

NEET- 2020- 45 Days Crash Course



Date : 22nd July 2020



Chapter Name : PLANT KINGDOM



Lecture Outline :

ALGAE

BRYOPHYTA

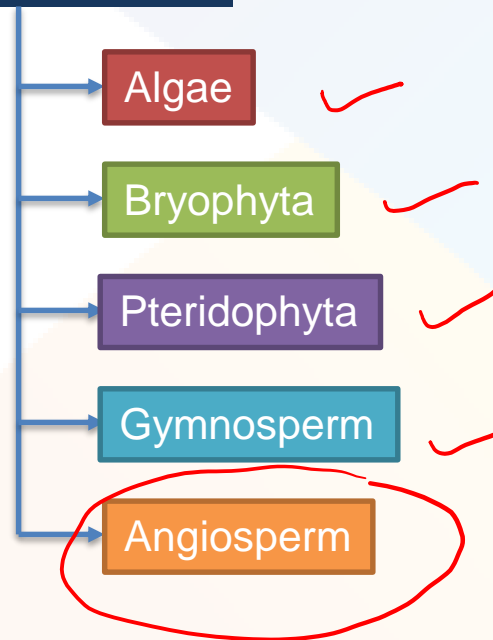
Kingdom Plantae

- All the multicellular eukaryotic plants are placed in Kingdom-Plantae.
- They are autotrophic i.e. they manufacture their food by photosynthesis.

cell wall

- Following plant groups are included in Kingdom-Plantae

Kingdom – Plantae



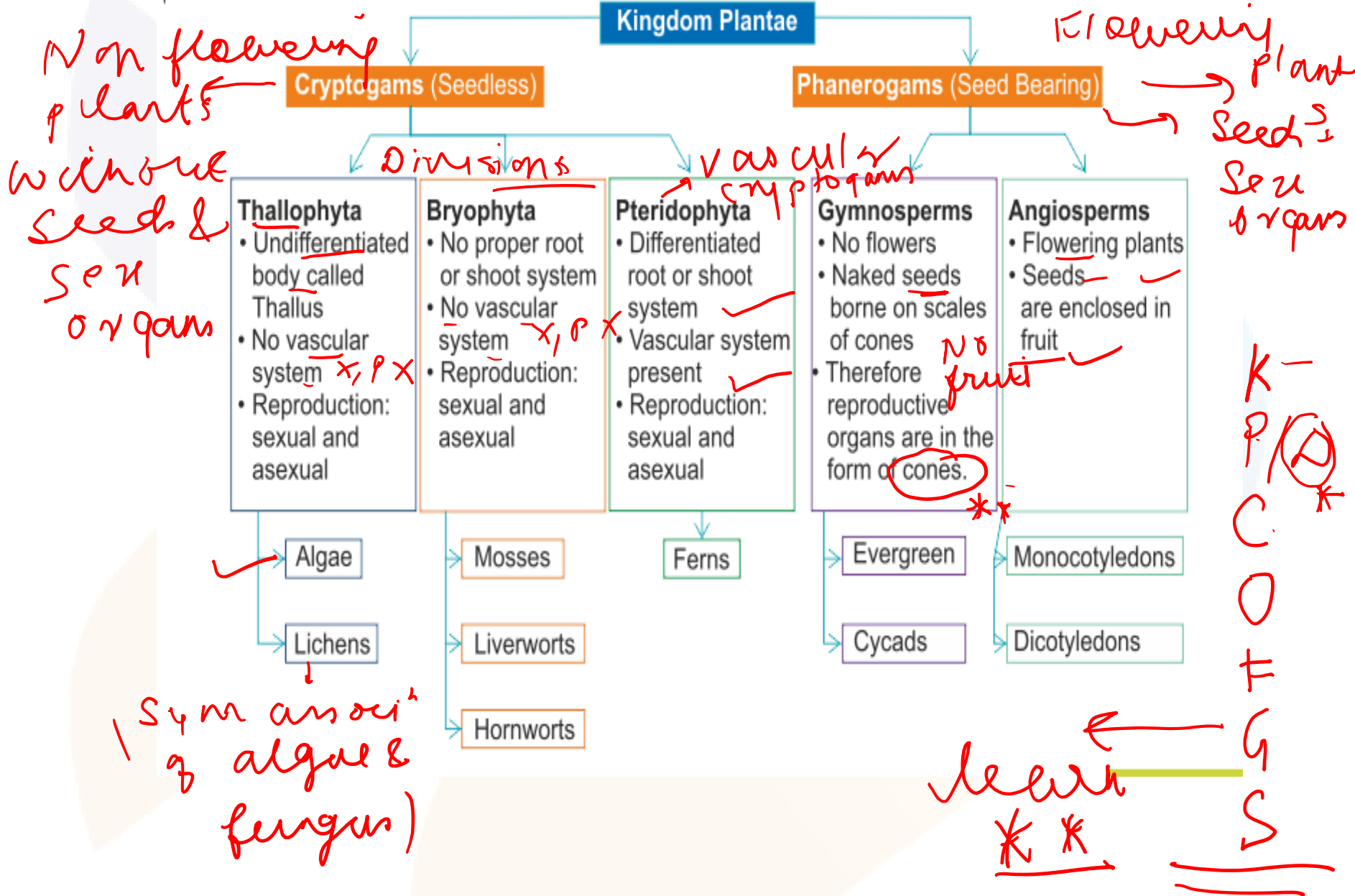
Criteria for Classification

The following points constitute the basis of these divisions

- (i) Presence or absence of distinct organelles.
- (ii) Presence or absence of distinct and differentiated tissues, which can carry food and water.
- (iii) Presence or absence of seeds.
- (iv) Whether the seeds are enclosed within fruits or not.

