YAKEEN NEET 2.0

2026

Biological Classification

Botany | Lecture - 03

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Topics to be covered

1. PROTISTA
2.
3.
4.

HOMEWORK (EXTRA POINT).

FILAMENTOUS BGA ↑

Spirullina:
Richest source of protein/
space-food/
single cell protein

Anabaena present in Leaves of Azolla (pteridophyte)
Symbiotic,
Rice production
N_2 Fixtn.

$CO_2 + H_2O \rightarrow glucose + O_2$ ✓
Oxygenic photosynthesis

Extra point

Nostoc
Anabaena → But also Symbiotic
↓
Aerobic, Freeliving, Autotrophs

Oscillatoria
Aulosira
↓
N_2 Fixtn, Free living
RICE PRODUCTION

Red sea: Red colour
Trichodesmium (Pigment)
↓
more growth (BGA

Eubacteria: BACTERIA,
BLUE GREEN ALGAE.

घर पर लिखना है!

Red Tide (a) (Dinoflagellate)

Red sea (BGA).

(b) Red sea (BGA)
(RED COLOUR)

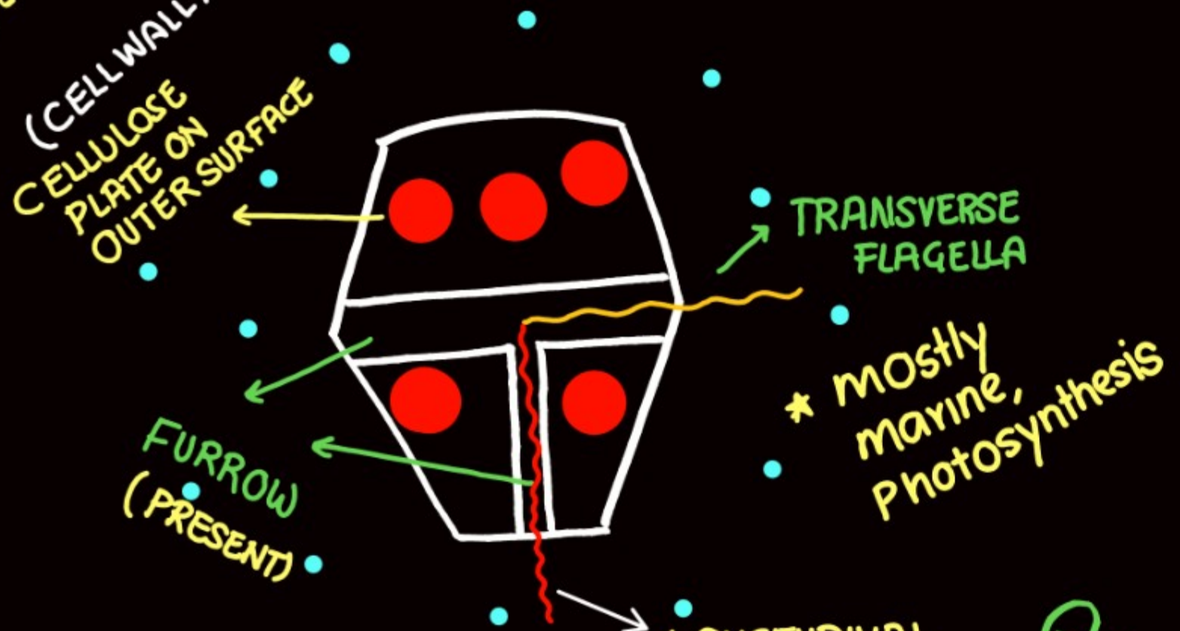
PROTISTA

- UNICELLULAR EUKARYOTES
- mainly aquatic
- membrane Bound organelle
  well defined nucleus ✓
- FLagella, cilia in some
- Asexual ✓
- Sexual (gamete/cell Fusion, zygote Formation)
- Plant: Photosynthesis (DIATOM)
  Animal: Cell wall ✗ (PROTOZOA)
  Fungi: Fruiting Body (SLIME MOULD)
- BOUNDARY: NOT WELL DEFINED

PLANTS ↔ PHOTOSYNTHETIC PROTISTA.

- DINOFLAGELLATE
- Chrysophytes
- Euglenoids
- Slime mould
- Protozoa

DINOFLAGELLATES



* mostly marine, Photosynthesis

Active movement.

