

Classification of Plantae

The study of different types of Trees, plants is called Botany. Theophrastus is called the father of Botany.

1. Classification of Plantae

In the year 1883, Eichler has classified the Botanical world as under:-

I. Cryptogamus plants

There is no flower and seed in these type of plants. These are classified into the following groups:

Thalophyta :

1. This is the largest group of the plant kingdom.
2. The body of the plants in this group is thaluss like i.e., plant are not differentiated into root, stem and leaves etc
3. There is no conducting tissue. It is divided into two groups.
(a) Algae and (b) Fungi

(a) Algae

1. The study of algae is called Phycology.
2. The algae normally have chlorophyll and autotrophic mode of nutrition.
3. Its body is thaluss like. It may be unicellular, colonial or filamentous.

Useful Algae

1. **As a food** : Porphyra, Ulva, Sargassum, Laeaminaria, Nostoc etc.
2. **In making iodine** : Laeaminaria, Fucus, Echlonia etc.
3. **As a manure** : Nostoc, Anabina, kelp etc.
4. **In making medicines** : Chloreloline from Chlorella and Tincher iodine is made from Laminaria.
5. **In research works** : Chlorella Acitabularia, Belonia etc.

Note : An astronaut can get protein food, water and oxygen by sowing the chlorella algae in the tank of the aircraft so chlorella is known as space algae.

(b) Fungi

1. Study of fungi is called Mycology.
2. Fungi is chlorophyll less, central carrier tissue less, Thalophyte.
3. Accumulated food in fungi remains as Glycogen.
4. Its cell wall is made up of chitin. Ex. Albugo, Phytophthora Mucor etc. Fungi may create serious diseases in plants. Most damage is caused by rust and smut. Main Fungal diseases in plants are as :
White rust of crucifer, Loose smut of wheat, Rust of wheat, Early Blight of potato, Red rot of sugarcane, Tikka diseases of ground nut, Wart disease of potato, Brown leaf spot of rice. Late blight of potato, Damping off of seedlings etc.

Bryophyta

This is the first group of land plants. In this division approximately 25000 species are included.

1. In bryophyta there is lack of Xylem and phloem tissue.
2. Plant body may be of the form like a leafy erect structure as in moss.
3. They lack true root, stem and leaves.
4. This community is also called Amphibian category of the plant kingdom.

The moss namely Sphagnum is capable of soaking water 18 times of its own weight. The reference gardeners use it to protect from drying while taking the plants from one place to another.

The Sphagnum moss is used as fuel.

The Sphagnum moss is also used as antiseptic.

Pteridophyta

The plants of this group are mostly found in wet shady places, forests and mountains.

1. The body of plants are differentiated into root, stem, and leaves. Stem remains as normal rhizome.

2. Reproduction occurs by spores produced inside the sporangia.
3. Gametophytic phase is short lived. The diploid zygote develops into an embryo.
4. Plants of this community have conducting tissues. But Xylem does not contain Vessels and Phloem does not contain companion cells.

Examples : Ferns, Azolla, Pteridium, Lycopodium etc.

II. Phanerogamus or Floral plant

The plants in this group are well developed. All the plants in this group have flowers, fruits and seeds. The plants in this group can be classified into two sub-groups – Gymnosperm and Angiosperm.

(A) Gymnosperm

1. These plants are in the forms of trees and bushes. Plant body are differentiated into root, stem & leaves.
2. Plants are woody, perennial and tall. Plants bear naked seed.
3. Its tap roots are well developed.
4. Pollination takes place through air.

The longest plant of the Plant kingdom, Sequoia gigantea comes under it. Its height is 120 meter. This is also called Red Wood of California.

1. The smallest plant is Zamioculcas.
2. Living fossils are Cycas, Ginkgo, biloba and Metasequoia.
3. Ginkgo biloba is also called Maiden hair tree.
4. Ovules and Antherozoids of Cycas is the largest in Plant kingdom.

The pollen grains of Pinus are so much in number that later it turns into Sulphur showers.