↳ vascular
tissues
flowers
seeds
fruits

Classification of Kingdom Plantae



Algae

Phycology - Study of algae

Nature

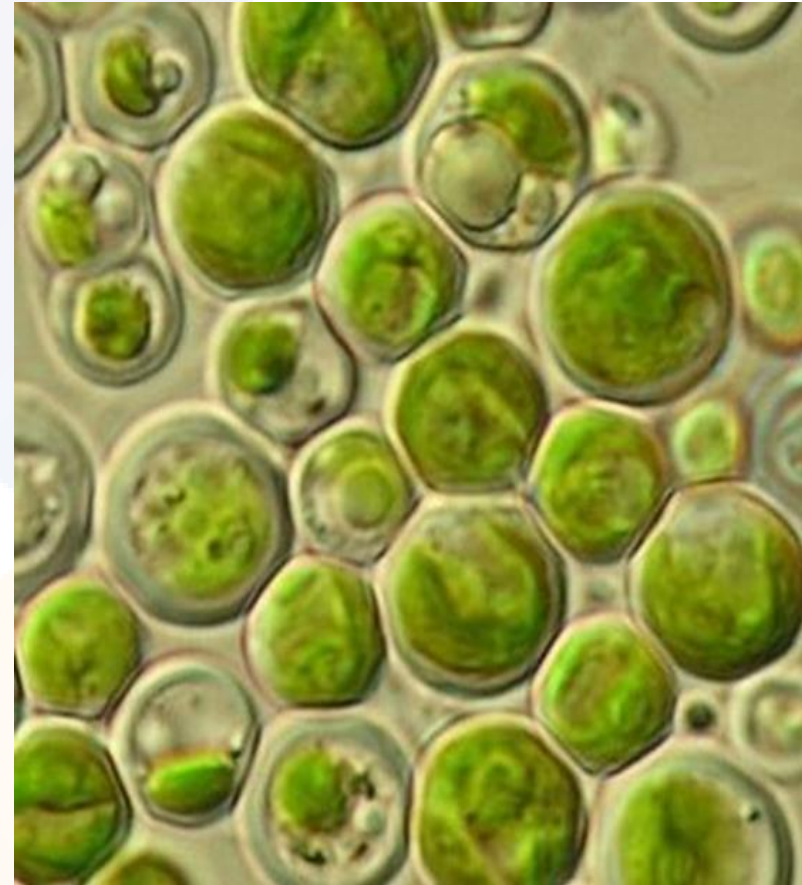
- Algae are surrounded by mucilagenous sheath and below the sheath cell wall is present which is made up of cellulose and pectin but mainly made up of cellulose, galactans, mannans and mineral like calcium carbonate. *→ imp, to prevent rolling due to waves*
- They are haploid ⁽ⁿ⁾ gametophytic, autotrophic, non vascular, aquatic cryptogams. *non flowering*
Primary producers of the food chain - 90% of P in ocean. *no xylem & phloem*
- On the basis of structure, algae are thalloid.
- Unicellular, non-jacketed sex organs *exception [Chara] ** A NERT*
- On the basis of nutrition, algae are photoautotrophic

