ATOMIC ENERGY CENTRAL SCHOOL, INDORE

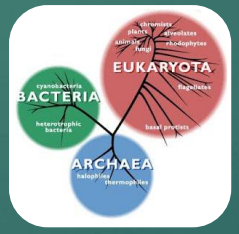
CLASS XI

BIOLOGY

UNIT 1

CHAPTER 2

MODULE 3 / 4



BIOLOGICAL CLASSIFICATION

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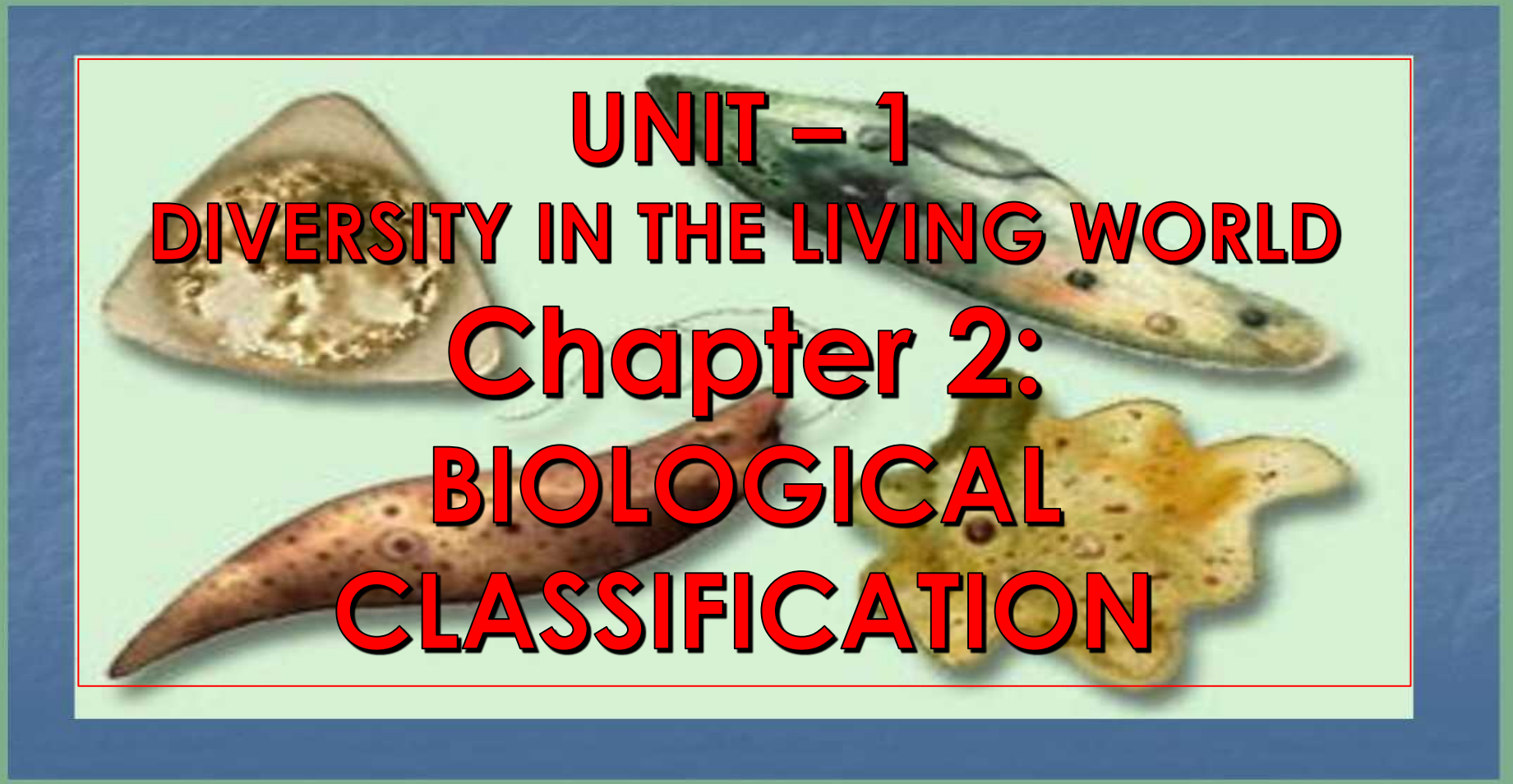
- PGT(SS) - BIOLOGY
- **ATOMIC ENERGY CENTRAL SCHOOL, INDORE**

