GENERAL BOTANY Lecture 33 - Lower Vascular Plants (Part I)

I. General Characteristics
- A. What are they?
  1. Evolved plants with simple vascular tissue - ferns and other stuff
- B. "Lower" vascular plants
  1. Simple vascular tissue is present
  2. They do not produce seeds - they form spores instead
  3. All have swimming sperm cells and require water for fertilization
  4. The sporophyte is conspicuous and usually more obvious than the gametophyte
- C. Phyla of lower vascular plants
  1. Psilotophyta (PPPSSSTTTT!) - no true roots; looks like wind-blown hair
  2. Lycophyta (like a POGO stick) - "club moss;" looks like an upright pine tree
  3. Equisetophyta - looks like a horse's tail
  4. Polypodiophyta (leaves look like a saw that could "tear," or could be torn) - real ferns
- D. What "Earth" looked like 260-395 million years ago
  1. Most abundant - Lycophyta (herbs and trees)
  2. Second - giant Equisetophyta
  3. Third – Polypodiophyta (ferns)

II. Definitions
- A. Sporophyte - a plant (usually diploid) in which meiosis occurs to produce spores
- B. Microphyll - a small leaf (connected to vascular system of stem by a single vein)
- C. Sporophyll - a spore-bearing leaf
- D. Sporangiophore - a branch bearing one or more sporangia
- E. Sporangium (pl. sporangia) - a spore case
- F. Megasporangia - spore case bearing spores that give rise to female gametophytes
- G. Microsporangia - spore case bearing spores that give rise to male gametophytes
- H. Sporocyte - a diploid or haploid cell that will undergo mitosis or meiosis to produce spores
- I. Spore - a reproductive cell that develops into a plant without union with other cells

III. Characteristics within phyla of lower vascular plants
- A. Phylum Psilophyta
  1. <u>Psilotum</u> (genus) - also called whisk fern
     - a) Upright green stems from rhizome (associated with a fungus)
     - b) "Leaves" are small and scalelike (microphylls) - no sporophylls
     - c) No roots
     - d) Vascular simple - cylinder of xylem surrounded by phloem
     - e) Reproduction - sporangia in leaf axils , meiospores become released, go to gametophytes with archegonia and antheridia, sperm swims, fertilization
- B. Phylum Lycophyta
  1. <u>Lycopodium</u> (genus) - also called club moss and ground pine
     - a) Resemble pine seedlings - microphylls spirally arranged
     - b) Upright stems have sporophylls with sporangia in leaf axils
     - c) True roots, stems, and leaves (as will be hereafter unless specified)
     - d) Vascular complex - xylem and phloem mixed as anastomosing strands (like blood vessels)
     - e) Reproduction - Leaves bear spores (if grouped, called a cone or strobilus), meiospores become released, go to gametophytes (fungal association) with archegonia and antheridia, sperm swims, fertilization
  2. <u>Selaginella</u> (genus) - also called spike moss
     - a) Unique because it is heterosporous
     - b) Microsporal (male) sperm released from antheridium can reach megasporal (female) egg of the archegonium in the sporphytic strobilus or somewhere on the ground