

CHAPTER 09

Adaptations in Different Ecosystem

Habitat:

Habitat is an environment, that meets all the environmental conditions and food requirements, a species needs in order to survive.

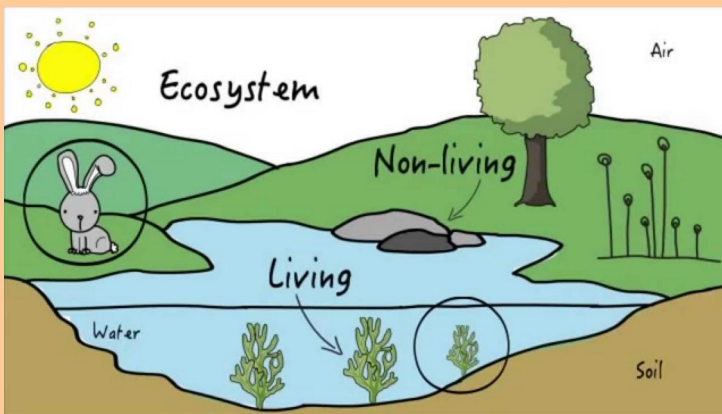
We know that crows live on trees. So tree is the habitat for crows.

Tree is also a habitat for other organisms like moth, worms, and other organisms that live on it.

**Ecosystem:**

Ecosystem is a community or group of living organisms that live in and interact with each other in a specific environment.

Ecosystem is defined as the interrelationships between the biotic and abiotic components of the environment whereas habitat is defined as the environment in which a particular species live.



Ecosystems can change with time.

In order to adjust with the diverse and distinct changes in ecosystems, organisms have to adapt different means for better survival.

We know that organisms need shelter, food, light, air and many other things for their survival. Organisms often show adaptation according to these requirements.

Adaptation in mangrove tree:

One such example is the adaptation that we see in a mangrove tree called avicennia. They grow in wet and salty place.

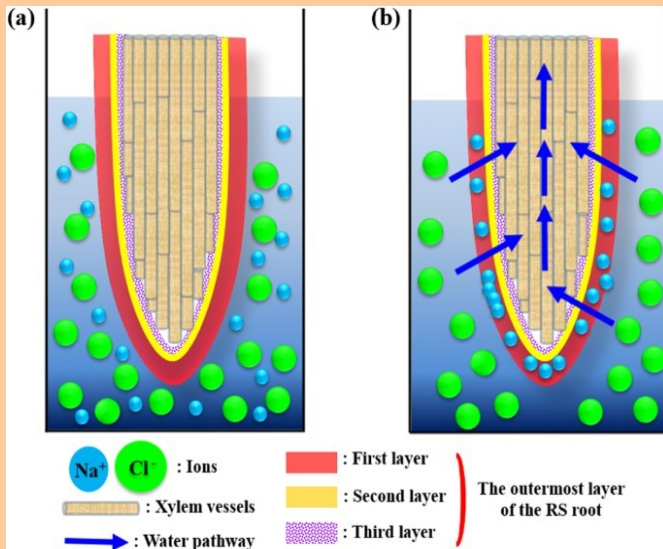


But Saltwater can kill plants.

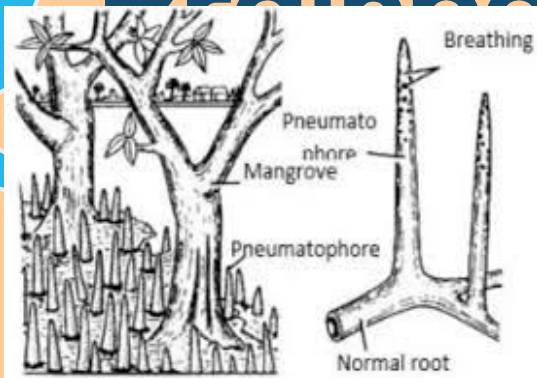
- Many mangrove species have adapted to survive in such salt conditions by filtering out salt through their roots.
- They have evolved to have aerial roots called Pneumatophores.

What are they?

- They are projections from the lateral roots growing near the surface and it can protrude up to 12 inches out of the soil or sediment.



