UNIT 17

PLANT KINGDOM

Learning Objectives

HX6682

After the completion of this lesson, students will be able to:

- know the general characteristics of algae.
- classify the types of algae based on the pigmentation.
- know about the salient features, mode of nutrition, classification and the uses of fungi.
- differentiate bryophytes from pteridophytes.
- list out the importance of medicinal plants and their uses.
- understand the classes of angiosperms and their charecteristics.
- tabulate Bentham and Hooker's classification of seeded plants.

Introduction

The living organisms found on the earth differ in their structures, habit, habitat, mode of nutrition and physiology. The estimated number of plant species on the earth is 8.7 million (1 million = 10 lakhs). Among them 6.5 million species are living on land and 2.2 million species are living in the ocean. Out of them 4,00,000 species are flowering plants. The living organisms show lot of similarities and differences so that they can be arranged into many groups systematically. In traditional system of classification, plant kingdom is divided into two sub-kingdoms called non flowering plants (Cryptogams) and flowering plants (Phenerogams). Thalophyta, bryophyta and pteridophyt are non flowering plants. In this lesson, we will study about algae, fungi, bryophytes, pteridophytes and classification of plants.

17.1 Algae

Algae is a latin word (Algae - Sea weeds). They are chlorophyll bearing, simple and primitive plants. These plants are autotrophs. Algae belongs to thallophyta and the plant body of algae is called thallus. i.e. the plant body is not differentiated into root, stem and leaf.

Most of the algae are living in aquatic region. It may be fresh water or marine water. Very few algae can survive in wet soil. Some algae are very minute and float on the surface of the water. These algae are called **phytoplankton**. Some of the algae are symbionts (Algae living with fungi and they both are mutually benefitted). E.g. Lichen. A few species of algae are epiphytes. The branch of study of algae is called phycology or algalogy. Algae reproduces by three methods. They are:

- Vegetative reproduction takes place by fragmentation. E.g. *Spirogyra.*
- Asexual reproduction takes place by spore formation. E.g. Chlamydomonos.
- Sexual reproduction takes place by means of fusion of gametes. E.g. Spirog*yra, Chara.*

17.1.1 Clarification of Algae

Algae are classified into different classes based on the pigments. They are given in Table 17.1.

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Table 17.1 Classification of algae based on pigments

Class	Example	Types of Pigments	Reserve food material
Bluegreen algae (Cyanophyceae)	*Ocillatoria*	Phycocyanin	Cyanophycean Starch
Green algae (Chlorophyceae)	*Chylamydomonas*	Chlorophyll	Starch
Brown algae (Phaeophyceae)	*Laminaria*	Fucoxanthin	Laminarian starch and Manitol
Red algae (Rhodophyceae)	*Polysiphonia*	Phycoerythirin	Floridian Starch

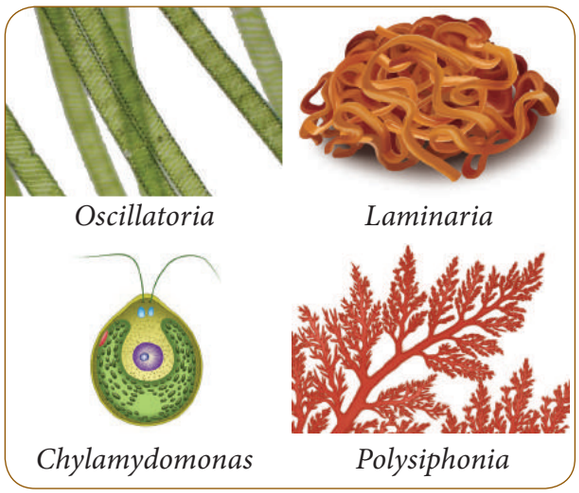

Figure 17.1 Algae

17.1.2 Economic importance

Food

Algae are consumed as food by people in Japan, England and also in India. E.g. *Ulva, Spirulina, Chlorella* etc. Some algae are used as food for domestic animals. E.g. *Laminaria, Ascophyllum.*

Agriculture

Some of the blue green algae are essential for the fixing of atmospheric nitrogen into the soil, which increases the fertility of the soil. E.g. *Nostoc, Anabaena.*

Agar Agar

Agar agar is extracted from some red algae, namely *Gelidium* and *Gracillaria*. It is used to prepare growth medium in laboratories.

Iodine

Iodine is obtained from brown algae like *Laminaria*.

Space travel

Chlorella pyrenoidosa is used in space travel to get rid of CO_2 and to decompose human wastes.

