

Plants

I. Characteristics of Plants

A. What is a Plant?

1. Grass, Trees, Ferns, Mosses and Forbs
2. 285,000 + species
3. Characteristics of plants
 - a) Sessile, nonmotile (they don't move)
 - b) All plants are many celled
 - c) Almost all contain chlorophyll
 - d) Have cell walls made of cellulose
 - e) Most held in place by root like structures
 - f) Prevent water loss
 - g) Obtain and distribute water and minerals to tissues

B. Adaptation of land plants that allow them to live on land

1. Protection and Support
 - a) Support themselves by cellulose
 - 1) Cellulose is an organic compound made of a chain of simple sugars
 - b) Protect themselves from water loss by a waxy cuticle
 - 1) The cuticle is a waxy layer on the stems and leaves
2. Reproduction by methods that do not require water or only require water for a short time

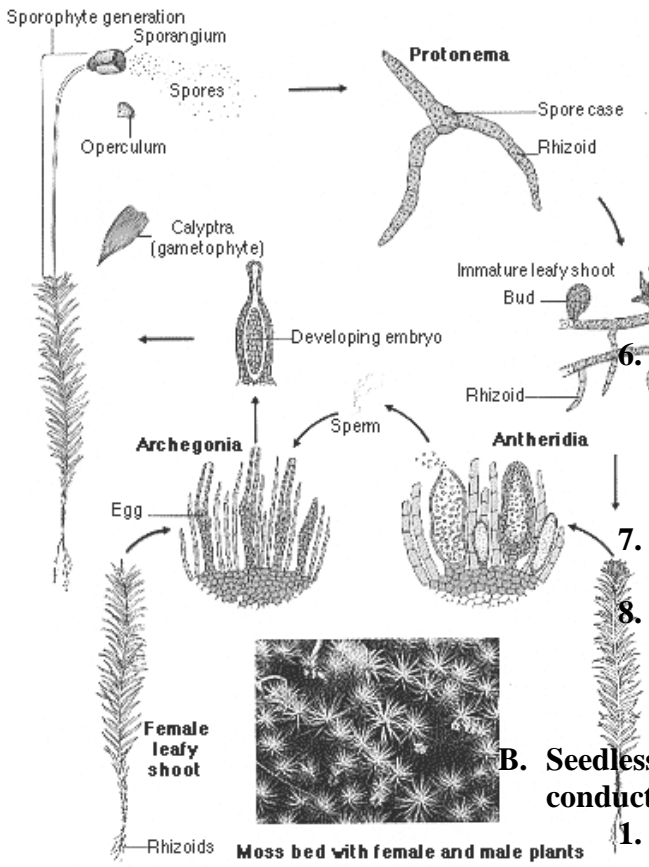
C. Classification of plants

1. Phylum Bryophyta (Bryon means moss) (Phyta means plant)
 - a) Includes mosses and liverworts
 - b) They have no conductive tissue (vascular) for transporting food & water
 - c) Live in damp areas because they are nonvascular
2. Phylum Tracheophyta – vascular plants that do have vessels for conduction water and nutrients

II. There are two main groups of seedless plants

A. Seedless nonvascular plants

1. Do not have true roots stems and leaves
2. Do have root like, stem like, and leaf like structures
3. Root like structures called rhizoids
4. They include mosses and liverworts
5. Spend most of their life in the gametophyte stage



- a) Liverwort – wort means herb
 - 1) Have flat thin photosynthetic liver-shaped structures that are much like leaves

6. Moss life cycle

- a) Slightly more complex than liverworts
- b) Alternation of generation
 - 1) Sporophyte stage (diploid)
 - 2) Gametophyte stage (haploid)

7. Can also reproduce asexually by a process called vegetative propagation

8. Importance of mosses and Liverworts

- a) Pioneer species (species that are first to get established on barren areas)
- b) Begin the weathering of rocks to make soil

B. Seedless Tracheophytes (Vascular plants) (plants that have conductive tissue)

1. Includes club mosses, spike mosses, horsetails, and ferns

- 2. True roots stems and leaves
- 3. Vascular tissue allows water and minerals to move up and down through out the plant

