

Endemism

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Introduction

- The occurrence of a species or genus in a restricted geographical area is called endemism.
- The idea of endemic plant distribution was first proposed by A. P. de Candolle in 1813.
- Endemism is also defined as ‘the occurrence of a taxa nowhere else except in a small area’.
- Taxonomic unit may be species or genus or even a family.



A species that is found restricted only to a biogeographic area is called endemic species.
Eg. *Nepenthes khasiana* is restricted to Meghalaya



If a genus of a plant is found restricted to a biogeographic area, it is known as endemic genera.

Eg. Genus *Arcyosperma* having single species is endemic to Western Himalayas

If all members of a family are found to a particular geographical area, that family is called endemic family.

Eg. Family Akaniaceae having two genera is native to china, Vietnam and eastern Australia



Akania bidwillii

Types of endemics

- The endemic species have been grouped into the following categories-
- Relics or Palaeoendemics
- Neoendemics
- Pseudo endemics

1. Relics or Palaeoendemics

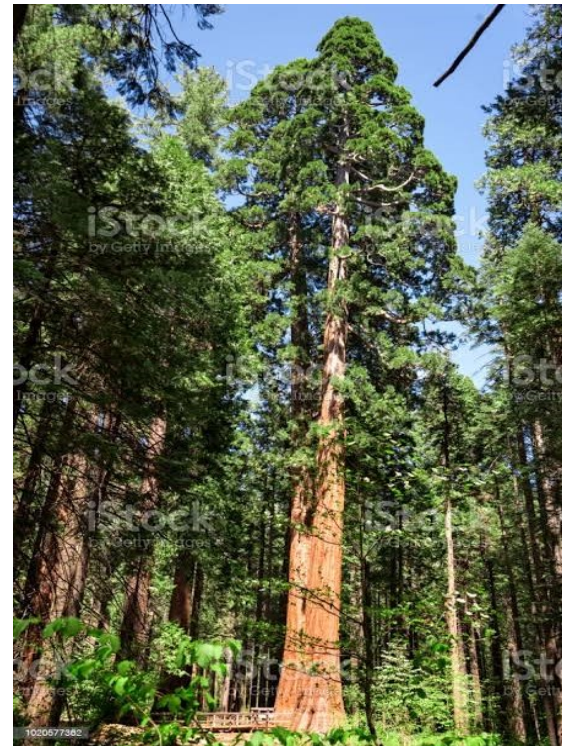
- The surviving species of ancient flora which was once dominant vegetation in the area are called relics or Palaeoendemics
- A great majority of the endemic species belonging to this type have many fossil relatives. They are also called living fossils
- Because of little variability the endemics are adapted only to a particular environment and even if they reach new areas, they fail to establish themselves in new environment.

Examples-

❖ *Ginkgo biloba* is paleoendemic to china and Japan



❖ *Sequoia sempervirens* is paleoendemic to coastal velly of California



2. Neoendemics

- The other endemics may be modern species which have had not enough time for occupying a large area through migration. They are called neoendemics.
- Neoendemics show good variability and have many biotypes, grow in diverse habitats and have wide tolerance for habitats.
- There are several such genera which are widely endemic or few species of which are endemic.

Examples-

- *Shorea robusta*, *Vanda coerulea*, *Piper nigrum* etc. are endemic to India.



3. Pseudo endemics

- These endemics arise due to mutation in existing population at a particular place
- These pseudo endemics or mutants may or may not persist for long in the particular area where they originate.
- Endemism results from the failure on the part of species to disseminate its seeds fruits spores or propagules because of existence of great barriers like mountains, oceans and large deserts.

Factors of endemism

1. Geographical barriers –
 - Mountain ranges, oceans, deserts, glacial belt, etc. act as the geographical barriers.
 - They do not allow the seeds, fruits, spores and reproductive bodies of plants to pass across them. So the plant can not migrate from the original area to the next.

2. Concentration of taxon

- Shrinking of the area of distribution of a species upto its place of origin is known as concentration of taxon.
- It is the backward migration of the species due to unfavourable climatic or biotic factors.
- In many circumstances the migrated plant species fail to establish in the new area so they become endemic to its original place.

3. Suitability of microclimate

- Almost all endemic plants survive only in a particular microclimate
- It provides suitable edaphic, climatic and biotic condition for growth, multiplication and establishment of the endemic species.
- Sometimes, microclimates of adjacent areas are worst for the survival of the new species. Therefore, newly evolved species is restricted to its place or origin and become endemic in course of time.

4. Selection by soil factors

- Usually new species evolves in a place where soil factors are more ideal for their survival than in other areas. And hence can not established in other areas and became endemic to its place of origin.

5. Natural variation in isolated plants

- In the islands new plant evolve due to natural variations.
- Since the sea is the barrier between the island and continent, the newly evolved species cannot migrate to the continent.
- So the new species becomes endemic to the island.