Single Cell Protein (SCP)

Some of the single cell algae and blue green algae are used to produce protein. E.g. *Chlorella, Spirulina.*

17.2 Fungi

Fungi (Singular – Fungus) belongs to thallophyta. Its plant body is not differentiated into root, stem, and leaves. The plant body of fungus consists of filament like structures called **hyphae**. Several hyphae are arranged in the form of network called **mycelium**. The cells of fungi are multicellular and eukaryotic. Some species of fungi like yeast are unicellular and eukaryotic. Cell wall of fungi is made up of a chemical substance called chitin.

The reserve food materials of fungi are glycogen and oil. They have no starch because they have no chlorophyll pigments. So, they are heterotrophs. Heterotrophs are of three types namely, parasites, saprophytes and symbionts.

Some species of fungus live as parasites. They absorb food from the living organisms with the help of special root called haustoria. E.g. *Cercospora personata*. It affects groundnut plants and cause Tikka disease.

DO YOU KNOW?

The branch of study of fungus is called **mycology**.

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Figure 17.2 Tikka disease in groundnut leaves

Some species of fungi live as saprophytes. They grow upon the dead and decaying organic matters and get food from them. E.g. *Rhizopus.*

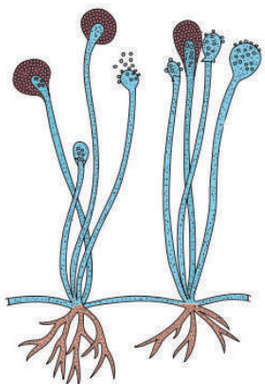
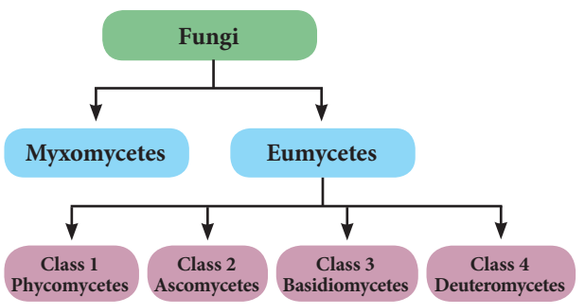


Figure 17.3 Rhizopus

Some species of fungi are living with algae and mutually benefitted. E.g. *Lichen.* Some of them live symbiotically with higher plants in their roots called *Mycorrhizae*

17.2.1 Classification of Fungi

Fungi are classified into different classes as given below.



17.2.2 Economic importance of Fungi

Fungi are useful to us in many ways. The importance of fungi are given below.

Antibiotic

Penicillin *(Penicillium notatum)* and Cephalosporin which cure different diseases are obtained from fungi.

Figure 17.4 *Penicillium notatum*

Food

Mushroom contains rich protein and minerals. The most common edible mushroom is *Agaricus* (Button mushroom).

Figure 17.5 Agaricus

Vitamins

Fungus like *Ashbya gospii* and *Eremothecium goshbyii)* are used to produce vitamin B_2 (riboflavin).

Alcohol

Fungus like yeast contain enzymes invertase and zymase, which ferment the sugar molasses into alcohol.

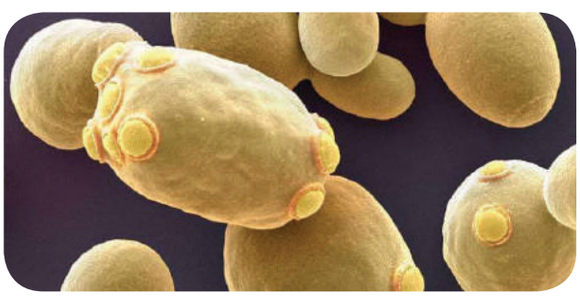


Figure 17.6 Yeast

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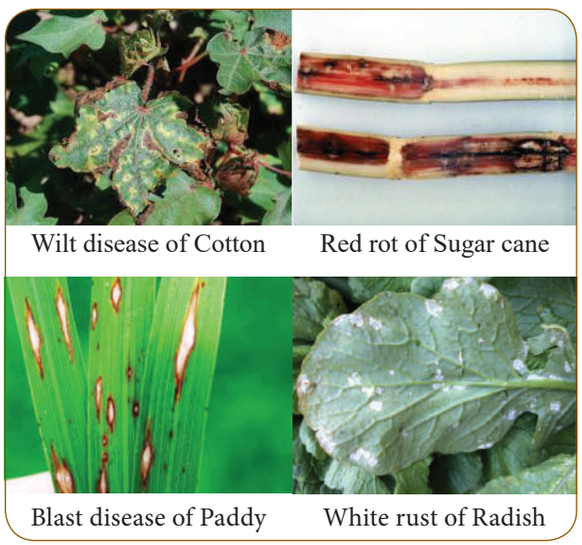
17.2.3 Harmful effects of Fungi

Fungi cause various diseases in plants and animals. They are given in the tables below.

