Community ecology

- Community – Assemblage of interacting species occupying a particular position in the landscape.
- Biotic community-an assemblage of plants, animals, microorganism that live in an environment and interact with one another, forming a distinctive living system with its own composition, structure, environmental relations, development and function.
- Plant community, Animal community, Microbial community
- Community vs organism
  - Born, grow, matures, reproduces and dies

Synecology or Study of Communities

- The study of the relationship of plants and animals making up a natural community is termed as *community ecology or synecology*.
- A group of individuals of the same species is commonly known as *population*.
- **Community Composition:** The following points characterized the community:
- **1. Species diversity**
- **2. Coexistence**
- **3. Interdependency:** Thallophytes, mosses, ferns and many shade loving herbs that are found on the forest floor are dependent on the forest trees because trees provide shadow and moist conditions.

- 4. Species Dominance: in the forest, tallest trees, for example, influence the under-storey plants and ground vegetation not only by decreasing the intensity of light reaching the forest floor and increasing the moisture content of air but also by changing the soil structure and its chemical composition.

- 5. Stratification: In plant community, plants form, more or less, distinct strata or layers or storeys on vertical as well as in horizontal planes. This is characteristically known as *stratification.* The individual of different layers represent different "Life forms". Each layer of community may sometimes include individuals of different morphological classes, as for example, the top layer or canopy of forest may be formed by tallest trees and liana (woody climbers).

- **6. Succession:** The sequence of communities showing a gradual change in composition is called *continuum* (Curtis 1959). As regards the composition of community, there are two opposing philosophies:
- i) Organismic view
- ii) Individualistic view
- The organismic view was advanced by Clements (1916). According to this view, the community is a sort of "*sugar organism*", the highest stage in the organisation of living world rising from cell to tissue, organs, organ-systems, species, population and to community. The community is regarded as super organism because it grows, adjusts, under some circumstances reproduces itself, and functionally represents higher level of integration than individual plants and animals that make it up.

- The individualistic concept was first advanced by H.A. Gleason (1962) and further extended by Whittaker (1951, 1952, 1958), Curtis (1958), McIntosh (1959) and several other ecologists. This approach emphasizes that no community necessarily reaches any prescribed composition or steady state. In this, species has been recognized as essential unit because it is only the species, and not the community, which is directly involved in inter-relationships and distribution.
- **Ecotone**

- Biological structure
  - Species diversity
    - Alpha diversity (Local diversity) – variety of organism occupying a given place or habitat.
    - Beta diversity (Regional diversity) – variety of organism occupying a number of different habitat over a region.
    - Gamma diversity – Diversity difference between similar habitats in widely separated geographic regions.

