P. U. C. I Year

CHAPTER - 3

THE PLANT KINGDOM

Biology Bridge Course Curriculum for the Academic Year 2012 – 2013

5 kingdom classification

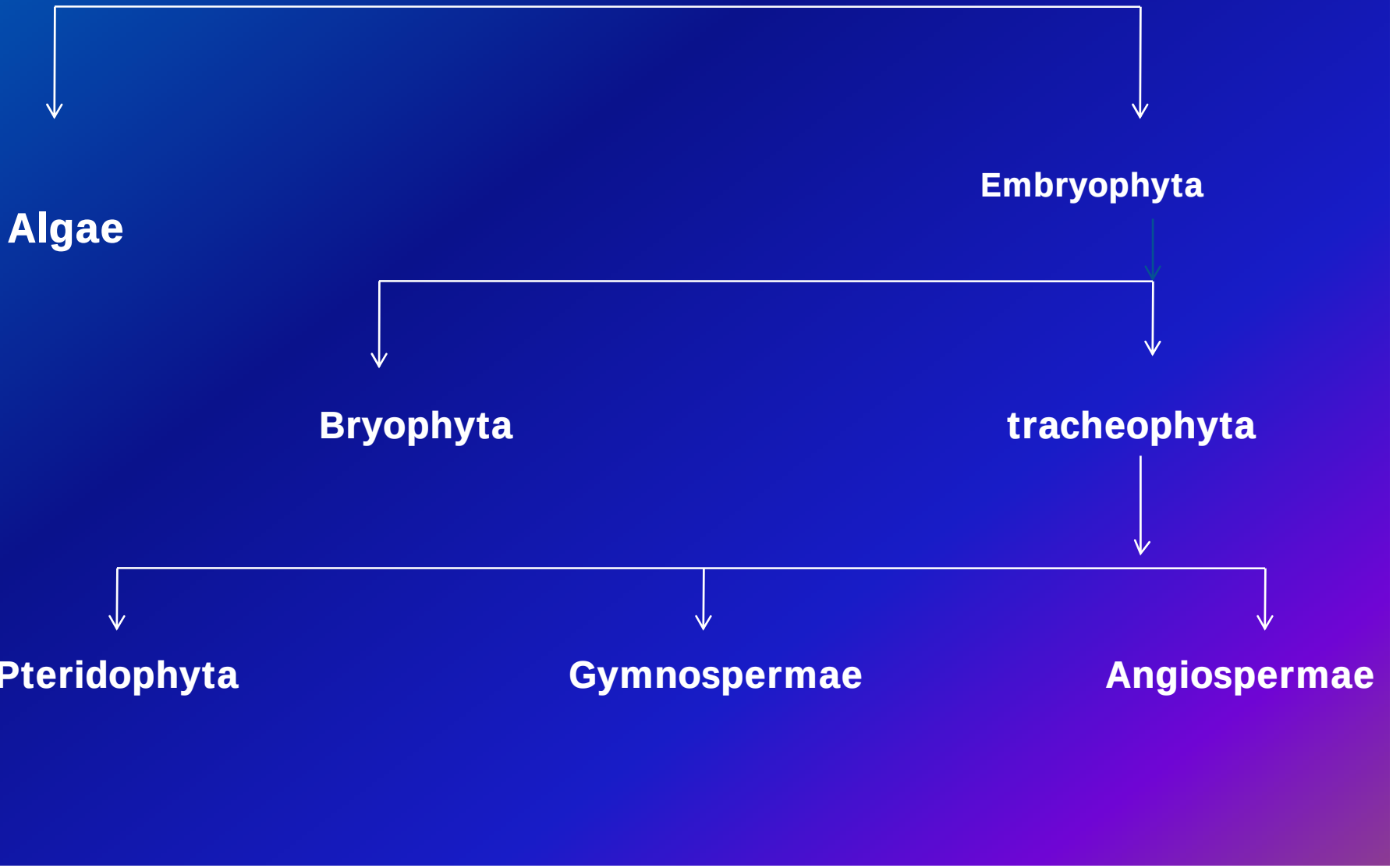
- This classification was proposed by R.H.whittaker in the year 1969
- It includes the following kingdoms
- 1.Monera: body has prokaryotic cell(s)
- 2.Protista: body has eukaryotic cell(s)
- 3.Fungi: body has eukaryotic cell(s)
- 4.Plantae: body is made of eukaryotic cell(s)
- 5.Animalia: body made of eukaryotic cells