* RED/GREEN/BLUE/YELLOW: DEPEND UPON PIGMENT
* Eg: GONYAULAX

FAST MULTIPLICATION (REPRODUCTION) → MORE IN NO. (PIGMENT) → PLACE → REDTIDE

SAXITOXIN → MOLLUSCA, FISH → CONSUMED BY HUMAN → PARALYSIS

CHRYSOPHYTES

- FRESH H_2O, MARINE
- INCLUDES: DIATOMS, DESMID (GOLDEN ALGAE)

UPPER: EPITHECA

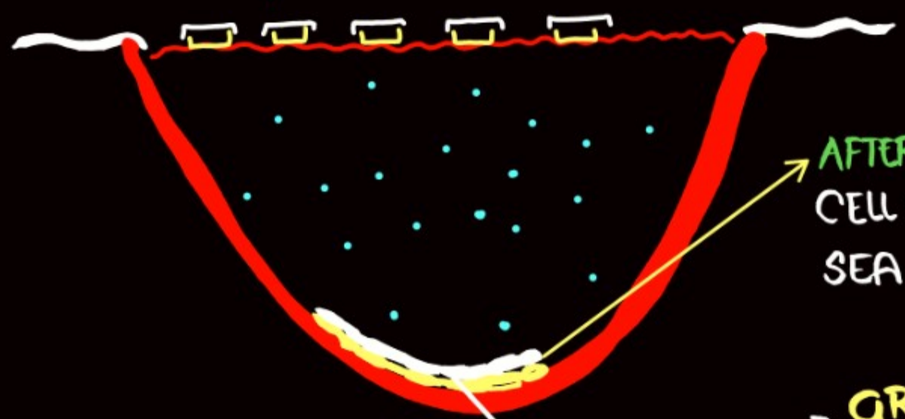
LOWER: HYPOTHECA

CELL WALL

- DIVIDE INTO TWO PARTS
- SOAP BOX
- OVERLAPPING
- THIN, SILICA
- INDESTRUCTIBLE (NOT ABLE TO DAMAGE)
- FLAGELLA ABSENT.
- MAIN PRODUCER IN OCEAN. (PHOTOSYNTHESIS)

DIATOM FLOAT/ MOVE (HELP: H_2O CURRENT) → PASSIVE MOVEMENT

PLANKTONS (ORGANISM)



AFTER DEATH
CELL WALL DEPOSIT AT BOTTOM OF SEA (BILLIONS OF YEARS)

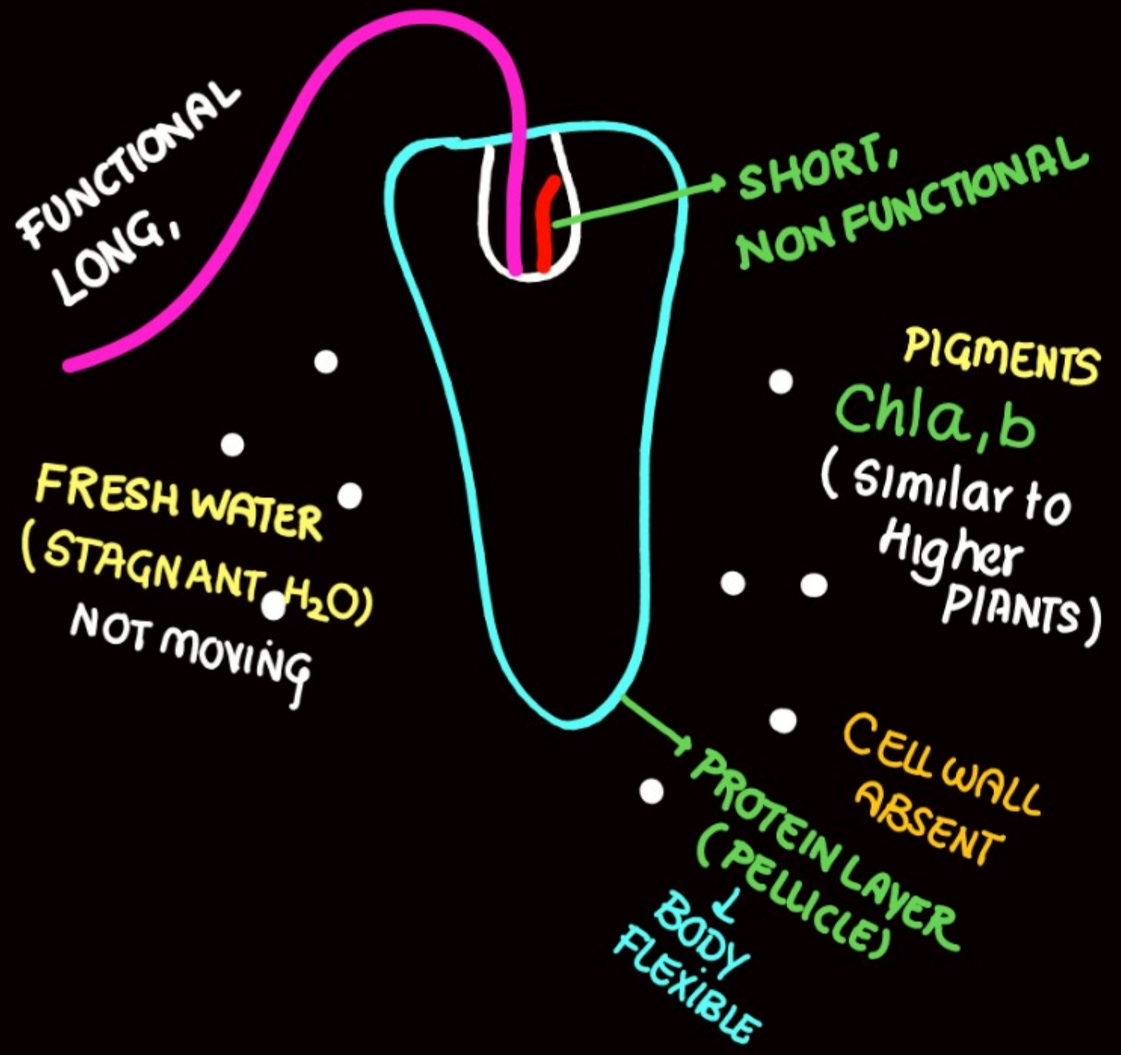
DIATOMACEOUS EARTH/ DIATOMITE (indestructible) silica cellwall

