

# LIFE SCIENCES 11

## GYMNOSPERMS

### Seed Plants

- 2 types of seed plants → gymnosperms and angiosperms
- characterized by producing seeds
  - protected coat over an embryonic sporophyte and stored food
- sporophyte is dominant generation

### Gymnosperms

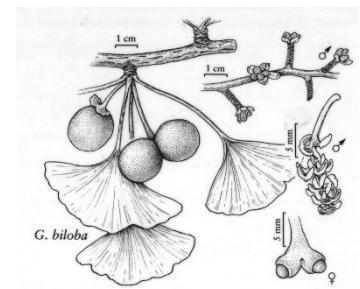
#### 1. Cycads (Cycadophyta)

- Palm-like plants found in the tropics and sub-tropics
- Have compound leaves
- Dioecious – plants have either male or female reproductive structures
  - Sperm are motile
- Flourished during the time of the dinosaurs



#### 2. Ginkos (Ginkophyta)

- Only one species left – maidenhair tree (*G. biloba*)
- Survive naturally in a small area of China
- Dioecious with motile sperm
- Considered to be a living fossil – latest fossils date back 270 million years (Permian)
- Very hardy tree – 6 trees survived the Hiroshima atomic bomb



#### 3. Gnetophytes (Gnetophyta)

- Only 3 genus alive today
- Has vessel elements associated with the xylem (characteristic of angiosperms)
- Ephedrine (stimulant, appetite suppressant and decongestant) derived from *Ephedra* plant

#### 4. Conifers (Pinophyta)

- Largest group of gymnosperms
- Cone-bearing trees that have needle like leaves (small leaves help conserve water)
- Monoecious – plants that have both male and female reproductive structures
- Two sizes of cones
  - Larger cone is female
  - Smaller cone is male → usually lower on trees



- Used for:
  - pulp & paper
  - lumber
  - medicine (taxol from Yew tree used to treat cancer)
  - tanning hides (tannin from bark)
  - resin products (turpentine, wine additives, disinfectants, vitamins, fragrances)

