

PROJECT: ANATOMY OF A NATIVE SEEDLING

AIM:

The aim of this project is to investigate the anatomy of a native seedling. You may study one of the seedlings provided in the laboratory or, if you wish, you may provide your own plant material. This project allows you to demonstrate your understanding of how a plant is put together and how a plant's function relates to its structure. You may study any aspect of the seedling that interests you. For example, you could set out to investigate the changes that occur in the stem with increments of secondary growth, how the transition from shoot to root occurs or how the leaf traces arise from the stem. These are just examples of what might interest you.

PROCEDURE

If you plan to use the plant material that we provide, choose a pair of seedlings of the same species from the tray for your allocated discussion group and label them clearly with your name. Plan your work carefully so that you can complete it using only these 2 plants. At the end of your session, return any remains of your seedlings to the trays for your group. They will be watered and brought to your peer review session in week 13.

Prepare and stain not less than 3 sections of plant material.

Staining

Generally, plant material is sufficiently stained with toluidine blue after 20-30 seconds. While this may be sufficient to stain the xylem, it may take up to 8 minutes to stain some fibres found in native Australian plants. You may find that in staining these fibres, other cell types become over-stained. In this case, you will need to prepare several sections and stain them for different lengths of time.

Mounting

After staining, mount all sections in 30% glycerol (glycerine) and ring the cover slip with nail polish to prevent it from drying out. You will need the sections for your presentation in week 13 so if possible check your sections the day after mounting to see if they have been sealed properly. If air has entered under the cover slip, add some more glycerine to the edge of the cover slip in that area and then reseal with nail polish.

Clearly label your sections and leave them in the AV lab in the appropriate grey slide trays. Particularly label the sections which you use for the map diagrams. These will be brought to your peer review session in week 13.

Map diagrams

Draw map diagrams of 2 of your sections. Fully label all of the tissues.

Proportion: Your map diagram must accurately represent the true proportions of your sections. Stylised diagrams (e.g. drawn with a compass or otherwise generalised) are inappropriate. Represent any tears in your sections with dotted lines.

Linework: Use a sharp pencil on blank paper. Only sharp clear lines are appropriate for map diagrams. The aim is to avoid ambiguity. Ensure that the lines finish neatly and clearly and that they do not overlap.

Labelling: Your map diagram must be clearly and unambiguously labelled. A useful approach is to label tissues from the outside to the inside of an organ and to position the labels down one side of the page. Use a ruler to draw straight lines.

Titles: Scientific figures must have accurate, concise descriptions including all the relevant details. E.g.

Figure 4: Map diagram of TS seedling of *Eucalyptus saligna* stem; third internode.

Figure 7: Map diagram of TS *Callistemon citrinus* juvenile leaf.

Scale: This must relate your diagram to the actual size of the section. A scale bar is therefore necessary, *and this is not the same as the ocular X the objective magnification*. The easiest way to do a scale bar for plant anatomical sections is to measure the approximate diameter of your section by eye using a ruler. Then on your diagram simply draw a scale bar to proportion. For example, if you measure with a ruler that your section of a stem is approximately 2 mm wide and you have drawn a map diagram of it that is 14 cm wide, then a scale bar of 3.5 cm marked as representing 0.5 mm would be appropriate.

Report

Make a clear statement of your particular aims in this study. Write a brief summary of your findings illustrated with your 2 map diagrams. Note any special features that you observed. *Please hand in your report by the time specified.* We will copy your map diagrams onto overhead transparencies and have them available for you at your peer review tutorial session.

ASSESSMENT

The majority of the assessment for this report will be based on the quality and accuracy of your map diagrams. In your TIMETABLED peer review tutorial session, you will have the opportunity to share what you have learned about your plant with the other students in your group. A microscope with video projection will be used to display your actual sections and to compare them with your map diagrams. The project will be marked as follows:

MAP DIAGRAMS: Drawing

| | | |
|-------------------------|-------|-----|
| Headings | ----- | 5% |
| Scale bars | ----- | 5% |
| Proportion and accuracy | ----- | 10% |
| Linework | ----- | 10% |

MAP DIAGRAMS: Interpretation

| | | |
|--|-------|-----|
| Accuracy of labelling and understanding | ----- | 60% |
|--|-------|-----|

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|----------------------------|-------|-----|
| QUALITY OF SECTIONS | ----- | 10% |
|----------------------------|-------|-----|

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|--------------|--|-------------|
| TOTAL | | 100% |
|--------------|--|-------------|