Ecology

The study of interactions among organisms and their environment (including other organisms)

Community Interactions

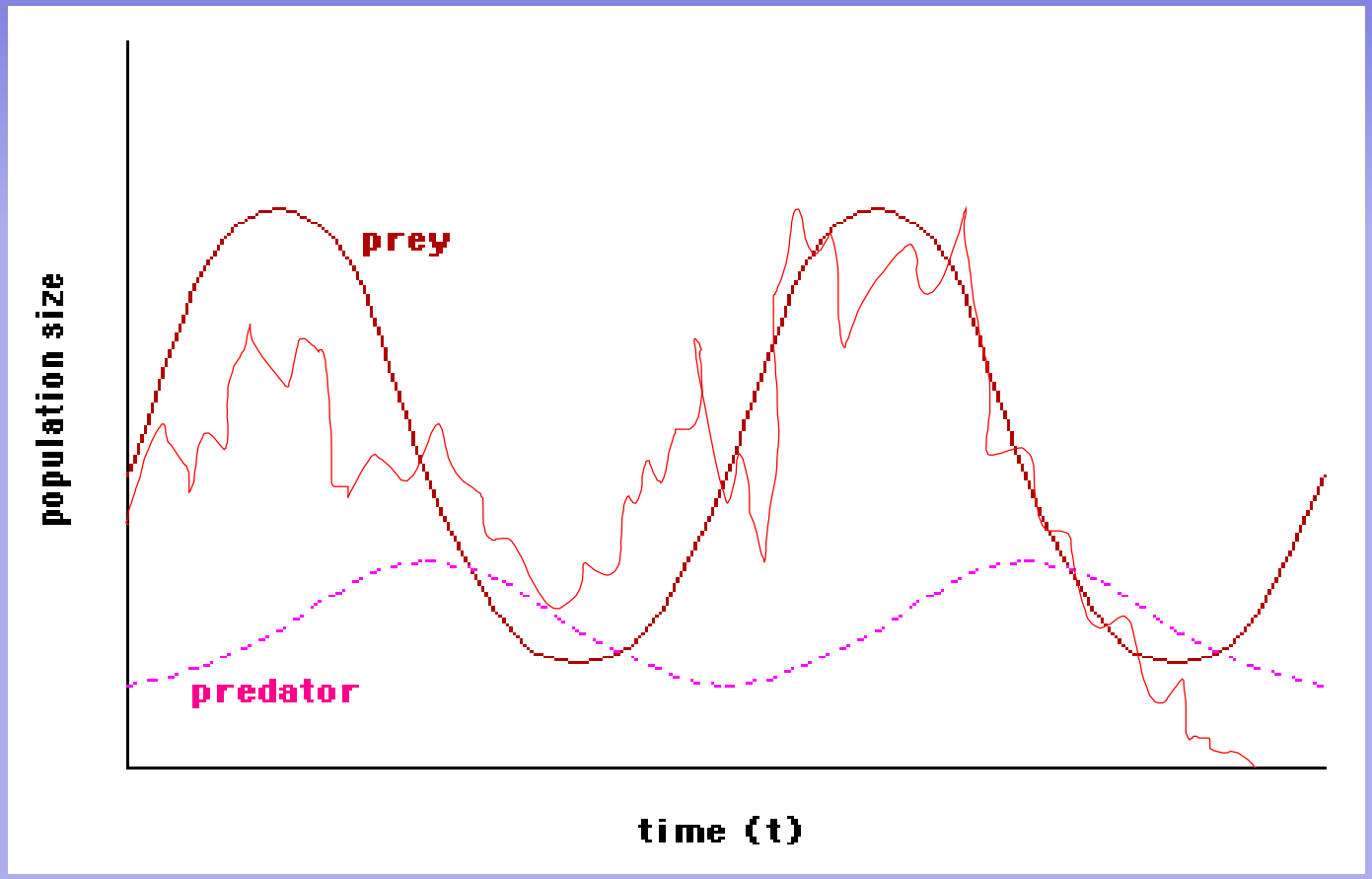
- Predation- (one organism feeds on another)
- Competition- (organisms attempt to use the same resource)
- Symbiosis- (two organisms live closely together)

Predation

- Examples include:
  - »Red Tail Hawk feeding on a small mammal
  - »Blue Whale feeding on krill, (a small shrimp-like animal)
  - »1st order consumers eating plants