Kingdom protista



UNIT – 1
DIVERSITY IN THE LIVING WORLD
Chapter 2:
BIOLOGICAL CLASSIFICATION

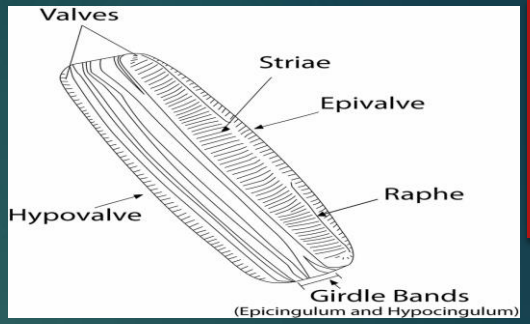
2.2 KINGDOM PROTISTA

(Kingdom of Unicellular eukaryotes):

Kingdom—Protista includes all single-celled eukaryotes but, the boundaries of this kingdom are not well defined. It was first proposed by Ernst Haeckel (1866).

- (a) The members are unicellular and colonial eukaryotes.
- (b) Most of them are aquatic and constitute plankton.
- (c) Their eukaryotic cell body contains membrane bounded cell organelles like nucleus, mitochondria, endoplasmic reticulum and Golgi complex etc.
- (d) They may have cilia or flagella for their movements which show 9 + 2 arrangements of microtubules.
- (e) On the basis of nutrition, the protists are grouped as: (a) Photosynthetic protists (protistan algae) like diatoms, dinoflagellates and euglenoids. They are known as phytoplankton's. (b) Consumer- decomposer protists (slime moulds) and (c) Predator protists (Protozoans).
- (f) Both asexual and sexual modes of reproduction are present.
- **Physiologically kingdom-Protista acts as a connecting link between the kingdom-Monera and the complex multicellular kingdom-Fungi, Plantae and Animalia.**

2.2.1 Chrysophytes



- This group includes diatoms and golden algae (desmids).
- **i. Diatoms**
- **(a) Diatoms occur in all aquatic and moist terrestrial habitats and are also known as chief producer in the ocean.**
- **(b) They pile up at the bottom of water reservoirs and form big heaps called diatomaceous earth.**
- **(c) They are microscopic unicellular organisms of different shapes, such as circles, semicircles, triangular, spindle-shaped, boat-shaped, etc.**
- **(d) The body wall of the diatoms is made up of cellulose impregnated with glass like silica. The cell wall has two overlapping halves like a soapbox called shell, a lid and a lower half fitted together.**
- **(e) Food is reserved in the form of oils and leucosin (polysaccharide).**
- **(f) The diatoms mostly reproduce asexually by binary fission. Sexual reproduction varies from isogamy to oogamy.**
- Examples Navicula, Amphipleura , Triceratium and Cymbella.

2.2.2 DINOFLAGELLATES

These are mainly marine and photosynthetic organism. There are about 1,000 species of photosynthetic protists.