4. Club mosses and spike mosses

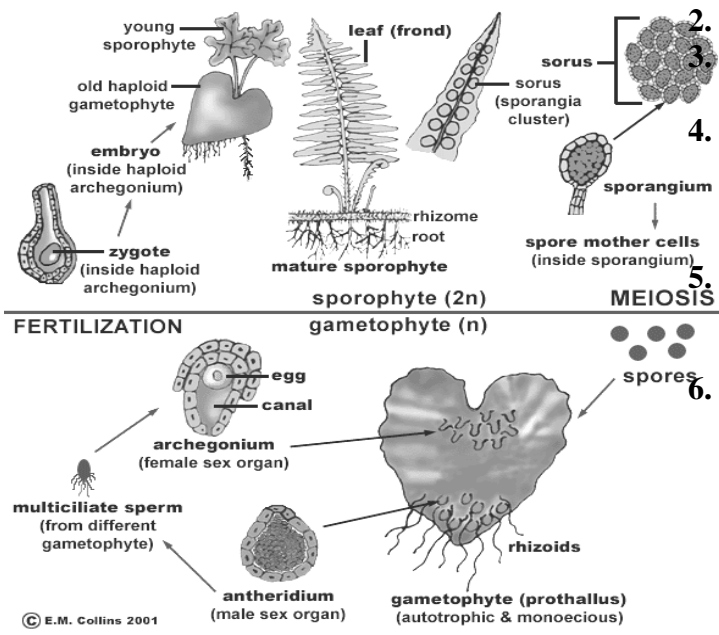
- a) Simple tracheophytes that resemble true mosses
- b) Reproduce spores in cone-like structures called strobili

5. Horsetails

- a) Only one genus alive today
- b) Slender stem and small wedge shaped leaves

6. Ferns

- a) Range in size from small to large as trees 15m
- b) Grow in moist areas
 - 1) Moisture is necessary for part of their reproductive life cycle
- c) Leaves are branched and have a lacy appearance
 - 1) Leaves are sometimes called fronds
- d) Ferns underground stems are called rhizomes
- e) Ferns grow as a tightly coiled fiddle head
- f) The Fern life cycle
 - 1) Fern leaf is called a frond



- 2) On the underside of the leaf spores are produced by sori
- 3) Gametophyte stage
 - i. Haploid spores produced in sori
 - ii. Sori fling spores away from plant
 - iii. Spores that land on moist area grow into a heart shaped plant called the prothallus
 - iv. Prothallus produces egg and sperm
 - v. The sperm swims to the egg
- 4) Sporophyte stage
 - i. After fertilization the zygote develops into a mature fern plant

III. Seed plants (Vascular Plants)

A. Most abundant plants on earth

B. Two types of seed plants

1. Gymnosperms - Naked Seed
2. Angiosperm - Vesseled Seed

C. Gymnosperm

1. Literally means naked seed
2. Gymnosperms are many times thought of synonymously with conifers or evergreens
3. Diploid phase is dominant part of life cycle
4. Seeds develop uncovered on a cone
5. Have separate male and female cones that produce gametes
6. Male gametes are fused in pollen grains
7. Examples: Pine, Cedar, Redwood, Cycads, Ginkgoes, Sequoia

D. Angiosperms over 250,000 species

1. These are flowering plants
2. The ovary encloses the seed
3. The flower is the plant's reproductive structure
4. Angiosperms' success is largely due to their many ways of pollination

