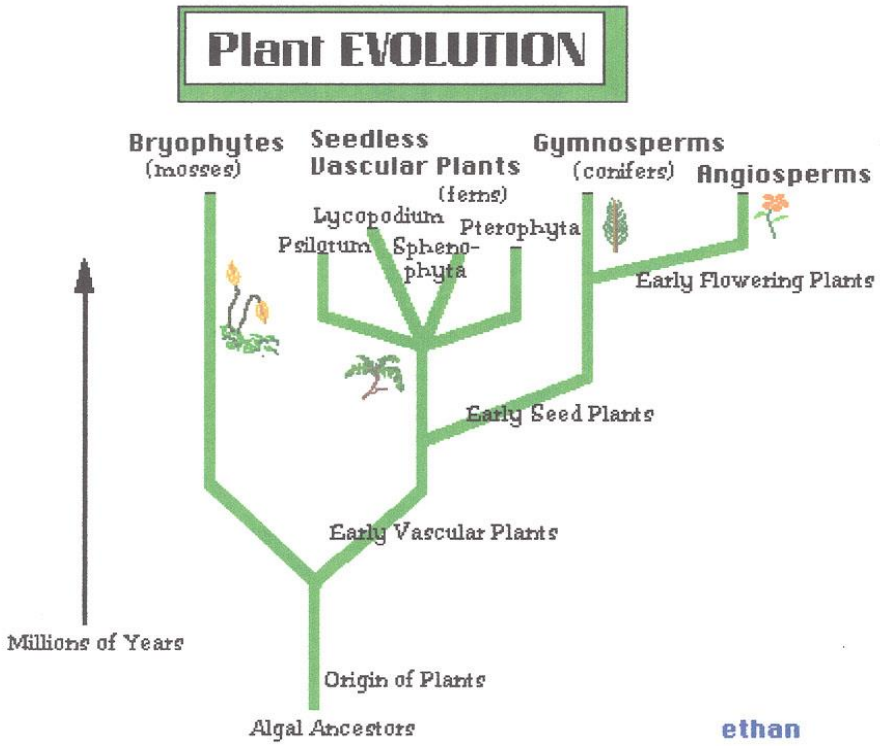
# Lecture 29

# Introduction to Kingdom Plantae

**Fundamental Features**

**1.** Most of the plants are eukaryotic and chlorophyll containing organisms.
Cell walls of plant cells are comprised of cellulose.
**2.** They have an ability to grow by cell division.
**3.** In life cycle of plant cells, the interchanges occur from the embryos and are supported by other tissues and self-produce.
**4.** Plants have both organs and organ systems.
**5.** They obtain their energy from sun through photosynthesis.
**6.** Plants reproduce both by sexual and asexual.
**7**. Plants develop a self-defense mechanism to protect them from being destroyed by animals, fungi and other plants.
**8.** Organisms within Kingdom Plantae are multicellular, eukaryotic and autotrophic.

**Historical Background**



**Roots Function**

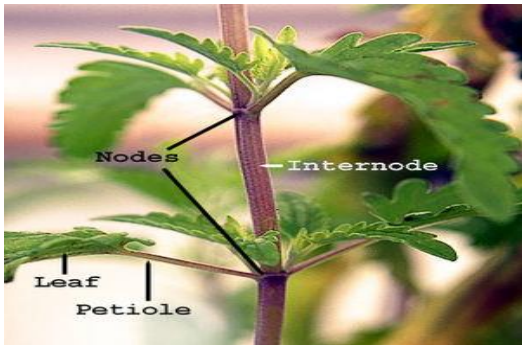
Roots anchor the plant to the ground. The roots absorb Necessary nutrients, water from the soil for photosynthesis. A root undergoes vegetative reproduction and competition with other plant

**Function of Leaves**

Leaves extend the surface area to capture sunlight. Photosynthesis occurs inside the chloroplasts. Chloroplasts are present in the cells present in leaves. The preparation of food material takes place out of water and carbon dioxide obtained from the soil and the air respectively.

**Function of Stems**

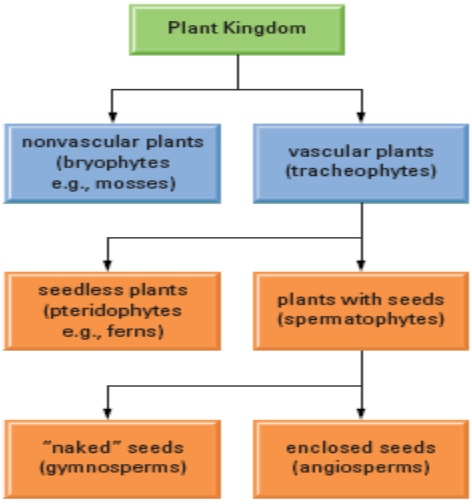
Stems are composed of rigid tissue. They provide support to leaves. It helps to maintain integrity of plants. Stems also transport materials. Transport occurs from the roots to leaves and vice versa. Plant stems always have nodes (points of attachments for leaves, roots, and flowers) and internodes (regions between nodes).The petiole is the stalk that extends from the stem to the base of the leaf.




