Edexcel (A) Biology A-level

CP 01 - Effect of caffeine on heart rate in Daphnia

Flashcards

Why is *Daphnia* selected as the organism in this practical?

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They have translucent bodies so the heart rate can be more easily observed.

How does caffeine act in humans?

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It is a stimulant that increases heart rate by increasing the release of excitatory neurotransmitters.

How is the control set up?

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Replace caffeine solution with distilled water to measure the heart rate of the *Daphnia* without the effect of caffeine.

What steps should students take to ensure that the *Daphnia* are ethically treated?

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Minimise the amount of time exposed to stressful testing conditions

Release into a stream/pond after the practical

Why should a cover slip not be used when observing the organism?

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To allow oxygen to reach the organism, preventing conditions from becoming anoxic.

What is the purpose of placing cotton wool on the slide?

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To restrict the movement of the organism so that it will be easier to count its heart rate.

Outline the procedure to this practical.

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1. Dilute the caffeine solution to produce several concentrations.
2. Place some cotton wool on a cavity slide. Add one large water flea. Use filter paper to absorb excess water.
3. Use a dropping pipette to add a few drops of distilled water to the slide.
4. Use a stopwatch to time a minute and record the number of heartbeats.
5. Repeat the experiment, replacing the distilled water with a caffeine solution.