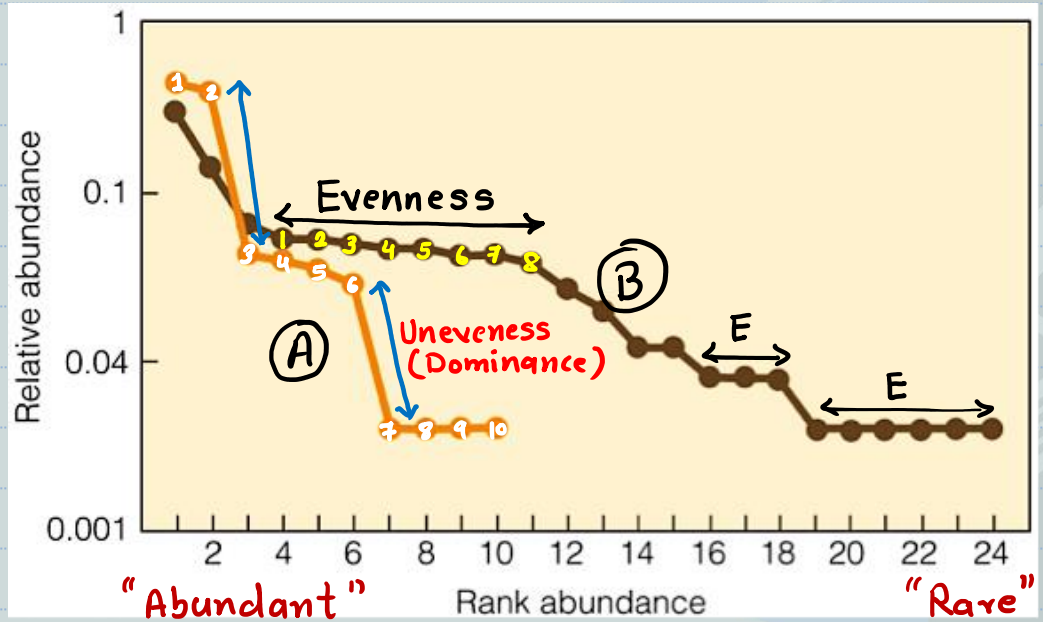
COMMUNITY ECOLOGY

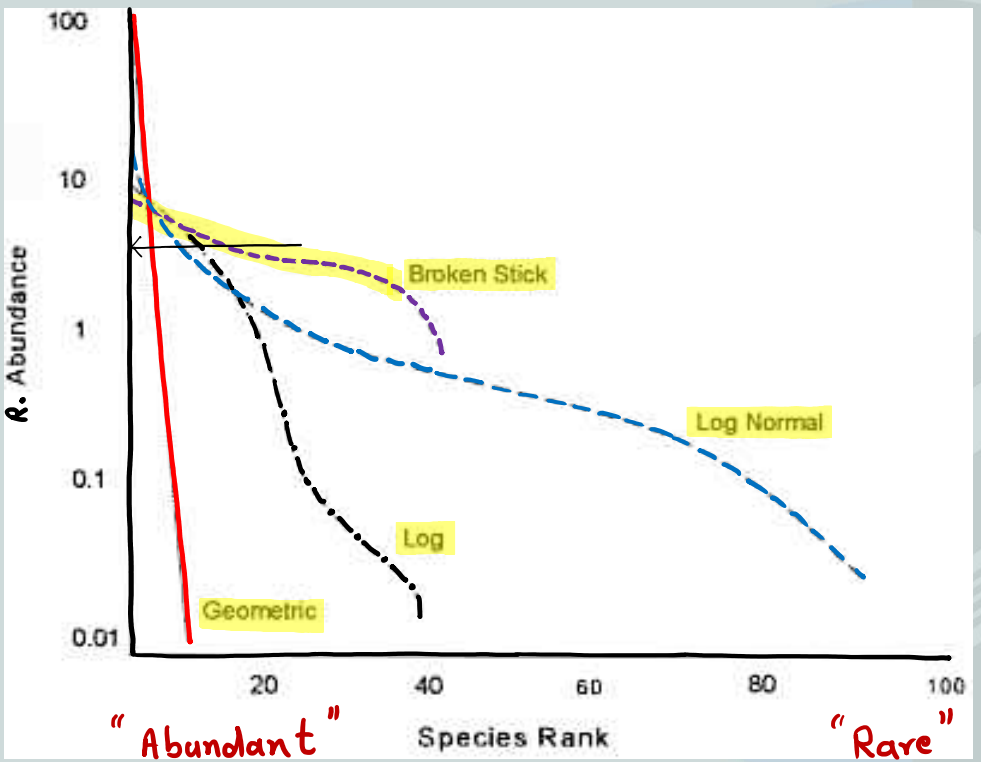
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Rank abundance curve

Visually Describe the Distribution of Individuals Among Species in Communities.



