

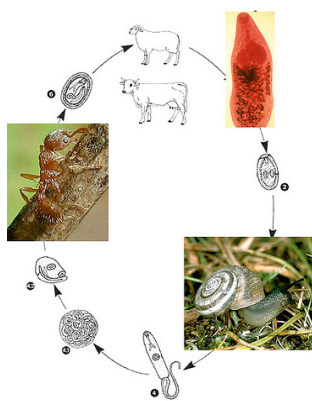
LECTURE GOALS:

- Marvel at the complexity and specificity of host manipulation by parasites.
- Consider what we can learn about behavior but studying parasites.
- Think about how to present your data as a poster.

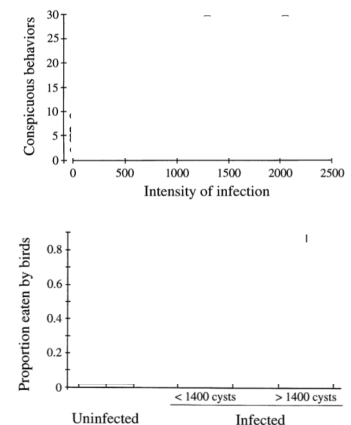
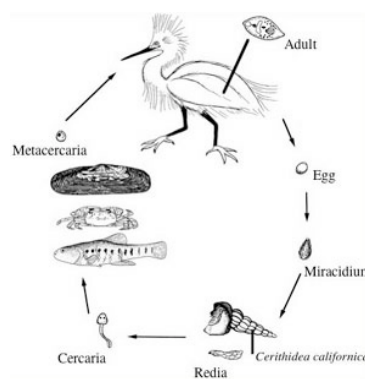
LECTURE OUTLINE:

1. Parasitism is a relationship **between** species, in which one organism (the parasite) lives on or in another organism (the host) and causes it some harm.
2. Parasites reduce host fitness by general or specialized “pathology”.
3. Even viruses, which seem to use generalized pathology can be highly specific (e.g. rabies)
4. Differs from predation in that the host must remain alive (at least temporarily) for the parasite to replicate and be transmitted to the next host.
5. Many parasites require different host species at different life stages.
 - a. *Leucochloridium* inhabits a snail and songbirds
 - b. Lancet liver fluke inhabits a snail, an ant, and a cow (sheep, human).
6. The life history of some parasites includes a free living stage (e.g. horsehair worm).
 - a. Evolved mechanisms to locate appropriate host & escape inappropriate hosts.
 - b. Evolved mechanisms of host manipulation are specialized to benefit the parasite.
7. *Saculina* barnacle manipulates crab to behave like a gravid female.
8. Fish infected with trematodes swim erratically which attracts bird predators.
9. *Toxoplasmosis* is an intracellular parasite of rodents and felines.
10. To reach the feline host, *Toxoplasma gondii* alters rodent behavior making them attracted to their natural predator.
11. Accumulating data suggests human behavior is also altered by *T. gondii*.
12. Dopamine synthesis may be an important part of that mechanism.
13. The jewel wasp is highly specialized to control cockroach behavior.

HELPFUL FIGURES:



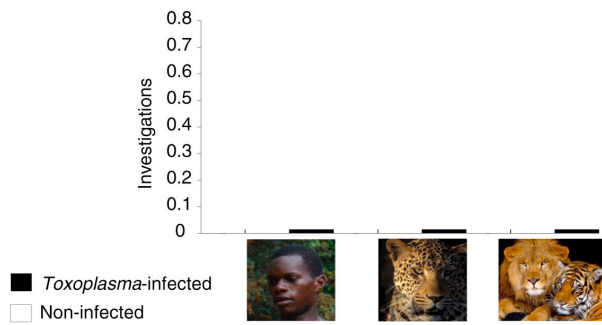
Multiple hosts



Trematodes manipulate fish behavior



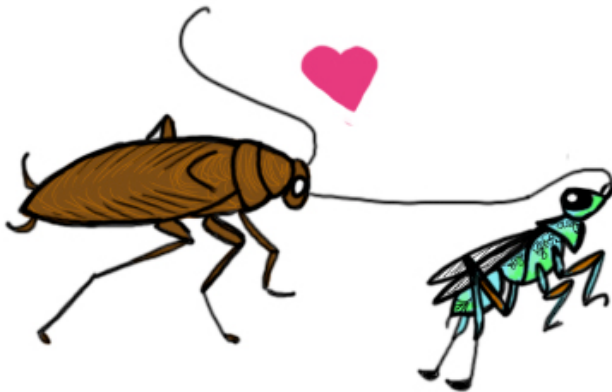
Toxoplasma gondii alters rodent behavior



Two Hypotheses about why *T. gondii* manipulates human behavior.

