short



If cline is caused by genetic differentiation

		FROM	
		Low	high
TO	Low	tall	short
	High	tall	short

Homo sapiens



Binomial nomenclature

Genus species

Quercus virginiana

Drosophila melanogaster

Binomial Nomenclature

Before: *dianthus, floribus, solitarus, squaris, subovata brevissimus, corollis crenatus*

After: *Dianthus caryophyllus*

Bidens alba

Leaves and flowers

Common Names

Beggar’s ticks

Sticktight

Burr marigold

Devil’s bootjack

Pitchfork weed

Rayless marigold

Seeds

At least 80 different species in North America are called “goldenrod”

Solidago juncea

Solidago sempervirens

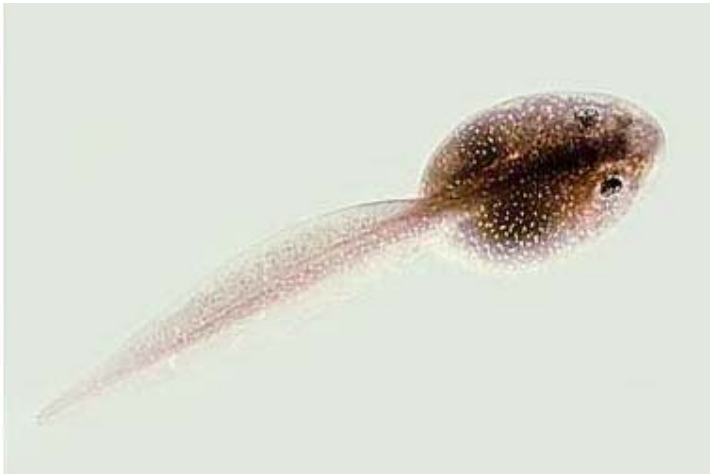
Solidago canadensis

Morphological variation within a species

Female

Male

Morphology can change drastically during the life cycle!