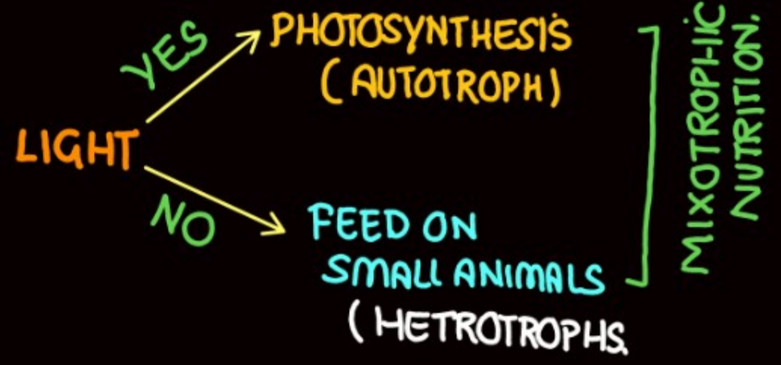
GRITTY / HARD

STONE POLISHING.

filteration of oil, syrups.

EUGLENOIDS → INCLUDES EUGLENA.





SLIME MOULD

ACELLULAR SLIME MOULD

- FEED: DECAY LEAVES, TWIG (CELLULOSE)
- SAPROPHYTIC

GROW & SPREAD SEVERAL FEET

NUCLEUS

CYTOPLASM

CELL MEMBRANE

MULTINUCLEATED WALLESS PROTOPLASM

DIPLOID (animal character)

(PLASMODIUM) favourable CONDITION.

MAIN BODY.

UNFAVOURABLE CONDITION

(PLASMODIUM TRANSFORM INTO FRUITING BODY.

(TIP) → SPORANGIA

→ STALK.

Fruiting Body (FUNGI CHARACTER)

(2N)

MULTINUCLEATED PROTOPLASM UNDERGOES MEIOSIS

(HAPLOID) SPORES FORMED

SPORE RELEASE FROM SPORANGIA

SPORE COVERED BY TRUE CELLULOSIC WALL (PLANT CHARACTER)

① AIR CURRENT DISPERSED (MOVE)

② SURVIVE IN ADVERSE/ UNFAVOURBLE CONDITION

③ HIGHLY RESISTANT

① Plasmodium ✗.

② PLASMODIUM. ✓ (Body)

∴

2.2 KINGDOM PROTISTA

All single-celled eukaryotes are placed under **Protista**, but the boundaries of this kingdom are not well defined. What may be 'a photosynthetic protistan' to one biologist may be 'a plant' to another. In this book we include Chrysophytes, Dinoflagellates, Euglenoids, Slime moulds and Protozoans under Protista. Members of Protista are primarily aquatic.

