GENERAL BOTANY Lecture 36 - Gymnosperms (Part II)

IV. Other phyla of gymnosperms

A. Phylum Cycadophyta (cycads)

1. Trees palmlike in appearance and very slow-growing
2. Gymnosperms because they produce large cones
3. All modern cycads are dioecious
a) Pollen is transferred by a weevil, insects or wind to a droplet of fluid at the micropyle of the ovule
b) Pollen grains are carried into the pollen chamber, where they germinate to free swimming sperm
1) Swimming sperm can have 40,000 to 70,000 flagella
c) Male gametes are drawn into the archegonium for fertilization
d) Uses: food, although some contain neurotoxins that cause convulsions

B. Phylum Ginkgophyta (ginkgos) - Ginkgo biloba is the only living species

1. May be the oldest-living seed plant - "living fossil"
2. Used as an ornamental because of its resistance to pathogens and air pollution
3. Fan-like leaves
4. Male and female sporangia are borne on spur shoots on separate plants (dioecious)
5. The seeds of female trees smell like rancid butter (butyric acid)
6. Seeds are sometimes eaten in China (cultivated for that purpose)

C. Phylum Gnetophyta (Genera: Gnetum, Ephedra, and Welwitschia)

1. An intermediate between gymnosperms and angiosperms
2. They have: vessels, integuments, and pollen-producing structures that resemble stamens
3. Can be easily mistaken for a dicot
4. Most are dioecious
5. Strobili look like flowers
6. Ephedra can be used to make Mormon tea - (contains an alkaloid that treats asthma)
7. Seeds of Gnetum can be eaten

INTRODUCTION TO ANGIOSPERMS

Angiosperms: dominant plants of the world
Nearly all croplands, forests, shrublands, grasslands, and deserts
How are angiosperms different from gymnosperms? (Note: angiosperms probably arose from gymnosperms)

Generation	Gymnosperms	Angiosperms
Sporophyte	1. Staminate and ovulate cones 2. Usually sieve cells and tracheids	1. Flowers, stamens, and carpels 2. Sieve cells with companion cells, tracheids and vessels
Gametophyte	1. Usually motile sperm 2. Reduced archegonium	1. Nonmotile sperm 2. Little archegonium (synergids?)
Fertilization	1. Single fertilization (no endosperm)	1. Double fertilization (endosperm)