Tadpole

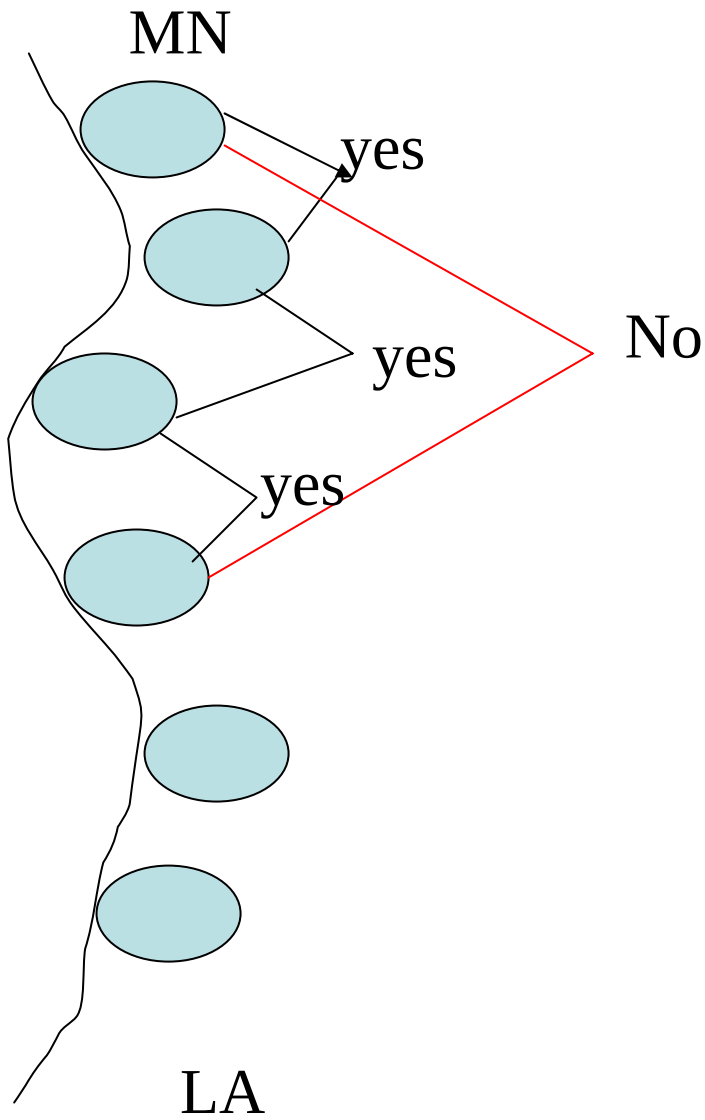
Aquatic
Gills
Herbivorous
Swimming

metamorphosis

Frog

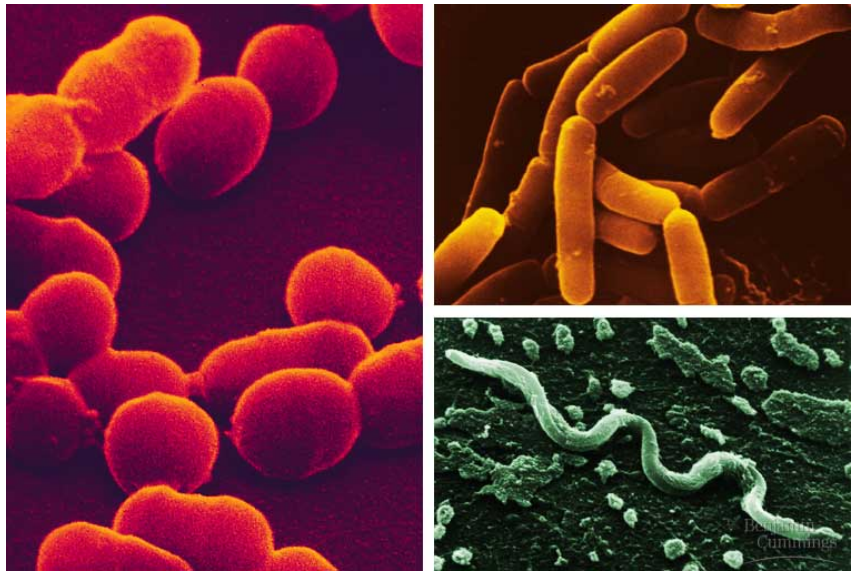
Terrestrial
Lungs
Carnivorous
Jumping

Leopard frogs - populations vary in reproductive compatibility along the Mississippi River



