

Biological Life Sciences

Habitat and Niche

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1. INTRODUCTION :- Habitat refers a place, where an organism or a species population lives. For example - a pond is a habitat of zooplankton, phytoplankton and fish. And the role of an organism in its environment is called niche. Niche denotes the working place of an organism. Habitat can be similler for some organism but niche is different. For example - a lake is a habitat of all type of fish whose niche are diffirent they may be carnivorous, herbivorous or omnivorous fish depending on their food habitat.

3. TYPES OF HABITAT :- As we all know, habitat is a place where the organism live. Habitat may be divided into many types such as terrestrial, aquatic etc.

(A) Terrestrial :- A terrestrial habitat may comprise forest, grassland, tundra, desert and so on.

(i) Forest habitat :- It is characterised with trees, mostly above 8 meters. The forest community may be evergreen, deciduous, high and low.

(ii) **Grassland habitat** :- This habitat consists of grass and herbaceous plants. The majority of them being graminoid.

(iii) **Desert habitat** :- In this habitat mostly succulent plants are found. The temperature of this region is very high.

(iv) **Tundra habitat** :- It consists of very low woody vegetation.



(B) Aquatic habitat

(i) Fresh water :- Species found in fresh water like river, lake, pond etc is called fresh water species and this type of habitat is called fresh water habitat.

(ii) Saline water :- Species found in marine water like ocean, sea is called saline water species and this type of habitat is called saline water habitat.

Niche is the effective role and position of a species in its environment that describes how the species responds to the location of resources and competitors or predators.

1. A niche may also involve what that individual eats, how it interacts with other living things, and also how it connects with the non-living factors.
2. Niche consumes the flow of energy from one species to another, and thus it is very important to accept how a species eats or interacts with other organisms in an ecosystem to maintain ecological balance.
3. Without ecological niches, there would be less biological variety, and the ecosystem would not be in balance.

- 2. HISTORY :-**
- **Joseph Grinnel (1917)** coined the word niche to denote the microhabitat, where the organism lives.
 - **Charles Elton (1927)** regard the niche as the fundamental unit of an organism.
 - **Kendeigh (1974)** considered the niche as a combination of the habitat and biotic interaction of a species for its survival and continuence in a community.

4. Types of niche :- The ecological niche may have 3 types :-

(A) Spatial/habitat niche :- As the name indicates the spatial niche is concerned with the physical space occupied by an organism. It is broadly related to concept of habitat, but differ from it in the sense that while different species may occupy the same habitat and the area is very large where an organism live. The activities of each organism may actually be confined to only a small portion of habitat called microhabitat.

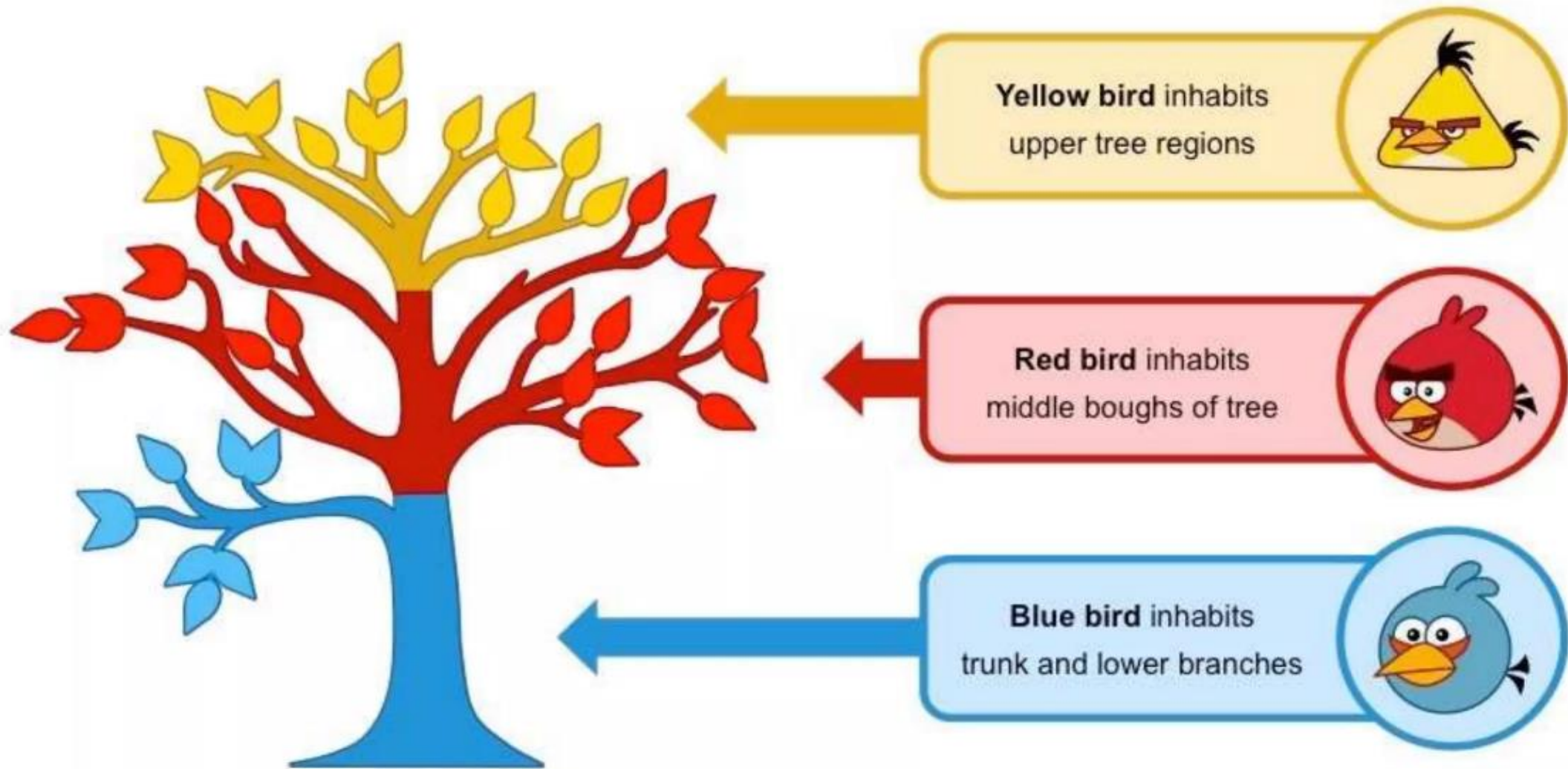
(B) Trophic niche :- This refers to a trophic position (food level) of an organism. For example – in the Galapagos island in South Africa birds belonging in 3 genera namely *Geospiza* (ground finches), *Camarhynchus* (tree finches), and *Certhidia* (warbler finches) are found. All the birds live in same habitat but differ in their trophic level. The *Camarhynchus* (tree finches) has a parrot like beak and feeds on buds and fruits. And the other two are carnivorous and feeds on insects of different size.