CHAPTER – 3

PLANT KINGDOM

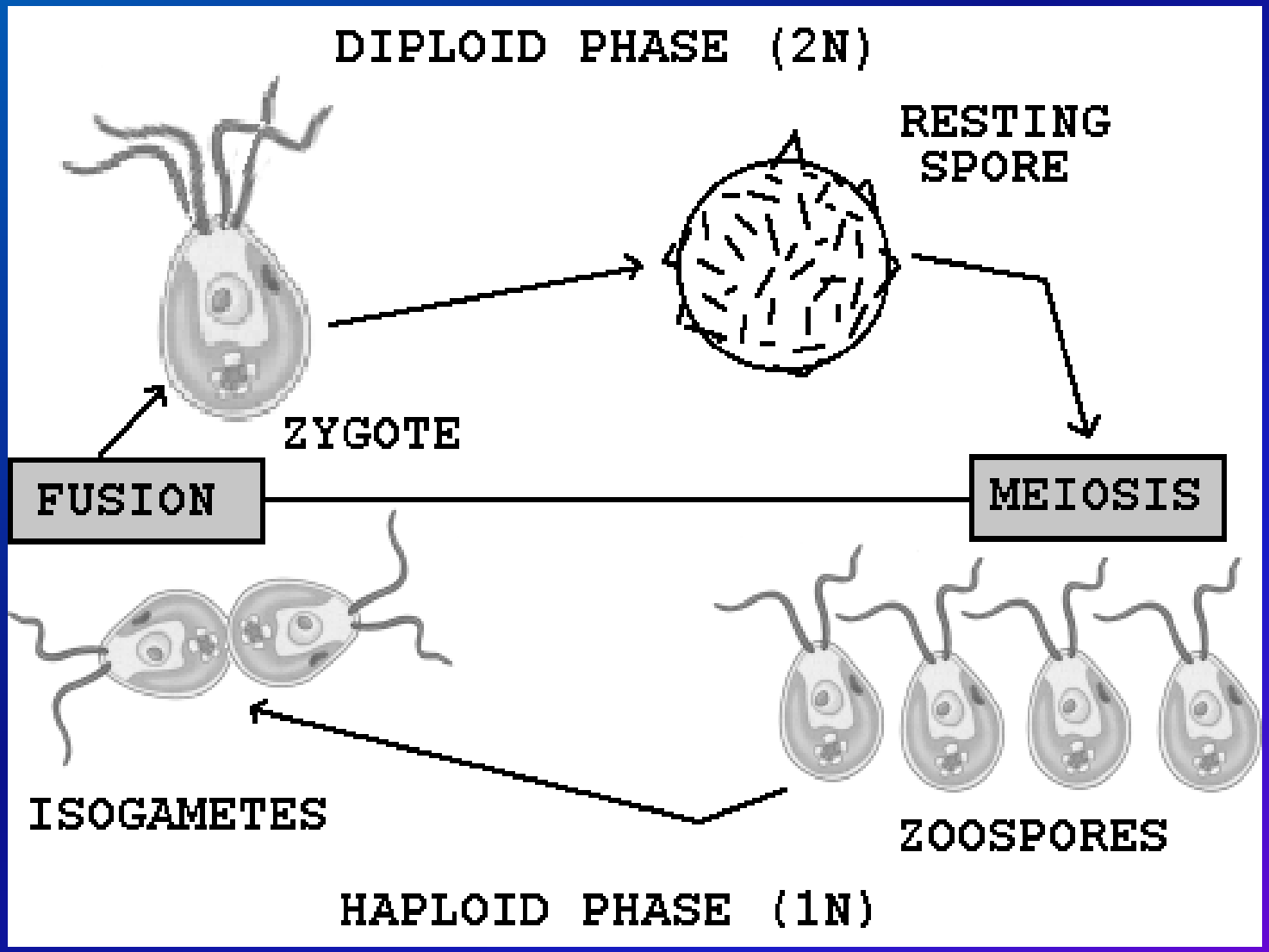
- The plants are made of a single cell (unicellular) or made of many cells (multicellular).
- Every plant cell has protoplasm which is surrounded by cell membrane and cell wall both.
- Protoplasm has a definite & complete nucleus in the cell .
- Such cells are called eukaryotic cells
- They prepare their own food by photosynthesis and so they are called Autotrophs.
- They are also called producers in our living world (Biosphere) because they produce food for all other animals.
- In their life cycle they have a Haploid Gametophytic generation and a Diploid sporophytic generation which go on alternatively generation after generation.

Kingdom : Plantae

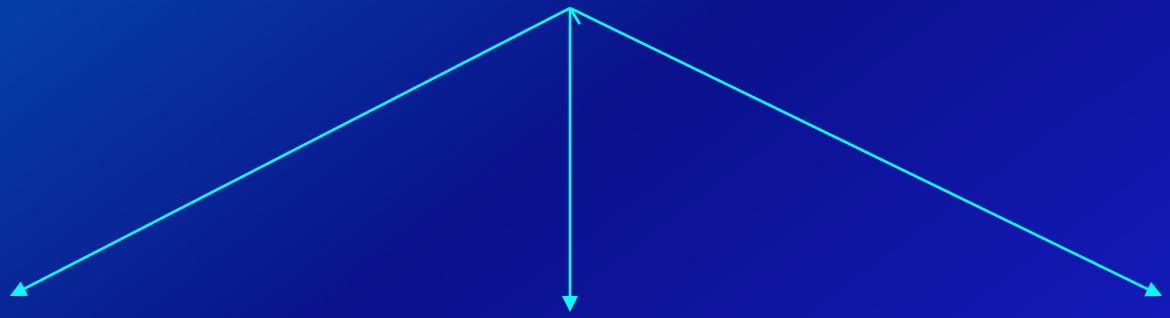


3.1 .class 1 :Algae

- These are plants made of a single cell which live alone or live together in a group called colony e.g., chlamydomonas & volvox colony respectively.
- They have no leaves, no roots, no flowers, no stem and no fruits.
- They live in water and so they are called Aquatic plants.
- The cell wall is made of cellulose.
- They reproduce by
  - Vegetative Method (Fragmentation)
  - Asexual Method(Spore formation)
  - Sexual Method by
    - (i) Isogamy e.g., Spirogyra;
    - (ii) Anisogamy e.g., Chlamydomonas;
    - (iii) Oogamy e.g., Volvox, Fucus


DIPLOID PHASE (2N)
RESTING SPORE
ZYGOTE
FUSION
MEIOSIS
ISOGAMETES
ZOOSPORES
HAPLOID PHASE (1N)

Classes of Algae with examples



1. Chlorophyceae
   Examples
   Chlamydomonas
   Volvox colony
   Ulothrix
   Spirogyra

2. Phaeophyceae
   Examples
   Ectocarpus
   Dictyota
   Fucus
   Sargassum
   Laminaria

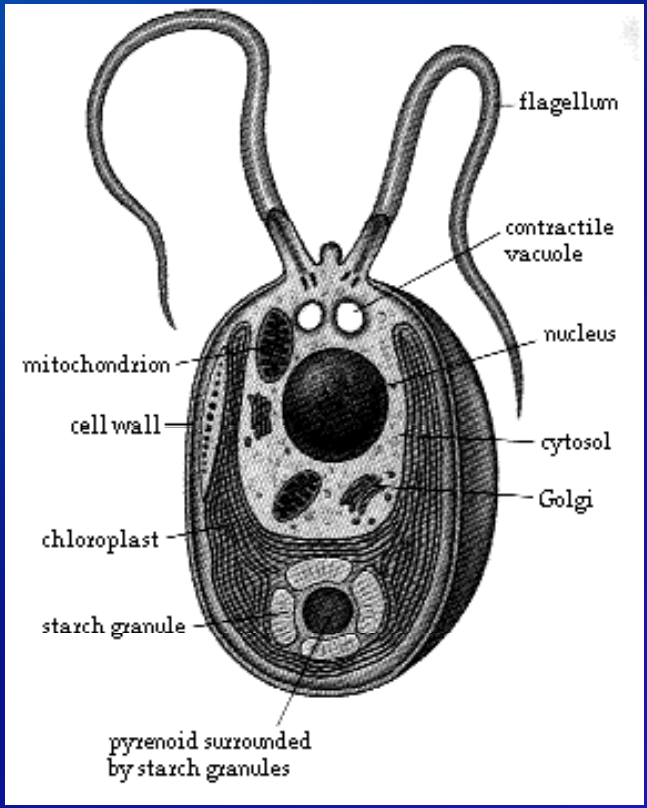
3. Rhodophyceae
   Examples
   Polysiphonia
   Porphyra
   Gracilaria
   Gelidium