Interaction between species in a community

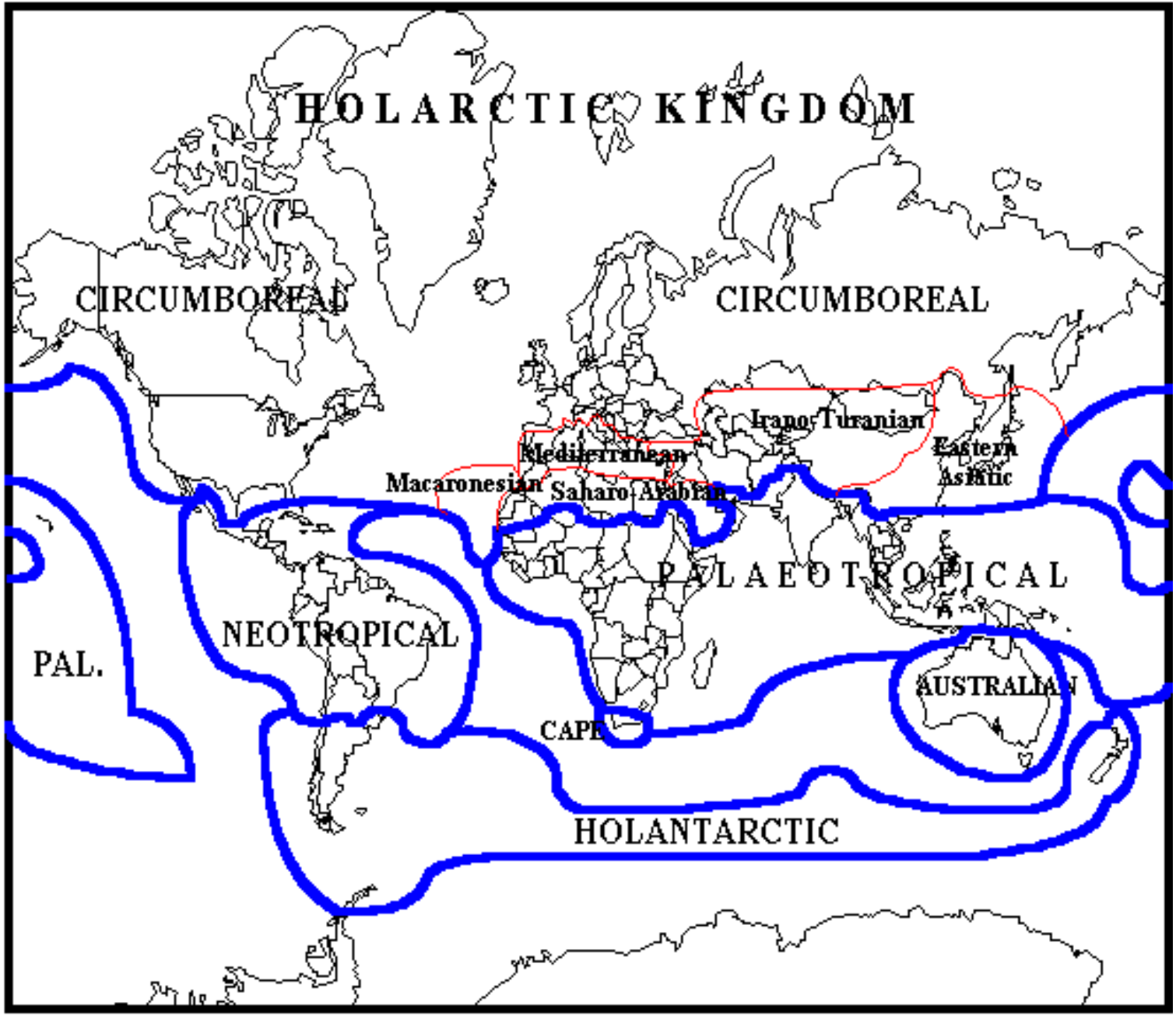
(2 species system)

Type of interaction	Responses	
	A	B
Neutral	0	0
Mutualism	+	+
Commensalisms	+	0
Parasitism	+	-
Predation	+	-
Competition	-	-

