Title Page

On a separate page, write your title, and the names and locations of people doing the study. Your title should summarize the question you studied. The title page should include the information in the following example:

Effects of different host plant species on growth rates and larval survival in *Danaus plexippus*

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Abstract

Your abstract should be a concise summary of your question, methods and results. Many people find it easiest to write the abstract last. It should contain no more than 200 words. A useful format is to recall what you did, explain the purpose, state the results, and finally summarize the implications of these results. Here is a 99-word example from one of Karen Oberhauser's papers:

We studied the relationship between the timing of mating and oogenesis in monarch butterflies to determine 1) the potential for male nutrient input into eggs and 2) whether mating stimulates egg development. Most females mated soon after they started maturing eggs. (this sentence tells what we did and why we did it) *One and two days after mating, females contained the same number of mature oocytes as virgin females of the same age, while three days after mating they contained more mature oocytes than did virgins.* (this sentence summarizes the results of the study) *These results confirm the potential for male-derived nutrients to augment oocyte production, but indicate that mating is not required for oocyte maturation to occur.* (this sentence tells the implications of the study)

Introduction

Your introduction should include a fairly detailed summary of the question you addressed, with some background on this problem. You want to convince people that this is an important and interesting question. You may want to do some research to learn about related studies, and discuss them in this section. For example, one of Sonia Altizer's papers includes the following introduction:

I explored geographic variation in host resistance and parasite virulence among populations of monarch butterflies infected with the neogregarine protozoan parasite, Ophryocystis elektroscirrha. (this sentence tells what she did) *Monarchs and this parasite are distributed worldwide, and parasite prevalence is highly variable among populations (Ackery and Vane Wright 1984, Leong et al 1997, Altizer et al. 1998). One possible cause of this variation in prevalence is that populations have genetically diverged with respect to host susceptibility or parasite infectivity.* (these sentences give some background information, with references, and introduce her approach to studying the cause of existing variation)

After introducing the topic, briefly describe your research procedure, and then list your hypotheses (it is OK to have more than one hypothesis). Here is an example of the end of Sonia's introduction to this paper:

To test the potential for genetic differences in hosts and parasites among populations, I conducted cross-inoculation experiments with hosts and parasites from three North American populations. Because virulence is often associated with the degree of parasite replication within hosts, I measured both host survival and the parasite loads of inoculated monarchs. (this sentence explains what was done and why) *I predicted several effects of host and parasite origin, including 1) higher replication of parasite strains on native hosts, indicating that parasites are locally adapted, 2) lower replication of parasites strains on native hosts, indicating that hosts are resistant to local parasites, 3) higher host resistance among the longest-distance migrants, resulting from an*

*increased cost of infection, 4) higher parasite virulence in non-migratory populations due to increased horizontal and vertical transmission opportunities, or 5) no effect of either host of parasite origin on host survival or parasite replication. (*numbers 1-4 are several alternative hypotheses, some of which are mutually exclusive (1 and 2), and 5 is the null hypothesis)

Methods

This section should be a brief, concise summary of what you did. It should be detailed enough that someone else could repeat your study, but should not go into long, boring detail (e.g. *We obtained milkweed plants from an unmowed area behind our school* is better than *During third period we walked to an unmowed area 0.5 km from our school. We picked milkweed plants from this area, then carried them back to our classroom).* You should include locations, dates, and sample sizes in this section.

Results

This section will summarize the answers to your question. Before you start writing the Results section, list everything that you learned, and decide what is most important and how to organize your results to make the important points. The section should include tables, charts and graphs to illustrate these points. As a general rule, graphs or charts (called figures) do a better job of making a point than tables, but it is not always possible to get all of the information you need into a figure. Tables and figures should both have captions. Whenever you use a table or figure, be sure to refer to it by number in the text of the results section. Never include a table or figure that you don't don't discuss in the text. Look at other reports on this site for examples.

Discussion

In this part of the report, summarize your findings, and discuss their implications with respect to your hypotheses. If relevant, compare your results to those found in similar

studies in the past. In addition, you could suggest future directions for research. If you feel that there were methodological problems with your work, mention them here, and state how they might have affected your results. If you think that your results were inconclusive, state what you might want to do differently in the future.

Acknowledgements

In this section, acknowledge people who helped you with this work. For example, you could say "I would like to thank my mother, Sylvia Plexippus, who checked my cages while I was at school." Here is an example from one of Karen's papers:

I thank De Cansler, Ann Feitl, Rachel Hampton, Brenda Jenson and Christine Jessup for help counting and weighing eggs. Don Alstad, Carol Boggs and Christer Wiklund provided helpful comments on the manuscript. Research was supported by the National Science Foundation (DEB-9220829).

Literature Cited

List all of the published sources you used to get information for your report. These should include the author's name, year of publication, title of article or book, publisher or journal, and issue and pages for journal articles. Below are examples of citations for a book and article:

Choe, J. C. & B. J. Crespi. 1997. *Mating systems in insects and arachnids.* Cambridge University Press.

Oberhauser, K.S. and R. Hampton. 1995. Relationship between mating and oogenesis in monarch butterflies. *J. Ins. Behav*. 8:701-713.

If you use websites, give the organization and the address of the site. (e.g. Monarch Joint Venture website: **www.monarchjointventure.org**)