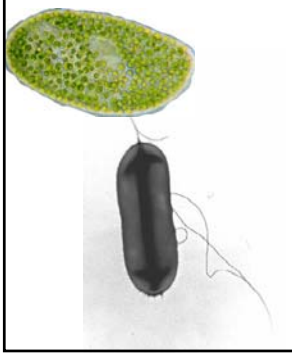
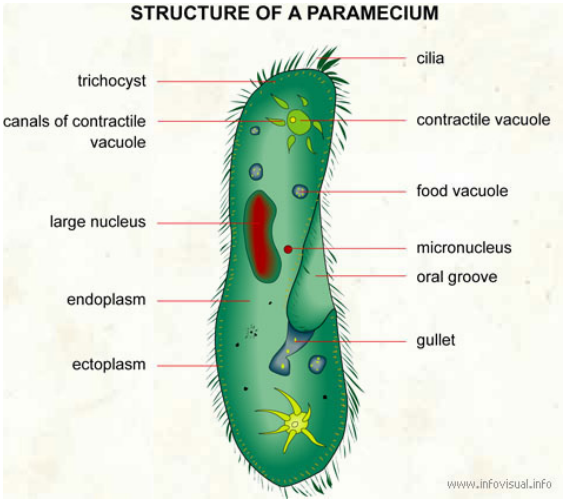
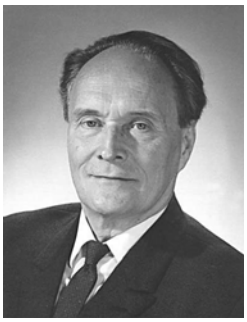
Culturing Wee-beasties for Mathematical Modeling

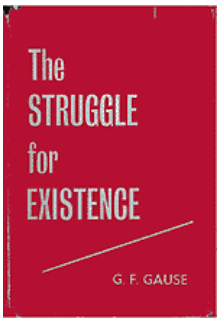


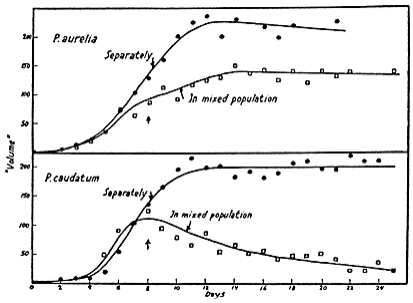
Paramecium
and
Bacteria

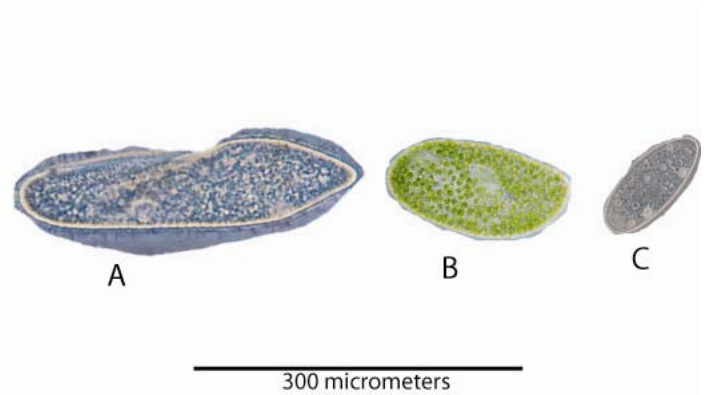
The World of *Paramecium*











A. P. caudatum
B. P. bursaria
C. P. aurelia

Procedures – Stock Populations

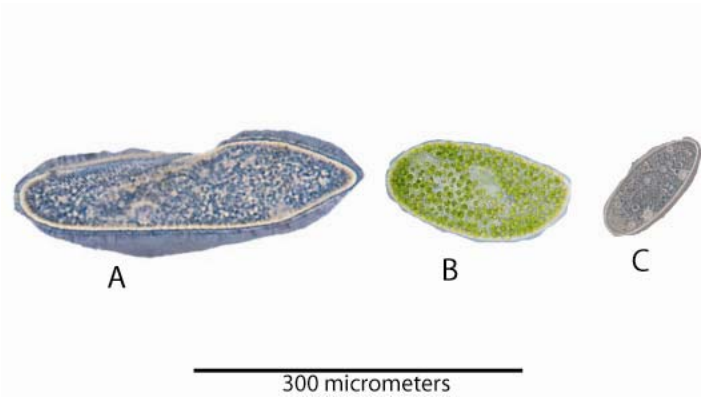
- Start stock populations with ~200mL of **spring water** in a wide mouthed jar (2 jars per species).
- Add approximately ½ of the Carolina stock vial to on jar for that species. Repeat for the second jar.
- Place two wheat seeds in each jar.
- Cover the mouth of the jars with a piece of cheesecloth secured by a rubber band.
- After the populations begin to settle, increase the volume of the habitat to 400 mL.
- Add additional water to the jars when needed.
- If it appears that too much algae or bacteria is building up in a jar, filter the population into a new clean jar using a piece of cheese cloth as the filter.