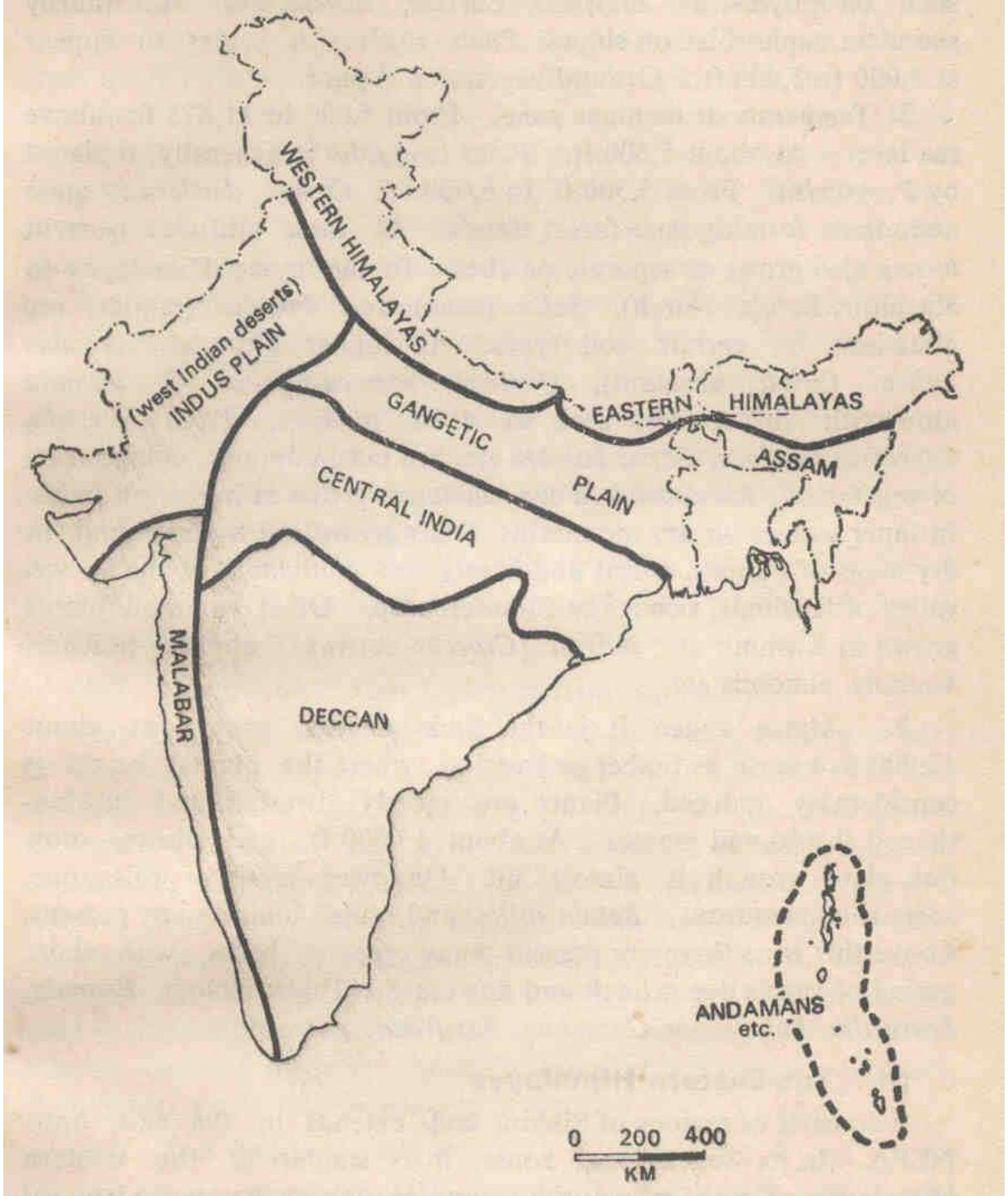
- Forest - Primary forest, secondary forest
- Primary forest
  - Species diversity
  - Small number
  - Heterogeneity
  - DBH – Number curve
  - Timber quality
  - Regeneration
  - Increment

- Secondary Forest –
  - Composition
  - Homogeneous
  - Timber quality
  - Competition for light and space
  - Increment

