

TP : 04 Gymnosperms

Gymnosperms are a group of seed-producing plants that includes conifers. The term *gymnosperm* means “naked seed,” referring to the fact that their seeds are not enclosed within a fruit, unlike those of angiosperms (flowering plants). These plants are usually woody, perennial, and mostly evergreen.

Gymnosperms are important both ecologically and economically. They dominate many forest ecosystems, especially in cold and temperate regions, and are sources of timber, paper, resins, and medicinal products.

Objectives:

To observe the morphological characteristics of gymnosperm plants.

Aleppo pine (*Pinus halepensis* Mill.)

Aleppo pine (*Pinus halepensis*) is a fast growing, medium-sized conifer. It is native to coastal areas of the western Mediterranean, thriving in dry, warm climates, is drought resistant, and grows on all substrates in hot areas exposed to frequent forest fires. Aleppo pine is adapted to drought but less adapted to cold conditions (Fady, Semerci, and Vendramin, 2003). In Algeria, Aleppo pine forests cover more than 850,000 hectares (MEZALI, 2003). This species, which is found across all bioclimatic zones (from the coastal areas to the Saharan Atlas) reaches its optimal growth mainly in semi-arid regions. Its great adaptability and robust nature have made it a pioneering species for large-scale reforestation.

Aleppo pine has a crucial role in preventing soil erosion, promoting ecosystem stability, improving water filtration, and acting as a windbreak. As a result, the tree has been used in several afforestation programmes. Used in paper industry and as firewood.

Classification:

Kingdom: Plantae

Division: Pinophyta

Class: Pinopsida

Order: Pinales

Family: Pinaceae

Genus: *Pinus*

Species: *Pinus halepensis* Mill.

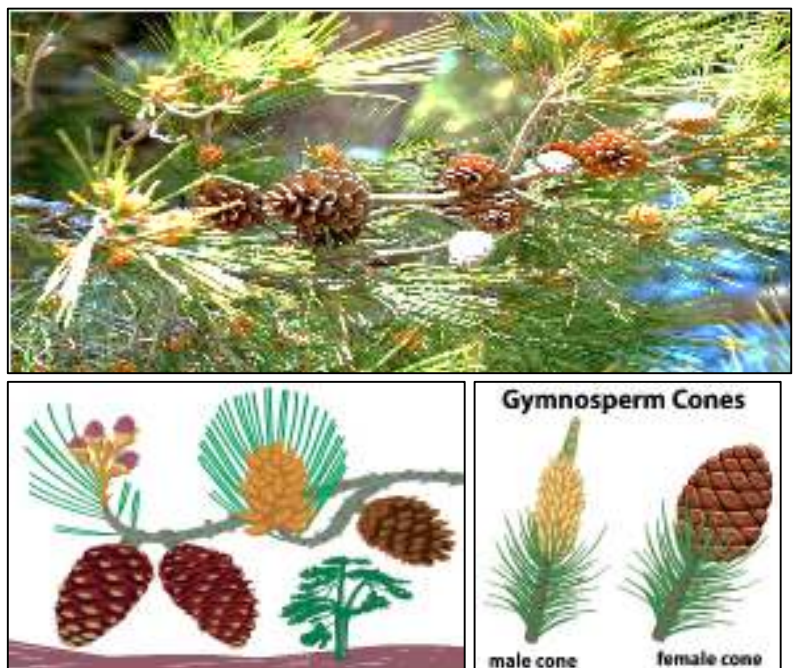
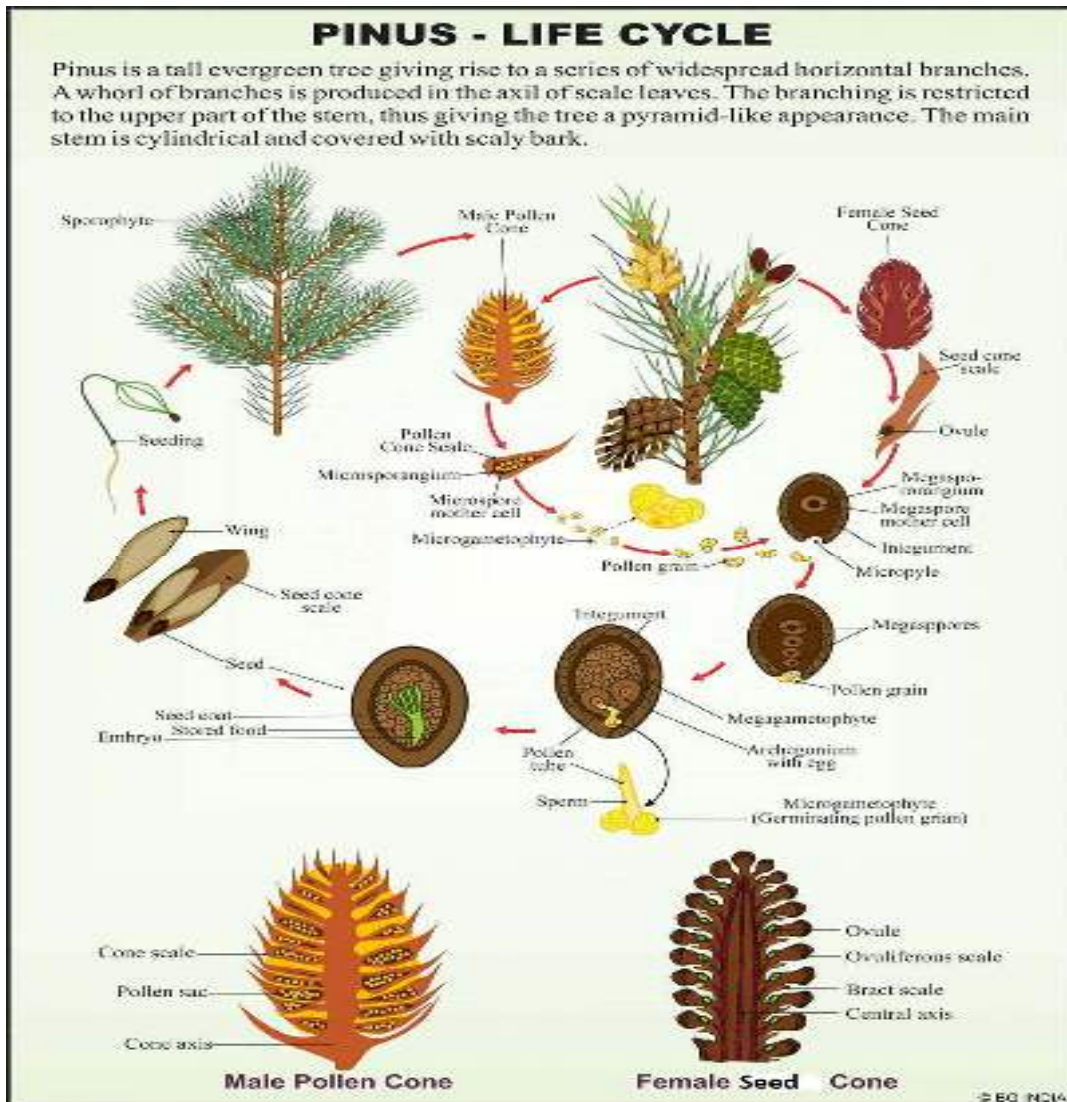


