

Bryophyta:

They are simple and first land plants. They are terrestrial, typically autotrophic organisms. They are multicellular forms. They range from thallus to the well differentiated root, stem and leaves. They are regarded as amphibian plants because they need water for reproduction.

The branch of biology which deals about bryophyta is known as bryology.

General Characteristics:

1. They are simplest form of land plants.
2. They are cosmopolitan in distribution. They are generally grown on shady, moist and cool places.
3. The plant body is thallus to the well differentiated into root, stem and leaves.
4. They are attached to soil with the help of rhizoids and scales.
5. Chlorophyll and accessory pigments are present. Hence, they are autotrophic.
6. Reserve food material is starch.
7. Vascular tissues are absent.
8. Gametophyte is the dominant phase of life cycle.
9. Sexual reproduction takes place by fusion of gametes which are different with each other.
10. Spores are developed in a special sac like structure known as sporophyte.
11. Sporophyte is differentiated into foot, seta and capsule.

Pteridophyta:

They are advanced land plants than bryophyta. They are terrestrial, typically autotrophic organisms. They are multicellular forms. The vegetative structure is well differentiated into root, stem and leaves. These are the first land plants which contain vascular bundle in it. Hence, are also called vascular cryptogams.

The branch of biology which deals about pteridophyta is known as pteridology.

General Characters:

1. The pteridophytes grow in variety of habitat. Most of them are terrestrial.
2. Plant body is sporophyte differentiated into root, stem and leaves.
3. True root is present.
4. Stem is herbaceous and horizontally growing.
5. Leaves are simple or pinnately compound.
6. Sporophyte possesses vascular supply. Xylem lacks vessels and phloem lacks companion cells.
7. Sporophyte reproduces asexually by means of spores which borne at the ventral surface of leaves.

8. Spore germinates into heart shaped gametophyte prothallus that contains male and female reproductive organs.
9. Fertilization occurs with the help of water.
10. The zygote develops into sporophyte by repeated division.
11. It shows clear alternation of generation.
12. The sporophyte and gametophyte are independent of each other.

Gymnosperms:

It is a first group of flowering plants. The plants are well developed. They are generally grown on dry and slopy land. They are various in shape and size. They do not contain true flowers. They bear cones instead of flowers. Male and female gametes are developed on cones. They also produce seeds which are not covered by any envelop. Hence, this group is also known as naked seeded plants.

General Characteristics:

1. They are predominantly woody plants represented by trees or shrubs.
2. Sporophytic plants are usually evergreen and of moderate size.
3. Most of the plants are xerophytic and evergreen.
4. Plant possess tap root. Some shows symbiosis with certain other cells.
5. Stems are erect, branched and woody.
6. Leaves may be of monomorphic or dimorphic.
7. Reproductive organs are aggregated in the form of compact cones. Here, cones are homologous to flowers.
8. Male cones are usually short lived and smaller than female cones.
9. The plants are heterosporous.
10. Pollination takes place with the help of wind (anemophily).
11. Ovules are naked.
12. Seeds are naked and not embedded in fruit.

Angiosperms:

It is a most group of plant kingdom. They are of flowering plants. The plants are well developed. They are easily grown everywhere. They are various in shape and size. They contain true flowers. The flower consists of male reproductive structure androecium and female reproductive structure gynoecium. They produce seeds after fertilization which is covered by fruit. Hence, this group is also known as close seeded plants.

General Characteristics:

1. They are cosmopolitan in distribution.

2. They are herbs, shrubs or tree in habit.
3. Most of the plants are mesophytic but some are hydrophytic or xerophytic in nature.
4. Plant possesses either tap root or fibrous root. Some shows symbiosis with certain other cells. eg: Leguminosae.
5. Stems are of various types.
6. Leaves are also various types.
7. Reproductive structures are androecium and gynoecium of flower. The flowers are either unisexual or bisexual.
8. The plants are heterosporous.
9. Pollination takes place with the help of various agents.
10. Double fertilization and triple fusion takes place.
11. Ovules are covered by membranous envelop.
12. Seeds are covered by fruit.

Difference between Dicot and Monocot plants:

Dicot	Monocot
1. They are found herbs, shrubs and trees	1. They are generally herbs, few are shrubs and trees.
2. They are mostly perennial in habit.	2. They are mostly annual in habit.
3. It consists of taproot system.	3. It consists of fibrous root system.
4. Stem is either branched or unbranched.	4. Stem is unbranched.
5. Stem is solid.	5. Stem is hollow.
6. Nodes are not distinct.	6. Nodes are well distinct.
7. Leaves are of various.	7. Leaves are lanceolate.
8. Leaves are generally petiolate.	8. Leaves are generally sessile.
9. Leaves have reticulate venation.	9. Leaves have parallel venation.
10. Flowers are tetra- or pentamerous.	10. Flowers are trimerous.
11. Flowers are various in colour.	11. Flowers are white in colour.
12. Seed contains two cotyledons.	12. Seed contains only one cotyledon.