- Representing about any community.
- Evenness ↑ : Species diversity ↑ - Stable (B)
- Uneveness : Species diversity ↓ (Dominace) - "Unstable"



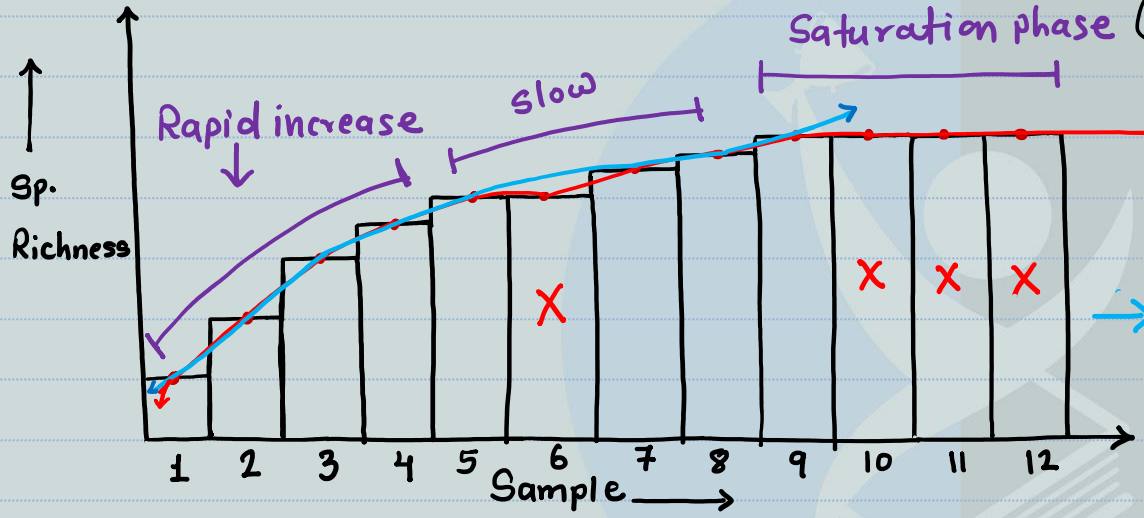
1. Geomatic curve
   - Uneveness
   - species poor commuuity
   - Disturbed environment.

2. Log series
   - Unevenness

3. Log normal
   - Eveness high
   - Natural Commuuity
   - Stable commuuity

4. Broken stick
   - All species have similar number of individuals.

Accumulation curve and Rare-faction curve :



Accumulation curve
"Left to Right"

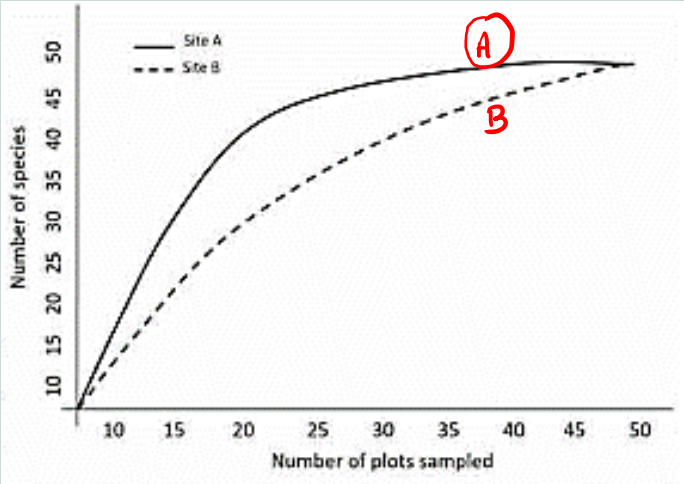
Rare-faction curve
"Right to left)

"Representing only samples with increase in Sp. richness"

You are sampling birds in a forest community to determine species diversity of birds in this region. How would you assess the sampling effort to ensure that you have obtained a reasonable estimate of the diversity in the region?

1. Based on the species accumulation curve.
2. You cannot determine this, as sampling effort and species richness are independent of one another.
3. Based on the calculation of Morisita-Horn similarity index.
4. Based on the calculation of Simpson's diversity index.

