
# Experiments to Teach Ecology, Volume 2.

*Teaching Issues and Experiments in Ecology (ESA - TIEE Web).*


## Environmental Correlates with Leaf Stomata Density


Contributed by:

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# Appendix 2. Detailed Guidelines for Stomata Lab Written Reports

General Suggestions.

1) Your report should contain 7 sections: Abstract, Introduction, Materials and Methods, Results, Discussion, Literature Cited (if any), and an Appendix containing the original data Each section serves a specific function detailed below.
2) DO NOT waste paper on a title page, or on any other wasteful blank areas.
3) Word-process your report, double space, with at least 1" margins along all edges.
4) Be clear, concise and insightful with your prose.
5) Avoid all anthropomorphisms, awkward phrasings, and grammatical illegalities. Proof-read aloud several times,
6) Never create words (e.g. "obtaination," "mobilate").
7) the word “data” is plural, “datum” is singular.
8) look up the appropriate usage for “affect” and “effect.” The former is a verb, and the latter is a noun.
9) it's = it is, whereas the word its is the possessive form of it,
10) Submit a disk-copy of your original data and of your document along with your hard copy of the final manuscript so that we may electronically publish your results on the course home page.

Specific Suggestions for the Abstract (length = 200-250 words in a single paragraph).

1) This section contains a short summary of every section in your report. Cover the main points only. Do not include lengthy details of the methods. Make sure you summarize your numerical results.
2) In reality, the abstract will be the only part of your paper that will be read by the majority of those who get past the title; therefore, tailor the prose for maximum speed, simplicity and impact.
3) Avoid a “narrative” style. Lift your best sentences from the body of the paper, and build one short tight paragraph.

Specific Suggestions for the Introduction (length = 1-2 pages).

1) Introduce the general topic of the report. Explain why the general topic of the report is of interest to you and to the reader. What is this topic of relevance to biological science? Your job is to MOTIVATE INTEREST in the reader in the introduction.
2) State the specific question that is the subject of the report.
3) Briefly explain the hypothesis(es) that may offer an answer to your question.
4) There may be alternate hypotheses that may answer the same question. If so, each should be explained, and also explain how you plan to distinguish among competing hypotheses.
5) If there are other questions that you address, then repeat steps (2)-(4) for each one.

Specific Suggestions for the Materials and Methods (length = 1-2 pages).

1) This section describes the procedure you used to address your research question. Write one brief paragraph describing EXACTLY where you went to locate plant individuals to sample (draw a little map), and EXACTLY from where on each individual plant the leaf samples were collected.
2) Include all of the necessary and sufficient detail for the reader to be able to duplicate your studies exactly. Distinguish between essential detail and extraneous detail (e.g., studies were carried out on Earth by *Homo sapiens*) and omit the latter.
3) Replicate your measurements at least 12 times per treatment (e.g. sun vs. shade).
4) For every experimental design there are important implicit assumptions. Be sure to address the critical ones.
5) Briefly explain the statistical techniques that you used to test for differences in stomata density. You must seek the advice of your instructor about the statistical analyses you need prior to collecting any data.

Specific Suggestions for the Results (length of text = 1 page, plus any Tables and Figures).

1) This section states in sentence form what you want your readers to learn from your tables and figures. This section contains all of the results of the experiments and other measurements you made, and is usually the SHORTEST section.
2) Any statistical tests are reported in your Results; however, this section contains NO interpretations of your results.
3) Only use the word "significance" when discussing a statistical test. Do not say "our results were significant" in any other context.
4) For every data set there exists an optimum format for presentation. Poorly conceived graphs will obscure the data and leave the readers unconvinced of your results. Select a combination of tables and figures (e.g. scatterplots, bar graphs, etc.) that are
    a) well documented and easy to read
    b) illustrate the data with a minimum of redundancy
    c) enable the reader to quickly perceive the results.
5) All Tables and Figures should be numbered in order (i.e. Table 1, Table 2, ... Figure 1, Figure 2, etc.) and referred to by number in the text.

Specific Suggestions for the Results (con.).

6) For each Table and Figure, include a "Legend" at the top or bottom. The Legend should briefly state what the Table or Figure shows, axes units (if appropriate), error bars (if appropriate), and other information to enable your Table or Figure to stand alone. A reader should be able to look at any Table or Figure and be able to understand what's in it without consulting the text of the ms. Thus, you are encouraged to duplicate text in the legend and report to facilitate clarity.

Specific Suggestions for the Discussion (length = 1-2 pages).

1) This section contains your interpretation of your results, whereas the Results section simply presents the data. Do your data support your hypothesis(es)? How "confident" are you in your statements (see below)?
2) You can never prove an hypothesis by experiments. Instead, you accept or reject hypotheses with a finite, numerical degree of "confidence" (e.g. 95% or 99%).
3) Explain to the reader what the graphs and figures say. Avoid recitation of detail, but cite table and figures by number as evidence of your statements.
4) Never over-extend yourself beyond your database. Abstain from speculations that your data do not specifically support. Feel free to suggest new hypotheses for future work, but do not present new data.
5) Be conservative in your assessments, but do not make excuses.
6) Conclude your Discussion with a brief comment about what would be the next thing you would do for this project. In what direction would your future research take you after this project?

Specific Suggestions for the Literature Cited.

1) Note that you will only need this section if you cite other previously published material somewhere in your paper, (e.g. if you used previously published methods).
2) Each citation of a research article or book should have: Author(s). Year. Title of paper. Journal. Volume: Pages.
3) Each citation of an internet resource page should have: Author(s) if known. Specific Title of the Page. General Title of "Home" Page/ Organization Name for the Site. Full "http" address. Date of Your Download.

Specific Suggestions for the Appendix.

1) Attach a copy of your original data and full output tables from your statistical analyses in an Appendix. Data should be well documented (including clear labels for measurement units). All words and numerical entries must be unambiguously legible, so write neatly.