Announcements

- Carol's presentation today
- Tanya's presentation Tuesday
- Nov. 16: Field trip report due
- Nov. 20-26: FALL BREAK!!!!
- Nov. 28: Grad report due.
- Final: Dec. 14, 2:30-4:30, here

Behavior and Interactions Among Microorganisms and Invertebrates

- Behavior of microorganisms
- Interaction types in microbial communities
- Predation and parasitism
- Herbivory
- Competition
- Mutualism: facilitation and syntrophy
- Chemical mediation of microbial interactions

Behavior of Microorganisms

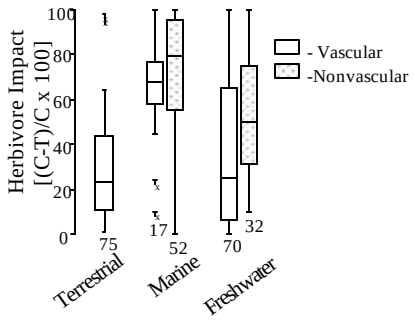
- Motility
- Taxis
  - moving toward or away from stimulus
  - phototaxis, light
  - geotaxis, gravity
  - chemotaxis, chemicals
  - magnetotaxis, magnetic fields

Predation and Parasitism

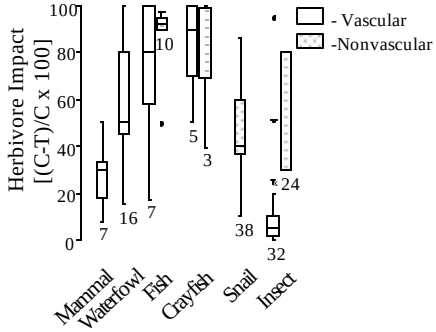
- Viruses
- Consumption of small cells
- Scrapers and shredders
- Filter feeders
- Selectivity of particle feeders
- Microbial adaptations to avoid predation

- Parasitism
- Other exploitative interactions

Herbivory in terrestrial, marine, and freshwater systems



Herbivory by freshwater taxa



Viruses

- All organisms have them
- May control algal blooms and bacterial populations at times
- Can be a problem in fish aquaculture
- Some small protozoa can engulf viruses
- Human disease viruses can survive in water
- Inactivated in natural environment over time
- May move genetic material across taxonomic lines
- A partial solution to the Paradox

Consumption of Small Cells and Particles

- Function of particle size
  - too small, the solution is too viscous, or collection apparatus is too small
  - too large and won't fit in mouth
- Function of particle concentration
- Function of particle quality
- Greatest rates when entire assemblage is consumed

Avoiding Predation

- Mechanical
  - size (too small or too large)
  - spines (chemical cues may induce protection)
  - indigestibility
- Chemical
  - toxins (must be a majority in community, e.g. algal bloom)
  - poor quality
- Behavioral
  - escape

Mutualism: Facilitation and Syntrophy

- Highly co-evolved mutualisms rare in freshwaters relative to marine
- N-fixing symbionts occur
- Syntrophy
- *Nostoc*-midge mutualism
- Bacteria-heterocyst mutualism