Table 17.2 Diseases caused by fungi in plants

Pathogen	Name of the Disease
Fusarium oxysporum	Wilt disease in cotton
Cercospora personata	Tikka disease in ground nut
Colletotrichum falcatum	Red rot in sugar cane
Pyricularia oryzae	Blast disease in paddy
Albugo candida	White rust in radish



Wilt disease of Cotton | Red rot of Sugar cane

Blast disease of Paddy | White rust of Radish

Figure.17.7 Diseases caused by fungi in plants

Info bits

Fungi are placed as third kingdom in R.H. Wittekar's five kingdom of classification because of absence of chlorophyll and starch.

Activity 1

Take a piece of bread, pour some water on it and cover it for four days. After four days place the bread on a slide and observe it through microscope. What will you see? Name the organisms which you see in the slide.

Table 17.3 Diseases caused by fungi in human

Name of the Fungi	Name of the Disease
Trichophyton sp.	Ring worm (Circular rash on the skin)
Microsporum furfur	Dandruff
Tinea pedis	Athletes foot

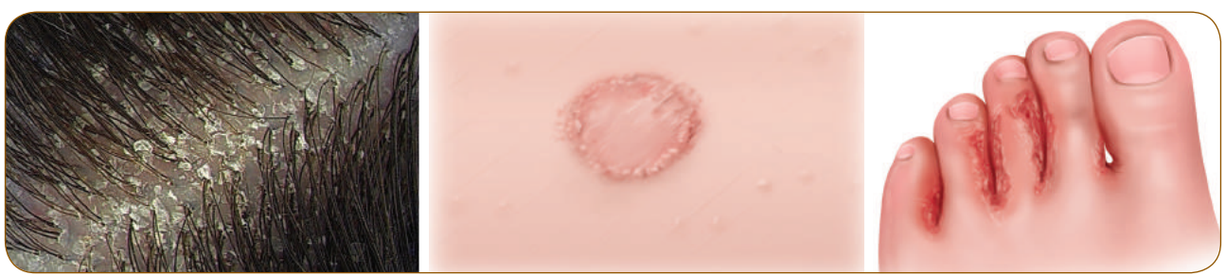
More to Know

Claviceps purpuriya is the hallucinogenic fungi which causes greatest damages to the frustrated youth by giving unreal, extraordinary lightness and hovering sensations.

Aspergillus species cause allergy to children while ***Cladosporium*** protects against allergy.

Table 17.4 Difference between algae and fungi

Algae	Fungi
Algae are autotrophs.	Fungi are heterotrophs.
They have pigments.	They have no pigments
Reserve food material is starch.	Reserve food materials are glycogen and oil.
Some algae are prokaryotic in nature E.g: *Cyanobacteria* (*Nostac, Anabenae*)	All are eukaryotic nature. E.g: *Agaricus*



Dandruff | Ring worm | Athlete's foot

Figure 17.8 Diseases caused by Fungi in human

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DO YOU KNOW?

Penicillin is known as Queen of Medicine. It was discovered by Sir Alexander Fleming in 1928.

17.3 Bryophytes

Bryophytes are the primitive and simplest group of plants. These are terrestrial and non-vascular cryptogams (They have no vascular tissues like xylem and phloem). Bryophytes live on land and in water. Therefore, they are named as amphibians of plant kingdom. Water is essential to complete their life cycle.

Bryophytes have distinct alternation of generation. Gametophyte generation is dominant and sporophytic generation is small. Sporophytic generation depends on the gametophytic generation. The gametophytic plant can be either thalloid (liverworts) or leafy (mosses). The plant remains fixed to the substratum with the help of root like structure called rhizoid.

Sexual reproduction is oogamous type. They have well developed sex organs like antheridia and archegonia. The male sex organ is antheridium, which produces antherozoid. The female sex organ is archegonium which contains an egg. Antherozoid swims with the help of water and reaches the archegonium. It fertilizes the egg and forms zygote (2n). Zygote is the first cell which develops into sporophytic generation and produces haploid spore (n) by meiosis. Spore is the first cell of the gametophytic generation.

17.3.1 Classification of Bryophytes

Bryophytes are classified into three classes. They are:

1. Hepaticae (Liverworts)
2. Anthoceratae (Hornworts)
3. Musci (Mosses)

Hepaticae (E.g. *Riccia*)

- These are lower forms of bryophytes. They are simple in structure than moss.
- Sporophyte is very simple and short lived.

Anthocerotae (E.g. *Anthoceros*)

- Gametophyte is undifferentiated thallus. Rhizoids are unicellular and unbranched.
- Protonemal stage is absent. Sporophyte is differentiated into foot and capsule only.

