

A Level Biology A
H420/01 Biological Processes

Question Set 10

10 (a) Plants lose water by transpiration.

The rate of transpiration varies between different species of plant. The rate of transpiration can be measured using a potometer.

Plan an investigation into the rate of transpiration in two species of plant that would allow valid data to be collected.

Details of how to set up a potometer are not required.

[6]

Set up the potometer. Assuming that the rate of water uptake is proportional to the rate of transpiration, measure the distance moved by the bubble over a certain period of time for each of the two different plant species. The rate of water uptake can be calculated by dividing the volume absorbed ($\pi r^2 l$) by the time. Repeat the investigation a further two times for each plant species so that anomalies can be identified and a mean rate of transpiration can be calculated for each. Throughout the experiment, a range of variables must be controlled. Light intensity should be controlled by removing any access to natural light and setting up lamps a set distance away from the plants. Light bulbs of a specific power that do not produce heat (e.g. LEDs) should be used. Room temperature should be kept constant throughout and all windows should be closed to ensure air movement does not change. The surface area of the leaves of each plant species used in the potometer should also be the same.

10 (b) Plant cell walls are made of cellulose. Cellulose is a polymer of β -glucose.

Give **three** properties of cellulose that make it suitable as the basis of plant cell walls.

Flexible, insoluble, high tensile strength

[3]

10 (c) Cellulose cannot be digested by animals. Some mammals have bacteria in their stomachs that produce enzymes that can digest cellulose.

Explain whether the action of these enzymes is intracellular or extracellular.

[1]

Extracellular because digestion of cellulose must take place outside of cells.

Total Marks for Question Set 10: 10

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