Figure : *Pinus halepensis* Mill.



Cupressus sempervirens L.

Mediterranean cypress (*Cupressus sempervirens*) is a light-demanding, medium-sized, coniferous, evergreen tree. Native to the eastern Mediterranean region and the Middle East, it thrives in a variety of climates, from coastal zones to dry mountainous areas with hot summers and wet winters.

This species is widely cultivated for ornamental purposes and is frequently planted in gardens, parks, and along avenues. The tree's fragrant wood is resistant to insects and fungi and is good for underwater construction, such as shipbuilding or in wells.

Classification:

Kingdom: Plantae

Division: Pinophyta

Class: Pinopsida

Order: Cupressales

Family: Cupressaceae

Genus: *Cupressus*

Species: *Cupressus sempervirens* L.



Figure : *Cupressus sempervirens* L.

1. General Characteristics :

- *Cupressus sempervirens* is a gymnosperm belonging to the Cupressaceae family.
- It is an evergreen, monoecious tree.
- It typically has a columnar or pyramidal shape, with dense, scale-like leaves.

2. Vegetative Structures :

- Leaves: Small, scale-like, arranged in opposite decussate pairs, dark green, and tightly appressed to the stem.
- Stem/Bark: The bark is grayish-brown and becomes fissured with age. The wood is aromatic, decay-resistant, and fine-grained.
- Roots: Taproot system with lateral roots; adapted to dry, calcareous soils.

3. Reproduction :

- *Cupressus sempervirens* is wind-pollinated.
- Male cones (microstrobili) are small, yellowish, and located at the tips of branches. They release pollen in early spring.
- Female cones (megastrobili) are ovoid to globular, 2–4 cm long, and take about two years to mature.
- Cones consist of woody scales that open at maturity to release winged seeds.

4. Life cycle :

- As a gymnosperm, it follows the alternation of generations.
- The dominant sporophyte (the tree) produces cones.



Figure : Male and female cones

- Pollen from male cones fertilizes the ovules in female cones through wind pollination.
- After fertilization, seeds develop and are eventually dispersed by wind.

5. Adaptations :

- Drought resistance: Thick cuticle and reduced leaf surface area minimize water loss.
- Fire resistance: Bark can offer protection; cones can remain closed and release seeds after fire.
- Longevity: Trees can live for hundreds of years in favorable conditions.

6. Ecological role :

- Provides habitat for birds and insects.
- Used in reforestation, landscaping, and erosion control.
- Acts as a windbreak and noise barrier in urban settings.

Work to be done:

Drawing of a leafy branch of *Pinus halepensis*

Drawing of a leafy branch of *Cupressus sempervirens*

Drawing a cross-section of a needle.

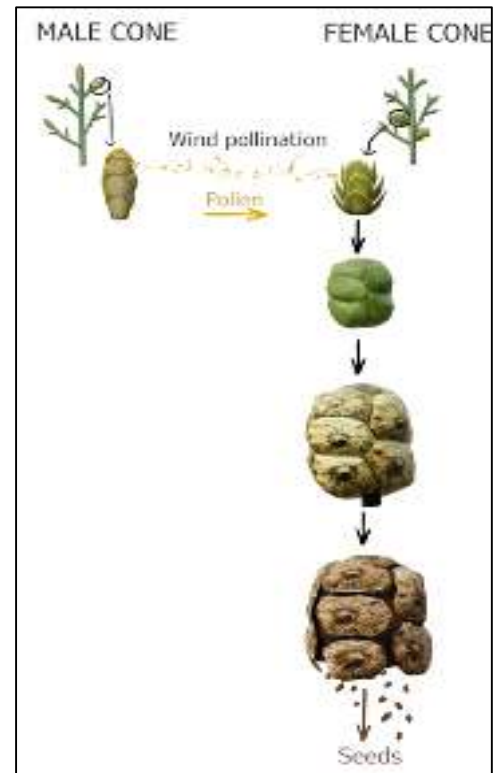


Figure : Life cycle