

PLANT KINGDOM - L3



BOTANY

PANKHURI MA'AM



ANTHE

AAKASH NATIONAL TALENT HUNT EXAM

— **Your Gateway To Success** —

For Class VII to XII

Current Students & Passouts

12TH CLASS | TUESDAY, THURSDAY
11TH CLASS | MONDAY, WEDNESDAY, FRIDAY

3 PM | 4 PM | 5 PM | 6 PM



VIVEK SIR

CHEMISTRY | 3:00 PM



ANUSHRI MA'AM

PHYSICS | 4:00 PM



SACHIN SIR

ZOOLOGY | 5:00 PM



PANKHURI MA'AM

BOTANY | 5:00, 6:00 PM



PUSHPENDU SIR

ZOOLOGY | 6:00 PM

FREE FOR 14 DAYS!







Recall: Classification of Algae



Based on the **colour** and the **pigments**

Rhodophyceae

Red algae
(Chlorophyll d,
Phycoerythrin)

Phaeophyceae

Brown algae
(Chlorophyll c,
Fucoxanthin)

Chlorophyceae

Green algae
(Chlorophyll b)

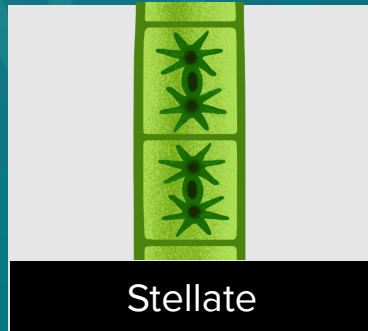
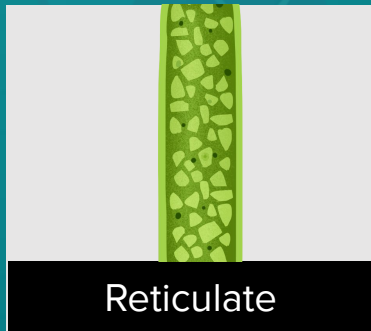
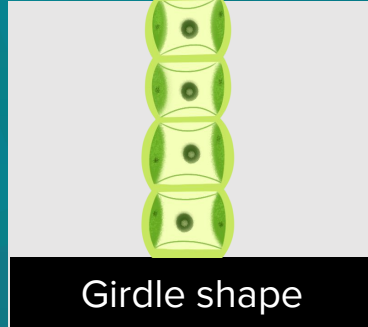
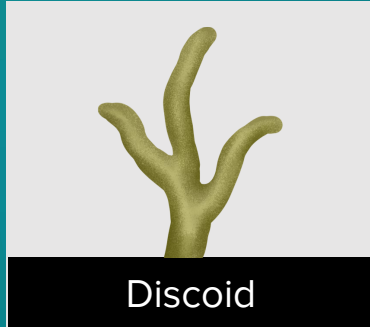
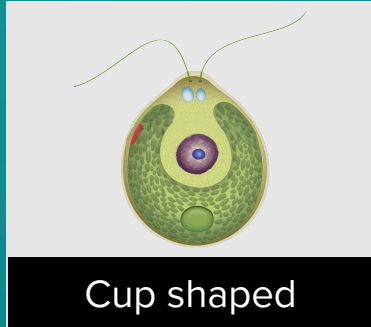
Chlorophyll a is common to all three groups.



Chlorophyceae: Green Algae



Chloroplast diversity





Chlorophyceae: Green Algae



Pigments that make the algae green

Chlorophyll
'a'

Chlorophyll
'b'

Beta
Carotene

Xanthophyll



Chlorophyceae: Green Algae



Reproduction

Asexual

Binary
fission

Fragmentation

Spore
formation

Sexual

Isogamy

Anisogamy

Oogamy



Chlorophyceae: Green Algae



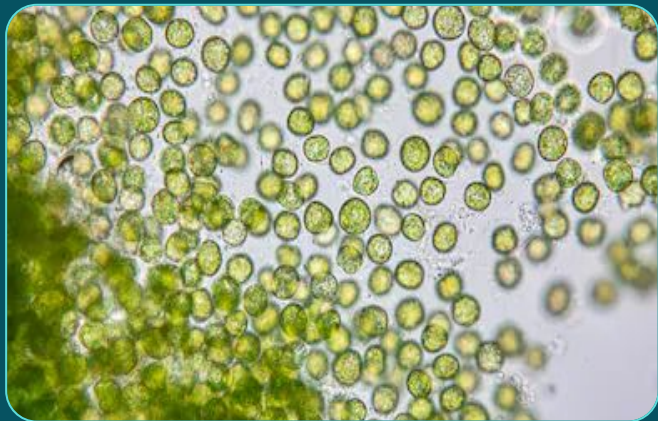
Alternation of generations

- **Haplontic** life cycle
- No exceptions



Algae in space missions!