Class: Chlorophyceae

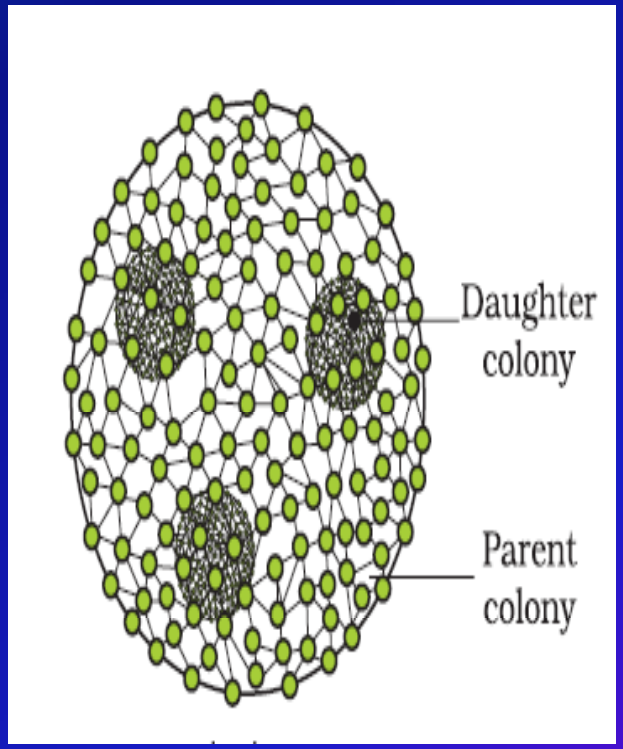
(Gr. Chloros = Green coloured)

- These algae are green in colour.
- They live in water
- Some examples are
  1. Chlamydomonas
  2. Volvox colony
  3. Ulothrix
  4. Spirogyra