Population Growth

- Use the concentration of the stock population to be used to seed the experiment to calculate the volume needed to obtain 800 individuals.
- Pipette this volume of the stock into a small, flat bottomed test tube and dilute to 20 mL.
- Use the above procedure to conduct population counts and observe the changes in population size for at least two weeks.

Counting…harder than you might hope

- Set a digital pipette to measure out 100 μL. Put a tip on the pipette and cut part of the narrow end of the tip off (2-3 mm).
- Swirl the jar to homogenize the population.
- Take four samples of 100 μL each
- Use a dissecting microscope to view each cell. Visually determine the number of individuals present in the cell and record your data.
- If the population becomes so dense so as to make it difficult to get an accurate count reduce the sample size to 50 μL or even as low as 25 μL.



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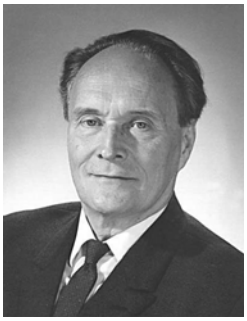
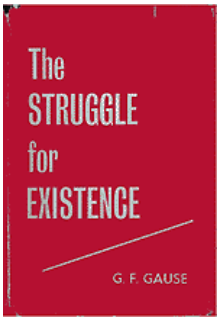
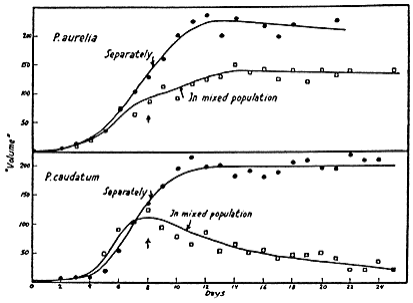




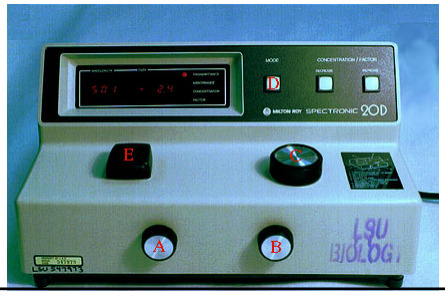


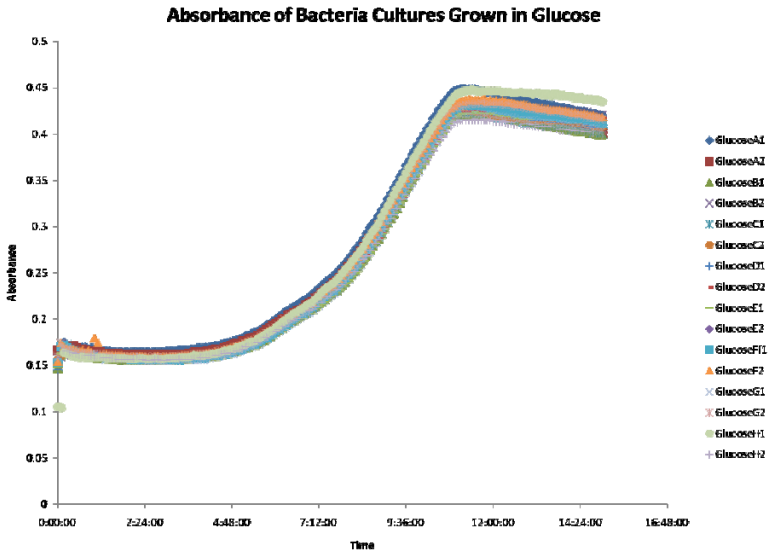
Competition between 2 species

- Use the concentration of the stock population to be used to seed the experiment to calculate the volume needed to obtain 800 individuals.
- Pipette this volume of the stock into a small, flat bottomed test tube and dilute to 20 mL.
- Use the above procedure to conduct population counts and observe the changes in population size for at least two weeks.

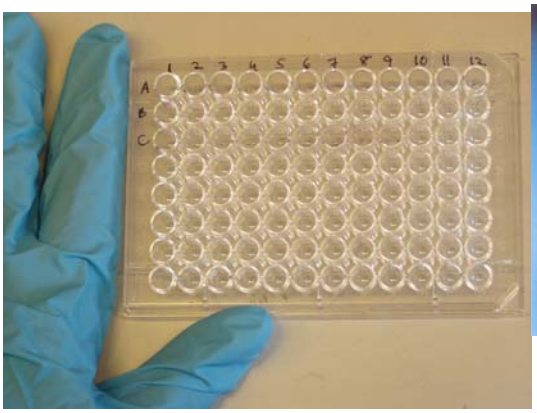
Working with Bacteria (briefly)

- Seed culture with *E. coli* in culture medium
- Incubate at 37^{o}C
- Measure “Optical Density” every 30 mins





Loads of data possible with microtiter plates



Important Resource for Protists from Ecological Society of America


POPULATION ECOLOGY:
EXPERIMENTS WITH PROTISTANS

INTRODUCTION

- http://tiee.ecoed.net/vol/expv1/expv1_toc.html#3

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