

AUTECOLOGY AND SYNECOLOGY

Q. What do you mean by autecology and synecology?

Autecology & Synecology are two main branches of ecology. **Autecology** is the study of individual organism or individual species. It is also known as population ecology. Autecology helps us to understand the relationships between individual plants and environment.

Important features of autecology:

- i) Autecology is experimental and inductive.
- ii) It is concerned with the relationship of an organism to one or more variables such as light, temperature, moisture or salinity and is clearly quantified and subject to experimental design.
- iii) Autecology has great significance for the following economic biological disciplines: economic botany which includes agriculture, horticulture, forestry etc and economic zoology including pisciculture, prawn fishery, pearl culture, animal husbandry, apiculture, sericulture etc.
- iv) It is also important for soil conservation and wild life conservation.
- v) Autecology gives an idea of distribution, adaptation, speciation etc of a particular species. Example—One finds in nature so many species living in various habitats. Some species are confined to limited areas due to limited characteristic of adaptation, whereas others may grow in different habitat conditions due to having a wide range of ecological adaptations.

Synecology is the study of group of organisms of different species which are associated together as a unit in form of a community. Also known as community ecology. Synecology helps us to understand the relationships between communities and environment.

Important features of synecology:

- i) Synecology is philosophical and deductive.
- ii) Synecology is largely descriptive and not easily subject to experimental design.
- iii) Synecology has entered a strong experimental techniques in recent years, with the development of such tools as computers and radioactive tracers (R. L. Smith, 1877).

Q. How autecology differs from synecology and population ecology?

Autecology is an approach in ecology that seeks to explain the distribution and abundance of species by studying interactions of individual organisms with their environments. An autecological approach differs from both **community ecology (synecology)** and **population ecology** by greater recognition of the species-specific adaptations of individual animals, plants or other organisms, and of environmental over density-dependent influences on species distributions.

Autecological theory relates the species-specific requirements and environmental tolerances of individuals to the geographic distribution of the species, with individuals tracking suitable conditions, having the capacity for migration at at least one stage in their life cycles. Autecology has a strong grounding in evolutionary theory, including the theory of punctuated equilibrium and the recognition concept of species.

Q. What do you mean by recognition complex? / Q. How recognition theory differs from biological species concept?

- i) Autecological theory is focused on species as the most important unit of biological organisation, as individuals across all populations of a particular species share species-specific adaptations that influence their ecology.
- ii) This particularly relates to reproduction, as individuals of a sexual species share unique adaptations (e.g. courtship songs, pheromones) for recognising potential mates, and share a fertilisation mechanism that differs from those in all other species.
- iii) This recognition concept of species differs from the biological species concept (or isolation concept) which defines species by cross-mating sterility, which in allopatric speciation is merely a consequence of adaptive change in a new species' fertilisation mechanism to suit a different environment.