Gametophytic → n → algae are G. ****
Sporophytic → 2n

Unicellular Algae



Acetabularia

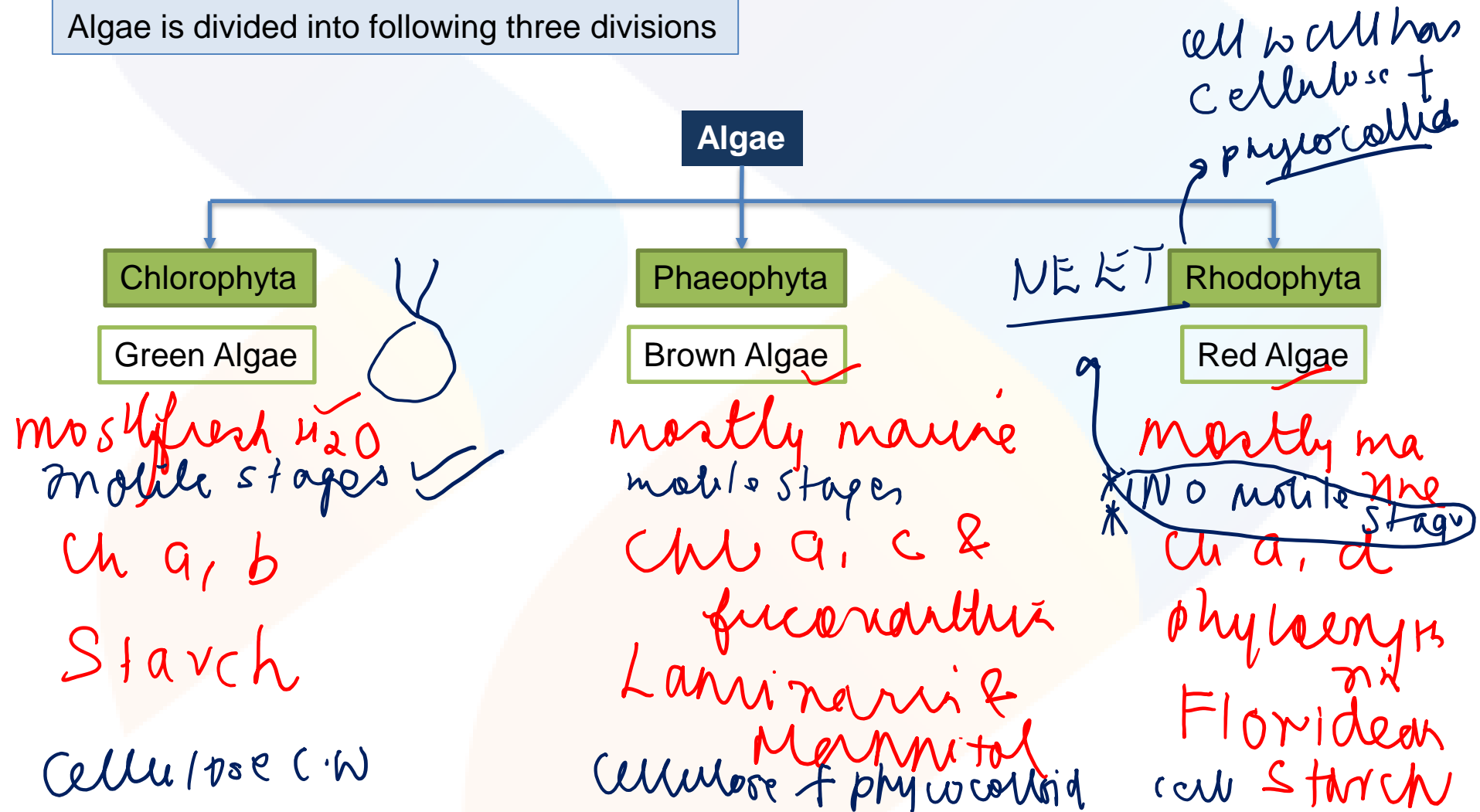


Chlorella ^{SCPT}
unicellular
non motile

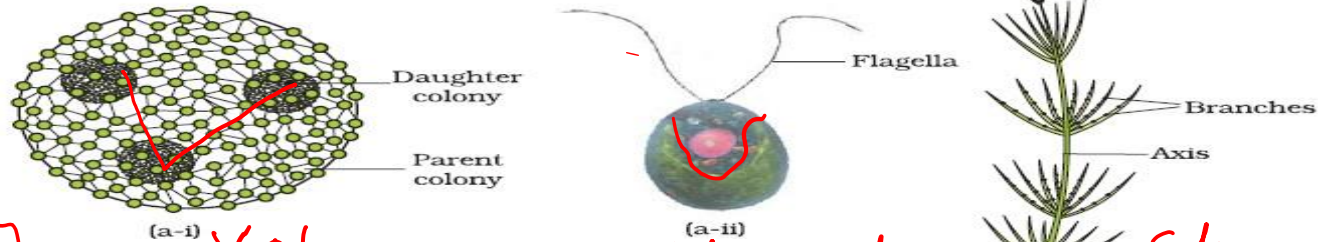
Classification of Algae

- The classification of algae is mainly based on the photosynthetic pigments. & reserve food
- In addition to this, cell wall composition and stored food are also the base of classification