Asexual species

Prokaryotes



Dandelions

Triploid lizards

Some species are known only from fossils

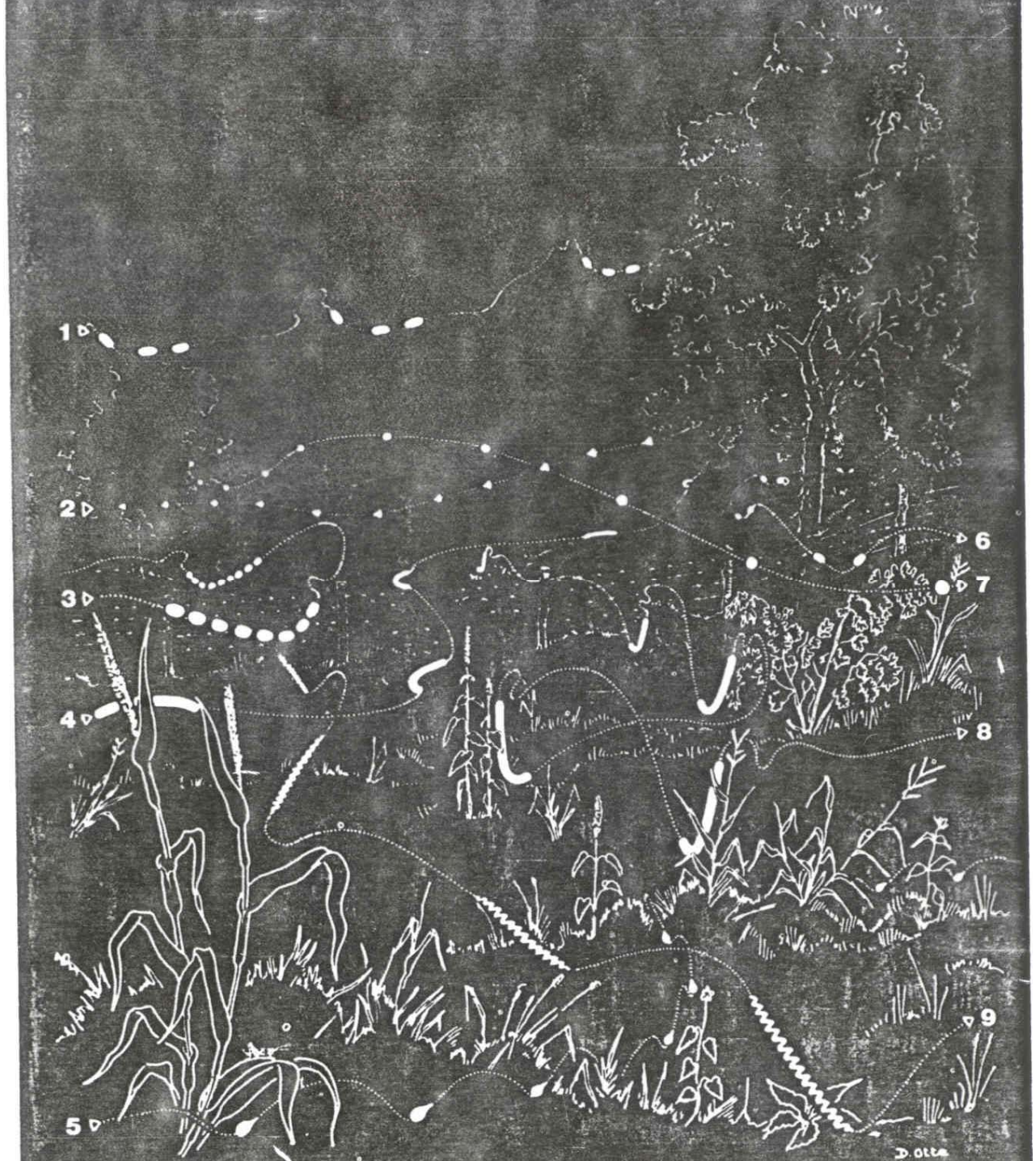
Ecological Isolation

Eastern spotted skunk – mates in late winter

Western spotted skunk – mates in late summer

Behavioral Isolation in fireflies

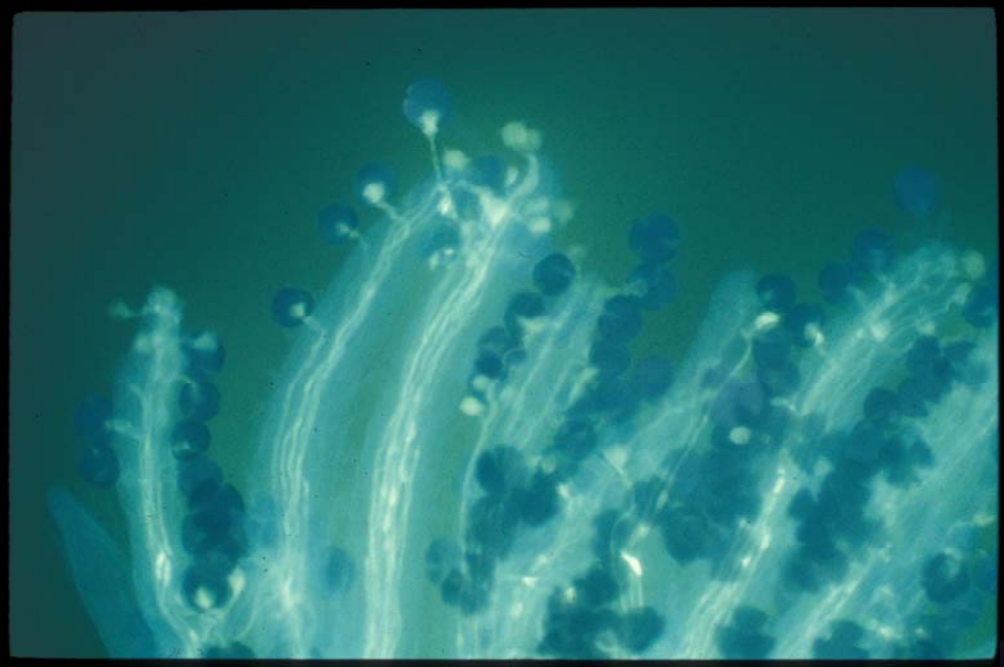
Flight and flash patterns of males of 9 species of fireflies



DANGER TO COURTING MALES

The insect world is full of strange intrigues. The females of some fireflies mimic the flashes of other species, pretending to be propective mates for the amorous males. The females then answer the flashes of these males by simulating the appropriate "love lights" and then devour them when they approach, all but their toes, eyes, wings, and a few other hard parts. These females, of course, will only mate with males of their own species.

Gametic Isolation



Pollen grains only germinate on the stigma of the correct species

Eggs do not “recognize” sperm of other species

The hybrid offspring of horse and donkey are viable but sterile