

Niche

For a long time Niche has been defined as the “functional status of an organism in its community” - a concept known as ‘Trophic Niche’ which has been used by Charles Elton(1927).

According to this concept if Habitat is the ‘**address**’ of the organism, niche is its ‘**Profession**’, its trophic position in food web, how it lives and interact with the physical environment (abiotic interaction) and with other organism (Biotic interaction).

Later, **G.E. Hutchinson(1957)** suggested that niche could be visualised as a multidimensional space or hypervolume within which the environment permits an individual or species to survive indefinitely. This concept can be designated as the **Multidimensional Niche**.

Fundamental and Realized Niche:

Where an organism free from interference by other species could use the full range of conditions and resources under which it can survive and reproduce – we can call this range as **Fundamental Niche**. *Here the Fundamental Niche is the maximum ‘abstractly inhibited hypervolume’ where there is no competition or other limiting biotic interaction for a species.*

Whereas the smaller portion of fundamental niche that a species actually exploits as a result of interaction with other species (such as competition, predation) is its **Realized Niche**. *So it is the smaller hypervolume occupied under particular biotic constraints.*

Example- Two species of *Typha* occur along the shoreline of ponds of Michigan where *Typha latifolia* dominates in shallower water and *T. angustifolia* occupies in deeper water away from shore. Both the species can survive in shallow water where *T.latifolia* outcompetes the later species for resources (*viz.* Light, space,Nutrient). *T.angustifolia* can survive in deeper water where *T.latifolia* can not survive. Therefore the fundamental niche of *T.angustifolia* is larger including the region of shallow water as well as in the deeper water but the realized niche of this species will be deeper water due to niche overlap (resulting competition) with *T.latifolia*.

Microclimate

Microclimate refers to local combination of factor (such as wind, rate of evaporation etc.) which differs from the regional climate. Microclimate may include a large volume such as layer of forest or it may be as small as the conditions on/within a single leaf.

Example- *In swampy wood land the rate of evaporation is high near the top of the trees whereas it reduces 30% at half of this height and finally reducing to 70% at the base near the damp soil.*

On the leaf surface there is no single surface temperature. The temperature at different sites of leaf may be much different. Relative humidity is maximum in the centre than towards periphery.