Musci (E.g. *Funaria*)

- These are higher forms in which the gametophyte is differentiated into stem, leaf and root like parts.
- Protonemal stage is present.
- Sporophytes are differentiated into foot, seta, and capsule.

17.3.2 Economic importance

- Bryophytes prevent soil erosion.
- *Sphagnam* can absorb large amount of water. Hence, it is used by the gardeners in nursery.
- Peat which is a valuable fuel like coal is obtained from *Sphagnum*.

Anthoceros Riccia Funaria

Figure 17.9 Bryophytes

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Activity 2

Visit a nearby nursery and observe how *Sphagnum* is used in horticulture and make a note on it.

17.4 Pteridophytes

Pteridophytes are the first true land plants with xylem and phloem. Hence, they are called vascular cryptogams. The main plant body is differentiated into true root, stem and leaves.

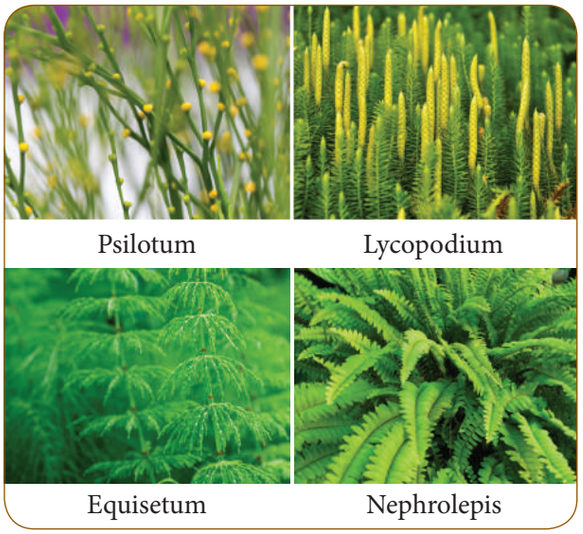
Pteridophytes also exhibit alternation of generation. The diploid sporophytic phase alternates with the haploid gametophytic phase. Sporophyte is the dominant phase. Sporophytes reproduce by means of spores. Spores are produced in sporangium. The sporangia bearing leaves are called sporophyll. Most of the plants produce only one type of spore either microspore or megaspore (homosporous). In some plants both microspore and megaspore are produced (heterosporous).

Spores give rise to gametophytic generation called *prothallus*, which is short lived and independent. The gametophytes produce the multicellular sex organs, antheridium which produces antherozoid (male gamete) and archegonium which contains an egg (female gamete). The antherozoid fertilizes with egg and form diploid zygote. It develops into an embryo which is differentiated into sporophyte.

17.4.1 Classification of Pteridophytes

Pteridophytes are classified into four classes. They are:

1. Psilopsida (Eg. *Psilotum*)
2. Lycopsida (Eg. *Lycopodium*)
3. Sphenopsida (Eg. *Equisetum*)
4. Pteropsida (Eg. *Nephrolepis*)



Psilotum | Lycopodium

Equisetum | Nephrolepis

Figure 17.10 Pteridophytes

More to Know

Lycopodium, is known as club moss.

Equisetum is known as horse tail.

17.4.2 Economic importance of Pteridophytes

- Ferns are used as ornamental plants.
- The rhizome and petioles of *Dryopteris* yield the vermifuge drug.
- The sporocarp of *Marsilea* (Water fern) is used as food by some people.

Table 17.5 Difference between Bryophytes and Pteridophytes

Bryophytes	Pteridophytes
Plant body cannot be differentiated into root, stem and leaf.	Plant body can be differentiated into root, stem and leaf.
Bryophytes are amphibians.	Pteridophytes are true land plants.
Vascular tissues are absent.	Vascular tissues are present.
The dominant phase of the plant body is gametophyte.	The dominant phase of the plant body is sporophyte.
Sporophytic generation depends on the gametophytic generation. E.g. *Riccia*	Gametophytic generation does not depend on sporophytic generation. Eg. *Selaginella*

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17.5 Gymnosperms

Gymnosperm are naked seed plant, i.e. the ovule is not enclosed by ovary. Gymnosperms have two phases in its life cycle (Gametophytic and Sporophytic). Sporophytic plant body is dominant and it is differentiated into root, stem and leaf. They have well developed vascular tissues (xylem and phloem). The water conducting tissue is tracheid and the food conducting tissue is sieve cell. They have cone in which sporangia and spores are produced.

