

BIOLOGY WEEK FIVE

ADAPTATION

Adaptation is defined as the ability of an organism to live successfully in a particular habitat as a result of its structure, appearance and behaviour. It is the process by which a species becomes fitted to its environment; it is the result of natural selection's acting upon inherited variation over several generations.

Adaptation can also be a phenotypic trait or adaptive trait, with a functional role in each organism, that is maintained and has evolved through natural selection. It is expected that every organism must adapt to its environment to survive. Plants and animals possess certain features which enable them to adapt to either aquatic or terrestrial habitats.

There are three forms of adaptation found in organisms, they are:

1. Structural adaptation
2. Behavioural adaptation
3. Physiological adaptation

Behavioural adaptations:

They are actions of an organism that enable them to survive in their environment (e.g. bears hibernate in winter to escape the cold temperatures and preserve energy).

Structural adaptations:

They are physical features of an organism that enable them to survive in their environment e.g. fishes have gills that enable them to carry out respiration.

Physiological adaptations:

Internal and/or cellular features of an organism that enable them to survive in their environment (e.g. snakes produce venom to ward off predators and to capture prey).

A special adaptation of some organisms

Some structural and physiological adaptation found in fish:

1. Possession of fins for movement in the water.
2. Presence of streamlined body for easy movement.
3. Possession of a lateral line system for detection of vibration in water.
4. Possession of a powerful tail which is used for propelling the fish forward.
5. The direction of the fins and scales backwards aid easy movement through the water.
6. Possession of large eyes without eyelids which enables it to see predators and preys easily.
7. Possession of swim bladder which aids its buoyancy in water.
8. The silvery-white colour of the body below and black above prevent it from being seen by enemies.

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Structural adaptation of birds:

These adaptive features are:

1. Possession of light bodyweight to ease flight.
2. Possession of feathers for protection.
3. Possession of wings for flight.
4. The streamlined shape of the body to ease flight.

Structural adaptation found in parasites:

1. Possession of organs for piercing the host and sucking nutrients from the host.
2. Possession of structures for attachment to the host such as claws or suckers.
3. Possession of body surface (cuticle) to withstand the host's digestive enzymes (for intestinal parasites)

Some physiological adaptation in parasites

1. Ability to secrete enzymes that could dissolve tissues, thus facilitating entry into the host's body.
2. Ability to produce a large number of offspring to increase chances of survival

Behavioural adaptation of some animals

1. Lizards use burrows, or underground holes, as a means of adapting to the desert heat.
2. Chameleons change their colours to avoid predation.
3. The ability of birds to bird calls and migrate to escape unfavourable conditions.