PLANT COMMUNITIES

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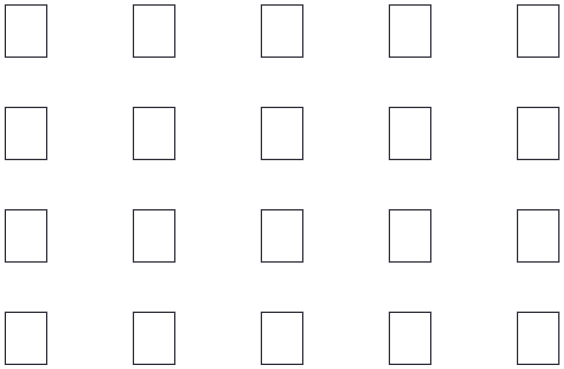
A group of several species (Plants and/animals) living together with MUTUAL TOLERANCE (ADJUSTMENT) and BENEFICIAL INTERACTIONS in a natural area

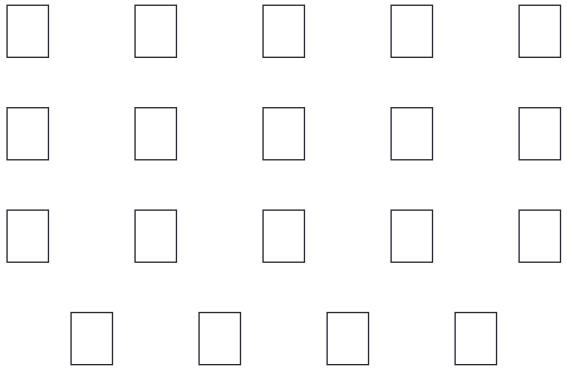
- **SPECIES DIVERSITY** - Species Diversity is simply **the number and relative abundance of species found in a given biological organisation**
- **GROWTH FORM AND STRUCTURE** – Tree, Shrub, Herb and Mosses etc
- **DOMINANCE –** Major influence of some species on a community
- **SUCCESSION -** the process by which the structure of a biological community evolves over time
- **TROPHIC STRUCTURE -** Trophic structure is defined as **the partitioning of biomass between trophic levels** (subsets of an ecological community that gather energy and nutrients in similar ways, that is, producers, carnivores).

SPECIES DIVERSITY

- **Regional Diversity**
- **Local Diversity**



Community-1



Community-2

Which Community is More Diverse & More Abundant ?

Shall I say a community with various species Diverse OR Rich ?

Terms and Definitions

- **Species Richness** - **Species richness** (S) is the number of species within a **defined** region
- **Species Abundance -** Species abundance is **the number of individuals per species**, and relative abundance refers to the evenness of distribution of individuals among species in a community.
- **Frequency** - Frequency is **the number of times a plant species occurs in a given number of quadrats**
- **Relative Frequency -** relative frequency is the frequency of a given species expressed as a percentage of the sum of frequency values for all species present.
- **Relative Dominance** - relative dominance is the basal area of a given species expressed as a percentage of the total basal area of all species present.
- **Density** - Population density is **the average number of individuals in a population per unit of area or volume**
- **Relative density -** Relative density is **calculated by dividing the density by the sum of the densities of all species, multiplied by 100** (to obtain a percentage)
- **Species Evenness - Species evenness** refers to how close in numbers each species in an environment is
- **Species Diversity** - Species Diversity is **simply the number and relative abundance of species found in a given biological organisation**
- **Diversity index-** a quantitative measure that reflects how many different types (such as species) there are in a dataset (a community)
- **Important Value Index -** Importance value index, **a measure of how dominant a species is in a given ecosystem**

General Formulas

$$\text{Relative Frequency (RF)} = \frac{\text{Frequency of a species}}{\text{Frequency of all species}} \times 100$$

$$\text{Relative Density (RD)} = \frac{\text{Number of individuals of the species}}{\text{Number of occurrence of all the species}} \times 100$$

