

ECOLOGICAL SUCCESION

*Anto Joseph
Dept. of Botany
Sacred Heart college, Thevara*

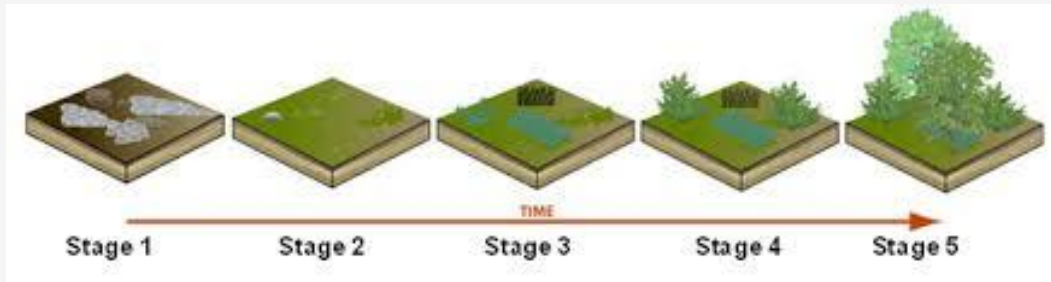
Anto Joseph, Botany@shcollege

Ecological succession

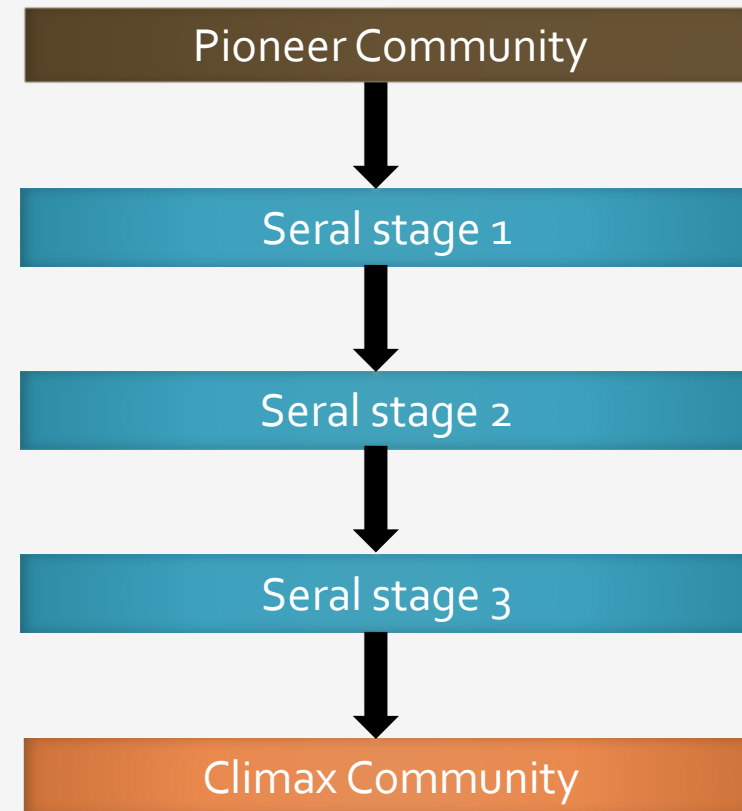
- Coined by Hult 1885
- The natural process by which the same locality become successively colonised by different groups or communities.
- Characteristics of Ecological succession
 - It is an orderly process of change in the species structure and community, and is predictable.
 - It is a physical environment based biological process
 - It ends in a stabilized ecosystem – Maximum biomass and symbiotic functions between the organisms are maintained
 - Climax community maintains dynamic equilibrium with the environment

- Causes of ecological succession
 - Climatic causes – Eg :Drought, Flood, Lightning...
 - Topographic causes – Any thing related to soil and substratum – Eg : Landslides, Soil erosion...
 - Biotic causes – By any living organism including mankind
- Types of ecological succession
 - Primary succession – Succession begins from primitive substratum where there were previously no any kind of living matter. .
 - Secondary succession – It begins from previously built up substrata with already existing living matter. The vegetation of such area has been destroyed due to climatic, topographic or biotic factors
 - Autogenic succession – the developing community brings a change in the environment which become unsuitable for them, but opens the way for the growth of another plant community.
 - Allogenic Succession – The change in habitat is due to external factors rather than internal factors. Eg : Climate
 - Induced Succession – A succession which is controlled and motivated by mankind.
 - Autotrophic succession – Succession which is dominated by autotrophic communities.
 - Heterotrophic Succession – Succession which is dominated by heterotrophic organisms.
 - Retrogressive succession – Backwardly moving Succession.

General Process of Succession



- The first community is called **Pioneer community**.
- The final community is called **Climax community**.
- The intermediate stages are called **seral stages**.



Various steps of Succession on a sterile habitat

- Nudation – Development of a sterile or virgin area is called nudation.
 - Catastrophic agencies
 - Manmade
- Invasion – It refers to the arrival and settlement of some organisms on the bare area.
 - The first invaders are called Pioneers.
 - **Invasion comprises 3 steps**
 - Dispersal or migration – The transfer of a species from one area to a new area.
 - It occurs through reproductive units
 - Ecesis – The adjustment followed by establishment of migrated plant species into the new area.
 - Aggregation – As a result of reproduction, the number of species increases and they close to one another.

Competition and reaction

- Struggle for existence
- Inter and intra specific competition
- modification of physical environment by dominant species – Reaction
- Migration of more complex species to the area
- competition between old and new species
- Introduction of animals to the community
- Further modification of environment
- This process continues until a stable and climax community is developed

Climax or stabilization

- ✓ After a long process of competition, the final community becomes **stable and in equilibrium** with climate.
- ✓ The final community is known as **climax community**.
- ✓ The stage is known as **Climax stage**.

- Characteristics of climax community
 - Soil is nutrient rich in both organic and inorganic matter.
 - Species having long life and resistance to the external disturbances predominate.
 - Species diversity will be very high and food chain become complex
 - Biomass is maximum and is in steady state
 - The community is in perfect equilibrium with the abiotic environment of that area.

Classification of Succession

- Hydrosere – beginning in aquatic environment
- Xerosere – beginning in xeric or dry habitat
- Lithosere – beginning on rock surface
- Psamosere – beginning on sandy habitat
- Halosere – Beginning on salty habitat.