- (i) These are important **phytoplanktons.** Most of them are marine but some occur in freshwater.
- (ii) They appear yellow, green, brown, blue or red depending on the main pigments present.
- (iii) The cell wall in dinoflagellates, if present is composed of number of plates made up of cellulose.
- (iv) Some dinoflagellates like **Gonyautax** and **Gymnodinium** grow in large number in sea and make the water look red and form 'red tide'.
- (v) Toxins released by such large numbers may even kill other aquatic animals.
- (vi) **The cells usually possess two flagella which are of different types (heterokont). One flagellum is transverse arising from the anterior part. The other flagellum arises in the vertical furrow. Both these flagella beat in different directions.**
- (vii) The nucleus is bigger in size, named as **mesokaryon.** Chromosomes do not have histone and RNA.
- (viii) Dinoflagellates reproduce asexually through cell division or by the formation of zoospores and cysts.
- (ix) Reserve food is stored in the form of starch and oils.
- **e.g., Gonyaulax, Ceratium, Noctiluca, Peridinium and Gymnodinium, etc.**

2.2.3 **Euglenoids**

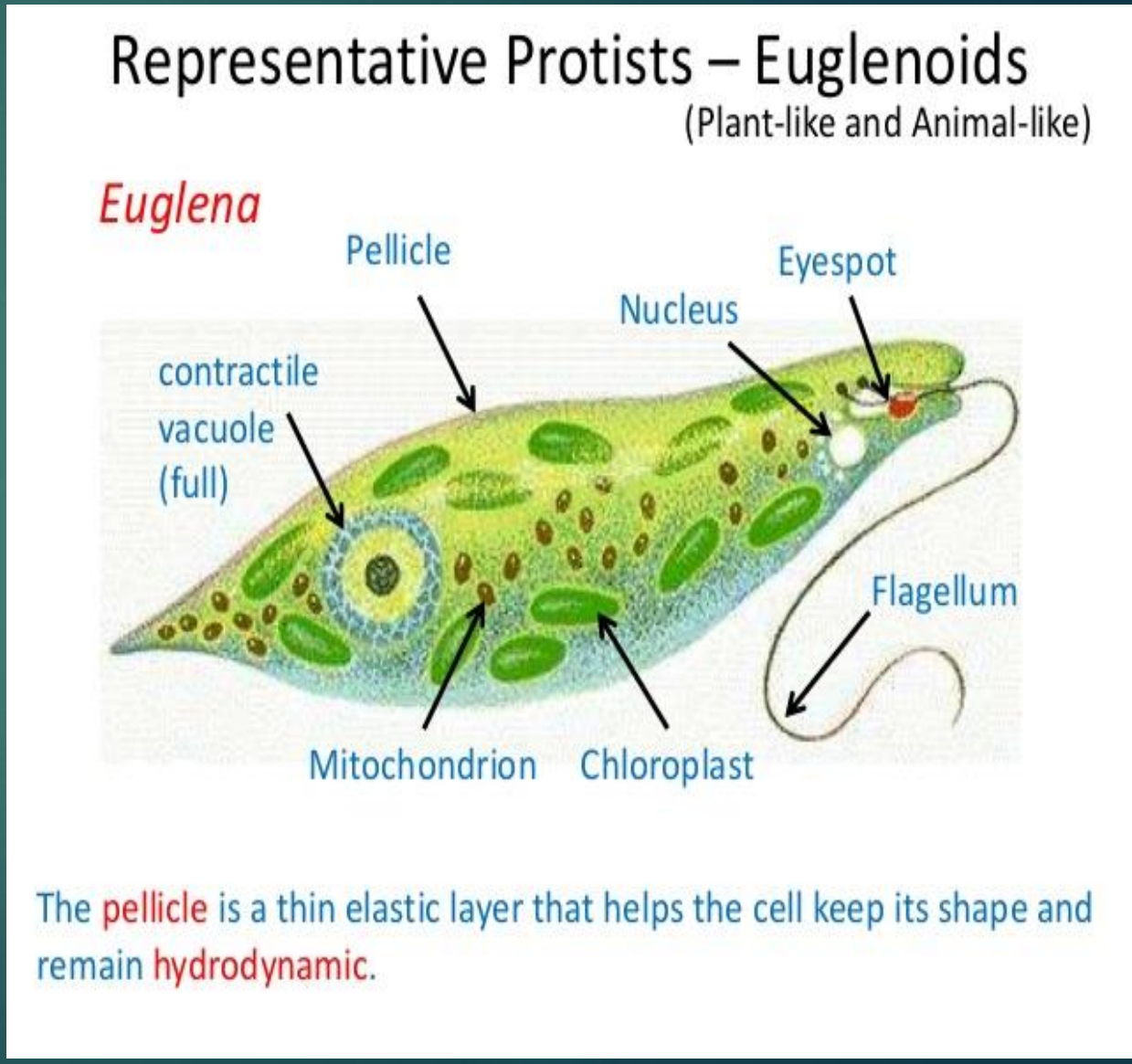
Euglenoids live in fresh aquatic habitats and damp soils.