Algae is divided into following three divisions



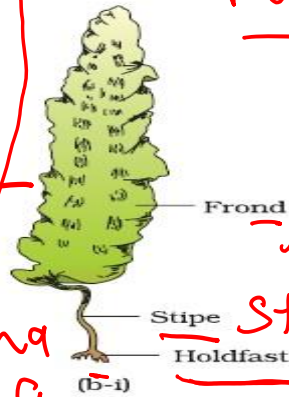
Some important Algae



Volvox

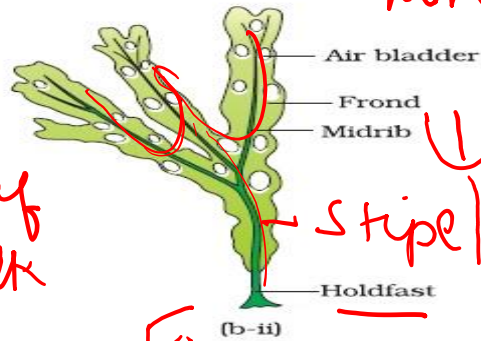
Chlamydomonas

Chara

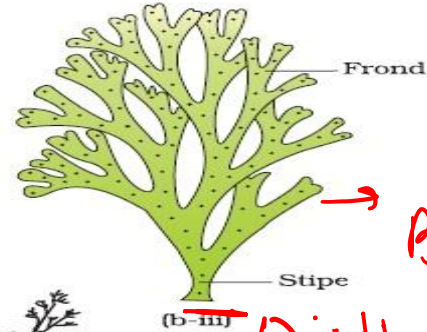


Laminaria

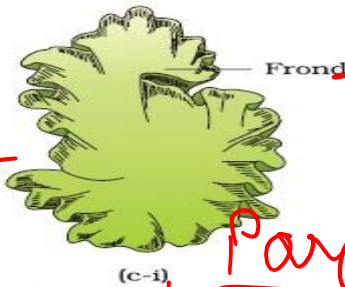
leaf stalk



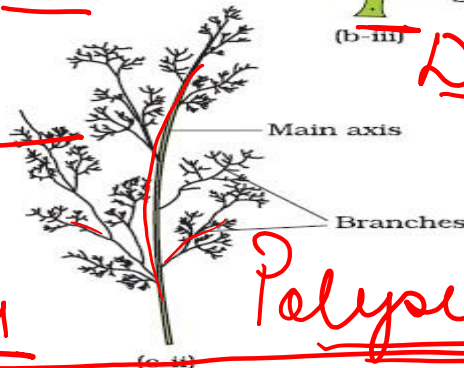
Fucus



Dictyota



Porphyra



Polysiphonia

Figure 3.1 Algae :

- (a) Green algae (i) Volvox (ii) Chlamydomonas (iii) Chara
(b) Brown algae (i) Laminaria (ii) Fucus (iii) Dictyota
(c) Red algae (i) Porphyra (ii) Polysiphonia

Reproduction in Algae I

Vegetative reproduction

Binary fission

- Cell is divided into two parts and nucleus is also divided into two parts by mitosis.
- e.g. Found only in unicellular algae

vegetative parts

no
nuclea
tion

Fragmentation

- Filaments break down into small pieces & form new filaments.
- e.g. All filamentous algae

common in Spiralgyra (Pond silk)
Pond

Asexual reproduction

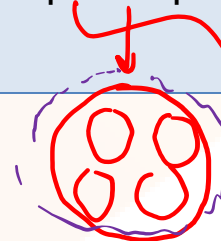
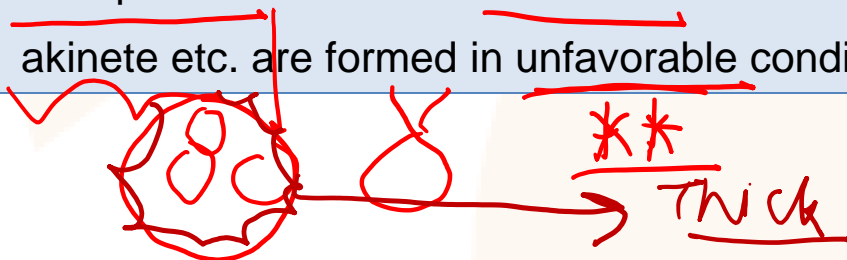
- Zoospores are formed in favorable conditions and Aplanospores, hyphospore and
akinetes etc. are formed in unfavorable condition

By asexual spores - Mitosis (Scum)