Class : Chlorophyceae



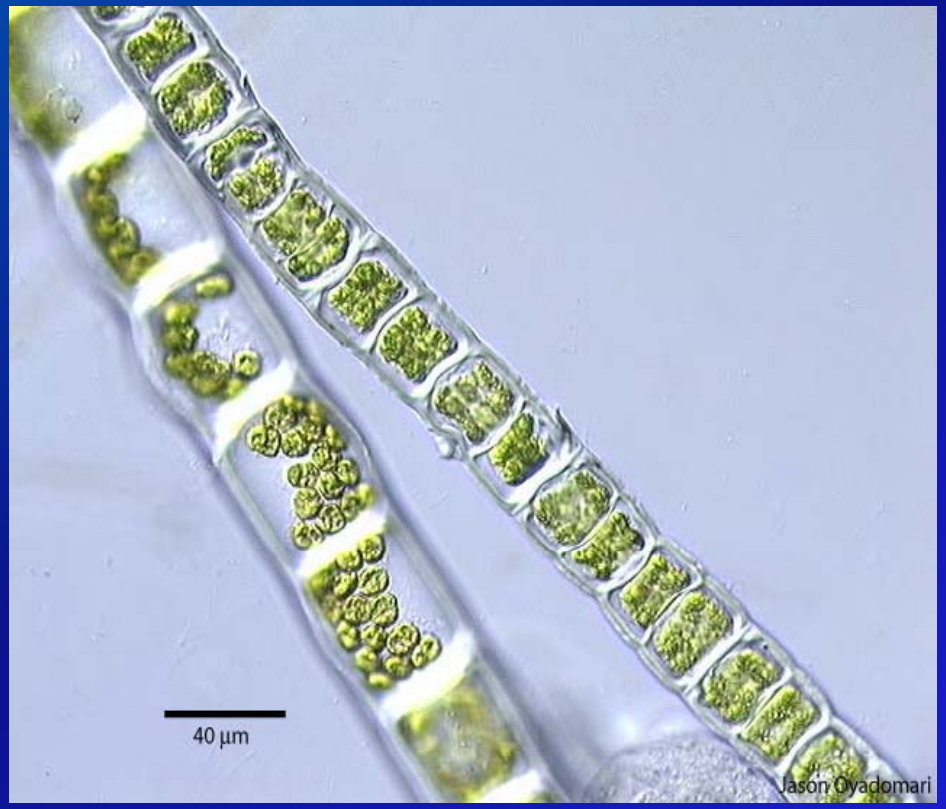
Chlamydomonas

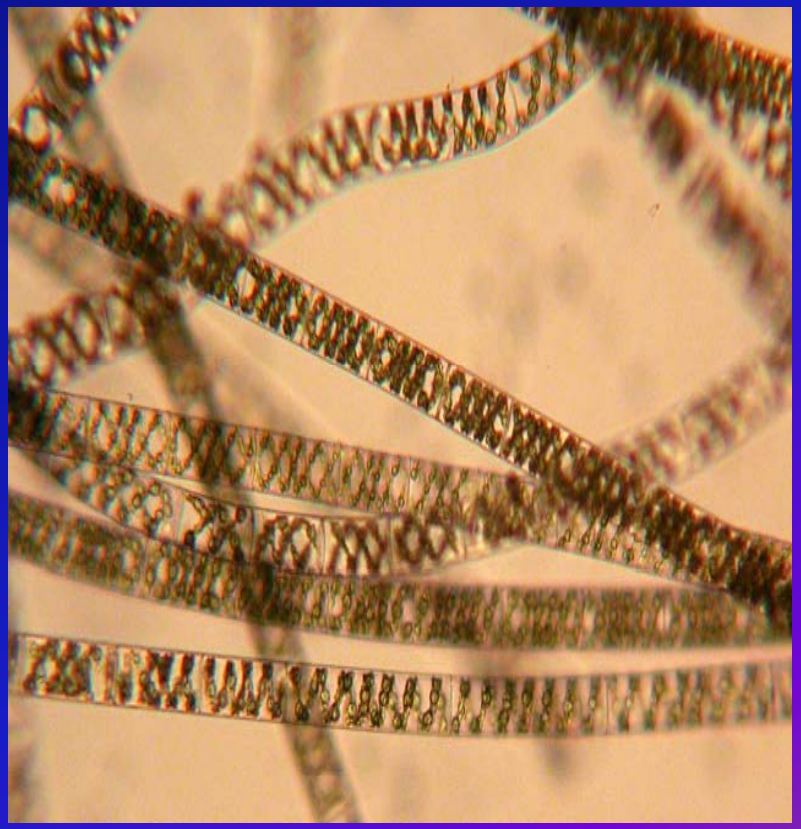


volvox

Class : Chlorophyceae

Ulothrix **spirogyra**





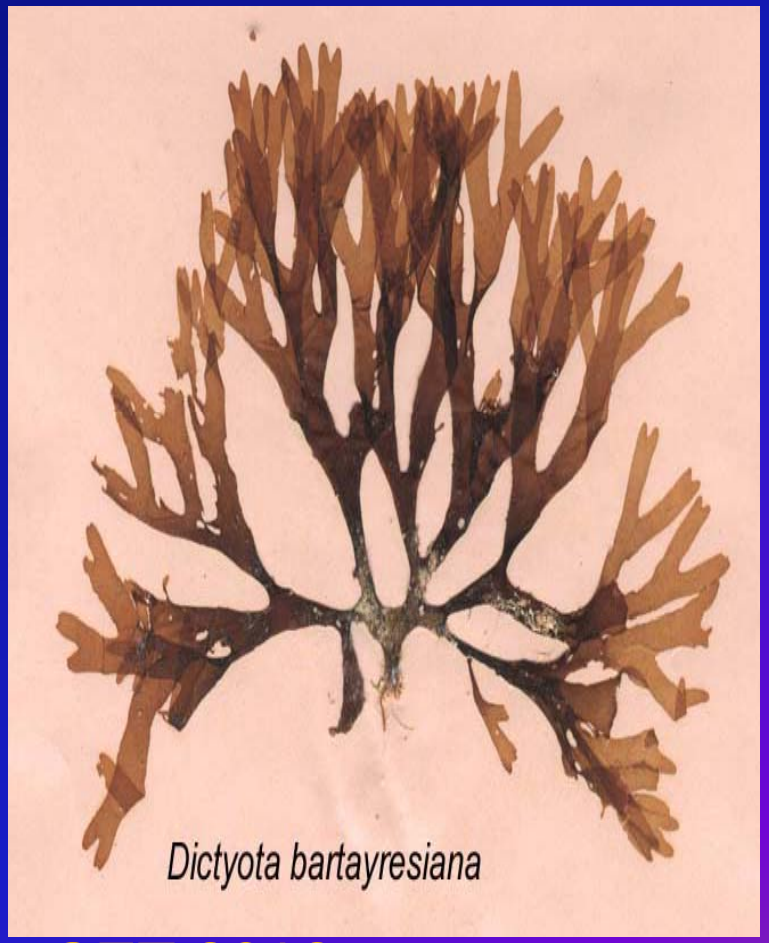
Class : Phaeophyceae

(Gr. Phaios = Brown coloured)

- These algae are brown in colour.
- They live in sea water
- Some examples are
  1. Ectocarpus
  2. Dictyota
  3. Fucus
  4. Sargassum
  5. Laminaria