17.5.1 Classification of Gymnosperms

Gymnosperm are classified into four different types. They are:

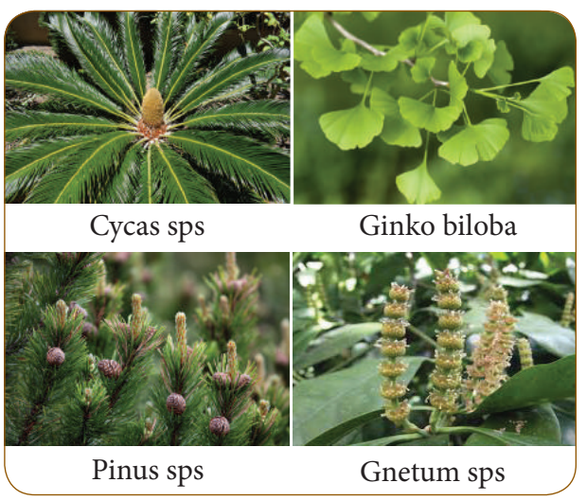
1. Cycadales
2. Ginkgoales
3. Coniferales
4. Gnetales

Cycadales

These are palm like small plants (erect and unbranched). Leaves are pinnately compound forming a crown. They have tap root system and coralloid root. E.g. *Cycas sps.*

Ginkgoales

These are large trees with fan shaped leaves. *Ginko biloba* is the only living species in the group. They produce unpleasant smell.



Cycas sps | Ginko biloba | Pinus sps | Gnetum sps

Figure 17.11 Gymnosperms

Coniferales

These are evergreen trees with cone like appearance. They have needle like leaves or scale leaves. Seeds are winged and produced in female cone. E.g. *Pinus sps.*

Gnetales

Gnetales are small group of plants. They possess advanced characters like angiosperm. Ovules are naked but, developed on flower like shoot. E.g. *Gnetum sps.*

17.5.2 Economic importance of Gymnosperms

- Woods of many conifers are used in the paper industries. E.g. *Pinus, Agathis*
- Conifers are the sources of soft wood for construction, packing and plywood industry. E.g. *Cedrus, Agathis*
- Turpentine, an essential oil, extracted from the resin of *Pinus* is used for paint preparation. It is also used medicinally to get relief from pain, bronchitis etc.,
- Seeds of *Pinus gerardiana* are edible.
- Ephedrine is an alkaloid extracted from *Ephedra*. It cures asthma and respiratory problems.
- *Araucaria bidwillii* is an ornamental plant.

17.6 Angiosperms

The term 'Angiosperm' is derived from two Greek words, i.e. 'angio' which means box or closed and 'sperma' which means seed. Habit of the plants may be herb *(Solanaum melongena),* shrub *(Hibiscus rosasinensis)* and tree (*Mangifera indica - Mango).* They have well developed vascular tissues called xylem and phloem. Xylem contains vessel, tracheid, xylem parenchyma and xylem fibre. Phloem contains sieve tubes, phloem parenchyma, companion cells and phloem fibres.

17.6.1 Classification of Angiosperms

Angiosperms are divided into two classes. They are:

- Dicotyledons
- Monocotyledons

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Characteristic features of Dicotyledons

- Seed has two cotyledons.
- Plants have tap root system and leaves are with reticulate venation.
- Flowers are tetramerous or pentamerous. Calyx and corolla are well differentiated.
- Pollination occurs mostly by insects.
- Examples are: Bean, Mango, Neem

Characteristic features of Monocotyledons

- Seed has only one cotyledon.
- Plants have fibrous root system, and leaves are with parallel venation.
- Flowers are trimerous and not differentiated into calyx and corolla.
- Pollination occurs mostly by wind.
- Examples are: Grass, Paddy, Banana.

Activity 3

Collect some flowering plants from your surrounding and classify them as monocot or dicot based on their root system and venation.

17.7 Taxonomy

Taxonomy is the branch of biology that deals with the study of identification, classification, description and nomenclature of living organisms. The word **taxonomy** is derived from two Greek words (**Taxis** means arrangement and **Nomos** means laws). The word 'taxonomy' was first coined by **Augustin-Pyramus de Candolle.**

17.7.1 Classification

Plants are arranged into different groups and categories on the basis of similarities and differences. It is called classification. There are four types of classification.

1. Artificial system of classification
2. Natural system of classification
3. Phylogenetic system of classification
4. Modern system of classification

1. Artificial system of classification

This is the earliest system of classification in plants. Plants are classified on the basis of one or few morphological characters. The most famous artificial system of classification is Linnaeus classification which was proposed by **Carolus Linnaeus** in his book **Species plantarum**.

