

Topic #14

**The Plant Kingdom**

(Campbell and Reece p. 573-588, 591-601)

**I. Objectives.**

- A. Describe the different major plant groups
- B. Understand how each group has adapted to living on land
- C. Relate evolution of the alternation of generations to each group

**II. Overview.**

- A. Plants.
  
  
  
  
  
  
  
  
  
  
- B. Species evolve by adapting to land.
  - 1. Water.
  
  
  
  
  
  
  
  
  
  
  - 2. Support.
  - 3. Reproduction without water.
  - 4. Extreme fluctuations in habitat.
  - 5. Adaptations

- C. How variation is achieved - sexual reproduction.  
Plants have alternation of generations.
1. **Diploid** stage.
  2. **Haploid** stage. One set of chromosomes in cell.

**III. Green Algae (Charophyceans).**

- A. Group from which land plants evolved.
1. Aquatic algae but most similar to land plants
  2. Energy utilization.
  3. Structurally similar to Protista.
  4. Structures similar to land plants
- B. Reproduction – Alternation of generations.

1. Haploid stage dominates.

2. Diploid stage.

- C. Evolved into first land plants about 500 million years ago.

#### **IV. Nonvascular Plants (Bryophytes).**

- A. Little adaptations to land

1. Dependent on water.

2. Rhizoids –

3. Photosynthetic tissue are leafy –

4. Must remain close to ground –

5. Simple structure allows resumption of activity after drying of cells

- B. Reproduction.

1. Gametophyte dominant.

2. Sporophyte.

**V. Seedless vascular plants.**

A. Adaptations seen in sporophyte

B. Plants that make-up coal deposits (260-360 million years ago)

C. Club mosses or Lycophyta.





b) Female.

3. Fertilization and new sporophyte complete seed development.

a) Pollen grains enter female cone from air.

b) Seed.

B. Adaptations.

**VIII. Seed plants - Anthophyta ("Angiosperms" or "Flowering Plants").**

A. Reproduction – Alternation of generations.

1. Sporophyte dominates

2. Male gametophytes are pollen.

3. Female gametophyte develops within the ovary.



**IX. Key terms.**

alternation of  
generations  
diploid  
zygote  
mitosis  
sporophyte  
meiosis  
spores  
haploid  
gametophyte  
green algae  
Bryophytes  
rhizoids  
foot  
stalk  
capsule  
Club mosses  
Ferns  
antheridium  
archegonium  
sori  
pollen grain  
seed  
Coniferophyta  
(Gymnosperms)  
sporangia  
cones  
integument  
embryo  
Anthophyta  
(Angiosperms)  
cotyledons  
dicotyledons  
monocotyledons  
sepals  
petals  
stamens  
anther  
pollen tube  
carpel  
pistil  
ovary  
style  
stigma

ovule  
zygote  
embryo  
double fertilization  
endosperm  
fruit  
cotyledons  
dicot  
monocot