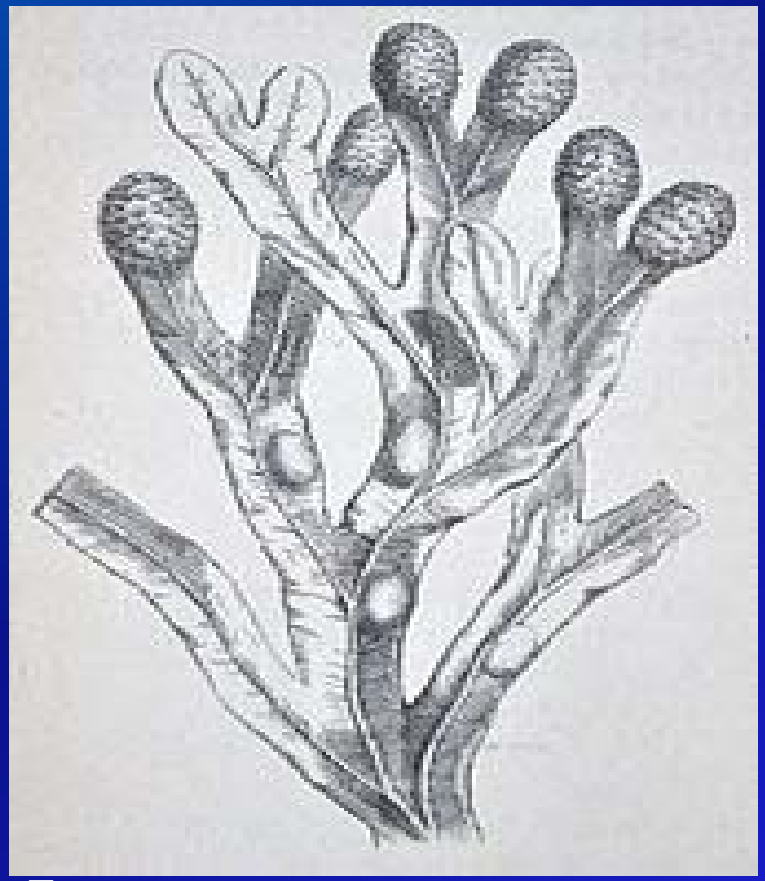
class : Phaeophyceae

Ectocarpus

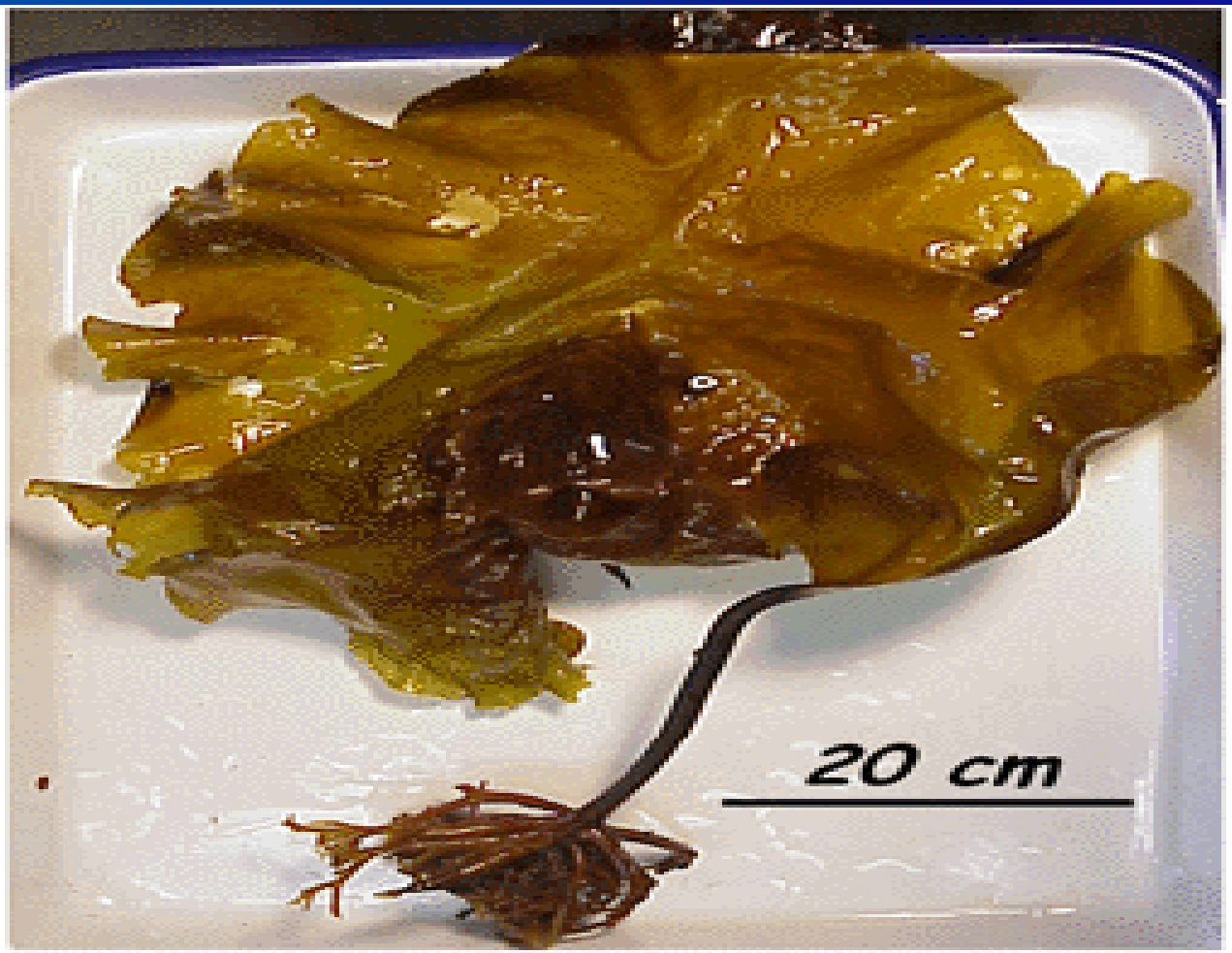


class : Phaeophyceae

sargassum



Fucus



Unidentified Laminaria sp.

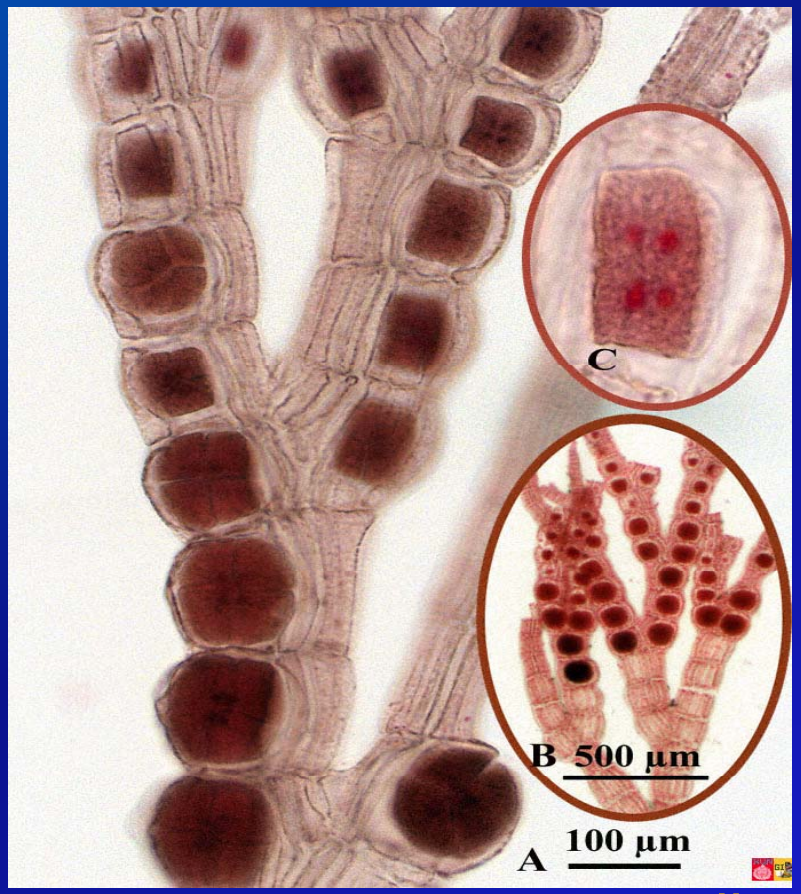
Class: Rhodophyceae

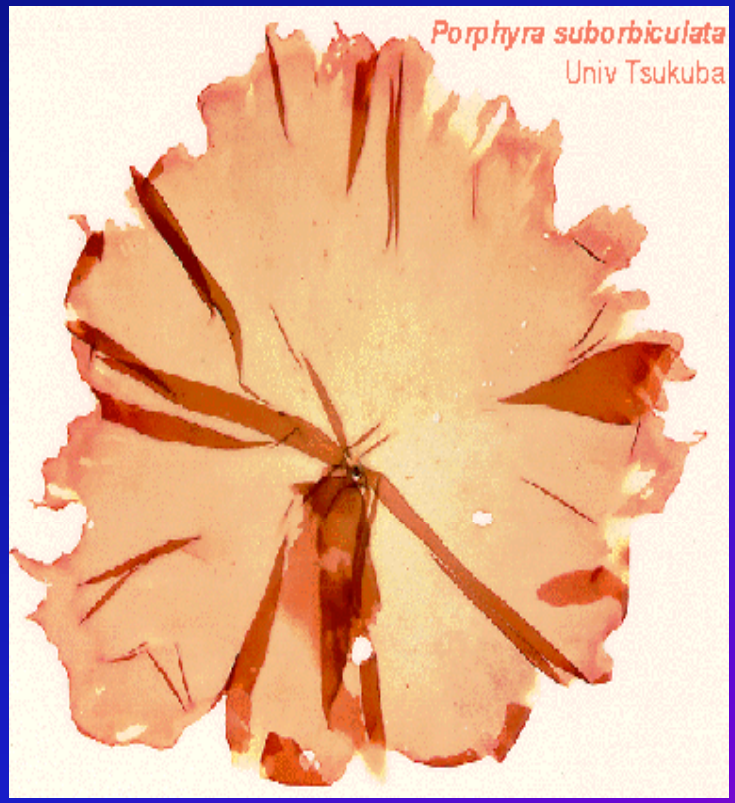
(Gr. Rhodon = Red or Rose)