mobile, favourable

* Macronucleus

Non mobile
Thin wall
Thick, Red

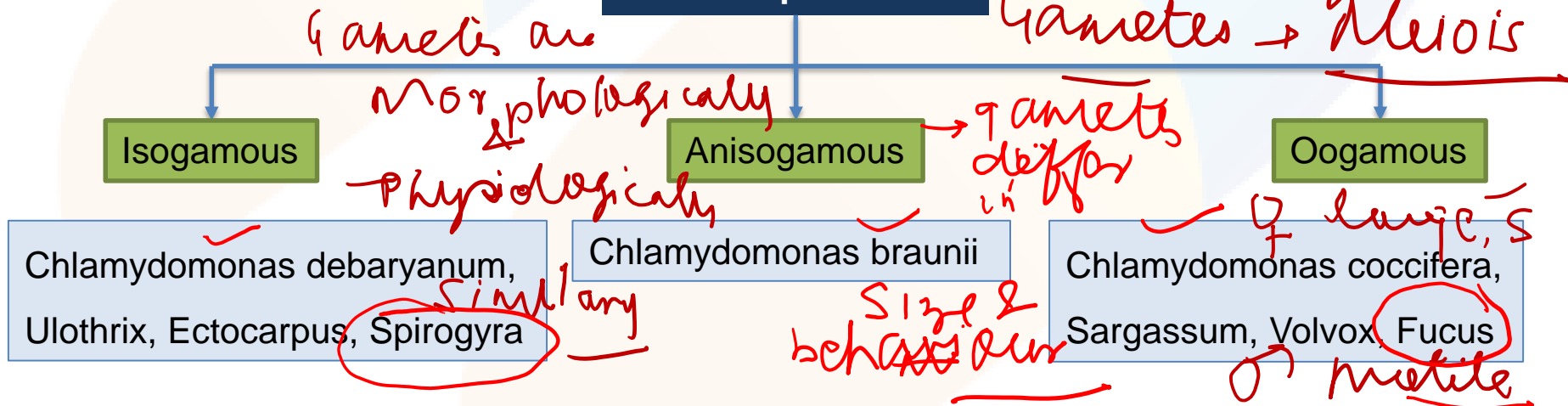


Reproduction in Algae II

Sexual reproduction

- The sex organs of algae are unicellular & jacketless.
- But exceptionally sex organs of green algae Chara (Chara - green algae - known as stone wort) are multicellular and Jacketed. * * Q N KKT
- The male sex organ of Chara is known as globule and female is known as nucule.
- Plant body of algae is haploid so sexual reproduction take place through zygotic meiosis i.e. first division in zygote is meiosis so embryo is not formed
- Sexual reproduction is of three types

Sexual reproduction



Chlorophyceae I (Green Algae)

Green Algae

- Green algae are the most advanced algae.
- It is believed that green algae are the ancestors of the higher plants.
- Habitat: Green algae are cosmopolitan in nature

Different forms of Green algae

1. Unicellular

- Chlamydomonas - Motile unicellular algae. This algae moves with the help of flagella.
- Chlorella - Non motile unicellular alga. ~~*~~
- Acetabularia - Umbrella plant - It is the largest unicellular plant with diameter 10 cm.

2. Colonial

- Some green algae are found in colonies. They form colony of cells. The number of cells in a colony is fixed. Colony with fixed number of cells called coenobium. **

- e.g. Volvox - Motile colony

fresh water mostly

↳ QNRKT

* NKKT Q

fine, Symmetrical

Chlorophyta II

3. Multicellular filamentous

- Mostly the green algae are multicellular and filamentous.
- e.g. Ulothrix - Known as pond wool Spirogyra - Known as pond silk

4. Multicellular thalloid or Parenchymatous

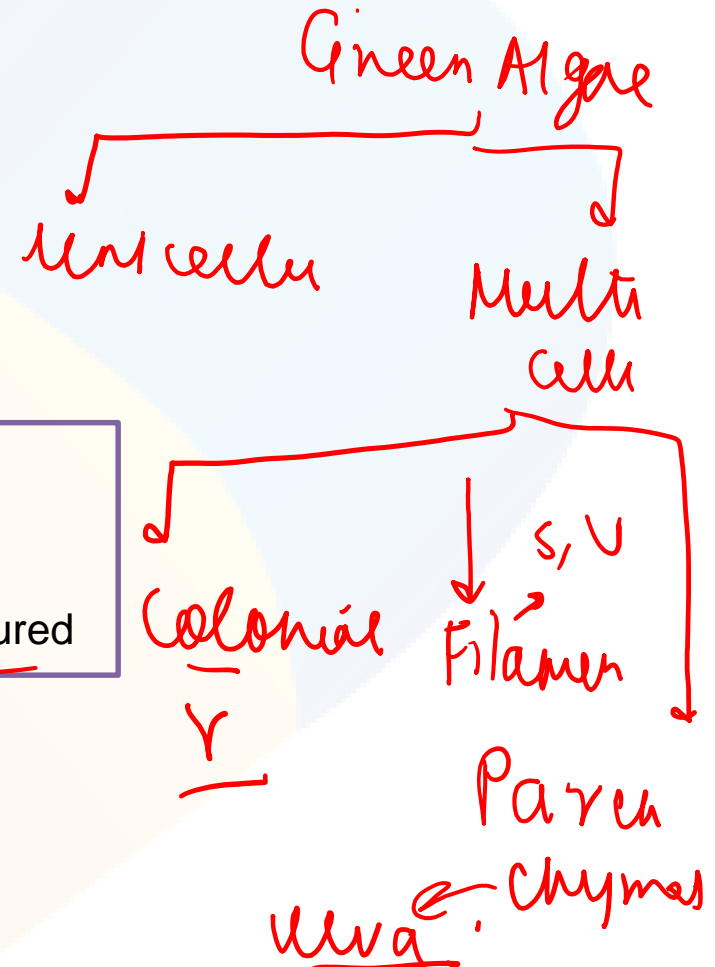
- Some algae are multicellular in length & width.
- e.g. Ulva - Also called as sea lettuce

