

Ecological Succession

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General characteristics

- It is also called **ecosystem development**
- It is the process of development of a community in a particular area.
- Gradual and fairly predictable changes occur in the species composition of the community.
- The species which colonise a bare area are called **PIONEER SPECIES**.
- The entire sequence of communities which come one after another form a **SERE**.
- The individual transition stages during the process of succession are called **SERAL STAGES OR SERAL COMMUNITIES**
- The final, more or less stable community which comes to occupy the given area is called the **CLIMAX COMMUNITY**.

General processes of ecological succession

- **Nudation** : It is the process of development of a bare area.
- **Migration**: Arrival of propagules of plants, fungal or algal spores etc.
- **Ecesis**: Establishment and initial growth of vegetation.
- **Competition**: Competition for space, light and nutrients occur in the community.
- **Reaction**: By its own actions the community changes the environment (autogenic factors) so much so that it is no longer suitable for the growth of the existing community and so is replaced by another community.
- **Stabilization**: finally a more or less stable community (Climax community) comes to occupy the area.

Types of ecological succession

- **Depending on the nature of bare area :** Primary and secondary succession.
- **Depending on availability of water in the habitat:** Hydrarch succession, Xerarch succession etc.
- **Depending on nature of factors:** Autogenic and allogeneic.
- **Depending on the type of dominant community:** Autotrophic and heterotrophic succession.

Primary and secondary succession

- **Primary succession:** succession occurs in an area where there no earlier community or no life existed before.
- **Secondary succession:** succession occurs in an area where earlier, a community existed but had got destroyed due to fire, floods or any other factor.

Autogenic and allogeneic succession

- **Autogenic succession:** a succession which progresses due to factors emanating within the community itself.

- **Allogeneic succession:** a succession which progresses due to some external factors.

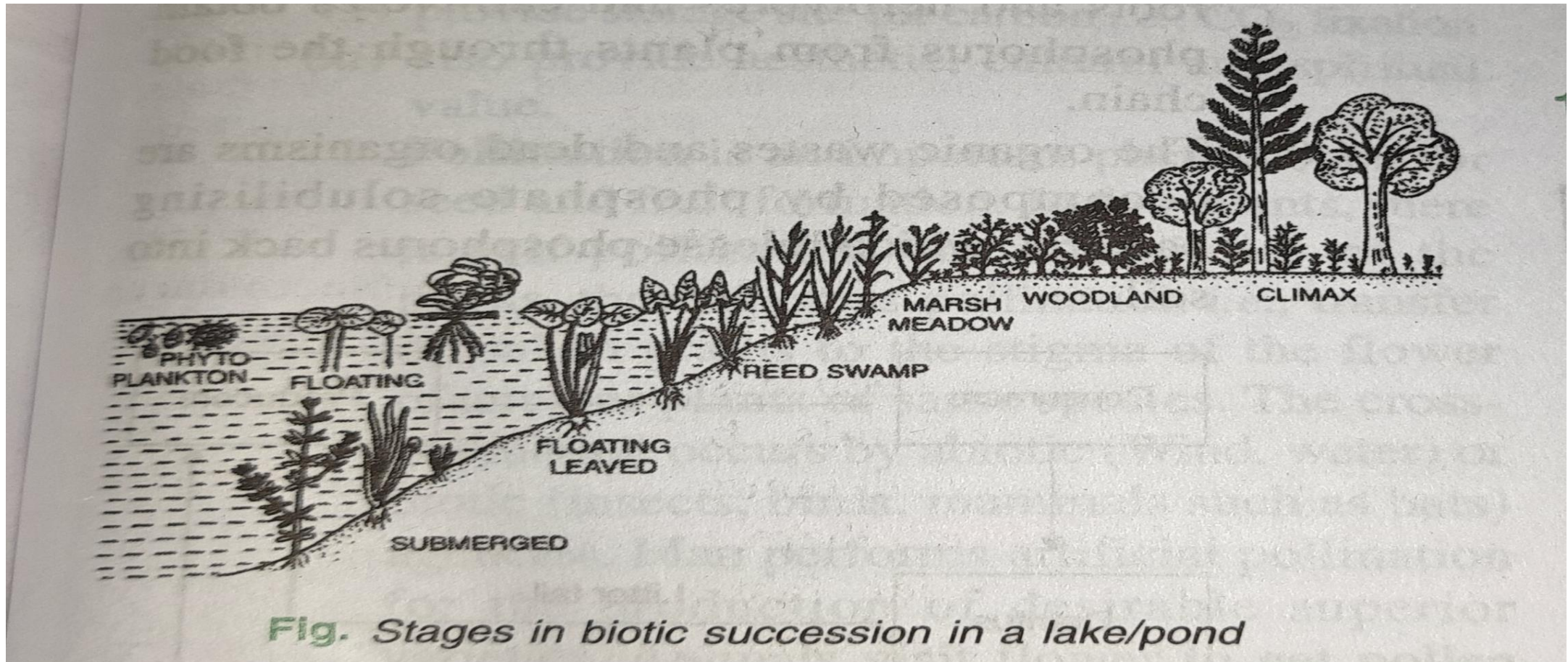
Autotrophic and heterotrophic succession