- These algae are Rose or Red in colour
- They live in sea water
- Some examples are
  1. Polysiphonia
  2. Porphyra
  3. Gracilaria
  4. Gelidium

Class : Rhodophyceae

Polysiphonia





Class : Rhodophyceae

Geledium

3. Bryophyta

- The plants belonging to this group are called Bryophytes.
- Bryophytes are also called Amphibians of plant kingdom because they live on land but need water for their sexual reproduction.
- Their life cycle has
  (a) Haploid gametophyte
  (b) Diploid sporophyte.
  Haploid gametophyte stage is with antheridia (male) to produce Antherozooids and Archegonia (Female) to produce female gametes (eggs).
- Antherozoid fuses with egg to produce zygote.
- This zygote produces a multicellular sporophyte.
- This sporophyte produces spores.
- The spores germinate to form the gametophyte of next generation.

Classes of Bryophytes

1. Hepaticopsida
   Example
   Riccia
   Marchantia

2. Anthocerotopsida
   Example
   Anthoceros
   Notothylas

3. Bryopsida
   Example
   Funaria
   Sphagnum
   Polytrichum

Class: Hepaticopsida

- These Bryophytes are also called Liver worts because of their liver like shape.
- Some of the examples are.
    1. Riccia
    2. Marchantia

Class : . Hepaticopsida

Riccia

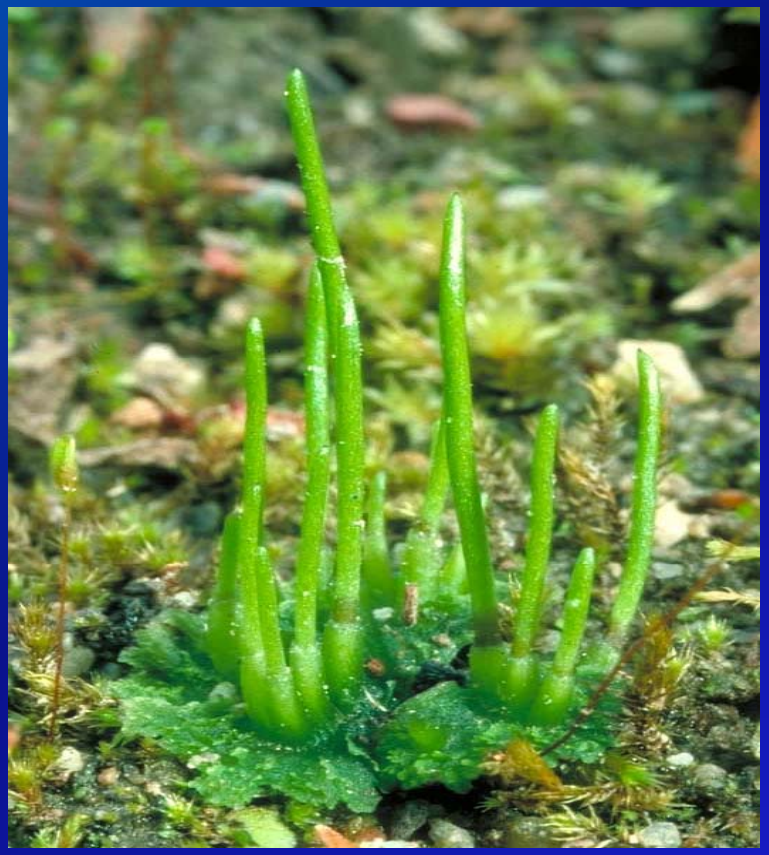
Marchantia

Class 2: Anthocerotopsida

- These bryophytes are also called horn worts because of their horn like shapes.
- Some of the examples are
  1. Anthoceros
  2. Notothylas

Class : Anthocerotopsida

Anthoceros



Notothylas

Class 3: Bryopsida

- These bryophytes are also called mosses because of the soft carpet like appearance that spreads in large number on moist surfaces.
- Some of the examples are:
  1. Funaria
  2. Sphagnum
  3. Polytrichum

Class : Bryopsida

Sphagnum

Polytrichum

Class : Bryopsida

funaria

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3.3 Pterodophytes

- These are the plants that appeared first on land.
- They have vascular tissue called xylem and phloem.
- The plant body is called a sporophyte which has roots, stem, leaves etc.
- Majority of the sporophytes produce one kind of spores in their sporangia and so they are called homosporous pteridophytes
- Some sporophytes produce 2 kinds of spores in their sporangia and so they are called heterosporous pteridophytes.

Pteriodphytes are divided into 4 classes

Pteridophyta

Class 1	Class 2	Class 3	Class 4
Psilopsida	Lycopsida	Sphenopsida	Pteropsida
Example	Example	Example	Example
Psilotum	Lycopodium	Equisetum	Nephrolepis
	Selaginella		Pteris
			Adiantum
			Dryopteris

Class : Psilopsida

Psilotum

Class : Lycopsida

Lycopodium

Selaginella

Class : Sphenopsida

Equisetum

Class : Pteropsida

Nephrolepis

Pteris

Class : Pteropsida

Adiantum

Dryopteris

3.4 Gymnospermae

- They are also called naked seeded plants.
- The plant body is called a sporophyte.
- Gymnosperms are heterosporous.
- Gametophytes depend on sporophytes to complete their alternation of generation of their life.

Gymnospermae

The gymnosperms are divided into 3 classes.

Class 1	Class 2	Class 3
Cycadopsida	Coniferopsida	Gnetopsida
Example	Example	Example
Cycas	Pinus	Gnetum
	Cedrus	Ephedra

Class : Cycadopsida

Cycas plant

Class : Cycadopsida

Cycas Male cone

Cycas female cone

Class : Coniferopsida

Pinus

Cedrus

Class : Gnetopsida

Gnetum

Ephedra

Class : Gnetopsida

ginkgo

3.5 Angiosperms

- These are also called flowering plants.
- The angiosperms produce fruits with seeds inside the fruit.
- The angiosperm plants show double fertilization and triple fusion before developing seeds and fruits.
- Ovules develop into seeds and ovary develops into a fruit.

