

A stylized illustration featuring a yellow birthday cake with a single lit candle in the center. The cake sits on a light blue rectangular base. In the top left corner, there are several parallel yellow lines representing sun rays. The bottom corners are decorated with large, stylized tropical leaves in various shades of blue and teal. The word "Acclimatization" is written in a teal, sans-serif font across the middle of the image.

Acclimatization

Introduction

In this process, an individual gives their best to adjust in the surrounding as per changes occurring in the environment. Some of the common factors with which organisms adjust themselves are: change in altitude, temperature, humidity, photoperiod, or pH. By adapting to these conditions, organisms make themselves capable of surviving in adverse conditions. Acclimatization process does not take too much of time, and these changes occur in a short period, i.e. in hours or weeks. We can also say that “Acclimatization” means adjustment i.e. a condition where an organism adjusts themselves with respect to their surroundings like temperature, altitude, humidity, pH, light, salinity, pressure and presence of certain chemicals.

Acclimatization

Definition

It is referred to as an adjustment which organisms do by changing their behaviour and physiology to survive with changes which are occurring in the environment. We call these changes as phenotypic changes as they occur in a short duration of time. And mostly these are reversible changes.



Acclimatization in Humans

1. High Altitudes:

When we travel to higher altitude locations, we see acclimatization, and it is considered as one of the best examples of the acclimatization process in humans. For example: if a person rides to 3,000 meters above sea level and stays there for at least a week, then, in that case, the individual becomes acclimatized to 3,000 meters. Further, if that person rides 1000 meter more than that they again have to acclimatize to 4000 meters in altitude.



Some of the common changes which body undergoes, when they show acclimatization on high altitude:

1. Increase in the synthesis of Red blood cells.
2. Causes an increase in pressure in pulmonary arteries – thereby forcing blood into sections of the lungs which are usually not used during normal breathing at lower altitudes.
3. It causes an increase in the depth of respiration.
4. It increases depth (volume) of breath during the inhalation process.
5. Whereas in other humans, there may be acute mountain sickness when they are above 3000 meters from sea level. Whereas in normal conditions, there may be very common and mild conditions that can be overcome if the body is given enough time to acclimatize. The main reason behind all this is reduced air pressure at high altitudes as well as the lower oxygen levels. In extreme cases, it causes major disorder inside the body. It is High Altitude Cerebral Edema, where fluid builds up in the brain and it is a totally life-threatening condition and requires immediate medical attention.



2. Deep Diving:

Deep-sea divers also undergo the acclimatization process when they ascend from a certain depth. In this type of acclimatization process, there is another process which acts behind them and is called decompression. In this case, the dissolved inert gases are eliminated from the diver's body by pausing at several stops during the ascent to the water surface. If drivers start descending in that case, it causes an increase in hydrostatic pressure as well as ambient pressure. So, due to this, the breathing gas which is used with the dive is supplied at ambient pressure. In this process, the gases begin to dissolve in the diver's body. On depressurization, the dissolved gases start forming bubbles inside the body, which lead to debilitating pain. In adverse cases, it can also cause coma or even death.