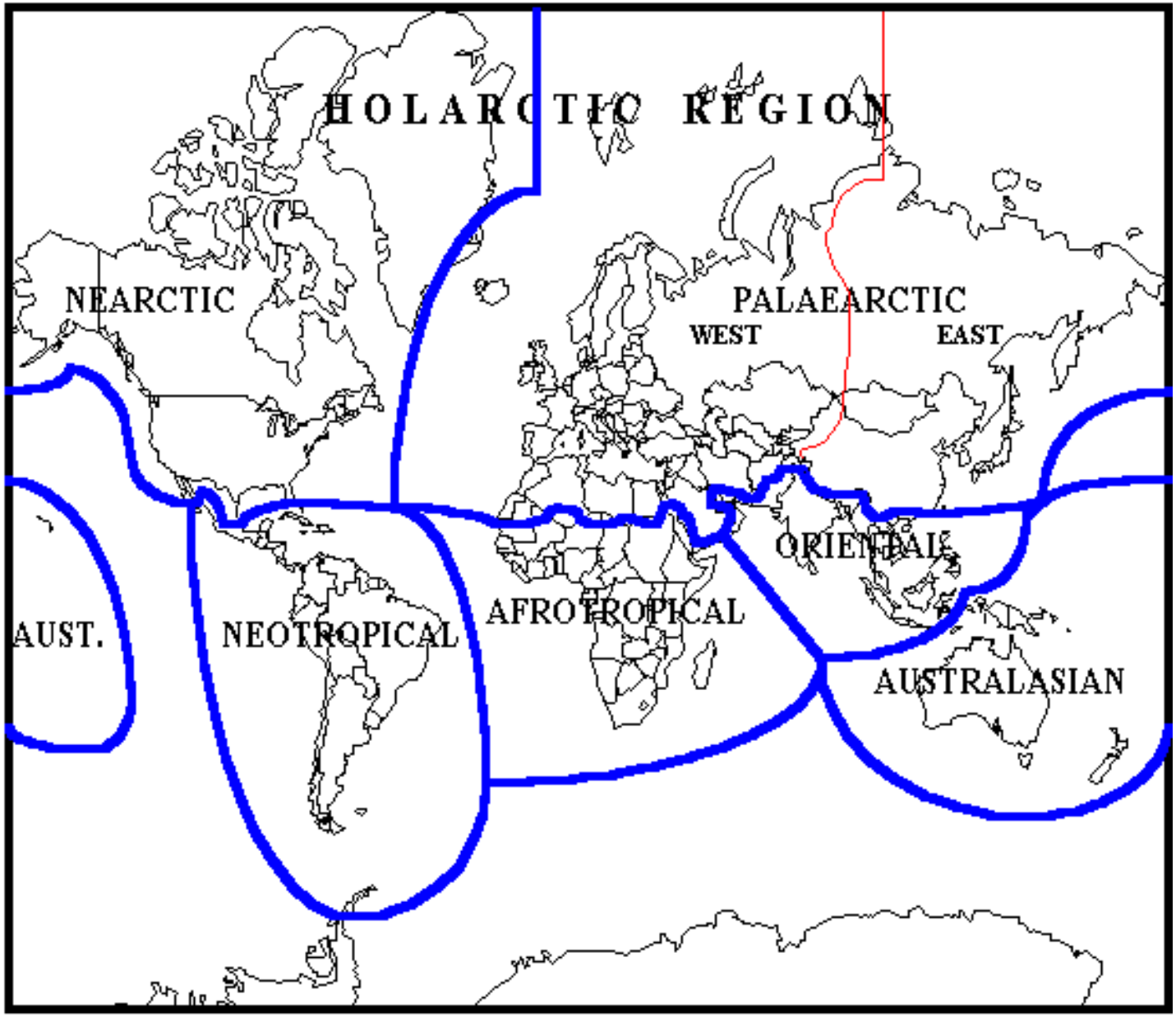
- **Phytogeography** – origin, distribution and environmental interrelationships of plants.
- **Descriptive or Static Phytogeography** – dealing with the description of flora and vegetation of different botanical areas.
- **Interpretive or Dynamic Phytogeography** – dealing with interpretation of causes of plants distribution.
- **Floristic kingdoms of the world**
- **Botanical regions of India**



Floristic kingdoms of the world


WESTERN HIMALAYAS
(west Indian deserts)
INDUS PLAIN
GANGETIC
PLAIN
EASTERN HIMALAYAS
ASSAM
CENTRAL INDIA
MALABAR
DECCAN
ANDAMANS
etc.
0 200 400
KM

- Zoogeography – geographic distribution of animals
- Six zoogeographical regions
  - The Neoartic region consisting of North America, Canada, Iceland and Green land
  - The Palaeartic region consisting of North Africa, Europe, North East and Central Asia.
  - The Neo-tropical region comprising southern peninsula of North America and South America.
  - The Ethiopian region consisting of three fourths of Africa and Southern Arabia
  - The oriental region including Indian Subcontinent and South East Asia.
    - Himalayan region
    - Tropical rain forest
    - Indian Peninsular region
  - The Australian region comprising mainly Australia.



The main zoogeographical regions of the world