Angiosperms

Class 1
Dicotyledonae

Examples :
1.Mustard plant
2.Bengal gram plant

Class 2
Monocotyledonae

Examples :
1.grass plant
2.Coconut plant

Angiosperms are divided into 2 classes.

Class 1: Dicotyledonae

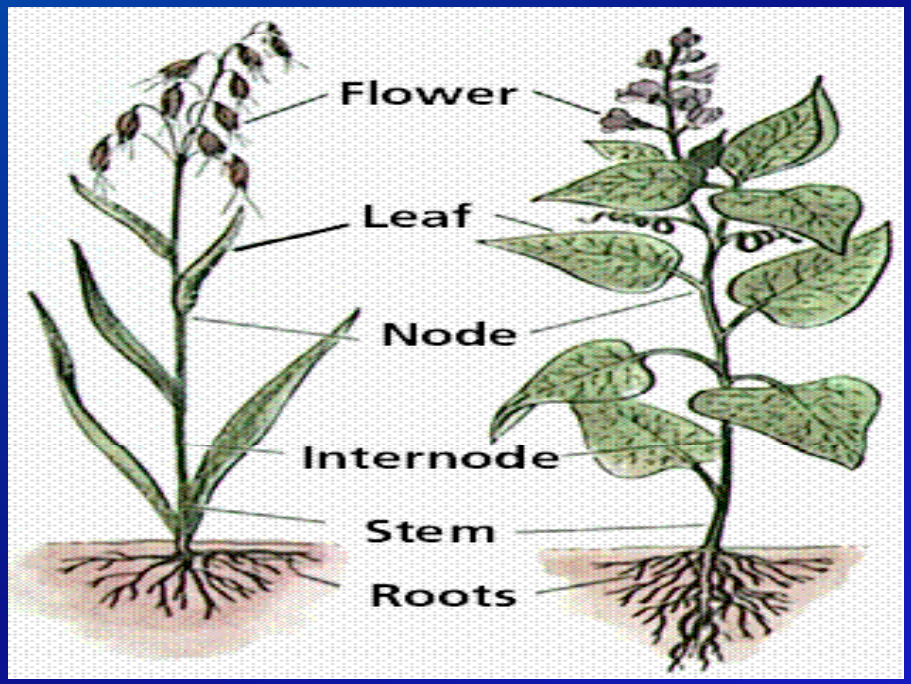
- The angiosperms of this class produce seeds with two cotyledons.
- Some examples are
  1. Mustard plant
  2. Bengal gram plant

Class 2: Monocotyledonae

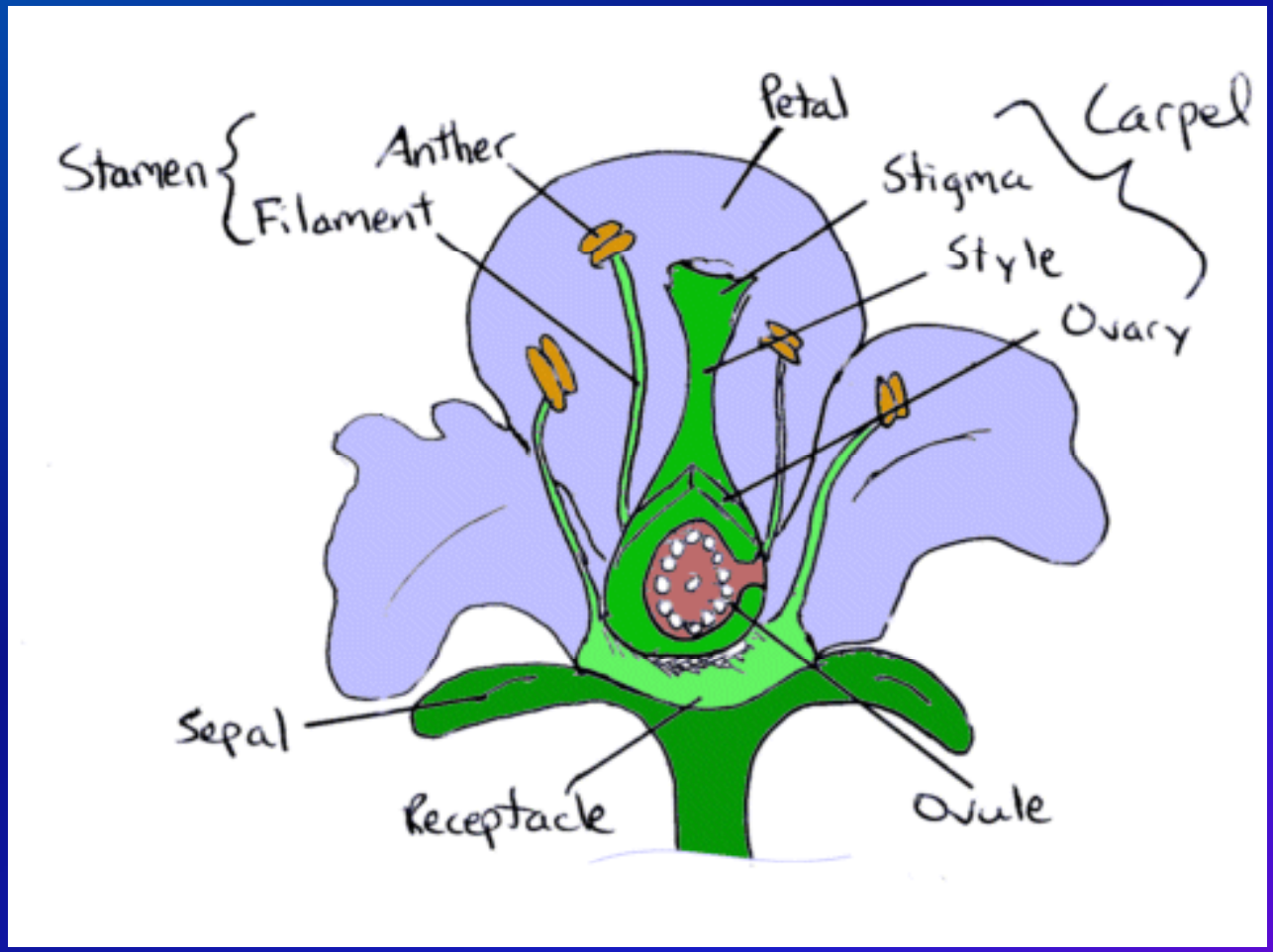
- The angiosperms of this class produce seeds with a single cotyledon.
- Some examples are:
  1. Grass plant
  2. Coconut plant

