

FIGURES AND CAPTIONS IN LAB REPORTS AND SCIENTIFIC PAPERS

Data in scientific papers is generally presented in one of three ways: text, data tables or figures. It is up to you to decide which is the best way to present your data in your results section. You will be using these results to support an argument, so choose the format that best represents your understanding of the data and is easiest for the reader to understand and interpret.

Figures include graphs, photographs and diagrams. The purpose of a figure is to present complex or graphic experimental results and analyses as an image. The accompanying figure caption should contain enough information so that the reader can understand the figure without referring to the description in the text of the paper. In other words, the figure and accompanying caption could be understood without reading any other part of the paper.

When to Use A Figure

- The use of a figure greatly adds to the strength of your argument. For example the figure clearly and dramatically illustrates differences among treatments (see Figure 1 for an example).
- Information can't be easily or clearly presented in other formats such as a table or an in-text description.
- The figure supports your argument by giving the reader an example or typical observation from an experiment.

When to Use a Figure and How to Write a Figure Caption

Example 1

An experiment was performed to determine the effect of cold acclimation on freezing tolerance in radish seedlings. Radish plants were grown in the greenhouse in 4 inch pots for about three weeks. Plants were either exposed to cold temperatures (2.5 C) for 2 days or kept at room temperature. Both cold treated and untreated plants were then exposed to freezing temperatures (~ -15C) for 2 hours. Control plants were kept at room temperature. Following the freezing treatment, all plants were returned to the greenhouse. After approximately 7 days in the greenhouse the plants were observed to assess damage due to the freezing treatment. All of the plants subjected to the freezing treatment appeared dead while the plants kept at room temperature appeared healthy. In other words, in this experiment there was no effect of acclimation at 2.5C on freezing tolerance when plants were treated at ~ -15C for 2 hours. Additional experiments are being performed with less severe freezing treatments.

The results from this experiment are easily described in the text. In discussing the damage caused to the plants by freezing, an image of the plants would likely be very convincing to the reader. Figure 2 shows the result of the freezing treatment five days after the plants were returned to the greenhouse.

Figures and Figure Captions

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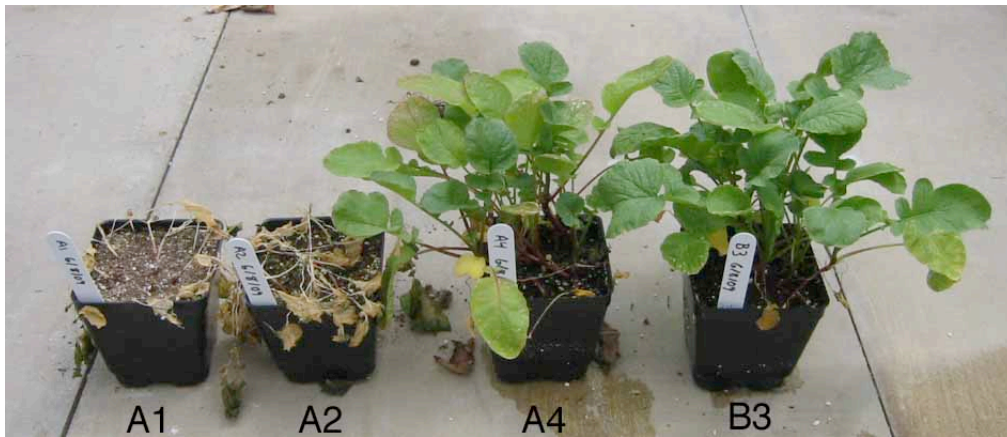
Figure Captions

A complete figure contains both an image and a caption. Together, these two parts should provide enough information that a reader can understand the data presented without referring to the text. A figure caption should contain a concise description of the graphic allowing a reader to understand the figure.

Example of A Poor Figure Caption

This was a figure produced for the experiment described in Example 1.