- (i) They are unicellular flagellate protists.
- (ii) Body is covered by thin and flexible pellicle. It lacks cellulosic cell wall.
- (iii) Euglenoids have two flagella, usually one long and one short.
- (iv) They perform creeping movements by expansion and contraction of their body. This phenomenon is called metaboly.
- (v) Nutrition is holophytic, saprobic or holozoic. This mode of nutrition is called mixotrophic.
- (vi) The photosynthetic pigments include chlorophyll a and b.
- (vii) Euglenoids reproduce by longitudinal binary fission under favourable conditions. The palmella stage is found during unfavourable conditions.
- Examples Euglena, Perenema, Eutreptia, Phacus, etc.

2.2.3 **Euglenoids**

Euglenoids live in fresh aquatic habitats and damp soils.

- **Euglena is considered as plant as well as animal.**
- *** Plant Features Chloroplasts and chlorophyll are present has holophytic nutrition.**
- *** Animal Features Presence of pellicle which is not made of cellulose. Contractile vacuole is present. Longitudinal binary fission.**



2.2.4 Slime Moulds

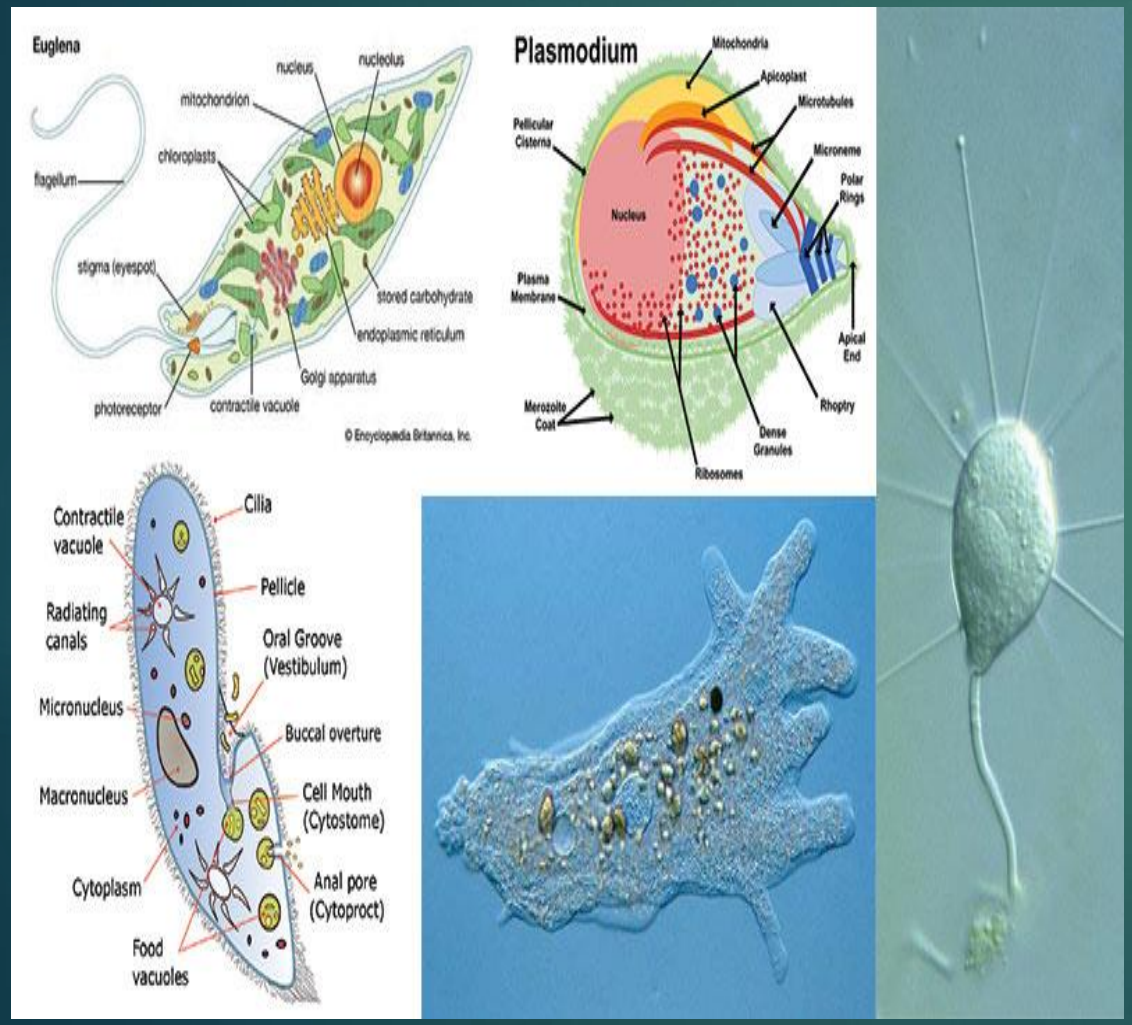
Slime moulds are saprophytic protists.

