

BIO 1C Study Guide 2: Bryophytes through Angiosperms and physiological ecology

Remember that this is a guide only. DO NOT rely on it solely for your studying. Use your notes, study sessions and the book. I cannot possibly put all the necessary details on here!
Also, remember, be able to *draw* (not just recognize), and *explain* and *label*. Know how things fit together, don't just memorize terms and cycles out of context.

- Be able to list and describe the 8 traits of land plants that are not (by and large) shared by charophyceans (the 'derived' traits)
- Alternation of generations: what it means, how it changed from bryophytes to angiosperms (eg. gametophyte/sporophyte dominance)
- Significance of water for moss and fern fertilization
- Life cycles of: moss, fern, pine, angiosperm (eudicot). Know which stages are $2n$, which are n , and where meiosis and mitosis occur. Know the major differences and the major similarities
- Dioecious vrs. Monoecious
- Antheridium Vrs. Archegonium
- Megaphyll, Microphyll, Sporophyll (types of leaves)
- Adaptations of pollen, fruits and seeds and their methods of dispersal
- Homosporous vrs. Heterosporous
- Be able to diagram and discuss the significance of double fertilization
- How do plants avoid self-pollination? (physical, genetic, timing of maturity of flower parts, perfect/imperfect, monoecious/dioecious etc.)
- Traits of bryophytes (non-vascular plants)
- Pterophytes and Lycophytes: major characteristics and know an example of each
- Traits and adaptations of first vascular plants
- Advantages of seeds
- Microsporogonia/sporocyte vrs. Megasporangia/sporocyte ($2n$), and Microspore vrs. Megaspore (n)
- Micro and Mega sporogenesis and gametogenesis in gymnosperms and angiosperms
- Know the 4 phyla of gymnosperms and key characteristics of each
- What are some key features of the Gnetales that make them different from other gymnosperms?
- Adaptations of conifers
- Angiosperms: know flower terminology (handout I gave you and your lab and the book)
- Why was the flower so revolutionary? Know the significance of insect and pollinator co-evolution, the flower as a reproductive structure, and seeds/fruits.
- Know the major traits and characteristics of angiosperms (flowers, fruits, double fertilization, vessel elements etc.)
- Flower types and parts
- Epigynous, hypogynous/ inferior, superior ovaries
- Be able to diagram the female and male gametophytes, double fertilization, and the resulting embryo and endosperm
- Pollination and pollination syndromes (specific morphologies vrs. Generalists)
- Monocots vrs. Eudicots – know the distinguishing characteristics: flowers, roots, embryos, vascular bundle arrangement etc.
- Evolutionary origins of carpels (infolding of sporophylls)
- Examples of asexual reproduction
- Young embryo structure
- Types of fruits and types of seeds (monocots vrs. Eudicots)

- What is an accessory fruit? A multiple fruit? an aggregate fruit?
- Root structure and types of roots (including adventitious roots)
- Plant body terminology and stem structure and terminology
- Leaf structure and types of leaves (simple, compound, dbl. compound)
- Tissue systems, tissue types, and cell types: know their functions
- Trichomes
- Guard cells and stomata: know what they are, how they work, and the important functions they play in plant physiological ecology and vascular transport
- Primary and secondary growth of roots and shoots
- Early wood vrs. Late wood
- Mycorrhizae and N₂ fixing bacteria (and nodules eg. *rhizobium*): mechanisms and importance
- Importance of nutrients and soils: role of topsoil
- Adaptations to water availability: mesophytes, halophytes, hydrophytes, xerophytes
- Know some abiotic and biotic factors affecting growth and development of plants
- Stomata: how they function and cues for opening and closing
- C₃, C₄ and CAM pathways: when are they used, what are the advantages and disadvantages, what is the mechanism. Be able to draw the general pathways
- What are some other ways plants deal with environmental stress
- Physical/mechanical, behavioral (eg. ant mutualists), and chemical (secondary compounds) defense mechanisms in plants.
- Know what allelopathy is and how it is used