24.11.30: population ecology

cengage chapter 5: population ecology

Five main types of species interactions:

1. interspecific competition
2. predation
3. parasitism
4. mutualism
5. commensalism

Interspecific competition: two species, niches overlap, compete for resources (e.g. humans and many animals)
Resource partitioning: one resource is shared by species, but in different ways:



Figure 5.2 *Sharing the wealth:* Resource partitioning among five species of insect-eating warblers in the spruce forests of the U.S. state of Maine. Each species spends at least half of its feeding time in its associated yellow-highlighted areas of these spruce trees.

Predation: predator-prey (one always dies, the other survives)
See also predator prey growth cycles
Predator strategies:

speed (e.g. cheetah)
teamwork (e.g. lions)
camouflage (e.g. praying mantis)
chemical warfare (e.g. spiders)

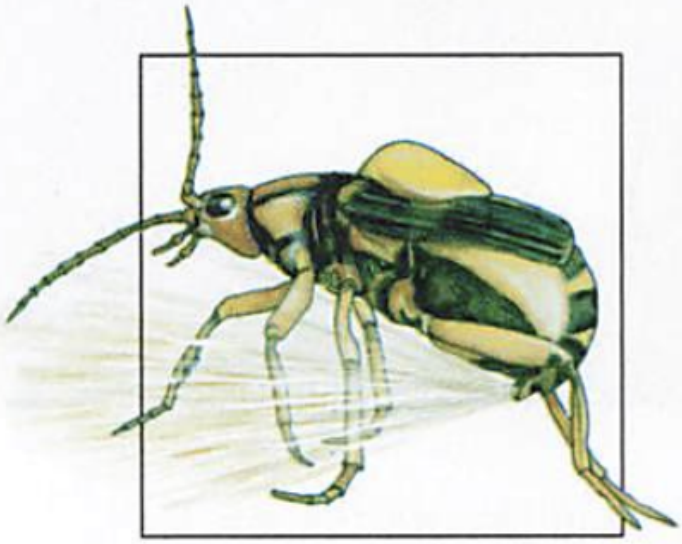
Prey survival strategies:
speed (gazelle)
senses (sight, sound, smell)
physical (shells, spines, thorns)
camouflage (arctic hare)
chemical warfare (octopus)
mimicry (looking like something else)



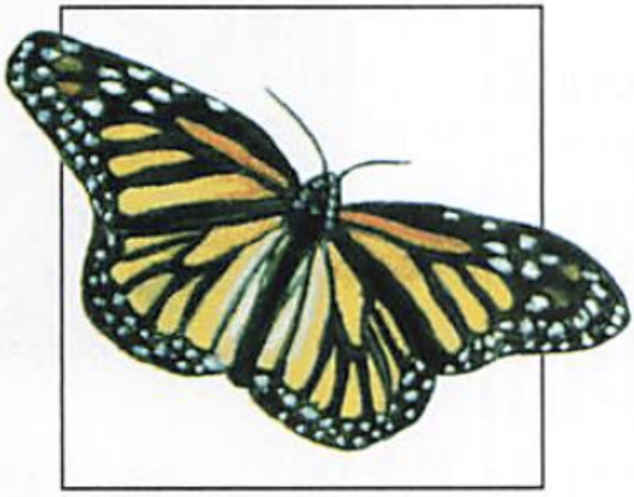
(a) Span worm



(b) Wandering leaf insect



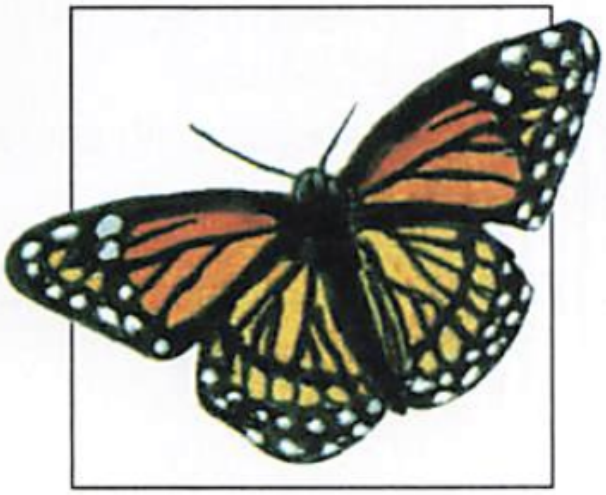
(c) Bombardier beetle



(d) Foul-tasting monarch butterfly



(e) Poison dart frog



(f) Viceroy butterfly mimics monarch butterfly.





Coevolution: predator gets better, prey gets better, predator gets better...