The graph below shows the accumulation of species in two sites A and B as more plots are sampled.



Based on this graph, following statements were made.

A. In both sites, sampling more plots will not add any more species.

B. Sampling more plots will add more species in Site B but not Site A.

C. Sites A and B are likely to have similar species richness.

D. Site B is likely to have higher species richness than Site A

Which one of the following options contains both statements that are INCORRECT ?

1. A and C
2. A and B
3. B and C
4. C and D

III. SYNTHETIC TRAITS :

A. Constance : Degree of presence in a unit area.

↳ Freq.

B. Fidelity: Faithfulness (Depends on Range of tolerance of species)

$$\text{Fidelity} = \frac{1}{\text{Range of tolerance}}$$

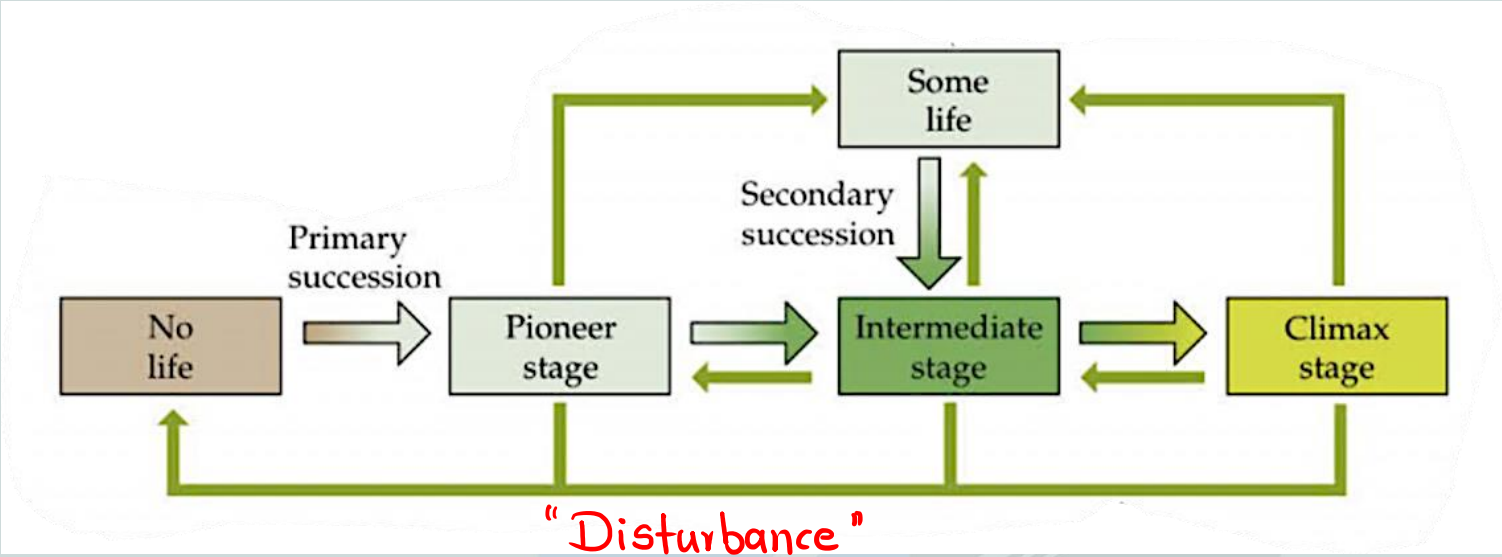
Ecological Succession / Community formation.

The progressive replacement of one community by another until a climax community is established.

- The concept of succession was largely developed by: Warming (1909)
  Cowles (1899)

- Concept was elaborated by - Clement

  Proposed a theory of
  " plant succession and community development"