- **Autotrophic succession:** autotrophic communities i.e. Green plants dominate in such a succession. It occurs in an inorganic environment.
Example: succession occurring in soil.
- **Heterotrophic succession:** heterotrophic communities dominate in the succession process. It occurs in an organic environment.
Example : ecological succession on a decaying fruit where saprophytic microbial communities successively occupy the microhabitat.

Hydrarch succession or hydrosere

- Succession starts in water or wet area.
- Succession progresses from hydric to mesic conditions. The primary colonisers in water are small **phytoplankton**.
- They are replaced by free **floating angiosperms**.
- Free floating plants are replaced by **rooted hydrophytes**.
- Rooted hydrophytes are replaced by **sedges**.
- Sedges are replaced by **grasses**.
- Finally the **Climax community (forest)** occupy the area.
- With time the water body is converted into land covered with forest trees.

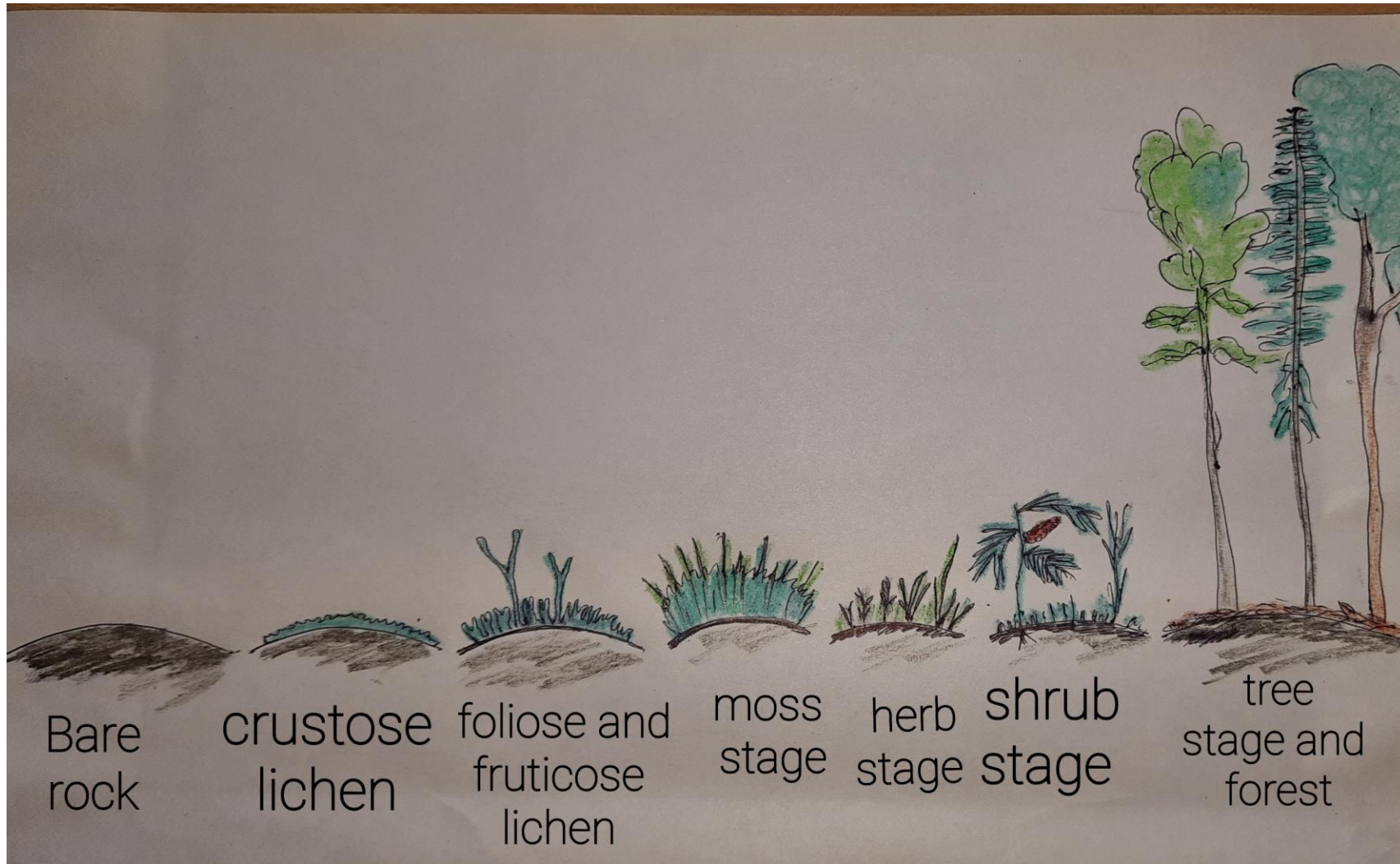
Stages in hydrarch succession



- **Phytoplankton:** *Spirogyra, Ulothrix, Oedogonium*, diatoms.
- **Rooted submerged stage:** water maintains a height of approx. 10 feet. *Hydrilla, Vallisneria, Utricularia, Chara, Ceratophyllum*.
- **Rooted floating stage:** 4-8 feet water; *Nymphaea, Nelumbium, Trapa*. Free floating plants such as *Azolla, Lemna, Wolffia, Pistia, Salvinia etc.*
