

Ecological Adaptation

Ecads:- An ecads of a plant species is a population of individuals which although belong to the same genetic stock but differ markedly in vegetative characters such as size, shape, number of leaves, stems etc. These variations are simply environmentally induced and thus are temporary or reversible i.e. one type of ecad may change into another with the change in its habitat. For example in India Euphorbia hirta has 2 ecads viz →

- a) prostrate, ^{compact} type - which grow along the footpath.
- b) prostrate type - which grow in dry, hard soil.

The ecads are also known as Ecophenes.

Ecotype:- These are also called ecological or physiological process. An ecotype is a population of individuals of a species which are genetically different but they are interfertile. As they are interfertile they are put into one taxonomic species. The different ecotype of a particular species, may differ in their edaphic, biotic or microclimatic requirements. Thus in ecotypes adaptations become irreversible. These arise only by changes in the gene structure within the chromosome recombination of genes through hybridisation or irregularities or meiosis and mitosis. Unlike ecad if different ecotypes are grown in identical habitat their differences will not change as they are genetical different. In India ecotypic differentiation has been reported in many plants like Euphorbia hirta, E. thymifolia etc.

✓ Niche :→ According to Grinnel niche is the ultimate distributional unit, within which each species is held by its structural and instinctive limitation. ✓

The ecological niche involves not only the physically space occupied by an organism but also its functional role in the community, and its position in environmental gradients. These 3 aspects of ecological niche are generally designated as i) The spatial or habitat niche ii) The trophic niche and iii) The hyper volume niche.

i) Habitat niche:- It concerns with the physical space occupied by an organism. A good example of habitat niche is provided by the 3 species of fungi colonising Setaria glauca. All these fungi live in the same general habitat, the decaying internodes, and they all belong to the same trophic level.

ii) Trophic niche:- It is concerned with the trophic position i.e. functional role of an organism.

iii) Hyper-volume niche:- It is concerned with the position of an organism in the environmental gradients.

Since there are a large number of biotic and abiotic factors that affect the population, the niche is an N-dimensional hyper volume. It is an abstraction since we are able to draw only with respect to 3 dimension. This is the functional niche of the species.