Photosynthetic pigments

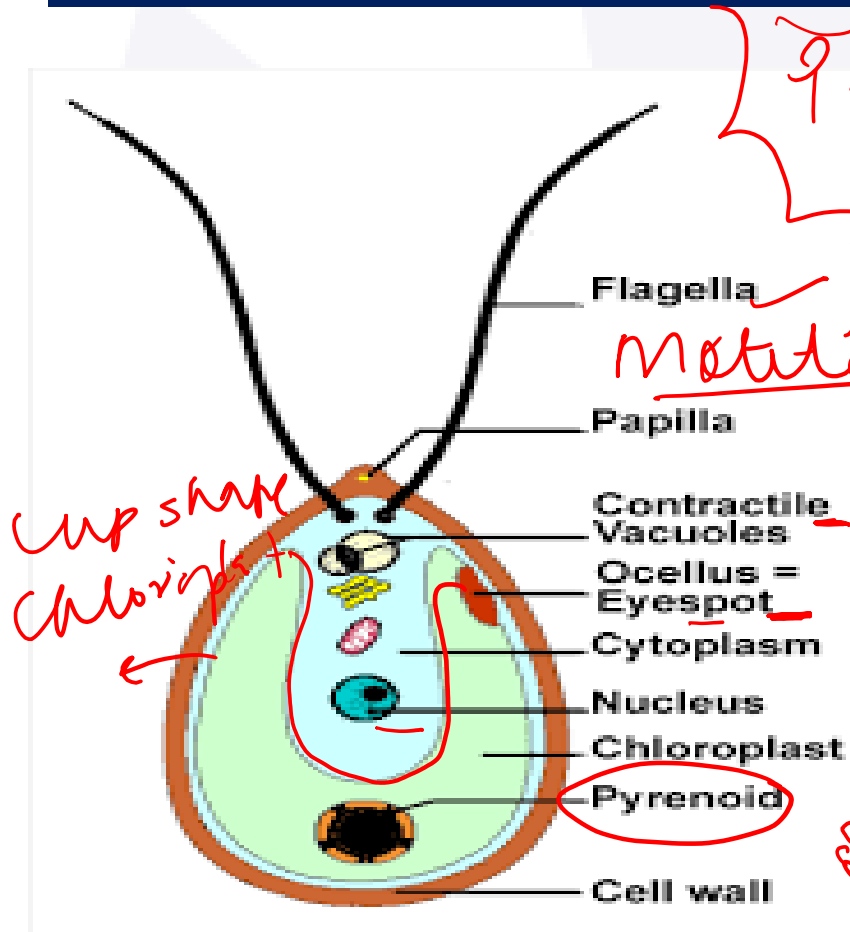
Chlorophyll - Chl 'a' and Chl 'b'