Monocot Plant

Dicot Plant

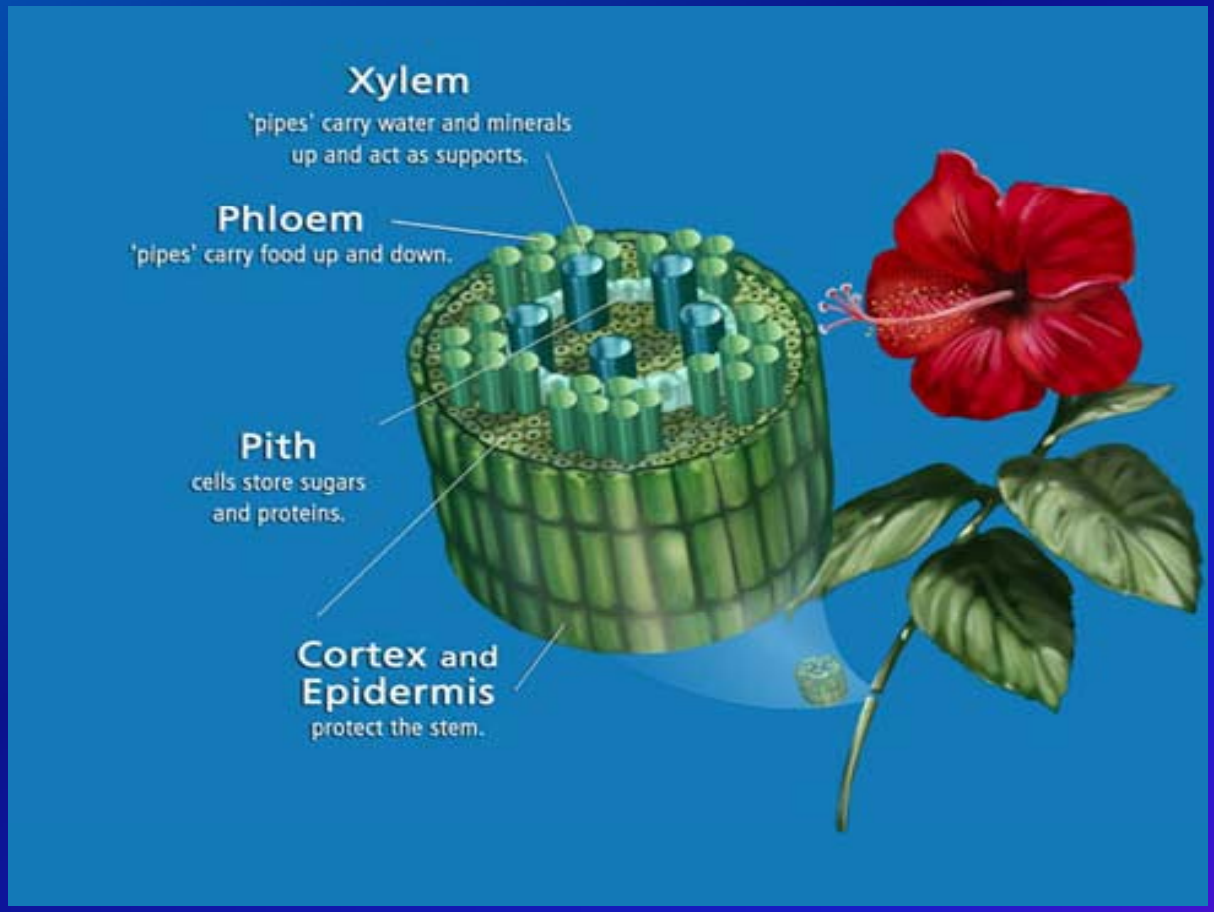


Dicot Flower



Dicot Flower (Model)

Vascular Tissue



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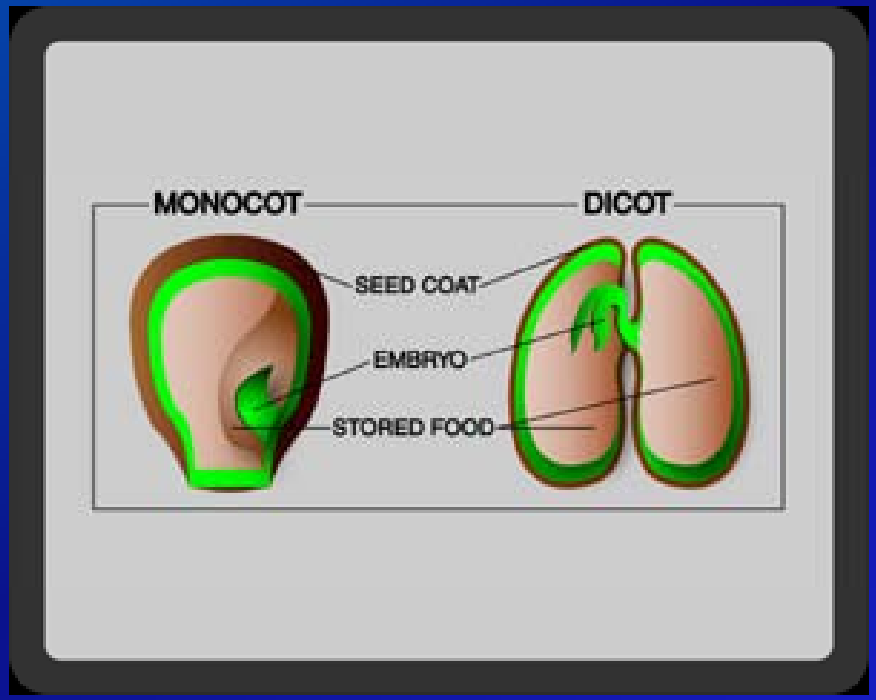
Seeds of Angiosperms



Class : Dicotyledonae

Mustard plant

Class : Dicotyledonae

Bengal gram plant

Class : Monocotyledonae

Grass plant

Class : Monocotyledonae

Coconut plant

Thank you

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