I. Predator – Prey Interactions

Predation is a key regulator of animal populations

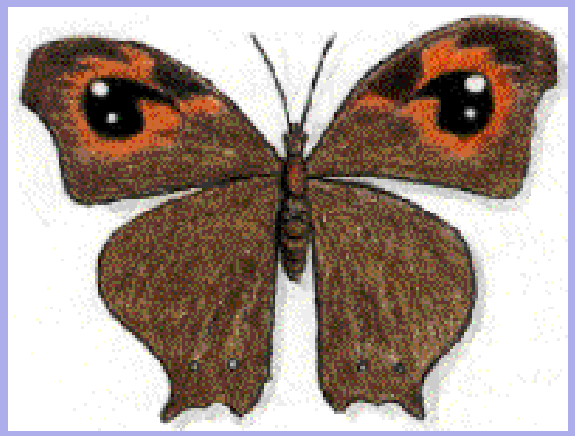


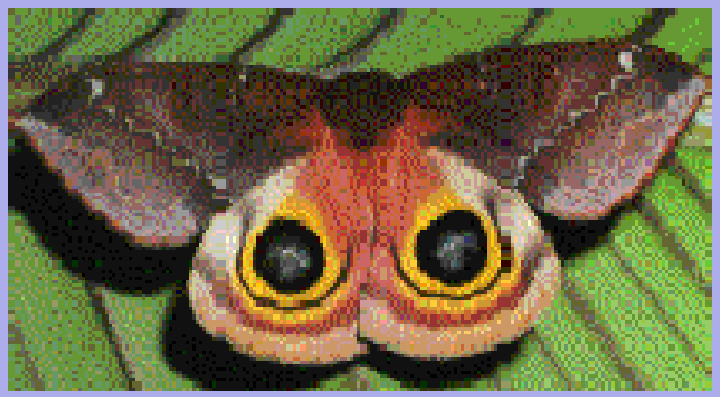
II. Animal defenses against predators

- Camouflage
  - Cryptic coloration *(making themselves difficult to spot)*
  - Defensive markings *(confuse and discourage predators)*
- Mechanical defenses (physical)
- Chemical defenses

- Crypsis *(Coloration, Body Type, or Behavior That Disguises Animal)*

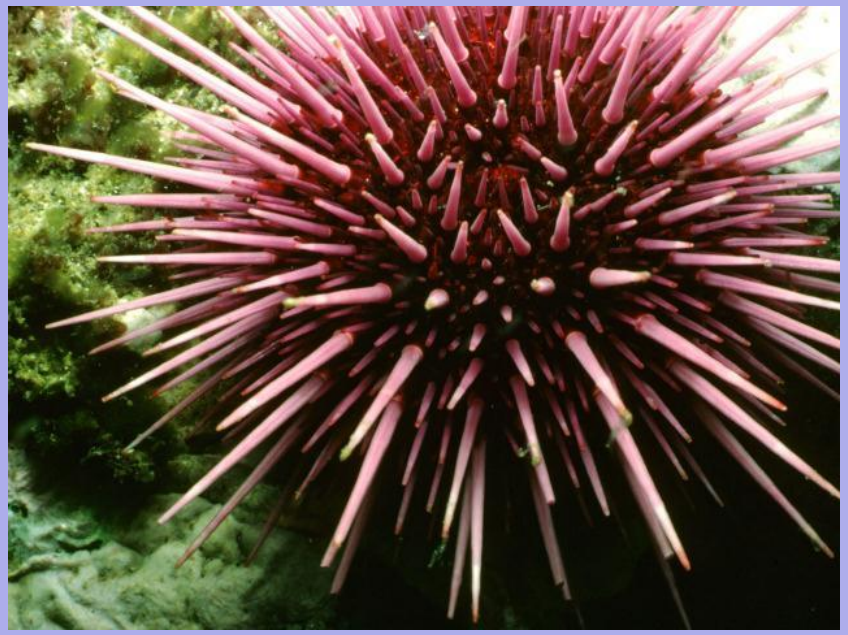
- Defensive markings *(used to confuse or discourage predators)*
  - Fake eye spots
    - Predators can't locate the head
    - Prey may appear much larger





- Mechanical defenses

- *Sharp quills or spines*



- Chemical defenses
  - Production of distasteful and toxic compounds
  - Often associated with warning colors
    - *Bright conspicuous color patterns*

- Aposematic Coloration (warning colors)

Monarch Butterfly

Retains cardiac poisons from when it was a larvae

Cobalt Blue Poison Dart Frogs

Golden dart frog

(*Phyllobates terribilis)*

- Most poisonous animal known to man
- Tetradotoxin (TTX)
  - Potent neurotoxin
  - 10,000 times more lethal than cyanide
  - Enough poison in one frog to kill up to 200 people
  - Causes convulsions and paralysis

Rough skinned newt

- Also produces TTX
- Enough poison to kill 7 people

Predator-Prey Arms Race
The Coevolution of Two Species

Rough skinned newt

Becoming more poisonous

Common garter snake

Becoming more tolerant of poison

- Mimicry

-Batesian *(harmless species resembles dangerous species)*

-Mullerian *(dangerous species resembling each other)*

- Predators learn to avoid both after tasting one
- Example: (Bees and wasps)

Batesian Mimicry and Warning Coloration

Coral Snake – “Red touches yellow, kill a fellow”

Arizona Mountain King Snake – “Red touches black, venom lack”

Symbiosis (two species living closely together)

- **3 types:**
  - *Mutualism* = both species benefit from the relationship
  - *Commensalism* = one member benefits and the other is neither helped nor harmed
  - *Parasitism* = one organism lives in or on the other and harms it

Mutualism

- Both organisms benefit from the relationship
- Example: Bees and flowers

Commensalism

- One organism benefits; the other is not helped or harmed
- Example: Bison and cowbirds

Parasitism

- One organism benefits and the other is harmed
- Example: oak trees, gall wasps … and secondary parasites!