PREDATION

1. INTRODUCTION

types of predation - ambush (hide + wait)
- stalk (long search, short chase)
- pursuit (short search, long chase)

benefits to prey species - cull weak, old, ill
- increase species diversity
  (decr comp., incr niche overlap)

parasitism - smaller & gradual

2. PREDATOR STRATEGIES

predator-prey oscillations
- predator pop. lags behind prey pop.

1. prey incr > pred incr
2. pred incr > prey decr
3. prey decr > pred decr
4. pred decr > prey incr

predator response to prey densities
- pred incr own repro & density
- pred exploit more prey faster

search image
- predator seek out most abundant prey
- switch to diff prey if more abundant
- switch to more palatable prey

3. OPTIMAL FORAGING

the most efficient predator
- goal obtain more energy than expend

factors - where to hunt?
- which prey to search?
- whether to pursue prey or not?
- whether pursuit successful or not?

optimal diet - select medium-size prey
- excess handling time if too large
- not enough energy if too small

optimal foraging efficiency
- feed at sites with most food available
- switch when no longer better

4. PREY DEFENSES

eyes - placement at sides (pred in front)

protection - toxic chemicals
- shell, armor, quills, claws

coloration - cryptic (camouflage)
- countershading (darker on top)
- warning (if toxic)
- Müllerian (reinforce unpalatability)

mimicry - plants, inedible, eyespots
- Batesian (palatable imitate toxic)

behavior - solitary, social, schooling

temporal - nocturnal, short repro phase
- prime life cycles (bamboo, cicada)

5. HERBIVORY

herbivory
- like predation if seeds, small plants
- like parasitism if leaves, fruits, sap
- reduces fitness of plants
  (decr biomass, growth, & repro)

plant defenses - woodiness (fibrous, low nutr.)
- chemical toxins & spines

benefits to plants - dispersal of seeds in feces
- pollination by insects, bats, hummers

6. PARASITISM

differences from predation
- size (smaller than host)
- time (consume gradually)
- evolved not to kill host (exc. overpop)

population regulation
- control size of host population

virulence - usually intermediate
- host killed if too harmful
- not spread if not contagious enough

disease - microparasites
- internal, short lifespan, single host

ectoparasites - suck blood, plant juices
- mistletoe, worms (flukes + leeches)
- insects (louse, flea, aphid)
- arachnids (tick, mite, spider?)

endoparasites - inside internal organs
- worms (fluke, tape & roundworms)
- succession of up to 4 different hosts
- numerous gametes (low survival)
- thick cuticle (resist host digestion)
- suckers & hooks (attach to host)
- reduced organs (digestive & senses)
- anaerobic respiration (low oxygen)

parasitoids - ichneumonid wasps
- lay eggs in paralyzed host (spiders)

brood parasites - cowbird, cuckoo
- lay single egg in nest of host
- expect host to raise own offspring
  (monopolize food, kill nestmates)