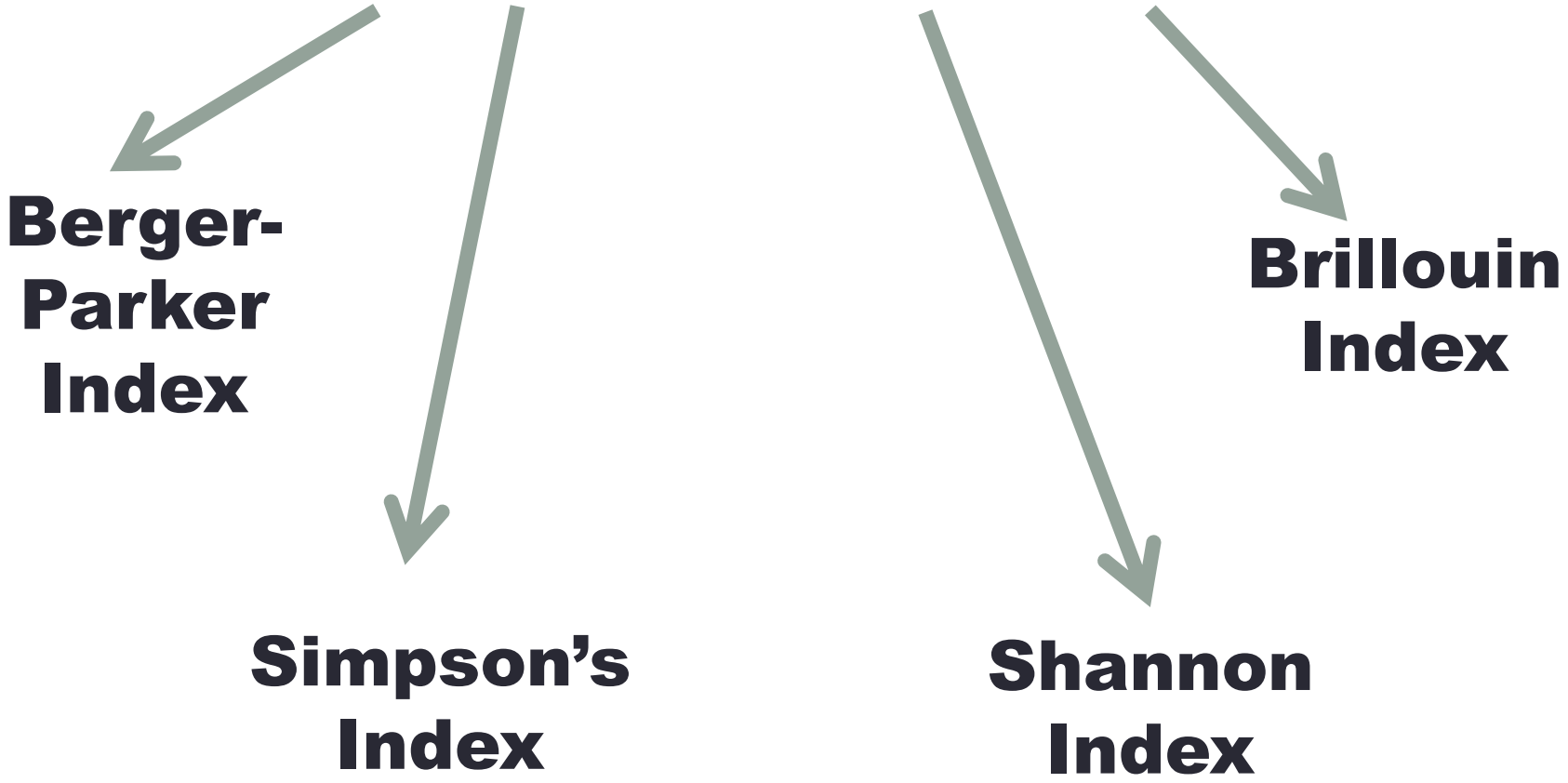
$$\text{Relative Dominance (RDo)} = \frac{\text{Total basal area of the species}}{\text{Total basal area of all species}} \times 100$$

Species IVI = Relative Dominance + Relative Density + Relative Frequency

In case of Pteridophytes..

$$\text{IVI} = \frac{\text{RD} + \text{RF}}{2}$$

Diversity Index



- **Dominance Index**
- **Important Statistical Index**

Berger-Parker Index

DBP = Nmax / N

Nmax = the number of individuals in the most abundant species and

N = the total number of all individuals in all species

Brillouin Index

$$HB = \frac{\ln(N!) - \sum_{i=1}^{S} \ln(n_i!)}{N}$$

So.. Which one will be Appropriate ??

Simpson's Index

measures the probability that two individuals randomly selected from a sample will belong to the same species

$D = \Sigma(ni/N)^2$

Simpson index of Diversity = 1 – D

(ranges from 0-1)

Shannon Index

Measures the Relative abundance of each species (pi)

pi = ni /N

$H = -\Sigma(pi)(\ln pi)$