E. Angiosperms are divided into two groups.

1. Monocots & Dicots

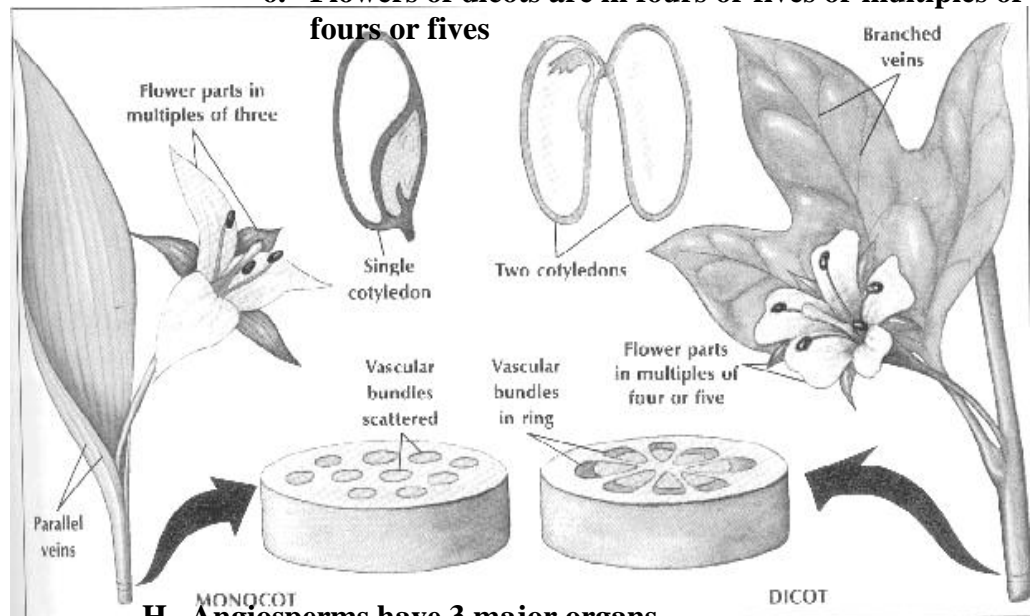
F. Monocots

1. Have one food storing leaf (cotyledon) and is observed when it germinates
2. Short for monocotyledon
3. Leaves of monocots show parallel veins

4. In monocots the vascular bundles are scattered throughout the stem
5. Common monocots are, bananas, corn, barley, wheat, rice, orchids, tulips, iris and lilies
6. Flowers of monocots are in threes or multiples of three

G. Dicots

1. Have two food storing leaves that are evident when they emerge from the ground
2. Short for dicotyledon
3. Leaves of monocots show netted venation
4. In dicots vascular bundles are in rings
5. Common dicots are most of your fruits, legumes, forbs & trees
6. Flowers of dicots are in fours or fives or multiples of four or five



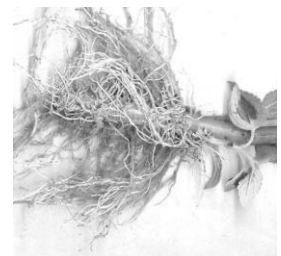
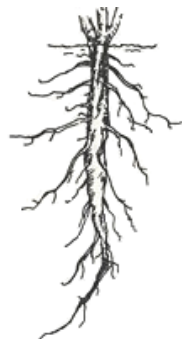
H. Angiosperms have 3 major organs

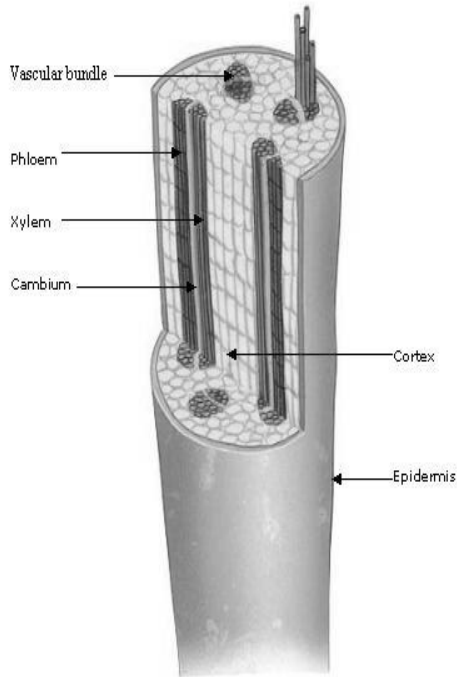
1. Roots

a) Anchorage, storage, & water and mineral absorption

b) Types of roots

- 1) Fibrous
- 2) Tap
- 3) Adventitious





2. Stems

- a) Stems are the link between the roots and the leaves
- b) Stems are either herbaceous or woody
- c) Herbaceous stems are soft green with little or no woody tissue
 - 1) Herbaceous plants come up annually
 - 2) Herbaceous plants support the upper of plant by fluid pressure in the stem called turgidity
 - 3) Loss of turgidity causes herbaceous plants to wilt
- d) Woody stems are stems supported by tough, dead xylem cells
- e) Stems have two main types of vascular tissue
 - 1) Xylem is the inner vascular cambium that takes minerals and water up the tree
 - 2) Phloem is the outer vascular cambium that takes food and minerals down the tree

3. Leaves

- a) Functions of the leaf is an increased area for photosynthesis
- b) Parts of a leaf
 - 1) Petiole
 - 2) Blade
 - i. Midrib
 - ii. Vein
- c) Types of leaves
 - 1) Simple
 - i. Pinnate
 - ii. Palmate
 - 2) Compound leaf
 - i. Palmately compound
 - ii. Pinnately compound