Anton De Bary (1887) related them to animals and called them as Mycetozoa.

- They share the common characters of both animals and are known as protistian fungi.
- Slime moulds are found creeping on debris, decaying leaves or twigs, in soil, on the forest floor, on tree canopies and moist, dark and cool conditions
- The protoplast is not surrounded by a cell wall in the vegetative phase
- They are saprophytic and lack chlorophyll. They feed on microorganisms such as bacteria, fungi and yeasts and decompose dead organic matter
- Some of the slime moulds are parasitic and found in the roots of cabbage and other plants of Brassicaceae family
- The plasmodial stage resembles protozoa and fruiting bodies form spores resembling fungi
- Spores have a cell wall made up of cellulose and are resistant to adverse conditions. They can survive for many years.

2.2.5. **Protozoan (Protists)**

Include unicellular protists with animal like behaviour.
They were first studied by Leeuwenhoek (1677).



- (i) They are microscopic small unicellular and colourless organism with different shapes.
- (ii) Locomotion occurs with the help of finger-like pseudopodia, flagella or hairy cilia.
- (iii) All protozoans are heterotrophs and live as predators or parasites.
- (iv) Respiration occurs through the general surface of the body.
- (v) Reproduction occurs by binary fission, multiple fission or budding. Sexual reproduction occurs by syngamy and conjugation.


BIOLOGICAL
CONVERGENT
SPECIMEN
TAXONOMY
HIERARCHY
FORESHADOWED
MAXIMUS
KINGDOM
SUBFAMILY
CLASSIFICATION
HIERARCHICAL
EVOLUTIONARY
ZOOLOGY
ANATOMISTS
SCHOLASTICS
SPECIES
METHOD
PUBLISH
BOTANY
CLASSIFICATION
DESCENT
GENERIC
INSECTIVORES
DATABASES
FRUCTIFICATION
PHYLUM
EPITHET
DIVISION
PLANT
SIMILARITY
HOMOLOGOUS

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