# Unique Environmental Adaptations

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Animals can be found in every corner of the Earth including many places that would seem to be hard to survive in. In order to cope with their environmental challenges, many species have developed very unique adaptations.



## Cave Dwellers

Troglobites are animals that must live in caves. They can be highly specialized and a species may live in only one cave in the world.

Cave environments tend to have few nutrients and little to no light. As a result, many cave dwellers have lost the use of their eyes over time and lack pigmentation. One very unique cave dweller is the olm, the largest vertebrate troglobite.

Olms are amphibians that are found in European caves. They can be up to sixteen inches long, although most are only 12 inches. They are aquatic and although they have lungs, they rely exclusively on external gills to breathe.

Food supply in a cave can be hit and miss. The olm has adapted to this and can gorge when food is plentiful, storing it for later use in his body. In lean times, he can go without food for up to ten years before starving to death. They can live up to one hundred years, making them the amphibian with the longest life span.

## Sea Vents

Photosynthesis, the conversion of light to energy, had been believed to be the backbone of all life until the discovery of hydrothermal vents over thousands of miles below the surface of the ocean.

There is no light that penetrates that deep. There are cracks in the ocean floor due to volcanic activity.

Seawater seeps down into the cracks and is superheated by the magma from the volcano. It boils and burst forth, picking up a variety of chemicals from the surrounding rock as it returns to the surface of the ocean floor.

The temperature of the water as it comes back out can exceed 750 F. Some bacteria species can feed on the chemical soup that comes forth in a process known as chemosynthesis, similar to photosynthesis except that it is chemicals and not light that is being converted.

These bacteria in turn feed other organisms that live around the vents, creating a unique ecosystem.

# High Altitudes

Anytime you read about mountain climbers and Everest, you will hear about the concerns regarding hypoxia (insufficient oxygen) and other side effects experienced at such high altitudes.

Yet many species make Everest and other high mountains their home. One of the more successful species is the yak.

In fact it is so successful, that true yaks (as opposed to those that have been crossed with domestic cattle) cannot survive at heights less than 10,000 feet above sea level and they can be found as high as 20,000 feet above sea level.

Yaks are the third largest mammal in Asia, after elephants and rhinos. Yet food is scarce at higher elevations.

To accommodate his environment the yak has developed several useful adaptations including a larger heart and lungs. He has genes that regulate his response to low levels of oxygen and edema, allowing the yak to cope with the extremes of his environment.

The yak also has genes that regulate how energy is absorbed from food, optimizing it to a degree that allows the yak to survive on much less food than another animal his size would require.

Although many environments feature very harsh living conditions, many animals have developed adaptations that allow them to not only survive but thrive in conditions that would destroy other creatures.

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