

A Level Biology B

H422/01 Fundamentals of biology

Question Set 3

1. (a) (i) A potometer was used to investigate the effect of wind speed on the rate of transpiration in a leafy shoot.

The investigation was set up as shown in Fig. 33.

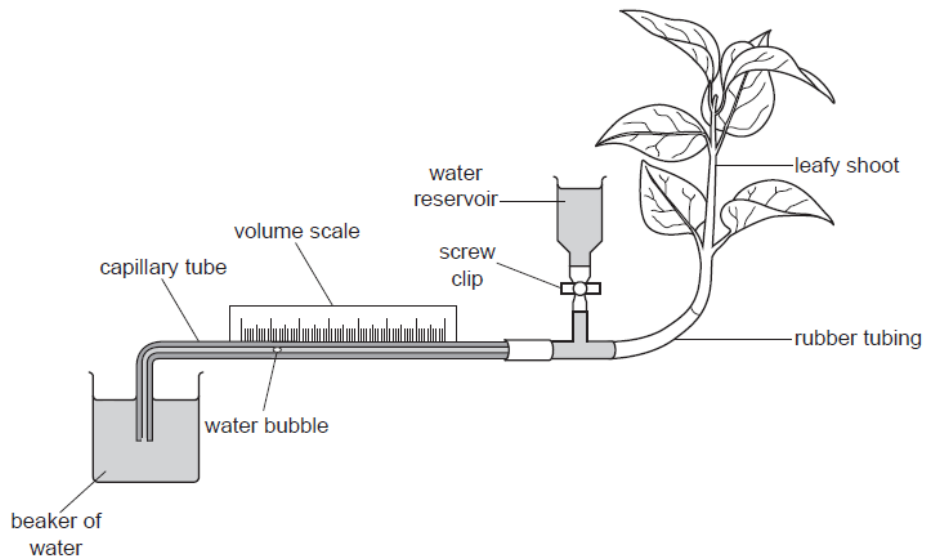


Fig. 33

To vary wind speed, a fan with five different speeds was positioned at a fixed distance from the leafy shoot.

The results of the investigation are shown in Table 33.

	Wind speed (ms^{-1})	Rate of water uptake (mm min^{-1})				
		Replicate 1	Replicate 2	Replicate 3	Mean	Standard deviation
1	0	0.3	0.3	0.3	0.30	0.00
2	2	2.6	2.5	2.5	2.53	0.06
3	4	5.0	4.8	4.9	4.90	0.10
4	6	7.0	7.0	7.2	7.07	
5	8	9.4	9.5	9.4	9.43	0.06

Table 33

Give **one** piece of advice when setting up the potometer to ensure a continuous stream of water between the capillary tube and the shoot.

[1]

- (ii) Using information in Table 33, calculate the standard deviation for the data from **row 4** (wind speed of 6 m s^{-1}).

Use the formula for standard deviation below.

$$s = \sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}}$$

[2]

- (iii) Describe **and** explain the data trend in Table 33.

[3]

- (iv) State **two** environmental variables that should have been controlled during this investigation.

[2]

- (v) Explain why the potometer only gives an estimate of the rate of transpiration.

[2]

- (b) Plants take up water into the root hairs. The water is then transported into the vascular tissue via the root cortex.

Describe how water travels through the root cortex in the apoplastic **and** symplastic pathways.

[3]

Total Marks for Question Set 3: 13

OCR

Oxford Cambridge and RSA

Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact The OCR Copyright Team, The Triangle Building, Shaftesbury Road, Cambridge CB2 8EA.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge