

CHARACTERISTICS OF THE ANTHOPHYTA (FLOWERING PLANTS (ANGIOSPERMS))

1. General features

- A. Sporophyte is woody or herbaceous
- B. Body types
- C. Size variation

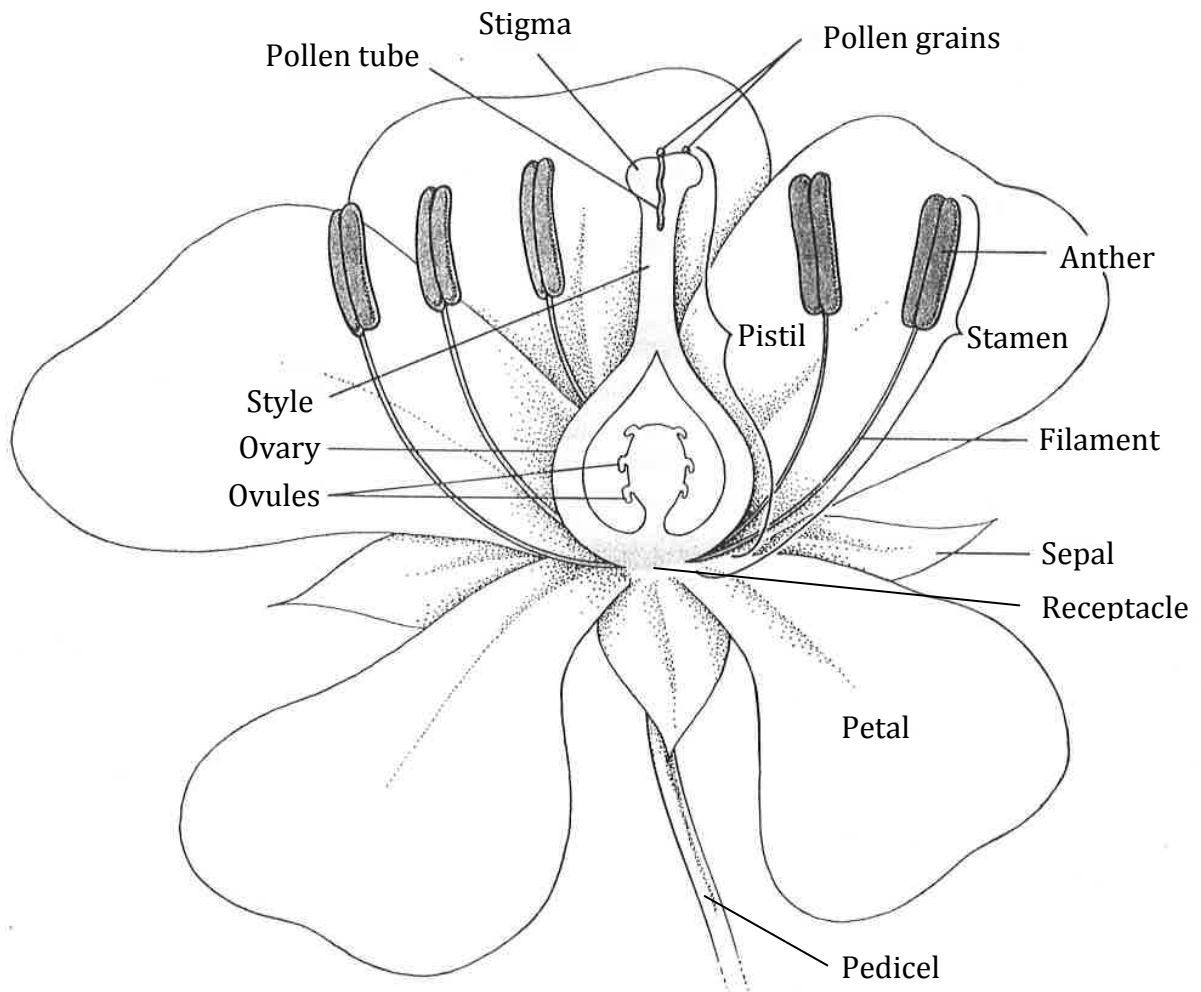
2. Leaves

- A. General shape
- B. Comparison with conifers
- C. Significance
- D. Persistence

3. Flowers – modified stems with four sets of parts

- A. Calyx – comprised of sepals, outermost, green, protect flower in bud
- B. Corolla– comprised of petals, above calyx, brightly colored, attract pollinators
- C. Stamens – collectively androecium, above corolla, anther and filament, produce pollen
- D. Pistil – vase-shaped at center of flower; stigma, style and ovary. Contains ovules.

Flower Structure



From: Curtis, BIOLOGY, 4th Edition
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ANGIOSPERM LIFE CYCLE

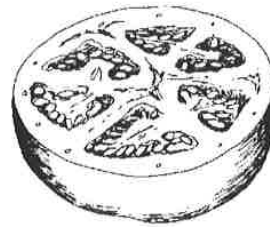
- A. Ovules develop in ovary; each ovule contains an egg
- B. Pollen produced within, and released from anthers
- C. Pollination
 - 1. Transfer of pollen from anther to stigma
 - 2. Either via animal vector or wind
- D. Pollen grain germinates to form pollen tube,
 - 1. Grows through style into ovary
 - 2. Grows into micropyle of ovule
 - 3. Two sperm nuclei develop
- E. Fertilization
 - 1. One sperm fuses with egg forming zygote
 - 2. Second sperm fuses with two other nuclei forming endosperm initial – double fertilization
- F. Seed formation
 - 1. Zygote develops into embryo
 - 2. Endosperm initial develops into endosperm
- G. Fruit development
 - 1. Sepals, petals, and stamens abscise after pollination
 - 2. Pistil enlarges to form fruit
 - 3. Either fleshy or dry

Fruit Types

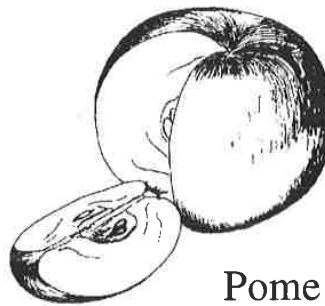
Fleshy Fruits



Drupe (plum)

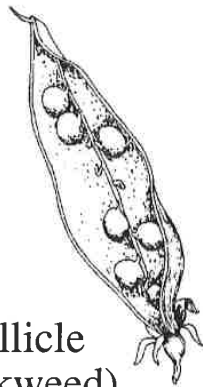


Berry (tomato)

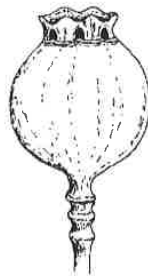


Pome (apple)

Dry Fruits



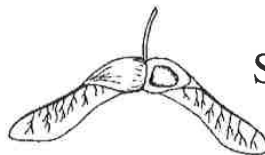
Follicle
(milkweed)



Capsule (poppy)



Acorn (oak)

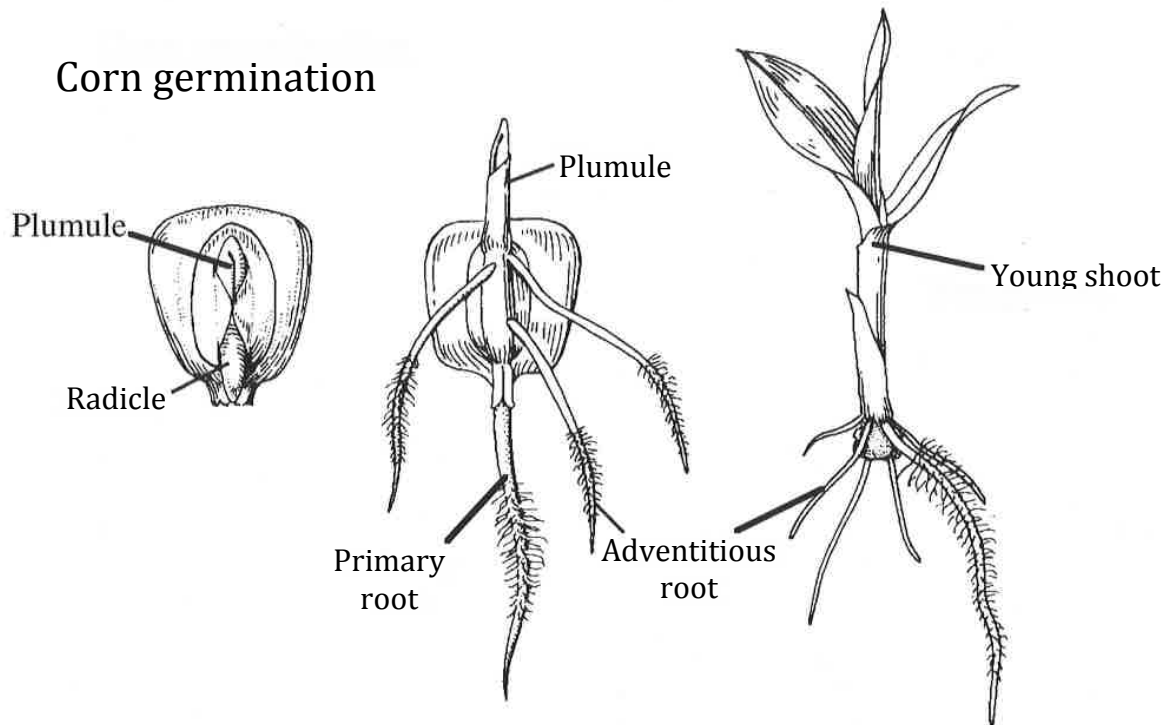


Samara (maple)

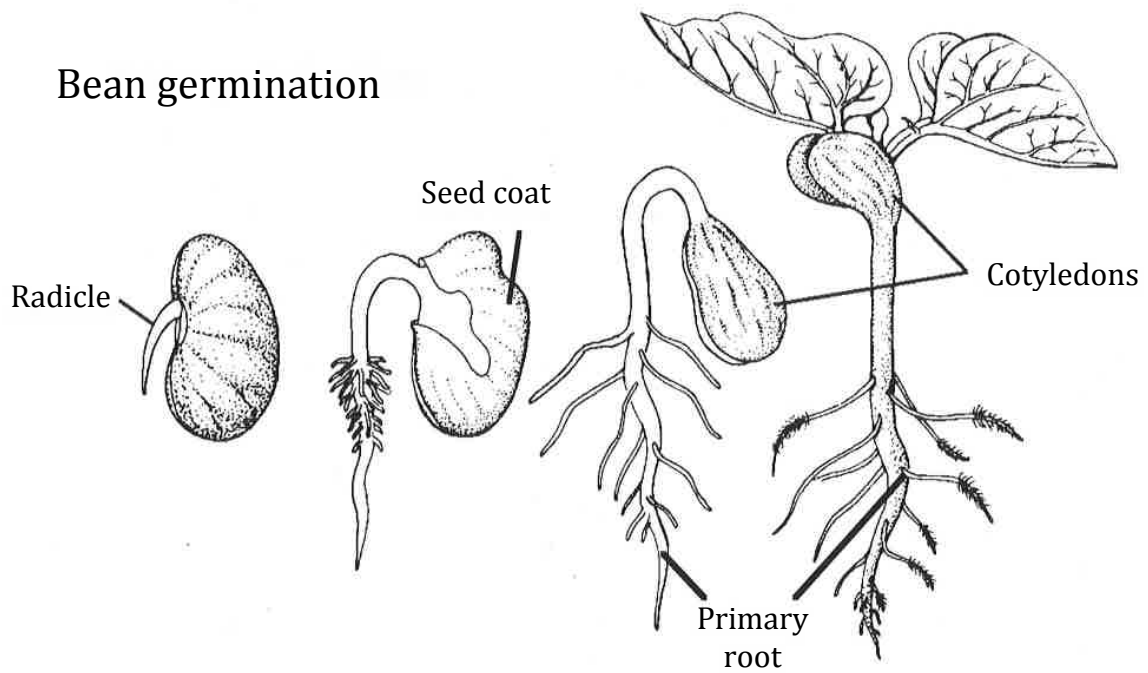
Diagram from Klein & Klein (1988)

Germination in Corn and Bean

Corn germination



Bean germination



MAJOR CHARACTERISTICS OF THE ANTHOPHYTA

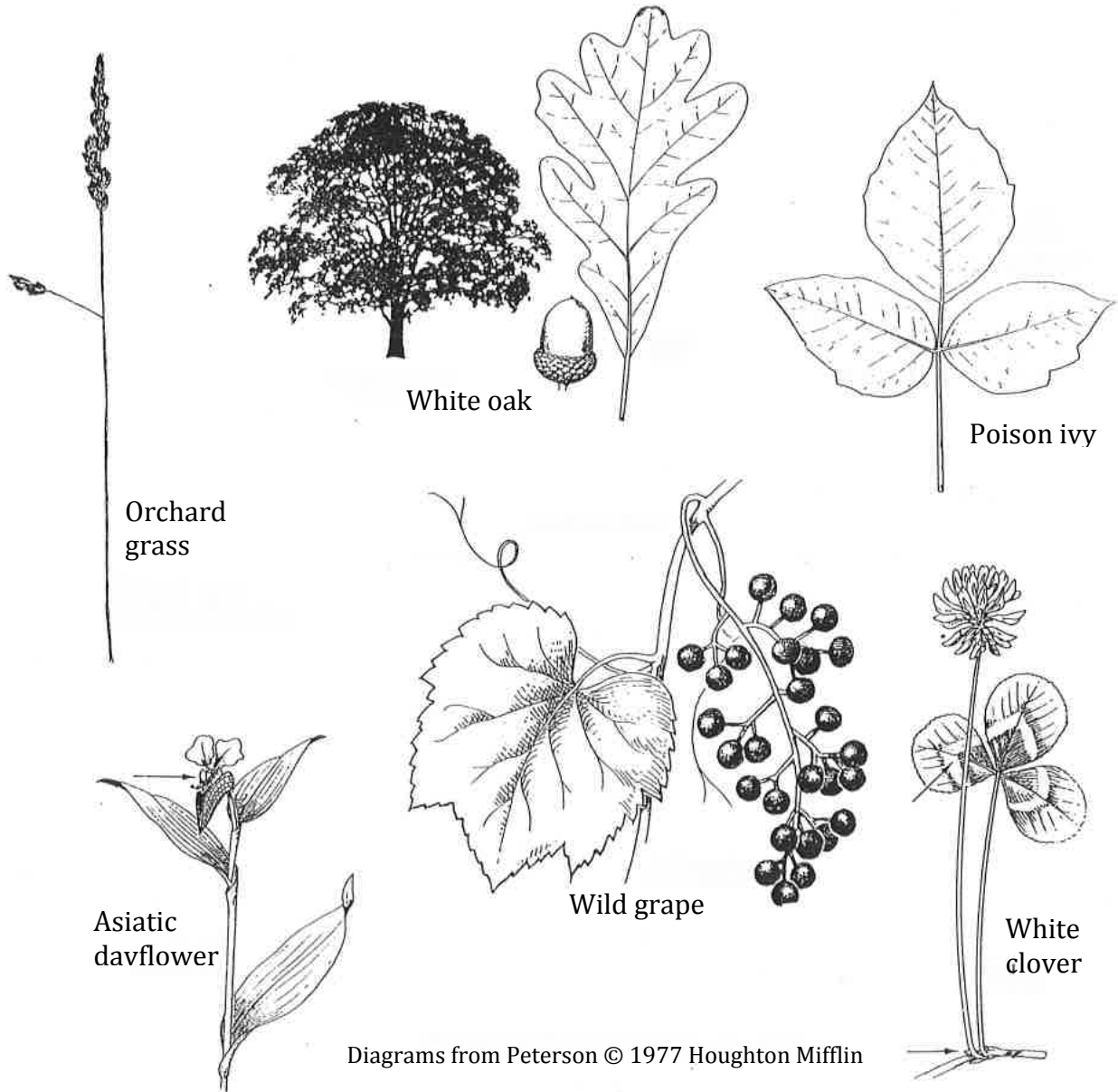
1. Most diverse of all plant phyla – ca. 250,000 species

2. Ecologically important

A. Dominate almost all terrestrial and aquatic plant communities

B. Found in almost every conceivable habitat

C. Serve as basis for terrestrial food chain



Diagrams from Peterson © 1977 Houghton Mifflin

BENEFICIAL AND HARMFUL ANGIOSPERMS

1. Beneficial angiosperms

A. Provide food

1. Directly in the form of fruits, grains, vegetables, beverages, and oils
2. Indirectly in the form of forage crops

B. Provide lumber, pulp, and fiber

C. Provide pharmaceuticals, psychoactives, perfumes, dyes, and rubber

D. Important in landscaping and floristry

2. Harmful angiosperms

A. Poisonous

1. Endotoxins
2. Dermatitis and abrasions
3. Allergens
4. Hallucinogens

B. Noxious weeds

INSECT VS WIND POLLINATION SYNDROMES

1. Most flowering plants pollinated by animals

- A. Mostly insects, some birds and bats
- B. Have well developed perianth, other adaptations

2. Some pollinated by wind, result in syndrome

- A. Apetalous / naked
- B. Copious pollen
- C. Well developed stigmas
- D. Three categories

3. Relevance to allergies