2. Natural system of classification

In this system, plants are classified on the basis of several characters. Bentham and Hooker's classification is an example of natural system of classification. This system of classification is based on morphological and reproductive characters of the seeded plants. **Bentham** and **Hooker** published their natural system of classification in their book named **General Plantarum** in three volumes. This classification is widely used in many herbaria and botanical gardens all over the world.

DO YOU KNOW?

Herbarium is the collection of pressed, dried plants pasted on a sheet and arranged according to any one of the accepted systems of classification.

17.8 Binomial Nomenclature

The naming of an organisms with two words is known as Binomial Nomenclature. For example, the binomial name of mango is *Mangifera indica*. Here the first word *Mangifera* refers to the genus name and the second word *indica* refers to the species name.

Binomial name was first introduced by **Gaspard Bauhin** in the year of 1623. Binomial system was implemented by **Linnaeus** in his book, **Species Plantarum.** The system of naming the plants on scientific basis is known as **Botanical nomenclature.**

DO YOU KNOW?

Largest Herbarium of India is in Kolkata, which has more than 10,00,000 (one million) species of herbarium specimens.

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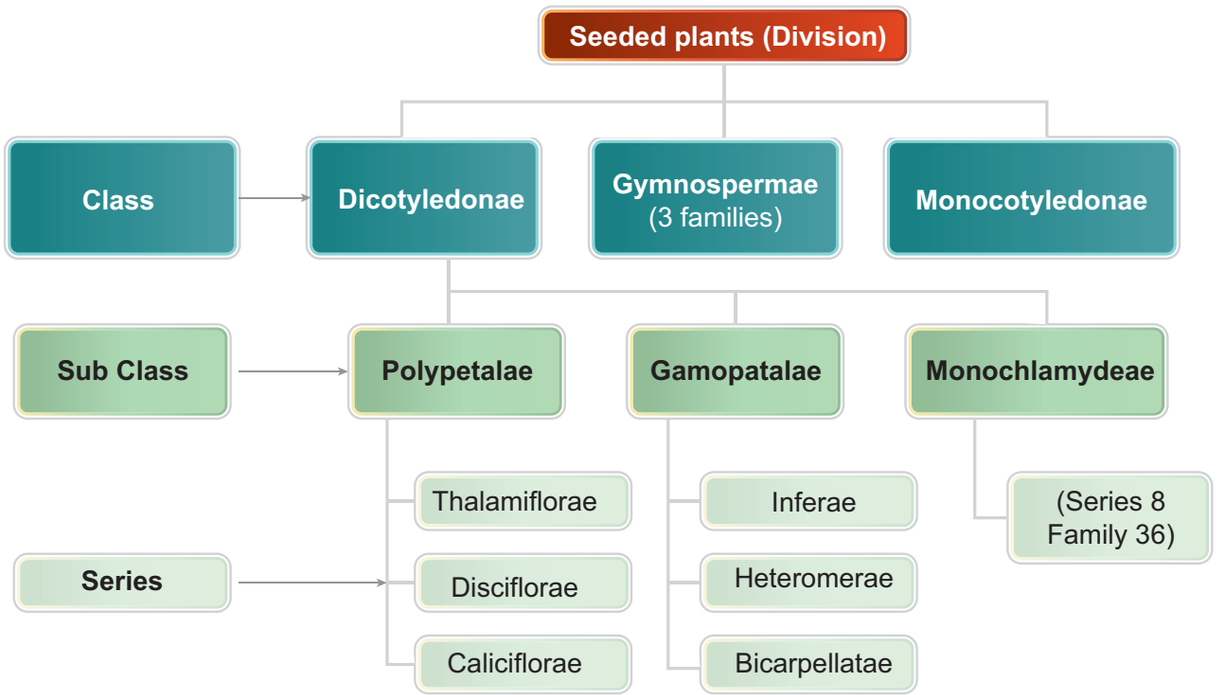
Outline of Bentham and Hooker's System of Classification



Info bits

The rules and recommendations regarding binomial nomenclature were found in ICBN (International Code of Botanical Nomenclature). Now it is known as ICN (International Code of Nomenclature).

Activity 4

Collect some plants which are growing inside your school area. Write their vernacular name, binomial name and classify them into dicotyledons or monocotyledons in the given table.

Vernacular name	Binomial name	Monocotyledons/ Dicotyledons

17.9 Uses of medicinal plants

Plants are useful to us in many ways. Some plants along with their parts are used as medicines. Uses of some medicinal plants are given below.

Acalypha indica (Kuppaimeni)

- It belongs to the family Euphorbiaceae.
- The paste obtained from the leaves of this plant is used to cure the burns on the skin.
- The juice of this plant leaves is mixed with lemon juice to cure ringworm.

