

- 7 (a) The Venus fly trap, *Dionaea muscipula*, is a plant that can capture insects. Each leaf of a Venus fly trap is modified to form 2 lobes.

Fig. 7.1 shows how the leaf of a Venus fly trap appears folded (closed) when an insect has been captured.



Fig. 7.1

- (i) Suggest a reason why the Venus fly trap needs to capture insects, even though it carries out photosynthesis.

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- (ii) The leaves are specialised to form 2 lobes. The lobes are red on the upper surface.

Suggest why the lobes are red.

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- (iii) The lobes have sensory hairs. Touching 1 sensory hair will **not** cause a response by the leaf. At least 2 sensory hairs need to be touched within 20 seconds to cause a response in the leaves.

State the advantage to the plant of producing a response only when 2 sensory hairs are touched within 20 seconds.

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- (iv) When an insect has been trapped, the leaves have to remain closed for a number of days.

Suggest why this needs to happen.

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- (b) Action potentials are produced by the Venus fly trap during the closure of a leaf. Each action potential is also associated with a refractory period. This is similar to the action potential and refractory period observed in a mammalian neurone during nerve impulse transmission.

Explain the role played by the refractory period in the transmission of an impulse in a mammalian neurone.

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