

3. ECOLOGICAL SUCCESSION

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- ❖ An important characteristic of all communities is that composition and structure constantly change in response to the changing environmental conditions. This change is orderly and sequential, parallel with the changes in the physical environment. These changes lead finally to a community that is in **near equilibrium with the environment** and that is called a **climax community**.
- ❖ The gradual and fairly predictable change in the species composition of a given area is called **ecological succession**.

Sere(s) or Seral community

During succession some species colonise an area and their populations become more numerous, whereas populations of other species decline and even disappear. The entire sequence of communities that successively change in a given area are called sere(s). The individual transitional communities are termed seral stages or seral communities. In the successive seral stages there is a change in the diversity of species of organisms, increase in the number of species and organisms as well as an increase in the total biomass.

There are two types of successions. They are **primary succession** and **secondary succession**.

Pioneer species are the species that invade a bare area. E.g. Lichens invade a bare rock and secrete some acids to dissolve rock, helping in weathering and soil formation, paving way for small plants, then succeeded by trees.

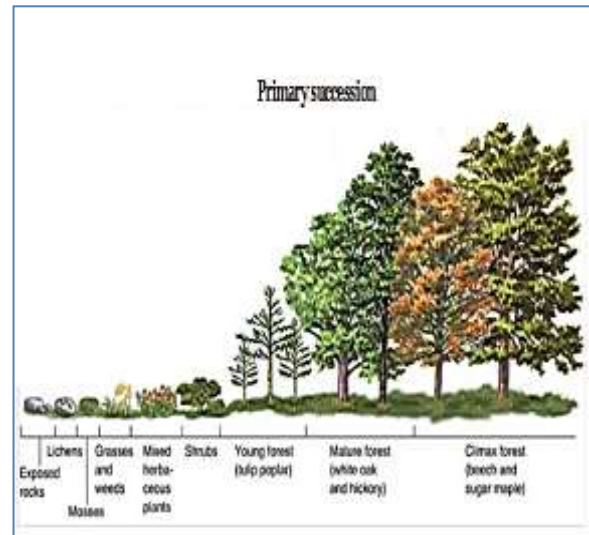
a) Primary Succession

- Succession is hence a process that starts where no living organisms are

there – these could be areas where no living organisms ever existed.

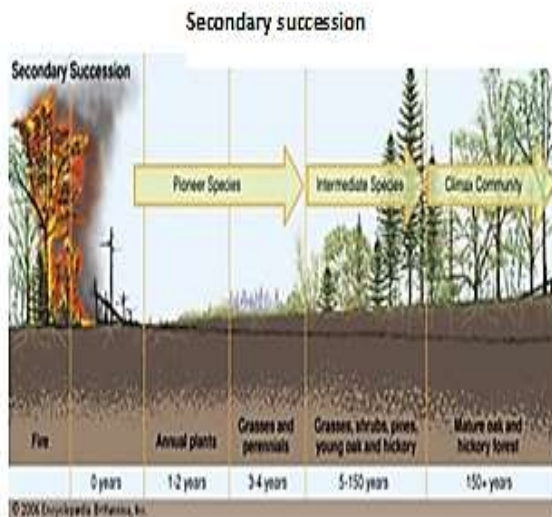
- (e.g.) newly cooled lava, bare rock, newly created pond or reservoir.
- The establishment of a new biotic community is generally **slow**. Generally, it takes natural processes several hundred to several thousand years to produce fertile soil to support living organisms on bare rock.

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b) Secondary Succession

- Secondary succession begins in areas where natural biotic communities have been destroyed and lost all the living organisms that existed over there.
- (e.g.) abandoned farm lands, burned or cut forests, lands that have been flooded.
- Since some soil or sediment is present, succession is **faster** than primary succession.
- As ecological succession proceeds there is change in vegetation and the numbers and types of animals and decomposers also change.



sedges, grasses and finally the **trees**. The climax community would be a forest. With time, the water body is converted into land.

- At any time during primary or secondary succession, natural or human induced **disturbances** (fire, deforestation, etc.), **can convert a particular seral stage of succession to an earlier stage.**
- Also such disturbances create new conditions that encourage some species and discourage or eliminate other species.

The present day communities in the world have come to be because of succession that has occurred over millions of years since life started on earth. Actually succession and evolution would have been parallel processes at that time.

Succession of Plants

Based on the nature of habitat, succession of plants is classified into two types. They are

1. **Hydrarch succession** takes place in wet areas (water).
2. **Xerarch succession** takes place in dry areas.

Both these successions will lead to a **mesic succession (neither too dry nor too wet)**

During succession in water, the pioneers are the small **phytoplankton**. They are replaced with time by **free-floating angiosperms**, then by **rooted hydrophytes**,