**Plant Taxonomy**

Plant taxonomy is the science that finds, identifies, describes, classifies, and names plants. Thus making it one of the main branches of taxonomy (the science that finds, describes, classifies, and names living things).Plant taxonomy is closely allied to plant systematics, and there is no sharp boundary between the two. In practice, "Plant systematics" involves relationships between plants and their evolution, especially at the higher levels, whereas "plant taxonomy" deals with the actual handling of plant specimens.

**Divisions of Kingdom Plantae**




**Bryophytes**

Bryophytes are small, herbaceous plants that grow closely packed together in mats or cushions on rocks, soil, or as epiphytes on the trunks and leaves of forest trees. Bryophytes are Non-vascular land plants do not contain any conducting tissues. Such plants are often referred to as bryophytes. These plants are small, grow near the ground surface. Examples include *mosses* and
Liverworts.

**Seedless Vascular Plants**

Seedless vascular plants are plants that contain vascular tissue, but do not produce flowers or seeds. In seedless vascular plants, such as ferns and horsetails, the plants reproduce using haploid, unicellular spores instead of seeds. The spores are very lightweight (unlike many seeds), which allows for their easy dispersion in the wind and for the plants to spread to new habitats.

**Seeded Vascular Plants**

Vascular seed plants, which include conifers and flowering plants, have transport tissues and produce seeds. Seed plants evolved more than 300 million years ago. Plants that reproduce by means of seeds do not necessarily require abundant moisture in order to complete their life cycle. These are divided into two further categories.

1) Angiosperms
2) Gymnosperms

**Gymnosperms**

Gymnosperms are nonflowering plants. Their seeds that do not develop within an enclosed structure. Examples are conifers, cycads, Ginkgo, and Gnetales. Gymnosperm seeds develop either on the surface of scale or a leaf-like appendage of cones or at the end of short stalks.

## Angiosperms

Angiosperms are seed-producing plants; they are distinguished from gymnosperms by characteristics including flowers, endosperm within the seeds, and the production of fruits that contain the seeds. Magnoliophyta are the most diverse group of plants.
Seeds produced from seeded plants are of two types

- Monocots
- Dicots

## Monocots

A monocot is a type of flowering plant that is characterized by having a single cotyledon, trimerous flowers, and parallel leaf veins. Monocots have only one seed leaf inside the seed coat. It is often only a thin leaf, because the endosperm to feed the new plant is not inside the seed leaf.

## Dicots

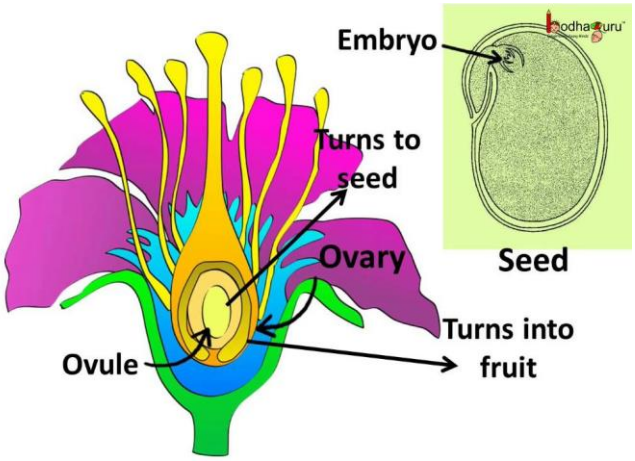
A dicot is a type of flowering plant that is characterized by having a two cotyledon, multiple flowers, and no parallel leaf veins. Dicots have two seed leaves inside the seed coat. They are usually rounded and fat, because they contain the endosperm to feed the embryo plant.

## Sexual Reproduction in Plants

Plants carry out sexual reproduction. Sexual reproduction in flowering plants centers on the flower. Within a flower, there are usually structures that produce both male gametes and female gametes.

## Development of the ovule and female gamete

Inside the ovary there may develop one or more ovules. Each ovule begins life as a small projection into the cavity of the ovary. As it grows and develops it begins to bend but remains attached to the ovary wall by a placenta. At the start, the ovule is a group of similar cells called the nucleus. As it develops, the mass of cells differentiates to form an inner and an outer integument, surrounding and protecting the nucellus within, but leaving a small opening called the micropyle. After fertilization the zygote develops in the seed where it can remain dormant for long periods of time and Survive drought, freezing and even fire.

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