This kingdom forms a link with the others dealing with plants, animals and fungi. Being eukaryotes, the protistan cell body contains a well defined nucleus and other membrane-bound organelles. Some have flagella or cilia. Protists reproduce asexually and sexually by a process involving cell fusion and zygote formation.

2.2.1 Chrysophytes

This group includes diatoms and golden algae (desmids). They are found in fresh water as well as in marine environments. They are microscopic and float passively in water currents (plankton). Most of them are photosynthetic. In diatoms the cell walls form two thin overlapping shells, which fit together as in a soap box.

The walls are embedded with silica and thus the walls are indestructible. Thus, diatoms have left behind large amount of cell wall deposits in their habitat; this accumulation over billions of years is referred to as 'diatomaceous earth'. Being gritty this soil is used in polishing, filtration of oils and syrups. Diatoms are the chief 'producers' in the oceans.

2.2.2 Dinoflagellates

These organisms are mostly marine and photosynthetic. They appear yellow, green, brown, blue or red depending on the main pigments present in their cells. The cell wall has stiff cellulose plates on the outer surface. Most of them have two flagella; one lies longitudinally and the other transversely in a furrow between the wall plates.

HARD.

Cellulosic.

Very often, red dinoflagellates (Example: *Gonyaulax)* undergo such rapid multiplication that they make the sea appear red (red tides). Toxins released by such large numbers may even kill other marine animals such as fishes.

2.2.3 Euglenoids

Majority of them are fresh water organisms found in stagnant water. Instead of a cell wall, they have a protein rich layer called pellicle which makes their body flexible. They have two flagella, a short and a long one. Though they are photosynthetic in the presence of sunlight, when deprived of sunlight they behave like heterotrophs by predating on other smaller organisms. Interestingly, the pigments of euglenoids are identical to those present in higher plants. Example: *Euglena* (Figure 2.4b).

2.2.4 Slime Moulds

Slime moulds are saprophytic protists. The body moves along decaying twigs and leaves engulfing organic material. Under suitable conditions, they form an aggregation called plasmodium which may grow and spread over several feet. During unfavourable conditions, the plasmodium differentiates and forms fruiting bodies bearing spores at their tips. The spores possess true walls. They are extremely resistant and survive for many years, even under adverse conditions. The spores are dispersed by air currents.

Fav

(Cellulose lignin)

cellulose.

SPORANGIA (TIP)

① Correct (Protista)

A. All single cell eukaryotes
B. only photosynthetic organism
C. boundary is not well defined
D. members mainly terrestrial
E. Protozoa also included
F. well defined nucleus not absent
G. All have flagella or cilia
H. asexual reproduction involve cell fusion and zygote formation

(A) 1 (B) 2 (C) 3 (D) 4

②

Chrysophytes

(A) Included diatom only
(B) microscopic float actively in water
(C) mostly photosynthetic
(D) cell wall form two thick overlapping shell

③ Diatom

(A) cell wall destructible like soap box
(B) silica wall absent
(C) cell wall deposit form diatomaceous earth
(D) being gritty so not used in polishing, filtration of soil, syrups
(E) chief producer in ocean
(F) (C) & (E) are correct

Dinoflagellates

(A) mostly freshwater, photosynthetic — marine
(B) appear yellow green red blue brown
(C) stiff cellulosic plates on inner surface — outer
(D) one flagella present — 2

Dinoflagellates

(A) longitudinal & transverse flagella in furrow absent

(B) gonyaulax multiply slow : red tide

(C) toxin release by gonyaulax kill marine animal such as fishes

(D) None

Euglenoid

(A) majority marine

(B) running water

(C) protein layer pellicle not flexible

(D) two long flagella

(E) all are incorrect

Correct

(A) In light photosynthetic

(B) predating small organisms if no light

(C) pigments similar to higher plant

(D) All are correct

Slime mould

(A) photosynthetic protist

(B) body engulf organic material

(C) form plasmodium during unfavourable condition grow and spread several feet

(D) plasmodium differentiate into fruiting body in favourable conditions

unf.

Slime mould (incorrect)

(A) spore at tip

(B) spore : true cell wall

(C) spore : resistant & survive for many years

(D) dispersed by water

air

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PROTISTA

NCERT BASED

EXCEPT PROTOZOA

THANK YOU