- 1)
- 2)

Zombie cockroach

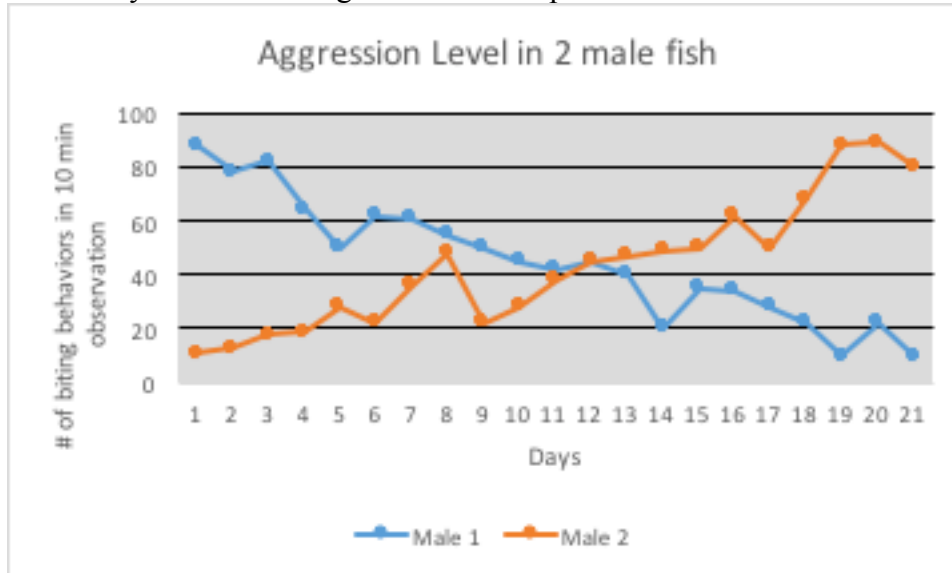


POSTER SUGGESTIONS:

1. The title of your Poster is very important. It must:
 - a. convey the overall subject matter of the project
 - b. appeal to your audience (humor is allowed but not at the cost of information)
 - c. be specific enough to describe the contents (or outcome) of the project.
2. The abstract of a Poster follows the same (7 sentence) format as for a paper but (in my opinion) does not belong on the poster.
 - a. Tell the overall topic.
 - b. State your key research question.
 - c. Summarize why the current literature fails to adequately answer your research question yet.
 - d. Explain how you tackled the research question.
 - e. Explain how did you go about doing the research that follows from your big idea (4).
 - f. Explain your major result.
 - g. State the greater impact of your research.
3. The poster begins with an introduction to interest your audience and provide the essential background.
 - a. provide context for your work
 - b. pitch your novel hypothesis
 - c. Use illustration and bullet points (<100 words you will say the rest)
4. Equipment/Procedures (rather than material and methods) will tell the audience how the project was accomplished.
 - a. Do not include the details
 - b. Use figures and flow charts
 - c. Include photographs or labeled drawings
5. The Results and their meaning are presented simultaneously.
 - a. Each figure, with title, presents a finding.
 - b. Use color consistently and to your advantage.
 - c. Do not rely on figure legends (p-value, sample size etc. on the figure).
6. Provide one (or two) bold conclusions.
 - a. Always be positive/don't talk about what failed.
 - b. Be emphatic/but realistic
7. Cite appropriately but sparingly.
8. Don't forget to acknowledge funding sources and folks who helped.
9. Practice presenting your work.
 - a. What one piece of information do you want them to remember?
 - b. Have a 2 minute presentation ready that can be extended to 5-7.
 - c. Watch your audience as you present.

