

## Lab (8): Advanced Vascular plants (Gymnosperms)

Super kingdom: Eukaryota  
Kingdom: Plantae

1-Division: Ginkgophyta

Genus: *Ginkgo*

2-Division: Cycadophyta

Genus: *Cycads*

3-Division: Gnetophyta

Genus: *Ephedra*

4-Division: Coniferophyta

Genus: *Pinus*

### Characteristics of Gymnosperms

1. They do **not** produce flowers.
2. Seeds are not formed inside a fruit. They are **naked**.
3. They develop **needle-like leaves**.
4. They are perennial or woody, forming trees or bushes.
5. They form **cones** with reproductive structures. (**cone**, also called **strobilus**, in botany, mass of scales or bracts, usually ovate in shape, containing the reproductive organs of certain nonflowering plants. The cone, a distinguishing feature of pines and other conifers)
6. These plants have vascular tissues which help in the transportation of nutrients and water. (**Xylem does not have vessels and the phloem has no companion cells and sieve tubes.**)

Genus: *Ginkgo*

Commonly called the ginkgo tree. It is also known as the maidenhair tree because of the resemblance of its bilobed leaves to those of the maidenhair fern. *It is* may be the oldest living seed plant, and it is regarded by some as one of the wonders of the world.



Figure(1): *Ginkgo* tree

Genus: *Cycads*

Cycads are gymnosperms distinguished by crowns of large pinnately compound leaves and by cones, which are typically borne at the end of the trunk in the center of whorled branches.



Figure(2): *Cycad* tree and cones

**Genus: *Ephedra***

Members of the genus *Ephedra* are low, straggling, or climbing desert shrubs.

The leaves, reduced to scales.



Figure(3): *Ephedra* tree

**Genus: *Pinus***

**Conifer**, needle-shaped evergreen leaves and seeds attached to the scales of a woody bracted cone. Conifers are most abundant in cool temperate and boreal regions, where they are important timber trees and ornamentals, but they are most diverse in warmer areas, including tropical mountains.



Figure(4): *Pinus* tree and cones