Chlorella



A vibrant, stylized illustration of a garden scene. In the center is a large, weathered wooden sign with a horizontal grain. The sign is surrounded by various plants and flowers. To the left, a vine with green leaves and small blue flowers climbs over the top left corner. To the right, a large purple flower with five petals and a yellow center is prominent, along with several yellow flowers. In the bottom right corner, a blue butterfly with white spots is perched on a white daisy. Other flowers include pink ones, orange ones, and a red anemone. The background is a soft, light blue sky with a few small orange butterflies. In the top right corner, there is a small purple square icon with a white circle containing a person silhouette and a white letter 'B' next to it.

Phaeophyceae: Brown Algae



Phaeophyceae: Brown Algae



- **Habitat:** Predominantly marine
- Show great variation in size and form
 - Simple branched, filamentous forms (Eg: *Ectocarpus*)
 - Profusely branched forms: Represented by kelps



Phaeophyceae: Brown Algae

- Pigments present

**Chlorophyll
'a'**

**Chlorophyll
'c'**

Fucoxanthin

A type of xanthophyll
pigment responsible
for the brown colour

Carotenoids



Phaeophyceae: Brown Algae

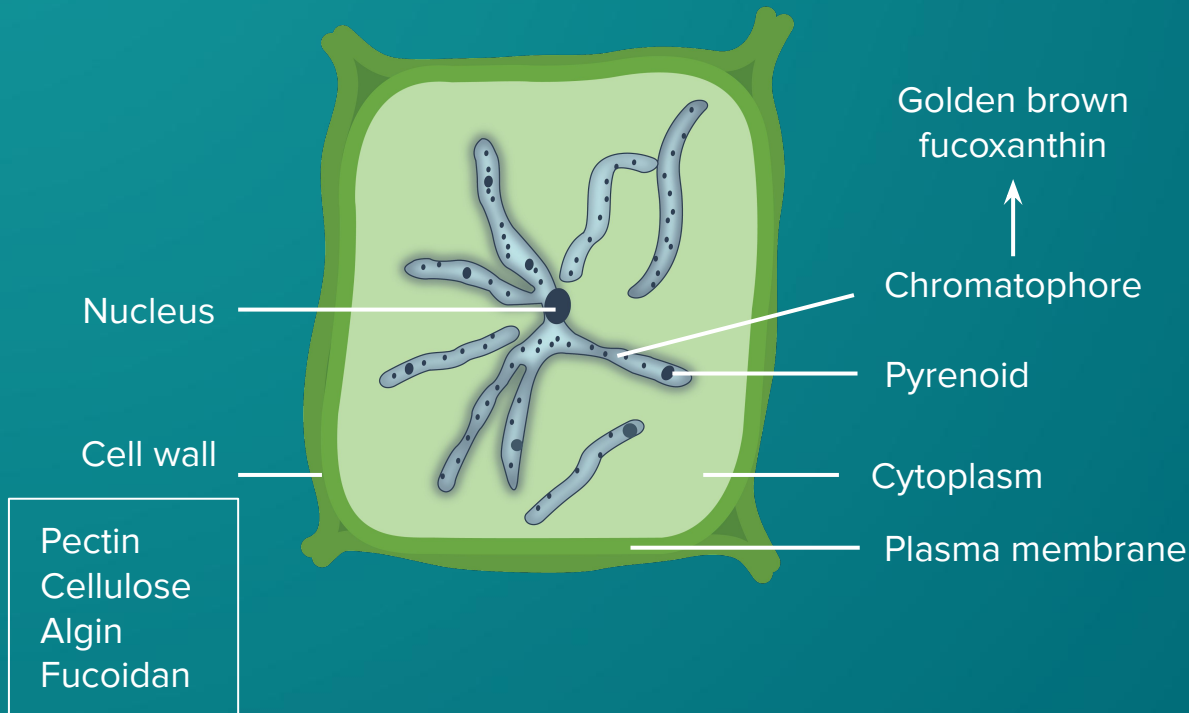
Food storage

- In form of **complex carbohydrates**
 - Mannitol
 - Laminarin



Phaeophyceae: Brown Algae

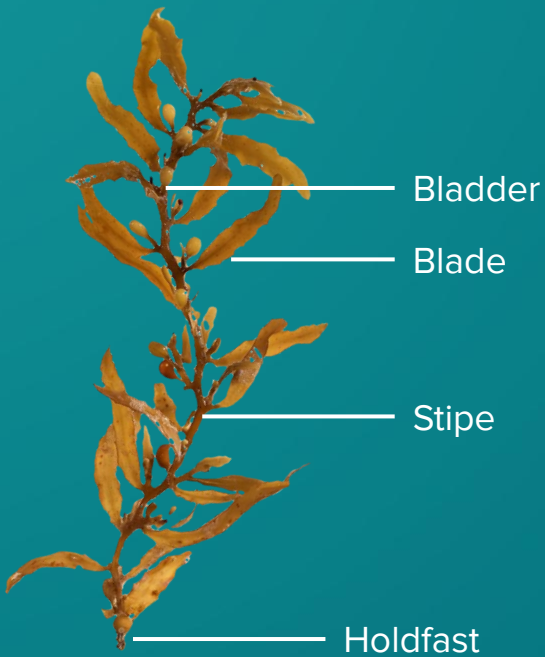
- **Cell wall: Algin-fucoidan** outer coat
- Protoplast contains, in addition to plastids, a centrally located vacuole and nucleus





Phaeophyceae: Brown Algae

Structure of brown algae





Phaeophyceae: Brown Algae

Ectocarpus

- Produces hydrocolloids
 - **Algin**
 - **Fucoidan**
- Used in manufacture of:
 - Beer
 - Toothpaste
 - Paint
 - Soaps
 - Medicine





Phaeophyceae: Brown Algae

Dictyota

- Produces **diterpene compounds**: Used in pharmaceutical industries





Phaeophyceae: Brown Algae

Laminaria

- Rich source of **iodine**





Phaeophyceae: Brown Algae

Sargassum

- Important **habitat** for fish
- Used as a **natural fertilizer**





Phaeophyceae: Brown Algae

Fucus

- Source of **alginate** and **iodine**

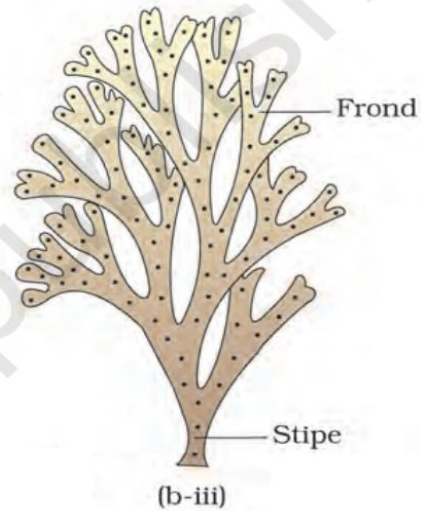
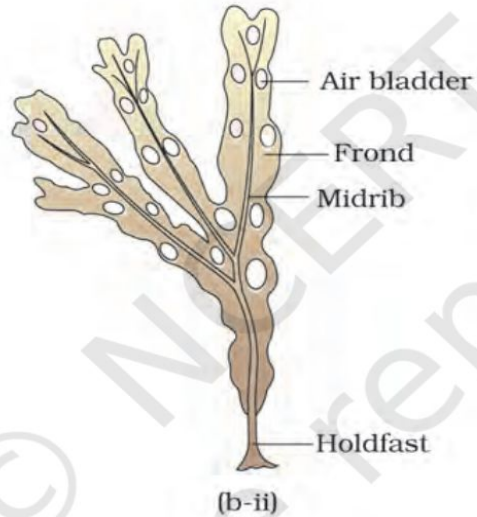
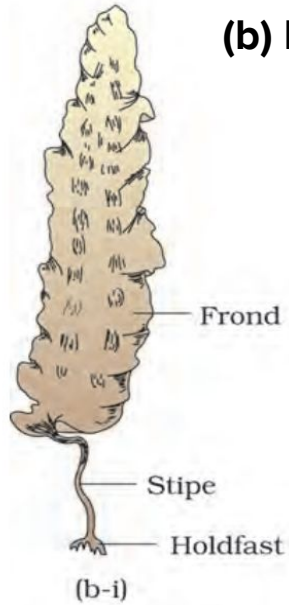




