

Lecture 1: Biology 3427: Plant Science

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- Syllabus on-line: access through Biology Department webpage

Plant Science Lab
begin next week
226 Life Sciences

Course Overview

- Flowering Plants
- The Plant Body
- Plant Cells and Processes
- “Plant-like” Organisms
- Survey of Plant Kingdom
- Hormones, Growth, Nutrition
- Ecology

Botany: An Introduction Chapter 1

Photosynthesis

- “What drives life is...a little current, kept up by the sunshine.”
– Albert Szent-Györgyi
- Overview
- Which organisms?

Importance of Plants to Humans

Evolution of Plants

- Earth is approximately 4.6 billion years old
- Earliest fossils
 - Western Australia
 - ~3.5 byo (Fig. 1-2)
 - Resemble bacteria
- Ancestors of first cells: simple aggregations of molecules

Characteristics of Living Things

Primitive Life on Earth

- heterotrophic organisms first
- eventually autotrophic organisms evolved

- evidence of photosynthesis 3.4 billion years ago
- split water to release oxygen
- consequences of oxygen in atmosphere
- seashore environment

Colonization of Land

- major challenge facing terrestrial plants
- plant body
 - roots
 - stems
 - leaves
 - epidermis
 - cuticle
 - stomata
- short-lived vs. long-lived plants
 - (annuals vs. perennials)
 - cork
- vascular system
 - xylem
 - phloem

Plant Characteristics

- meristems
 - apical meristems
 - primary growth
 - root and shoot
 - lateral meristems
 - secondary growth
 - vascular and cork cambium
- reproduce on land
 - spores
 - seeds
- summarize adaptations for life on land

Communities and Biomes

- defined by vegetation
- ecosystems
- most organisms reliant on autotrophs for energy, oxygen
- appearance of humans

Study of Plant Biology

- botany

- many subdisciplines
 - physiology
 - morphology
 - taxonomy
 - anatomy
 - ecology
 - etc.
- traditionally includes
 - virology
 - bacteriology
 - mycology
 - phycology
- urgently important
- “Fight plant blindness!”
- human impacts on Earth
 - How can plants be used to mediate these?

Summary

- importance of photosynthesis in ancient and modern times
- complex organisms evolved after simple ones
- adaptations of autotrophs to land
- ecosystems
- genetic engineering