- Pneumatophores helps in maintaining adequate root respiration in saline marshy environment.



- Adaptations are the means that organisms adopt or develop over a certain period in different conditions for better survival are adaptations of organisms.

Adaptation is common in any population because it provides some improvements for better survival.

There are several such adaptation that we see around

us.

Consider that we have Aloe vera, which is a succulent and a rose plant in two separate pots and add 2-table spoon of water to each.

If you leave them for a week without watering, you will notice that rose has grown a bit but has died because it requires more water for its growth while the aloe vera did not show much growth but still looks green since it does not require much water for its survival.

This is due to the adaptation of aloevera to survive in xerophytic or desert like conditions. Aloe vera use their tissue to store large volumes of water and release to other plant parts whenever required.

Hence without water , some plants dry up very quickly, while others can grow even with very little water.

Aquatic plants like hydrilla and vallisneria requires more amount of water for their survival hence they live in water bodies.



In the absence of water such aquatic plants will become dry soon.

To sum up each of these plants are adapted to the conditions in their surroundings on the basis of need of water.

Opuntia (A desert plant):

Adaption to survive in xerophytic condition:

Organisms in nature adapt to situations specifically.

For example,

Let us take Opuntia, which is a desert plant, In order to survive in water scarce regions such as deserts and dry lands they mainly have two adaption.

- They do not have broad leaves. The leaves are reduced to spines so that transpiration loss is checked. This is common to many xerophytic plants.
- Water is stored in the tissues of its succulent stems.



These modification or adaptation helps such desert plants to survive in water scarce regions.

Xerophytic plants like agave, which is -grown as fence around crop fields in some areas in our state have fleshy leaf that stores water. They are used as fence since they uptake less amount of water for growth.



Baobab tree:

Have you seen the pictures of Baobab tree?

They are xerophytic trees. What is peculiar about Baobab tree is that its trunk is swollen. It stores water in its trunk and survives the scorching heat of dry seasons. Let us have a look at this picture first.

You might judge that they are stones, but they are actually plants.



Living stones (Pebble plants):

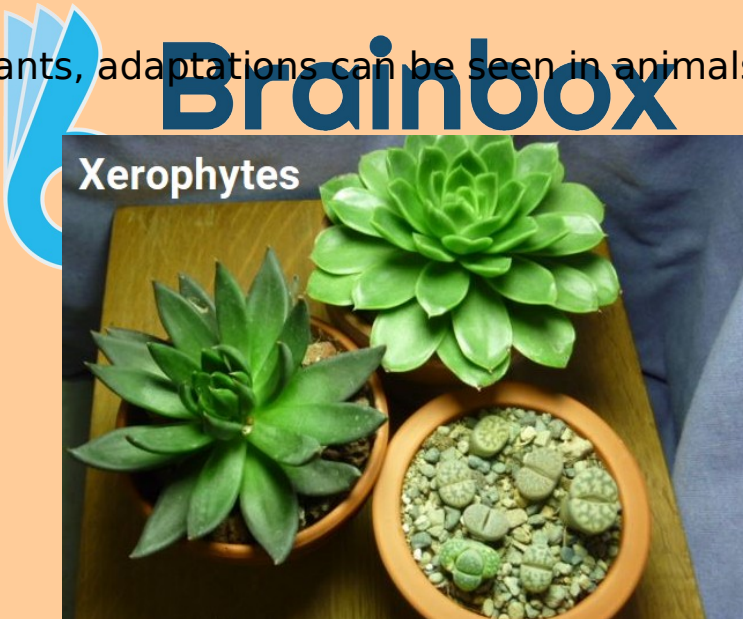
- They are called living stones due to its absolute similarity with a stone.

- Have swollen leaves adapted to desert conditions to minimize water loss and storing water. They are also called as Pebble Plants.
- Each pebble is actually a leaf with a cut window that lets in light.
- The stone like appearance deceives the animals and saves it from being eaten.

Nowadays many Xerophytes are grown as ornamental plants and used as gifts home decor.

Some plants as a whole seem to be flowers. Some with thorns some have flowers with bright colour petals.

