

## Writing the Materials and Methods

Extremely meaningful because the consistency of the results is dependent on knowing exactly how the experiment or study was performed.

An example:

Approximately one-half gram (dry weight basis) of three soil samples from each site was measured with a steel spatula into a 1.5 ml microcentrifuge tube and suspended in 5 ml of 5 mM sodium phosphate buffer (pH 7). Prior to this, the soils were measured for moisture content by drying at 60° C. This suspension was thoroughly mixed for 1 min. A dilution series of the suspension was created to the 10<sup>-4</sup> dilution in 10 ml tubes. Fifty µl of this suspension was plated in quadruplicate onto solidified one-tenth-diluted (0.1x) Difco Nutrient Agar (pH 7) (Difco Labs, Detroit, Michigan). As a supplement to prevent fungal growth, the agar contained 100 ppm cyclohexamide.

## Three main points:

### 1. Most difficult decision: Selecting the proper level of detail

#### Detailed enough to...

- Allow repetition of the experiment

- Organization of thoughts

- Answer to the question "Why was the experiment done?"

#### Brief enough to...

- Be concise

- Not promote confusion with details

#### Some potential problems with this section:

- Sequence of experiment is not mirrored in the text sequence.

  - Keep everything in order; don't make the reader go back.

#### Contains some ambiguous wording

- What is the "highest setting"?

- Is "solidified" necessary?

#### Can the section be shortened?

- "Three soil samples"? It is more proper to say "triplicate", or "in triplicate".

- Combine short sentences into longer sentences in order to reduce line and word number.

- Before:

This suspension was thoroughly mixed for 1 min. A dilution series of the suspension was created to the  $10^{-4}$  dilution in 10 ml tubes.

After:

This suspension was thoroughly mixed for 1 min and diluted.

## 2. It is most important to omit excess details, but keep essential details (tricky).

How can you do this?

List all of the factors that could have influenced the results.

Ask yourself “if the factor was omitted or changed, could the result have been different?”

Example list of all factors:

one-half gram

dry weight basis

three soil samples

steel spatula

1.5 ml microcentrifuge tube

5 ml of 5 mM sodium phosphate buffer (pH 7)

measured for moisture content

60° C.

thoroughly mixed

1 min

dilution series was created to the  $10^{-4}$  dilution  
10 ml tubes  
Fifty  $\mu$ l  
plated in quadruplicate  
one-tenth-diluted (0.1x) Difco Nutrient Agar (pH 7)  
agar contained 100 ppm cyclohexamide

Which of these parameters are essential to the method (in bold)?

**one-half gram**

**dry weight basis**

**three soil samples**

steel spatula

1.5 ml microcentrifuge tube

**5 ml of 5 mM sodium phosphate buffer (pH 7)**

measured for moisture content

60° C.

**thoroughly mixed**

**1 min**

**dilution series was created to the  $10^{-4}$  dilution**

10 ml tubes

**Fifty  $\mu$ l**

**plated in quadruplicate**

**one-tenth-diluted (0.1x) Difco Nutrient Agar (pH 7)**

**agar contained 100 ppm cyclohexamide**

Edited version:

Triplicate soil samples (0.5 g, dry weight) were suspended in 5 ml of 5 mM sodium phosphate buffer (pH 7), thoroughly mixed for 1 min, diluted, and plated (50 µl) in quadruplicate onto one-tenth-diluted (0.1x) Difco Nutrient Agar (pH 7) (Difco Labs, Detroit, Michigan) containing 100 ppm cyclohexamide.

### 3. Reference whenever possible as long as the reader will be able to follow.

The distribution of phylotypes within each eco-collection was determined by RFLP analysis of the near-full length 16S rRNA gene of each isolate according to previously described methods (Massol-Deya et al., 1995) using a combination of two tetrameric restriction enzymes, *HaeIII* and *TaqI*.

## Other important ideas:

It is reasonable to mention why particular steps were taken whenever you think it might not be obvious.

**Since one objective of this study was to assess differences in the community structure of the two endolithic layers,** care was taken during color-based separation not to contaminate a particular fraction by co-harvesting small, attached portions of dissimilar-colored dolomite.

**Due to the limited sample size of each rock fraction,** pH measurement and elemental analysis were performed on bulk samples (free of biomass layers) of crushed dolomite (Table 1).

### Use of subheadings

Done when the Materials and Methods section is longer than one paragraph.

Be descriptive, not overly general.

**General:** Environmental isolates.

**Descriptive:** Response of environmental isolates to stress.

**General:** Analysis of the soil community.

**Descriptive:** Analysis of the soil community  
response to disturbance.