Figure 17.12 *Acalypha indica*

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Aegle marmelos (Vilvam)

- It belongs to the family Rutaceae.
- The unripe fruit of this tree is used to treat indigestion.
- It is used to cure chronic diarrhoea and dysentery.

Figure 17.13 *Aegle marmelos*

Solanum trilobatum (Thoodhuvalai)

- It belongs to the family Solanaceae.
- The leaves and fruits of this plant cure cough and cold.
- It is widely used in the treatment of tuberculosis and bronchial asthma.

Figure 17.14 *Solanum trilobatum*

Phyllanthus amarus (Keezhanelli)

- It belongs to the family Euphorbiaceae.
- The entire plant is used for the treatment of jaundice.
- It gives additional strength to human liver and it is used to treat other liver disorders.

Figure 17.15 *Phyllanthus amarus*

Aloe vera (Sothu Katrazhai)

- It belongs to the family Liliaceae.
- Leaves of this plant is used to cure piles and inflammations on the skin.
- It cures peptic ulcer.

Fig.17.16 *Aloe vera*

Points to Remember

- Algae are chlorophyll bearing, simple, primitive plants and they are autotrophs.
- Gametophytic thallus is dominant phase in Bryophytes
- Parasites have special roots called haustoria.
- Pteridophytes are the first true land plants. They are vascular cryptogams.
- Gymnosperms are the naked seeded plants.
- Angiosperms are the closed seeded plants (Ovules are enclosed by the ovary).
- Angiosperms are divided into two classes, namely dicotyledons and monocotyledons.
- Scientific method of naming the plants with two words is known as Binomial Nomenclature.
- The paste obtained from the leaves of *Acalypha indica cures* burns on the skin.
- The leaves, flowers and fruits of *Solanum trilobatum* cure cough and cold.

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GLOSSARY

Haustoria	Special roots present in parasites.
Mycorrhiza	Symbiotic association of fungi with higher plant roots.
Epiphytes	Plants growing upon other plants.
Autotroups	Organisms which prepare their own food.
Heterotrophs	Organisms which depend on other organisms for their nutrition.
Vascular tissues	Tissues which conduct water and minerals.
Polypetalae	Petals which are many but not united.
Gamopetalae	United petal
Monochlamydeae	Flower with single whorl of perianth which can not be differentiated into calyx and corolla.

TEXTBOOK EXERCISES

BJBVTS

I. Choose the best answer.

1. *Solanum trilobatum* is the binomial name of Thoothuvalai. The word 'Solanum' refers to
   a) Species b) Genus
   c) Class d) Orders
2. Floridian starch is a reserve food material of
   a) Chloroplyceae b) Phaeophyceae
   c) Rhodophyceae d) Cyanophyceae
3. An example for colonial form of algae is
   a) *Oscillatoria* b) *Nostac*
   c) *Volvox* d) *Chlorella*
4. One of the following is an edible mushroom
   a) *Polyporus* b) *Agaricus*
   c) *Pennicillium* d) *Aspergillus*
5. Plants that prevent soil erosion are
   a) algae *b) fungi*
   c) bryophytes *d) pteridophytes*
6. The first land plants are
   a) bryophytes b) pteridophytes
   c) gymnosperm d) angiosperm
7. The well-developed sporophytic plant body is seen in
   a) bryophytes b) pteridophytes
   c) gymnosperms d) angiosperms
8. Binominal Nomenclature was first introduced in the year
   a) 1970 b)1975 c) 1978 d) 1623
9. Penicillin is an antibiotic which is extracted from
   a) algae b) fungi
   c) bryophytes d) pteridophytes

II. Fill in the blanks.

1. The word 'Taxonomy' is derived from _____
2. Binomial nomenclature was first introduced by _____
3. The book 'Genera Plantarum' was published by _____
4. Monocotyledon seed bears only _____ cotyledon.
5. Brown algae belongs to _____class.
6. Agar Agar is obtained from _____algae.
7. The reserve food material of fungi are _____ and _____
8. The first true land plant is _____
9. Xylem and phloem are absent in_____ plants.
10. Reticulate venation is present in _____ plants.

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III. State true or false. If false, correct the statement.

1. In polypetalae, the petals are free.
2. Binomial name should contain more than two words.
3. Artificial system of classification is based on a few characters of the plant.
4. Cell wall of fungi is made up of chitin.
5. Pinus is a closed seeded plant.
6. All bryophytes are hydrophytes.
7. Dicotyledons have well developed characters than the gymnosperms.
8. Mosses are the well developed plant in bryophytes.
9. The dominant phase of the bryophytes is sporophyte.
10. The dominant phase of the pteridophyte is gametophytic phase.