HELPFUL FIGURES & NOTES:

How can you make this figure better for a poster?



how can you make this figure better for a Poster

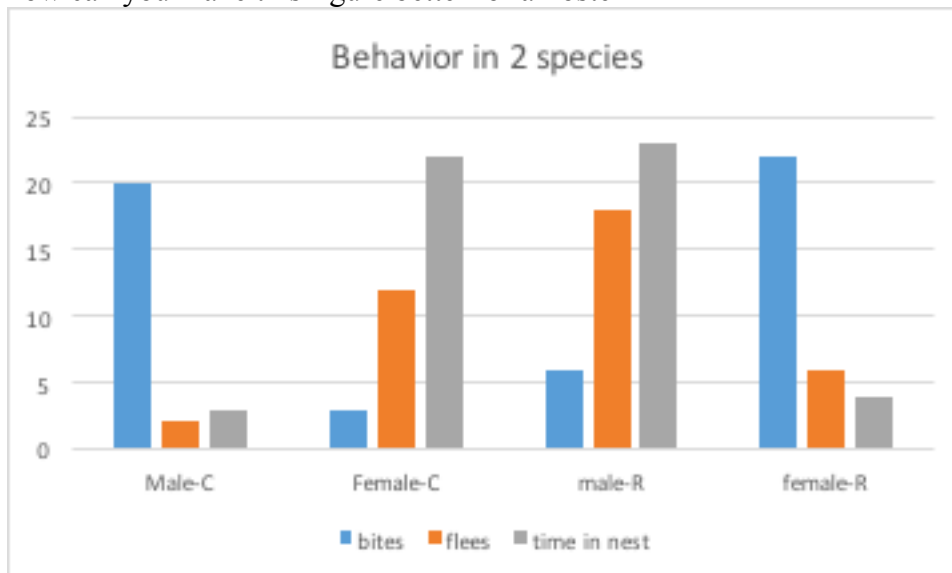


figure 2. Male and Female behavior in a sex-role conventional (C) and sex-role reversed (R) species. Bites and Flees reported as number of events/10 minutes, time in nest as percent total time.

BIO342 Animal Behavior: How to write a seven sentence Abstract:

(You need not follow exactly this template but use it as a guide.)

1. **Introduction. In one sentence, what's the topic?** Phrase it in a way that any scientific reader will understand. For Bio342, consider your audience to be other undergraduate students in Biology not necessarily in Animal Behavior.
2. **State your key research question.** What is the research problem you tackle? Again, in one sentence, state the central question that you address. Remember, your first sentence introduced the overall topic, so now you can build on that, and focus on one key question within that topic but this is still a biological topic, not your explicit experiment. If you can't summarize your IP in one key question, you are probably thinking too narrowly.
3. **Summarize (in one sentence) why the current literature fails to adequately answer your research question yet.** This will not cover everything that has been done previously. Here, you have to boil that down to one sentence giving both the strength of that past research and the gaps that remain. Don't try and cover all the various detailed ways in which people have tried and failed; the trick is to explain that there's this one particular approach that nobody else tried yet (i.e. the thing that your research does). You need to explain in a few words what the general message in the current literature is in order to convey what's missing.
4. **Explain, in one sentence, how you tackled the research question.** What's your big new idea or research strategy? This is not the experimental design or even the explicit techniques but the approach you used (gene expression analysis, anatomical localization, functional studies, pharmacological manipulation, behavioral observation, field collections, etc). Think about how this perspective is a novel approach to your research question (sentence 2).
5. **In one sentence, how did you go about doing the research that follows from your big idea (4).** What type of techniques were used? Remember, this is an abstract, not detailed methods. Tell your reader what you did but you don't need sample sizes, detailed protocols, etc.
6. **In one sentence what was your major result.** This will be our experimental outcome, but it should be worded in a more general sense related to the key research question (2). Do not include statistics (no means, variance, p-values). This should interpret the experimental results in terms of their biological meaning.
7. **In one sentence state the key impact of your research.** Here we're not looking for the outcome of an experiment (that was #6). We're looking for a summary of the implications. What does it all mean? Why should other people care? What can they do with your research?

For Class, include your poster title & the names of the students on the project.

Up Load to Moodle by **Saturday before the poster** session as a word document.

READING FOR MAKING POSTERS:

<http://colinpurrington.com/tips/poster-design>

<https://projects.ncsu.edu/project/posters/>