- **Reed swamp stage:** water 1-3 feet; *Typha, Saggitaria, Polygonum etc.*
- **Sedge meadow stage:** marshy stage ; plants of family Cyperaceae and Poaceae predominate.
- **Woodland stage:** huge accumulation of humus; shrubs and herbs predominate. *Salix, Eupatorium, Alnus, Acacia, Cassia, Terminalia etc.*
- **Forest stage:** well build up soil as substratum; rich accumulation of humus and organic litter on Forest floor. *Shorea, Quercus, Acer etc*

Xerarch Succession or xerosere

- **Crustose lichen stage:** Lichens are primary colonisers on rocks.
- *Licanora, Rhinodina etc.* Produce acids and weather rock surface; thin film of soil formed
- **Folios and fruticose lichen:** *Parmelia, Dermatocarpon etc*
- **Moss stage:** xerophytic mosses eg. *Tortula, Grimmia etc*
- **Herb stage:** herbaceous weeds mostly annuals such as aster and evening primroses. Growth of bacteria and fungi results in increased microbial decomposition.
- **Shrub stage:** *Rhus* and other species. Scrub gradually invade the area.
- **Tree stage:** tree saplings grow between scrubs. Leaf litter and decaying roots further weather the substratum and also add humus. Mosses and ferns also grow.
- **Forest stage:** It is the **CLIMAX community**. Forest type depends on climatic conditions.



Xerosere : succession on rock

THANKS.

