WJEC Wales Biology GCSE

SP1.5B: Transpiration

Practical notes

Transpiration

Aim
Investigation into factors affecting transpiration.

Equipment
- Potometer
- Leafy shoot
- Plastic bag
- Fan
- Water bath
- Lamp
- Vaseline
- Beaker of water

Method
1. Set up a potometer and immerse the potometer in a beaker of water.
2. Cut the leafy shoot underwater to prevent air bubbles from entering the vascular tissues and insert into the potometer. Keep the leaves above the water.
3. Keeping the potometer underwater, use vaseline to seal gaps in the potometer to make sure it is airtight.
4. Dab leaves to remove excess water if present.
5. Set up the necessary environmental factors:
- Temperature: use a temperature-controlled room or immerse potometer in a thermostatically controlled water bath.
- Humidity: Wrap the shoot in a plastic bag.
- Wind speed: Set up a fan with different speeds.
- Light intensity: Set up a lamp at different distances from the shoot.
- Surface area: Remove leaves one by one.
6. Remove the capillary tube from the water to allow an air bubble to form before returning it to the beaker.
7. Wait for the air bubble to reach the start of the scale and start timing.
8. Leave the apparatus for 30 minutes.
9. Record the final position of the air bubble and calculate the distance moved, calculate the volume of water absorbed by the plant in the period of time.
10. Repeat steps 1-9 twice more and calculate a mean.
11. Repeat steps 1-10, changing the factor that is being investigated at fixed intervals.
12. Plot a graph of the 'factor' against the mean water loss per minute by the plant.

Sources of error
Air may have leaked out of the apparatus causing the movement of the air bubble in the capillary tube.
When changing light intensity, temperature may also change which will affect the results.

Safety precautions

Be careful when cutting shoot.

The capillary tubing is quite delicate - handle carefully.