Carotene - b carotene

Xanthophyll - Luteaxanthin and Violoxanthin - Yellow coloured



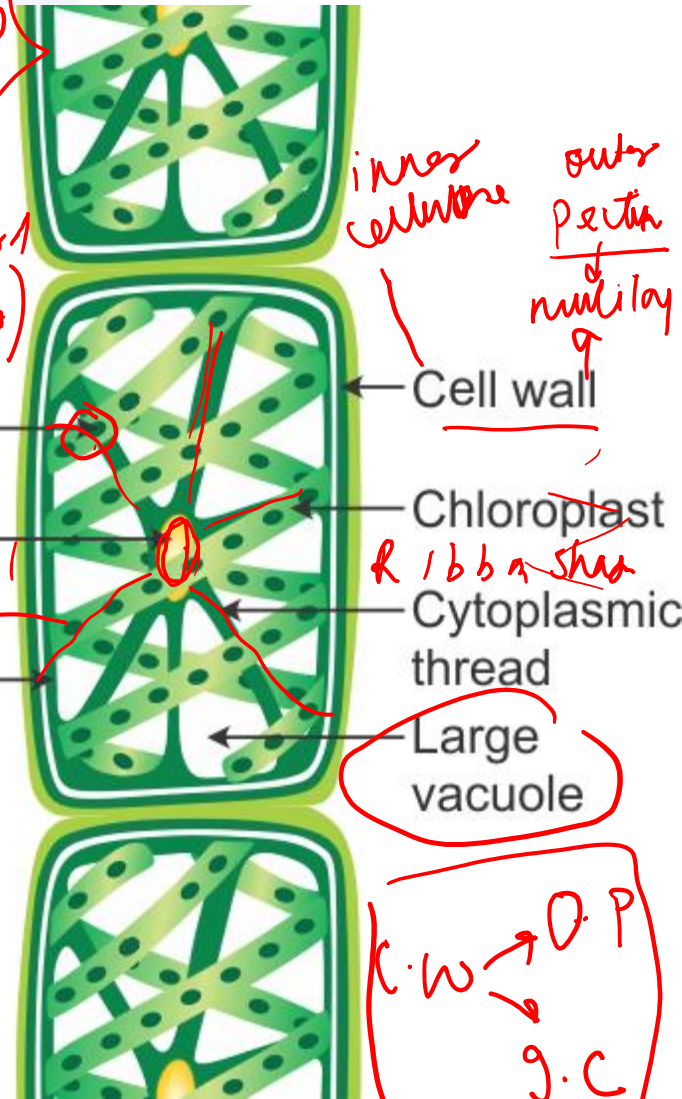
Green Algae



Prinordial utricle
peripheral cytoplasm

Pyrenoid
Nucleus
Cytoplasm

starch granules



Chlamydomonas

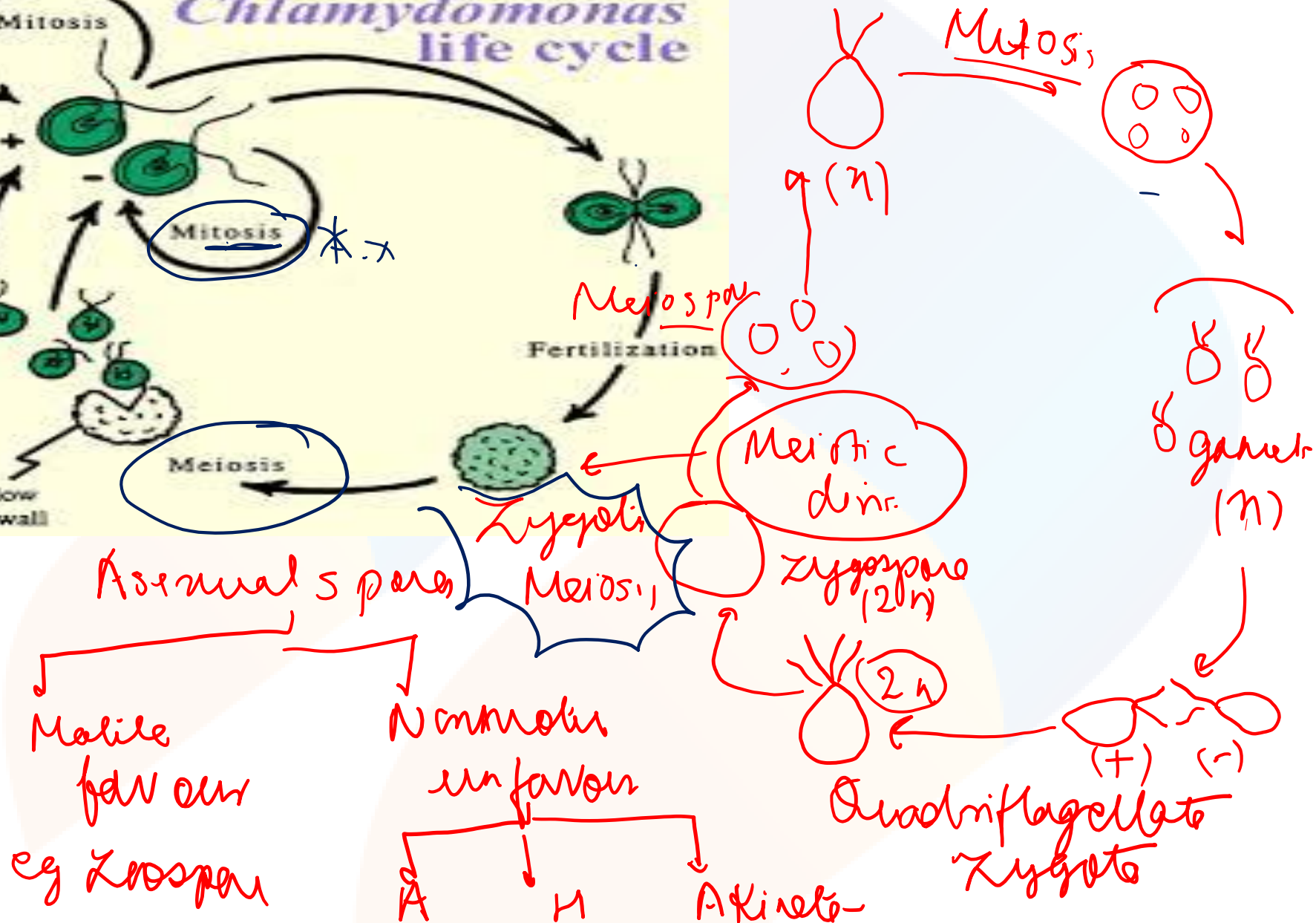
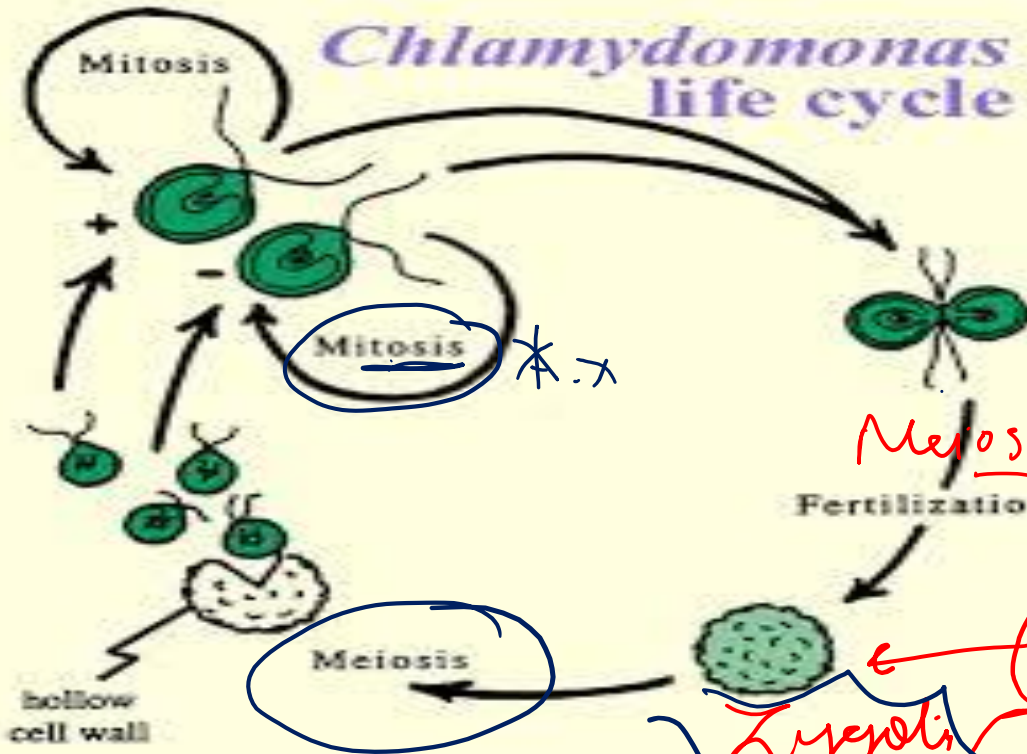
Ulothrix



