Species Interactions & Animal Behavior

21-1 p. 397-402
Essential Questions

1. Identify and describe the main types of species interactions in a community.
2. Compare individual and group behavior.
3. Explain how the different types of group or cooperative behavior can increase a species chance of survival.
Species Interactions

- Ecological communities contain populations of interacting species
  - Symbiosis – a close interactions between species
  - Symbioses (pl) may be beneficial, harmful or have no effect on the species involved

- Five major types of Symbioses:
  - Predation
  - Parasitism
  - Competition
  - Mutualism
  - Commensalism
Predation (+/-)

• One individual (predator) captures, kills and consumes another individual (prey)
  – Benefits predator (+)
  – Harms prey (-)
Predator Adaptations

• Improves the efficiency of finding, capturing & consuming prey
  – Sensory adaptations (sight, smell, hearing)
  – Sharp teeth & claws
  – Speed & agility
  – Binocular vision (increases depth perception)
Prey Adaptations

• Increases ability to avoid being captured
  – Camouflage
  – Toxicity (chemical defense)
  – Warning coloration (usually signals toxicity)
  – Mimicry (harmless species resemble poisonous species)
  – Spines, thorns
  – Monocular vision (increases peripheral vision)
Parasitism (+/-)

- One individual (parasite) feeds on another individual (host)
  - Benefits parasite (+)
  - Harms host (-)
- Does not usually result in immediate death of host
  - Parasite will feed on host for long periods of time
- Parasite & host are often in an evolutionary arms race (co-evolving)
Competition (-/-)

- Two or more species using the same limited resource
  - Often negative for both species
Common Results of Competition

- Competitive Exclusion – one species out competes the other
  - One species is eliminated
- Resource Partitioning – Each species uses only a portion of the resources
  - Both species co-exist
Mutualism (+/+)

- A cooperative relationship where both individuals benefit
  - Example: butterflies get nectar from flowers & the flowers are pollinated
Commensalism (+/0)

• One individual benefits, but it does not affect the other individual
  – Example: barnacles attached to a whale
  – Example: cow birds
## Summary of Species Interactions

<table>
<thead>
<tr>
<th>Interspecific Interaction</th>
<th>Effect on Species 1</th>
<th>Effect on Species 2</th>
<th>Interspecific Interaction</th>
<th>Effect on Species 1</th>
<th>Effect on Species 2</th>
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<tbody>
<tr>
<td>Competition</td>
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<td>Exploitation</td>
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<td>Predation</td>
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<td>Mutualism</td>
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<td>Herbivory</td>
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<td>Parasites and Pathogens</td>
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Animal Behavior

• Understanding animal behavior can help us to understand:
  – Species interactions
  – Adaptations
  – Wildlife management strategies
  – Etcetera...
Group Behavior

• Species interactions focuses on the behavior of individuals
  – Each organisms acts a specific way to improve its own chances of survival

• Group behavior focuses on the actions of the whole social group
Advantages of Social Groups

- Protection from environmental factors
- Protection against predators
- Easier to find potential mates
- Defense against competing species
- Division of labor
- Population regulation
Disadvantages of Social Group Behavior

• Increased competition for resources
• Increased chance for diseases to spread
• Interference with reproduction
Examples of Group Behavior

- **Flocking** – birds feed and nest in flocks
  - Protection against predators
  - Protections against environmental conditions

- **Schooling** – fish swim in schools
  - Protections against predators
  - Increased ability to locate food sources
  - Conserves energy for individuals
  - Increases likelihood of finding mates

- **Herding** – land animals move in herds
  - Protection against predators
  - Protection of resources
Cooperative Group Behavior

- Cooperative group behavior is a more organized form of social behavior
  - Individuals often have specific jobs within the group
Examples of Cooperative Group Behaviors

• Swarming – allows insects to fight off predators
• Hunting – a group of individuals work together to bring down prey
• Migrating – a group of individuals travel long distances together
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