AQA Biology A-level

4.4 - Genetic diversity and adaptation

Flashcards

Define population.

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All the organisms of a particular species that live in the same place.

What is an allele?

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Different forms of a particular gene, found at the same locus (position) on a chromosome. A single gene could have many alleles.

Define genetic diversity.

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The total number of different alleles in a population.

What advantage does a high genetic diversity provide?

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Ability to adapt to a change in environment; allows natural selection to occur.

Explain how natural selection results in development of new characteristics.

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- Random mutations result in new alleles.
- Some alleles provide an advantage, making an individual more likely to survive and reproduce.
- Their offspring receive the new allele, and frequency continues to increase over many generations.

What is directional selection?

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Occurs when environmental conditions change. Individuals with phenotypes suited to the new conditions will survive and pass on their genes. Over time the mean of the population will move towards these characteristics.

Give an example of directional selection.

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Antibiotic resistance. Bacteria with a mutation allowing them to survive in the presence of antibiotics will reproduce. Therefore frequency of this allele will increase and the population will shift to have greater antibiotic resistance.

What is stabilising selection?

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Occurs when environmental conditions stay the same. Individuals closest to the mean are favoured, and any new characteristics are selected against. Results in low diversity.

Give an example of stabilising selection.

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Birth weight; babies that weigh around 3kg are more likely to survive than those at lower or higher weights.

Define a niche.

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The role of a species within its environment. Species sharing the same niche will compete with each other.

What are the three types of adaptation? Give examples of each.

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- Anatomical (changes to body structure) e.g. oily fur.
- Physiological (changes to bodily processes) e.g. venom production.
- Behavioural (changes to actions) e.g. hibernation.