"Disturbance"
- Natural calamities

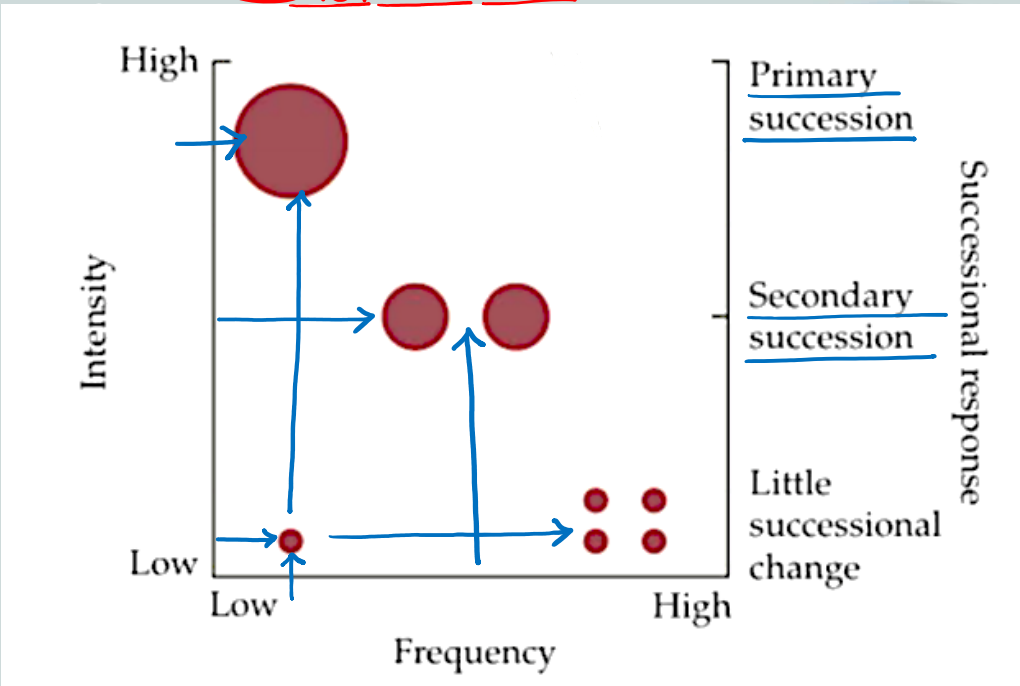
1. Pioneer community : 1st community in barren area.
   - Pioneer species (r-selection species)

2. Seral communities : Intermediate communities bet^{n} pioneer's and climax community.
   - Replaceable.

3. Climax community : Last/final and stable community.
   - Unreplaceable.

4. Disturbance : Natural calamities.

"Disturbance"



Types of ecological succession

1. On the Basis of barren area:

- Hydrosere – Newly formed water bodies
- Psemosere – Sanddune
- Lithosere – Rock's
- Xerosere – Desert
- Halosere – Saline environment.

2. On the Basis of intensity of disturbance:

I. Primary Succession

- High intensity dist.
- Start: Barren area.
- Pioneer community
- Soil formation
- Time consuming

e.g. • Igneous Rock
• Glacier's

II. Secondary Succession

- Moderate intensity dist.
- Start from any intermediate stage.
- Fast process

e.g. • Flood
• Cyclone
• Forest fire.
• etc.

3. On the Basis of Pioneer species :

I. Auto-trophic Succession

- Pioneer species : Producer
  e.g. phytoplanton's
  . lichen's

e.g. Hydrosere
- Xerosere
- Lithosere.
  etc.

II. Hetero-trophic Succession

- Pioneer species : Decomposer.

e.g. "Decomposition process"

4. On the Basis of replacement :

I. Auto-genic Succession

↓

"Self" replaced.

II. Allogenic Succession

↓

Other factor

↓

Biotic

- Another species

Abiotic

- Climatic factor.
- Natural calamity.

Steps in Ecological succession

1. Nudation : formation of Barren area.
2. Invasion : Entry of species
   - Dispersal
   - Ecesis – Try
   - Aggregation – Success in invasion.
3. Competition and co-action :
   - Replacement, New community (Seral)
4. Reaction : changing the environmental condition.
5. Stabilization : formation of climax.

Features	Pioneer community	Climax community
Photosynthesis		
• Light-saturation intensity	High	Low
• Light-compensation point	High	Low
• Efficiency at low light	Low	High
• Photosynthetic rate	High	Low
Respiration rate	High	Low
Water-use efficiency		
• Transpiration rate	High	Low
• Mesophyll resistance	Low	High

"r" "k"

Features	Pioneer community	Climax community
Seeds		
• Number	Many	Few
• Size	Small	Large
• Dispersal distance	Large	Small
• Dispersal mechanism	wind, birds, bats	gravity, mammals
• Viability	Long	Short
• Induced dormancy	Common	Uncommon
• Germination enhanced by light	Yes	No

"r" "K"

Features	Pioneer community	Climax community
Root-to-shoot ratio	Low	High
Mature size	Small	Large
Structural strength	Low	High
Growth rate	Rapid	Slow
Maximum life span	Short	Long
Resource-acquisition rate	High	Low
Recovery from nutrient stress	Fast	Slow
Stomatal conductance	High	Low

HAPPY LEARNING

THANKS

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