Importance of Gymnosperm

1. As a food – Sago is made by extracting the juice from the stems of Cycas. Therefore, Cycas is called Sago-palm.

2. Wood – The wood of Pine, Sequoia, Deodar, Spruce etc. is used for making furniture.

3. Vapour oil – We get Turpentine oil from the trees of Pine, Cedar oil from Deodar tree and Cedarcast oil from Juniperous wood.

4. Tannin - It is useful in tanning and making ink.

5. Resin – Resin is extracted from some conical plants which are used in making varnish, polish, paint etc.

(B) Angiosperm

1. In the plants of this sub-group seeds are found inside the fruits.

2. In these plants root, leaves, flowers, fruit and seeds are fully developed. In the plants of this sub-group there is seed coat in seeds. On the basis of number of cotyledons plants are divided into two categories —

(1) Monocotyledon and (2) Dicotyledon

Monocotyledon plants : These plants which have only one cotyledon in seed. Example :

Dicotyledon plants : Those plants which have two cotyledon in its seed are called dicotyledons.

Example :

Name of category Name of main plants

Virus

1. Study of viruses is virology.

2. Virus was discovered by Russian scientist Ivanovsky in the year 1892. (During the tests of Mosaic disease on tobacco).

3. In nature, there are ultra microscopic particles known as viruses. Viruses are connecting a link between living & non living.
4. It has both the characters of living and non living, so it is a connecting link between living & non living.

Characters of virus

1. They become active inside a living cell.
2. Nucleic acids replicate themselves and they reproduce rapidly.
3. They cause disease like bacteria & fungi.

According to parasitic nature, virus is of three types

1. **Plant virus** – RNA is present as its nucleic acid
2. **Animal virus** – DNA or sometimes RNA is found in
3. **Bacteriophage**– They depend only on bacteria. They kill the bacteria. DNA is found in them. Example – T-2 phage.
4. In man viruses cause disease like mumps, chicken pox, hepatitis, polio, AIDS and Herpes.
5. **Bacteriophages** : Bacteriophages are those viruses which infect the bacteria. Example —Tobacco mosaic virus.

Note : Those viruses in which RNA substance is found as genetic material are called Retroviruses.

Bacteria

It was discovered by Antony von Luewenhoek of Holland in the year 1683.

---> Leeuwenhoek is called the father of Bacteriology. In the year 1829 Ehrenberg called it bacteria.

---> The year 1843-1892 – Robert Koch discovered the bacteria of Tuberculosis diseases.

---> The year 1812-1892 – Louis Pasteur discovered the vaccine of Rabies and pasteurization of milk.

---> On the basis of shape, bacteria is of different types :

1. Bacillus : This is rod-like or cylindrical.

2. Round or Coccus : These are round and the smallest bacteria.

3. Comma shaped or Vibrio : Like the English sign (,), example – Vibrio cholerae etc.

4. Spirillum : Spring or screw shaped.

---> Some species of Azotobacter, Azospirillum and Clostridium bacteria live freely in the soil and fix atmospheric nitrogen into the nitrogenous compound. Anabaena and Nostoc cyanobacteria fix atmospheric nitrogen in soil.

---> The species of Rhizobium and Bradyrhizobium etc. bacteria live in the roots of the Leguminous plants capable of converting atmospheric nitrogen into its compound.

Note : To preserve the milk for many days pasteurization is done. There are two methods of pasteurization —

(a) Low temperature holding method (LTH) : Milk is boiled at 62.8 degree Celsius for 30 minutes.

(b) High Temperature short time method (HTST) : Milk is boiled at 71.7 degree Celsius for 15 seconds.

---> In leather industry separation of hair and fat from leather is done by bacteria. This is called tanning of leather.

---> Pickles, soup is kept in salt or in dense liquid of sugar so that in case of bacterial acid bacteria are plasmolysed and destroyed. Therefore, pickles etc. do not get spoiled soon and can be preserved for long time.

---> In the cold Storage objects are kept at low temperature (-10 degree Celsius to -18 degree Celsius).

---> Mycoplasma : Smallest known prokaryotic cell causing pleuropneumonia. It is also known as PPLO