

4 Fig. 4.1 is a photograph of a water lily, *Nymphaea alba*, in a lake.



Fig. 4.1

Fig. 4.2 is a photomicrograph of a cross-section of part of a water lily leaf.

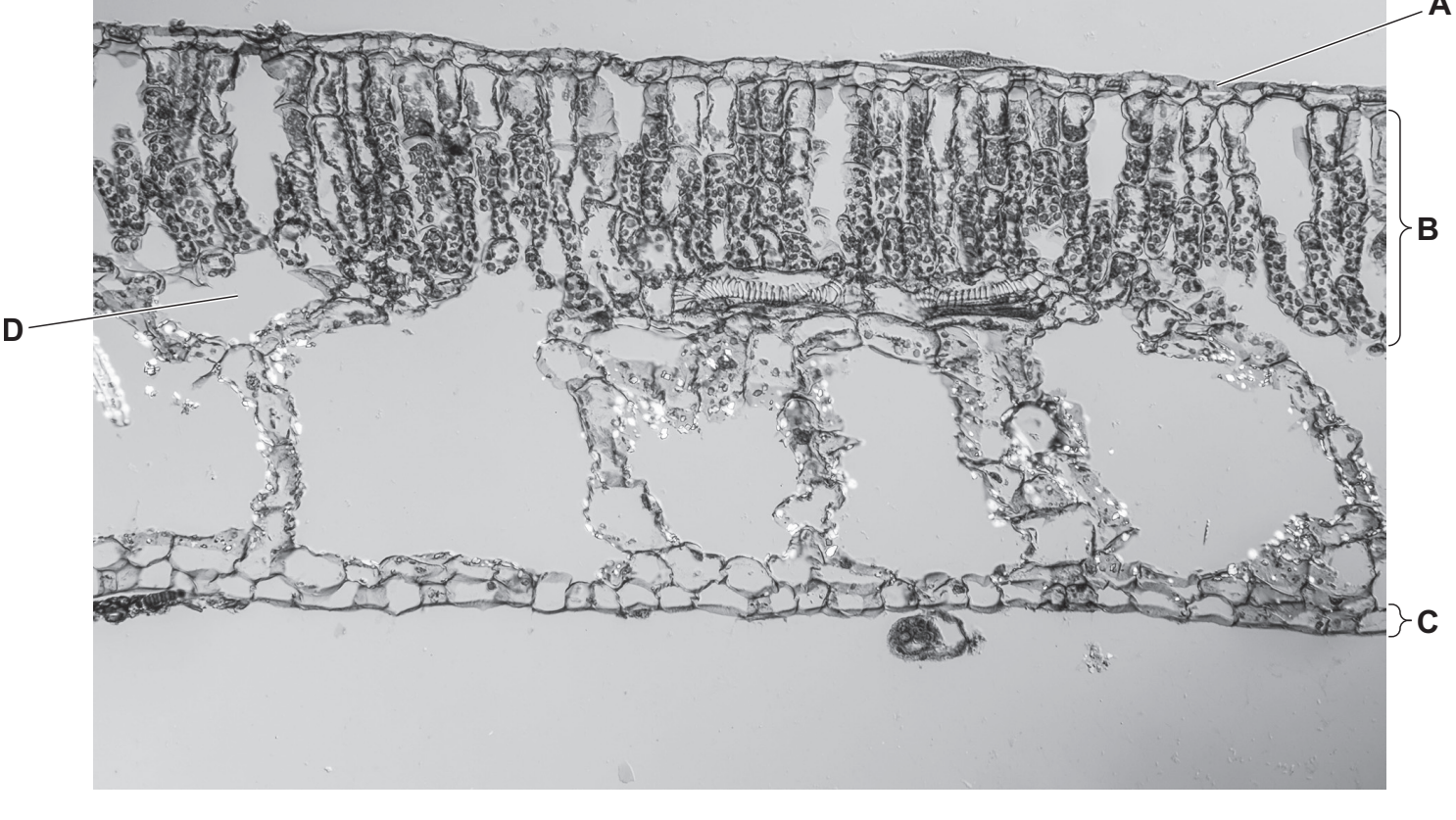


Fig. 4.2

- (a) (i) Identify tissue **B** and tissue **C** labelled in Fig. 4.2.
- B** .....
- C** ..... [2]
- (ii) Describe **two** functions in water lilies of the area labelled **D** in Fig. 4.2.
- 1 .....
- 2 ..... [2]
- (iii) A green pigment is found in tissue **B** in Fig. 4.2.
- Describe the function of this pigment.
- .....
- ..... [2]
- (iv) Water lilies have a very thin cuticle compared to a plant growing on land.
- Explain how this is an adaptation for water lilies.
- .....
- ..... [2]

(b) Table 4.1 shows the stomatal density and habitat of two different hydrophytes.

Table 4.1

type of plant	habitat	stomatal density on upper leaf surface /stomata per mm <sup>2</sup>	stomatal density on lower leaf surface /stomata per mm <sup>2</sup>
pondweed	under the water	0	0
water lily	leaves on the surface of the water	573	0

- (i) Convert the stomatal density of the upper leaf surface of the water lily to stomata per cm<sup>2</sup>.
- ..... stomata per cm<sup>2</sup> [1]
- (ii) Using the data in Table 4.1, explain the stomatal density found in the two different hydrophytes.
- .....
- ..... [4]

(c) Fig. 4.3 is a photograph of rice, *Oryza sativa*, a monocotyledonous crop plant grown in flooded fields in waterlogged soils.



Fig. 4.3

- (i) Identify a characteristic visible in Fig. 4.3 that can be used to classify rice as a monocotyledonous plant.
- ..... [1]
- (ii) Waterlogged soil contains very low concentrations of oxygen.
- Suggest how this limits the amount of proteins a plant can make.
- .....
- ..... [3]