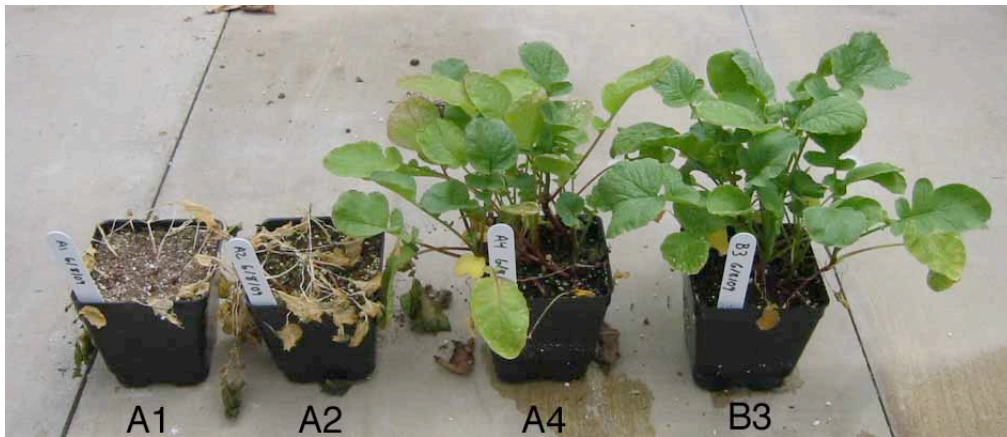
Figure 1. Radish plants subjected to a freezing treatment.



Example of A Good Figure Caption

This was a figure produced for the experiment described in Example 1.

Figure 1. Radish plants showing the effects of freezing at -15C for 2h (A1 and A2) compared with control plants (A4 and B3) kept at room temperature. The plants in pots A1 and A4 were cold acclimated for 2 days at 2.5 C prior to freezing or room temperature treatments. The plants in pots A2 and B3 were not cold acclimated and were kept at room temperature (~ 25C) for 2 days prior to freezing or room temperature treatments. Following the freezing or room temperature treatments, plants were kept in a greenhouse for one week.



When to Use a Figure and How to Write a Figure Caption

Example 2

An experiment was performed to determine the minimum amount of genomic DNA template required for successful PCR amplification of the 18S ribosomal RNA gene from baker's yeast (*Saccharomyces cerevisiae*). Determining the minimum amount of DNA required for a successful PCR reaction is a way of assessing the sensitivity of PCR. PCR reactions were set up using PuReTaq Ready-To-Go PCR beads (GE Healthcare) with different amounts of genomic DNA template and standard primers for amplification of the 18S gene from fungi (yeasts are fungi). Following the PCR reaction, the products were separated by electrophoresis through an agarose gel, stained with ethidium bromide, visualized under UV light and photographed.

The results of this experiment could easily be described in the text. If demonstrating the sensitivity of the PCR reaction is critically important to your conclusions, it would be more convincing to the reader to show an example of PCR performed with differing amounts of template. Figure 1 shows the results of a PCR sensitivity assay for the amplification of the 18S ribosomal RNA gene using varying amounts of genomic DNA from bakers yeast as a template for PCR.

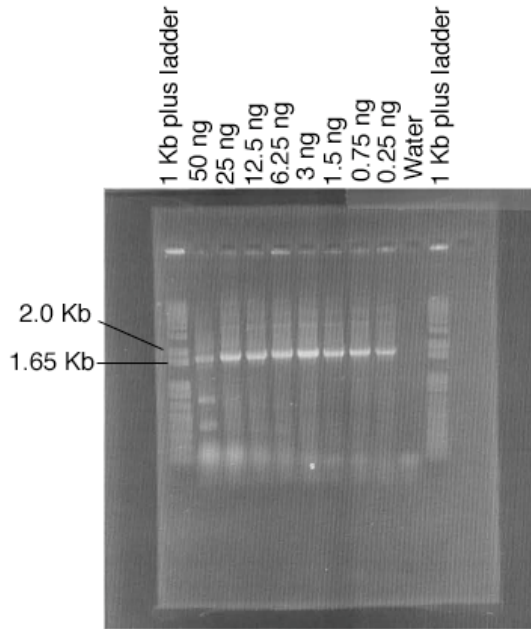
Figures and Figure Captions

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Example of A Poor Figure Caption

This was a figure produced for the experiment described in Example 2.

Figure 2. PCR amplification of the 18S ribosomal RNA gene from *Saccharomyces cerevisiae*.



Example of A Good Figure Caption:

This was a figure produced for the experiment described in Example 2.

Figure 2. An ethidium bromide stained agarose gel showing DNA fragments produced by PCR amplification of the 18S ribosomal RNA gene from *Saccharomyces cerevisiae*. The amount of genomic DNA used as template was varied from 50 ng to 0.25 ng. Lanes one and eleven contain a 1Kb plus DNA ladder (Invitrogen); the 2.0 and 1.65 Kb fragments are labeled. The amount of genomic DNA used as template for PCR amplification is indicated above each lane. For the negative control, sterile distilled water was used in place of template DNA.