Phaeophyceae: Brown Algae



(b) Brown algae (i) Laminaria (ii) Fucus (iii) Dictyota





Phaeophyceae: Brown Algae



Vegetative reproduction

- By fragmentation

Asexual reproduction

- By biflagellate zoospores that are pear-shaped and have two unequal laterally attached flagella



Phaeophyceae: Brown Algae

Sexual reproduction

- May be isogamous, anisogamous or oogamous
- Union of gametes may take place in water or within the oogonium
- The gametes are pyriform (pear-shaped) and bear two laterally attached flagella



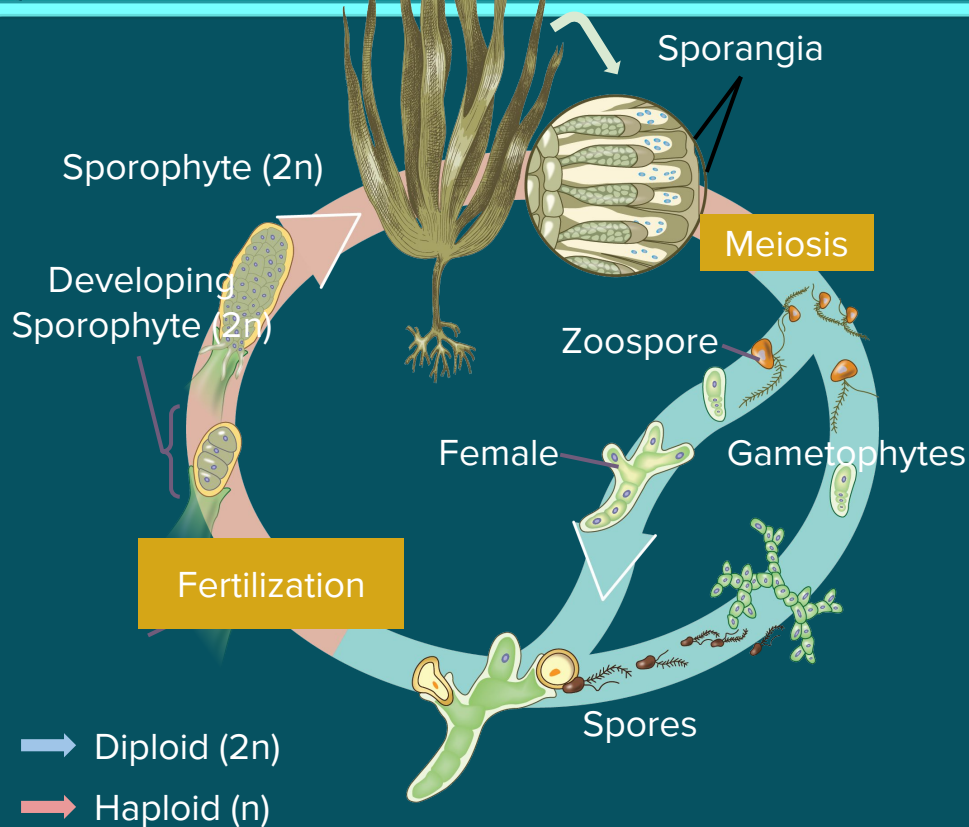
Phaeophyceae: Brown Algae

Alternation of generations

- **Haplontic** life cycle
- Exceptions are
 - **Fucus: Diplontic** life cycle
 - **Ectocarpus and Kelp: Haplo-diplontic** life cycle



Phaeophyceae: Brown Algae



**Alternation of generations:
Haplontic life cycle**



Summary

Habitat

Found in marine habitats

Cell wall

Cellulose and algin

Pigments present

Chlorophyll a & c, carotenoids, **xanthophylls (Fucoxanthin)**

Food stored

Complex carbohydrates: Mannitol and laminarin

Members

Ectocarpus, Laminaria, Fucus, Sargassum, Dictyota

Reproduction

- a) Vegetatively by **fragmentation**
- b) Asexually by **biflagellate zoospores**
- c) Sexual reproduction may be **isogamous**, **anisogamous** or **oogamous**

Alternation of generations

- **Haplontic** life cycle
Exceptions are
- **Fucus** - **Diplontic** life cycle
- **Ectocarpus** and **Kelp** - **Haplo-diplontic** life cycle



**Keep
Learning!**