IV. Match the following.

Cyanophyceae	Green algae
Chlorophyceae	Blue green algae
Phaeophyceae	Red algae
Rhodophyceae	Brown algae

V. Answer very briefly.

1. Define - Thallus.
2. What is meant by binomial nomenclature? Give example.
3. Write any two characters of dicotyledons.
4. Seeds of gymnosperm plants are naked. Why?
5. Write any two economic importance of fungi.

VI. Answer briefly.

1. Write a short note on natural system of classification.
2. Write any three economic importance of algae.
3. Write the differences between algae and fungi.
4. How many classes are there in bryophytes? What are they?
5. Write any four characters of pteridophytes.

VII. Answer in detail.

1. Draw the outline of Bentham and Hooker's system of classification.
2. Write any five differences between monocot and dicot plants.
3. Write the differences between gymnosperm and angiosperm.
4. Write the economic importance of gymnosperms.
5. Write the names of medicinal plants and explain their uses.

REFERENCE BOOKS

1. Algae - A.V.S.S Sambamurty. I.K International publishing house.
2. Bryophyta - Afroz Alam. I.K International publishing house.
3. Pteridophyta - O.P.Sharma. Mc Graw Hill Educations.
4. Gymnosperms - S.P.Bhatnagar. New Age Publishers.
5. Taxonomy of Angiosperms - B.P.Pandey. S.Chand Publishers.
6. Plant Kingdom - Theresa Greenaway. Hodder Wayland Publishers.

INTERNET RESOURCES

1. https://www.topper.com>guides>biology
2. https://www.britannica.com>science
3. https://topper.com.>plant-kingdam
4. https://merriam-webster.com>binomial

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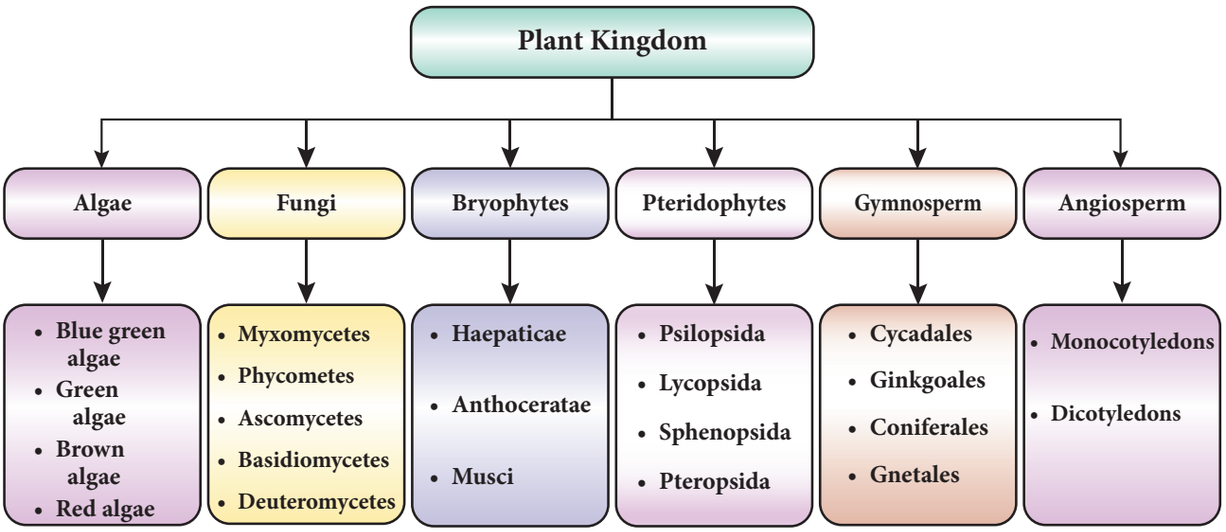
Concept Map



ICT CORNER

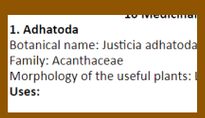
Plant Kingdom

Through this activity the students will learn about Medicinal plants and their uses

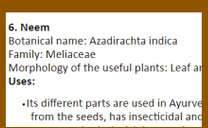
Steps

- Open the Browser and type the URL link (or) Scan the QR Code.
- Click the title "Medicinal plants and their uses
- Select and view the images of Medicinal plants and their uses
- Through this image u can identify the uses of medicinal plants

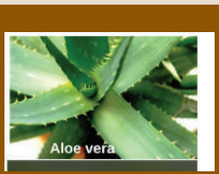
Step1



Step2



Step3



Step4

Web link : https://www.plantscience4u.com/2018/08/10-medicinal-plants-and-their-uses-with.html#.XHZnyogzaM8

(or) scan the QR Code

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*Pictures are indicative only

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