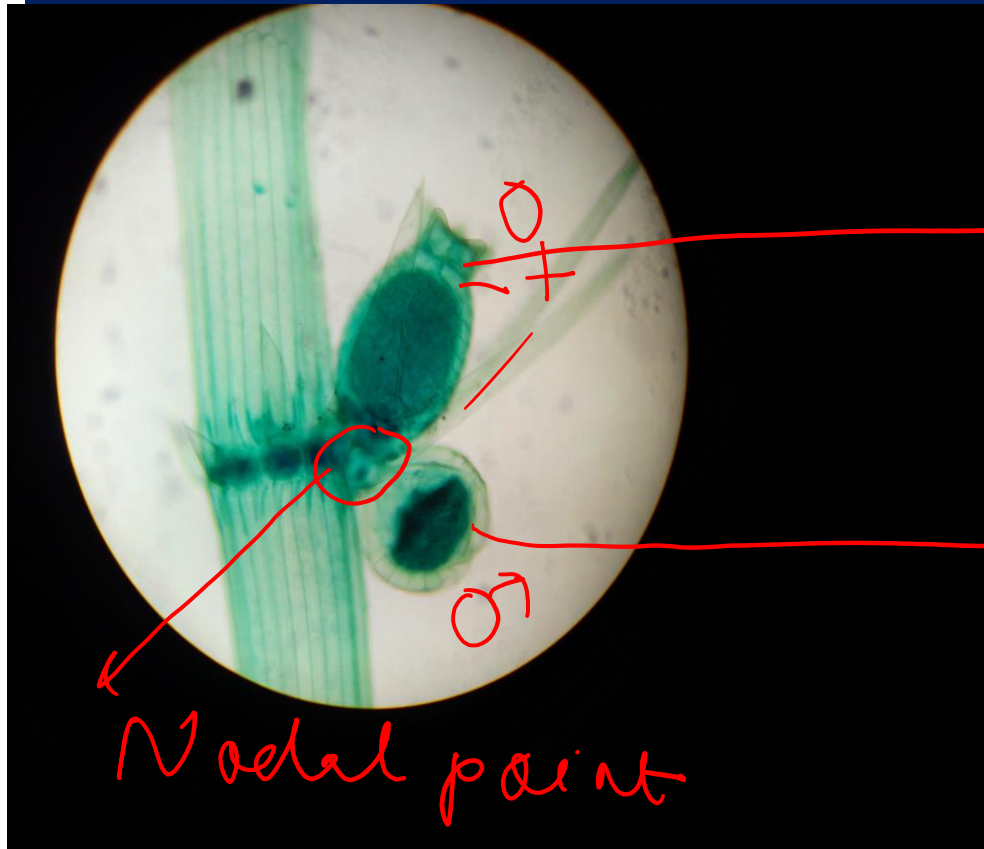
Spirogyra

K.W → O.P
g.c

Life cycle of Chlamydomonas



GREEN ALGAE



Nucule
female part
↳ Archegonium
Gloekule → ♂
↓
Antheridial
filaments

Chara - Reproductive
Organs

ECONOMIC IMPORTANCE OF GREEN ALGAE

Food

- Chlorella is used as food, because after Spirulina, Chlorella has largest amount of protein

Antibiotics

- Chlorellin antibiotic is obtained from Chlorella

Space research

- In space, Chlorella is used as a source of food and O₂ by space travelers

Parasitic algae

- Cephaleuros algae remains parasitically in the leaves of tea plant and causes disease 'red rust'

Red Rust of Tea is caused by Cephaleuros

→ BGA

Phaeophyta I

Brown algae or Sea weeds

popularly called 'Kelps'

- Brown algae are multicellular filamentous found in marine water.
- Brown algae are the largest in size (upto 100 meter in length).
- Largest brown algae – Macrocystis
- The vegetative cells have a cellulosic wall usually covered on the outside by a gelatinous coating of algin. inside inner
- Thallus of brown algae is divided into three parts

Laminaria
Sargassum
(Sargasso sea)

Algin } Fucoxanthin
cellulose } Laminarin

Thallus of brown algae

Lamina

(Frond)

Stipe

Stalk

Hold fast

Basal part

Pigments

Chlorophyll - Chl 'a', Chl 'c'

Carotene - Only b carotene

Xanthophylls - Mainly Fucoxanthin *