WJEC Wales Biology A Level

SP 4.2b: Dissection of wind and insect-pollinated flowers

Practical notes

Introduction

During **pollination**, **pollen grains** from the **anthers** of one plant are transferred to the **stigma** of another. Some species rely on **insects** to **disperse** their pollen grains whilst other species rely on the **wind**. The type of pollination strategy used determines the plant's structural adaptations.

Equipment

- Insect-pollinated flower
- Wind-pollinated flower
- Scalpel
- Fine forceps
- Mounted needle
- Pipette
- White tile
- Magnifying glass
- Microscope slide
- Coverslip
- Microscope
- Stage micrometer
- Eyepiece graticule
- Distilled water
- Paper towel

Risk assessment

Hazard	Risk	Precaution	Emergency
Scalpel	Cuts	Direction of cut away from the body; do not attempt to change blade; keep scalpel away from the edge of the desk	Elevate cuts and apply pressure; wash minor cuts in cold water; seek medical assistance
Mounted needle	Pricking skin	Hold with pointed end downwards; keep away from the edge of the desk	Seek medical advice
Pollen	Allergies	If allergic, take antihistamine medication prior to the experiment	Seek medical advice
Biohazard	Contamination	Cover any cuts; wash hands after handling plant	Seek medical advice

Method

Dissection of insect-pollinated flower

1. Examine the flower and identify its structural features: **stigma**, **style**, **anthers**, **filaments**, **petals** and **sepals**. Count the **number** of petals and sepals.
2. Place the flower onto a white tile. Using a **scalpel**, cut the flower in **half** lengthways (**longitudinal** cut) to expose deeper structures of the flower.
3. Examine the flower using a **magnifying glass**. Identify the **ovary** (generally located at the base of the style).
4. Construct an annotated scientific diagram of the flower.
5. Using fine forceps, remove some **pollen grains** from an anther and place in the **centre** of a microscope slide.
6. Use a pipette to add **2 drops** of **distilled water** onto the pollen grains and apply a **cover slip**. *Lower the cover slip at an angle to prevent the formation of bubbles.*
7. Absorb any **excess** water on the microscope slide using a paper towel.
8. Use a stage micrometer to **calibrate** the microscope for the ×4 and ×10 objective lenses (see 'Calibration of a light microscope' practical).
9. Place the microscope slide under the clips on the microscope stage and observe the pollen grains. Using the eyepiece graticule, measure the **diameter** of a **single pollen grain**.

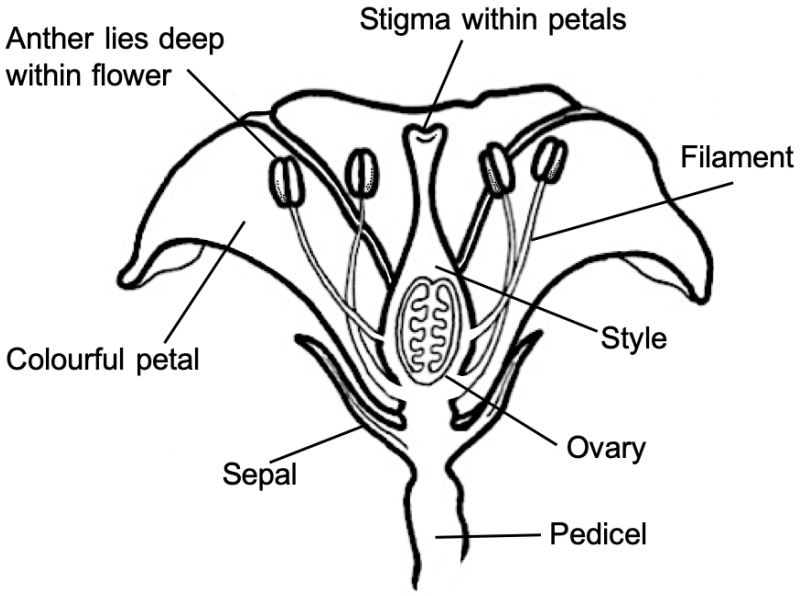
Dissection of wind-pollinated flower

1. Take a flower with **protruding anthers**. Examine the flower using a **magnifying glass** and identify its structural features.
2. Construct an annotated scientific diagram of the flower.
3. Using a **mounted needle**, **separate** the different structures of the flower.
4. Using fine forceps, remove some **pollen grains** from an anther. **Mount** on a microscope slide and use the eyepiece graticule to measure the **diameter** of a **single pollen grain**.
5. Take a flower with a **protruding stigma**. Examine the flower using a **magnifying glass** and identify its structural features.
6. Once again, **separate** the different structures of the flower using a **mounted needle**.

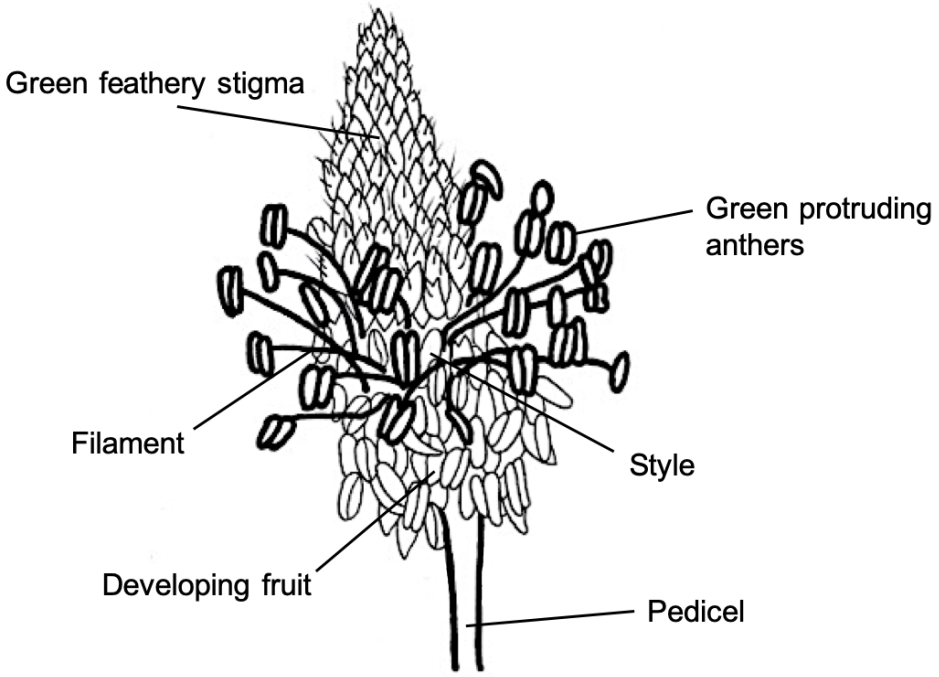
Diagrams

*Some structures appear in bold for the purpose of identification. When drawing your own diagrams ensure **all** lines are the same thickness.*

Insect-pollinated flower



Wind-pollinated flower



Results

Pollen grain diameter

Pollen grains produced by wind-pollinated flowers are **smaller** in diameter than those produced by insect-pollinated flowers:

- Wind-pollinated flowers produce **smaller** and **lighter** pollen grains so that they can be carried through the air more easily. They are produced in **greater numbers** to increase the chance of pollination.

- Insect-pollinated flowers produce **larger** but **stickier** pollen grains. These are more likely to adhere to pollinators and become deposited on the stigma of the next flower they visit. **Fewer** pollen grains are produced.