1. bats use sound to find moths (echolocation)
2. moths evolve to hear the sounds, evade
3. bats change the frequency
4. moths evolve to create their own sounds, blocking the bats
5. bats evolve to listen for the moth sounds

Parasitism: One lives off of energy and nutrients from the host "it is bad manners for the parasite to kill the host"
Mutualism: both benefit (birds eating bugs on cattle)
Commensalism: one benefits, the other does not care (orchids in trees)

Ecological succession:
Primary succession: from bare rock, no organic materials
Secondary succession: building blocks for live are there, have been removed (e.g. forest fire)

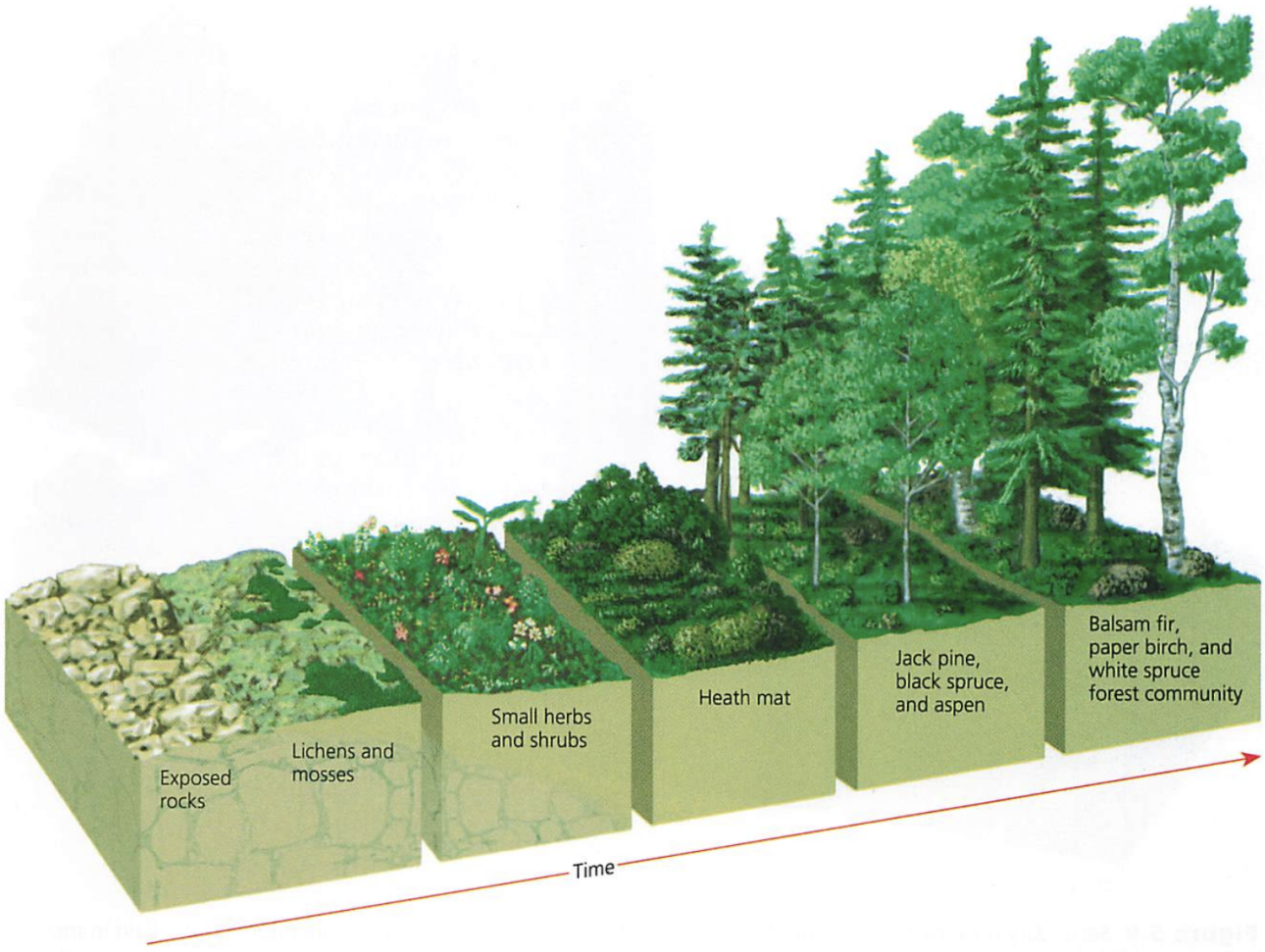


Figure 5.8 *Primary ecological succession*: Over almost a thousand years, these plant communities developed, starting on bare rock exposed by a retreating glacier on Isle Royal, Michigan, in western Lake Superior. The details of this process vary from one site to another.