(C) Hypervolume/ Multidimensional niche :-

The concept of hypervolume or multidimensional niche was developed by **Hutchinson 1965**. He recognised two type of niche :-

(i) Fundamental niche :- The fundamental niche is the maximum abstractly inhibited hypervolume, when the species is not competing with others for its resources.

(ii) **Realised niche** :- An individual or a species normally remains in competition (either interspecific or intraspecific or both) and thus under biotic constraints only a part of the niche is realised by the species. This smaller hypervolume occupied by a species called the realised niche.



Fundamental Niche = Whole Tree

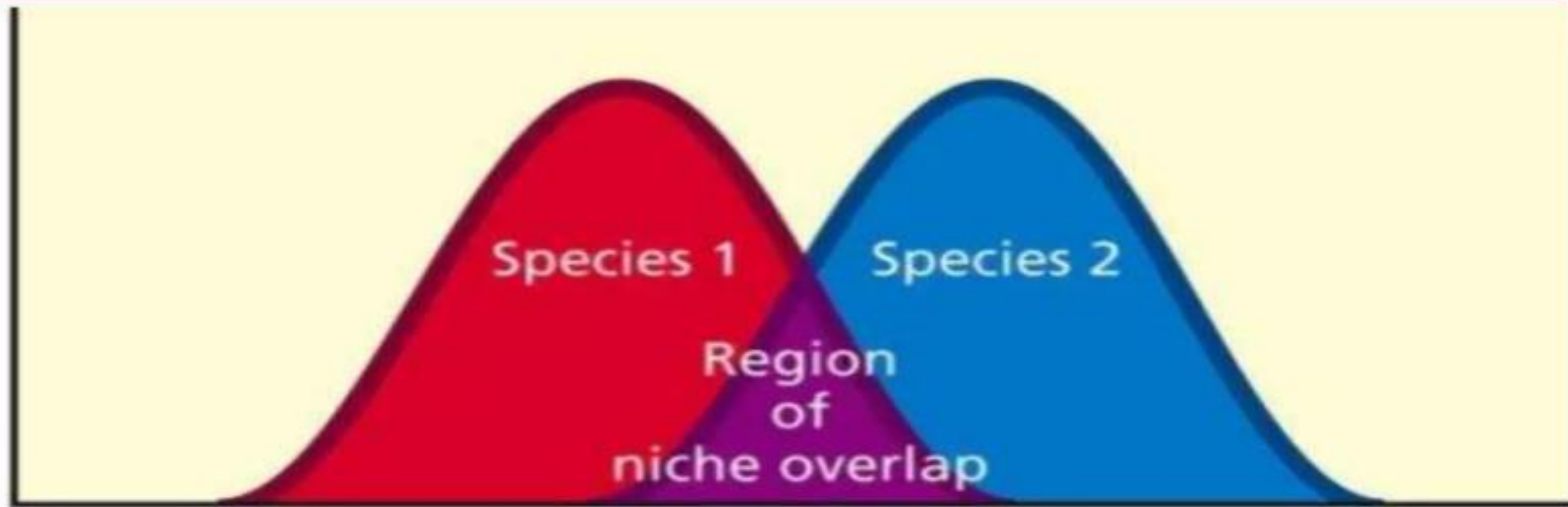
Realised Niche = Specific Elevations

5. Niche breadth and overlap :-

(i) Niche breadth :- Niche breadth may refer to the width of the area. The species that utilised a broad spectrum of the environment are called habitat generalists. They usually have high niche breadth score. Some species are restricted in their distribution and live in a narrow range of environmental spectrum. They exhibit low niche breadth score.

(ii) Niche overlap :- Niche overlap is a measure of the association of two or more species. In other words, how often any two species occurred together in a habitat or ecosystem. A high niche overlap value of two species indicates that they are found together more often than other species in a particular habitat. This indicates their similar habitat requirement and may also indicate competition if trophic or spatial niche is same food or space is limiting.

Number of individuals



Resource use

Habitat	Niche
A habitat is a particular place where organisms live, i.e. address.	A niche defines a specific role played by organisms in an ecosystem, i.e. profession.
Habitat is not species-specific, and many species can occupy the same habitat.	Niche is species-specific, and it supports only a single species.
Habitat consists of several niches.	Niche is specific to a particular species, which may overlap with a similar niche but must have distinct differences.
Habitat is a superset of niche.	Niche is a subset of habitat.
Examples: desert, ocean, mountains, grassland, forest, etc.	Examples: different trophic positions occupied by Darwin's finches.

Thank You