WJEC Wales Biology A Level

SP 1.6: Scientific drawing from slides of developing anthers to show stages of meiosis

Practical notes

Introduction

Meiosis is a form of **cell division**. It forms **four** genetically **different** daughter cells known as gametes which are **haploid**.

Anthers are plant structures that comprise of **four pollen sacs**. Within each sac, male gametes (found in **pollen grains**) are produced by meiosis.

Pollen grains are produced at early stages in flower development, so **developing anthers** are a **good specimen** to study meiosis.

Equipment

- Light microscope
- Prepared microscope slide of T.S anther
- Eyepiece graticule
- Stage micrometer

Risk assessment

Hazard	Risk	Precaution	Emergency
Broken glass	Cuts	Keep glassware away from the edge of the desk; handle microscope slides carefully	Dispose of broken glassware carefully; elevate cuts; do not remove glass from cuts; seek medical assistance
Microscope bulb	Burns	Do not touch the lamp whilst hot	Run burn under cold water; seek medical assistance

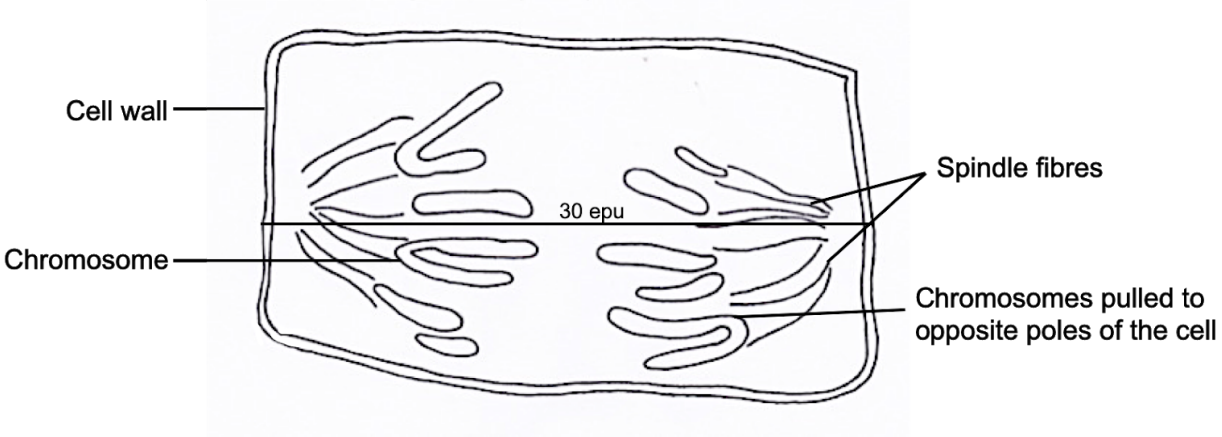
Method

1. **Calibrate** the microscope for all three objective lens magnifications (see 'Calibration of a light microscope' practical).
2. Place the microscope slide under the clips on the microscope stage.
3. Turn the **lowest power objective lens** on the nose piece.
4. Turn the **coarse adjustment knob** to move the stage close to the lens.
5. Look down the microscope and turn the **coarse adjustment knob** to **focus** the image.

6. Turn the **fine adjustment knob** until the best image is obtained.
7. Rotate to the medium power objective lens and focus using the **fine adjustment knob.**
8. Locate and focus on cells in the centre of one **pollen sac.**
9. Rotate to the high power objective lens and focus using the **fine adjustment knob.**
10. Observe and identify the **stages of meiosis** visible. Repeat for the three other pollen sacs.
11. Make **annotated scientific drawings** of the different stages of meiosis.
12. Calculate the **size** of one cell and the **magnification** of one drawing (see below).

Example

Late anaphase I in cell of developing anther (×400)



Tips for high-power plan drawings

- Drawing should fill at least half of the provided space
- Only draw what you can see
- Use a **sharp pencil**
- Ensure lines are **single**, **complete** and **non-overlapping**
- Do **not** use shading or colour
- Create **straight lines** for labels using a ruler
- Lines should **not** intersect
- Label lines should **not** have arrow heads
- Include a scale in terms of **eyepiece units**
- Include a title and objective lens power
- Include a **magnification**

Magnification of drawings

$$\text{magnification} = \frac{\text{size of image}}{\text{size of object}}$$