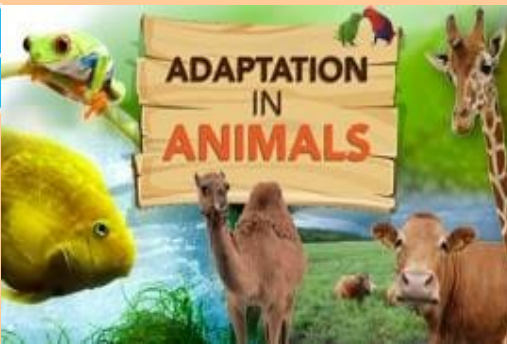
Like plants, adaptations can be seen in animals also.





Adaptation in camels:

When you visualise a camel, you will obviously think if its hump present in its back.





- Hump - stores fat for later use.
 - Long eye lashes - Protects eye from sand.
 - Nostrils - closes voluntarily to protect from blowing sand.
 - Long legs - keeps the body away from hot ground
- all animals living in desert conditions show particular adaptations in order to survive.

Some have scales that helps to retain water by preventing the evaporation of water through the skin. As a result, they are less prone to dehydration and require smaller amounts of water to survive.

Some animals that lives in burrows usually wander during night time only in order to escape day-time heat of the soil adaptations in some more desert animals.

Adaptations in desert animals:

The **Sidewinder adder snake** - crawls sideways with only a small amount of its body pressed against the hot sand. This technique helps to keep itself cool.

The **Golden Mole** - escapes the heat of the sun by swimming through the sand just below the surface. It rarely emerges out as it finds all the needs below the ground.



Some animals show extraordinary ability to survive in the desert.

The **Kangaroo Rat** (Western North American desert) can live without drinking water throughout its life. Because its body synthesizes little water in the process of digestion.



Desert bird the **Sand grouse** (desert bird), it flies long distances to an oasis in search of water, which it carries back in its crop and feathers for its nestlings.



Fennec Fox, its furry soles helps it walk on hot sand and loses heat through its ears.



Sand-diving Lizard, when the sand becomes too hot, it holds its feet in the air to cool down.

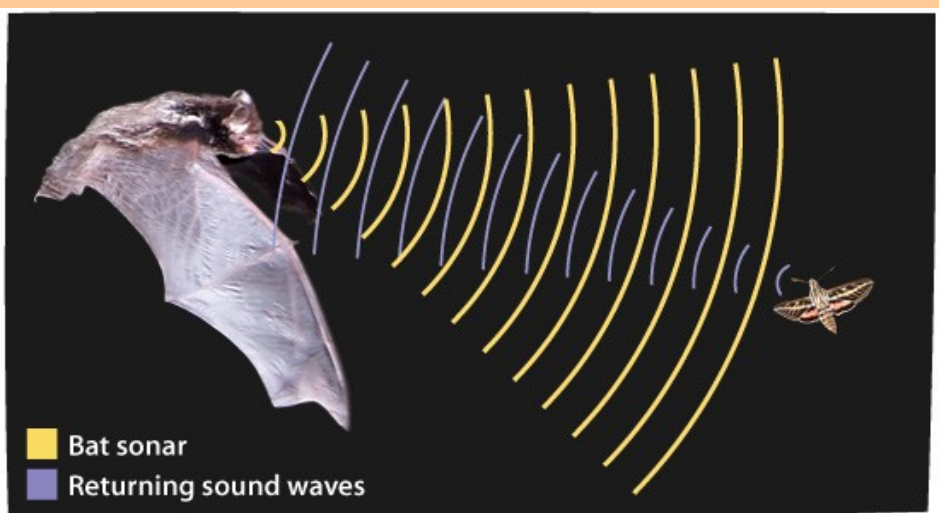
Nocturnal animals:

- They are animals, which are active during night and sleep during the day.

Cats, Rats, Bats, Owls are the nocturnals generally seen in our surroundings.

- They have highly developed senses of hearing and smell.
- They have specially adopted eyesight to see well in dark.

Animals like bats, emit a high-pitched ultrasonic soundwaves, which bounces off objects to find prey and protect from predators.



Some insects like crickets, firefly and fishes like

cuttlefish are active during night only.

Some desert animals become nocturnals in order to escape extreme daytime heat as said before.

