TOPIC: INTRODUCTION TO PROTOZOA:STRUCTURE AND LIFE OF PARAMOECIUM

LECTURE NO:02

B.SC PART 1

ZOOLOGY(HONS.)-PAPER I-GROUP A

CHAPTER 2

DATE: 25TH MARCH 2020

AUTHOR: DR.NIRMAL KUMARI

Classification of Protozoa

Phylum protozoan's are a larger and varied group and possess a number of problems in its classification. The conventional scheme followed by Hyman (1940), Hickman (1961) and Store (1965) etc. recognizes two subphyla on the basis of organs of locomotion and 5 classes , briefly outlined as follows:

Subphylum A. Plasmodroma

Locomotory organelles are flagella, pseudopodia, or none.

Nuclei of one kind.

Class-1-Mastigophora:

Move by one too many flagella. E.g. Euglena.

Class-2-Sarcodina:

Move and capture food by pseudopodia. E.g. Amoeba.

Class-3- Sporozoa

No locomotory organs.

All Parasitic. E.g. Plasmodim.

Subphylum B. Ciliophora

Cilia or sucking tentacles throughout or at certain stages.

Nuclei of 2 kinds.

Class-4-Ciliata

Move by cilia
E.g.
Parameciu
m

Class-5-Suctoria

Move by cilia as young stage and by tentacles as adult stage.

Eg. Podophyra.

The following classification of Protozoa is based on the scheme given by the committee on Taxonomy and Taxonomic Problems of the society of Protozoologists, and mainly proposed by B. M. Honigberg and others (1964).

Phylum Protozoa has been classified into four sub-phylum:-

Sub-phylum 1. Sarcomastigophora

Sub-phylum 2. Sporozoa

Sub-phylum 3. Cnidospora

Sub-phylum 4. Ciliophora

Sub-phylum1. Sarcomastigophora

Locomotors organelles pseudopodia or flagella or both.

Nucleus one or more and of the same kind.

Asexual reproduction by binary and multiple fission.

Superclass (A) - Mastigophora (Flagellata)

Simple, primitive and with firm pellic.

Locomotor organelles flagella.

Nutrition autotrophic or heterotrophic.

Class- 1. Phytomastigophora (Phytoflagellata)

Chlorophyll bearing chromatophores present.

Nutrition holophytic or photophytic.

Flagella 1 or 2 or many.

Order- 1. Chrysomonadida

Amoeboid forms without gullet but with stigma.

Flagella usually 1, sometimes 2 or 3.

Chromatophores 1 or 2, yellowish or brownish or yellowish green.

Starch absent but leucosin and fats may be present.

Siliceous cyst.

Marine or freshwater animals. Eg. *Chrysamoeba, Dinobryo*

Order- 2. Cryptomonadida

Anterior gullet reaches upto the middle of the body.

Flagella 2 and unequal.

Chromatophores 2, yellow, brown, colourless.

Reserve food starch.

Stigma present.

Marine or freshwater.

Eg. *Chilomonas, Crytomonas.*

Order- 3. Euglenida;

Anterior end with a gullet or cytophyarynx leading into a reservoir.

Flagella 1 or 2, and with mastigonemes.

Chromatophores numerous and green.

Mostly freshwater.

Eg. *Euglena, Peranema*.

Order- 4. Volvocida (Phytomonadida)

Small with rigid cellulose covering and no gullet.

Flagella usually 2, sometimes more.

Reserve foodstuff starch and oils.

Stigma present,

Mostly freshwater, some
from colonies. E.g.
Chlamydomonas, Volvox.

Order- 5. Chloromonadida

Dorso-ventrally flattened forms with delicate pellicle.

Flagella 2, sometimes 1 or more.

Chromatophores green and numerous, some colourless.

Reserve foodstuff oil.

No stigma.

Large
freshwater.
E.g.
Coelomonas
.

Order- 6. Dinoflagellida

Small and planktonic, naked and amoeboid or with a thick pellicle or theca.

Flagella two.

Chromatophores numerous, yellow or brown.

Reserve food starch or oil or both.

Stigma present; contractile vacuoles two.

Some are bioluminescent.

Largely marine.

E.g. Noctiluca, *Ceratium, Gymnodinium*.

Class-2. Zomastigophorea (Zooflagellata)

Chlorophyll or chromatophores absent.

Nutrition holozoic or saprozoic.

Parasitic, symbiotic or free living.

Reserve food glycogen.

Flagella one or many.

Order-1. Rhizomastigida

Small and amoeboid.

Flagella one or four.

Locomotion by flagella or pseudopodia.

Chiefly fresh water.

E.g. *Mastigamoeba, Dimorpha*.

Order-2. Kinetoplastida

Small and more or less amoeboid in form.

Flagella 1 or 2.

Holozoic or saprozoic nutrition.

Solitary or colonial.

Parasitic forms living in blood. Eg. *Leishmania, Trypanosoma.*

Order- 3. Choanoflagellida

Free living.

Colonial

A collar around the base of a single flagellum.

Nutrition holozoic. Eg. *Proterospongia*.

Order- 4. Diplomonadida

Flagella 3 or 8, one forming the border of undulating membrane.

Uninucleate, sometimes multinucleate.

Mostly intestinal parasites. E.g. Giardia, Hexamita.

Order- 5. Hypermastigida

Highly specialized forms with numerous flagella.

Kinetosomes or parabasal bodies arranged in a circle or longitudinal or spiral rows.

Uninucleate or multinucleate.

Mouth absent, food ingested by pseudopodia.

Gut parasites of termites and cockroaches. Eg. *Trychonympha, Lophomonas*.

Order-6. Trichomonadida

Flagella 4-6.

One flagellum trailing.

Parasites in genital passage. Eg. *Trichomonas.*

Superclass (B) Opalinata

Body covered by flagella or cilia.

Nuclei 2 to many and monomorphic.

Nutrition saprozoic.

Reproduction by binary fission or by gametes.

Parasites of frogs and toads. E.g. *Opalina.*

Superclass (C) Sarcodina (Rhizopoda)

Body without definite pellicle.

Locomotion by pseudopodia.

Nutrition holozoic or saprozoic.

Asexual reproduction by binary fission.

Solitary and free living some parasitic or colonial.

Class- 1. Actinopodea

Pseudopodia are axopodia with axial filaments radiating from spherical body.

Subclass (1) Heliozoa

Spherical protozoans.

Pseudopodia (axopodia) radiating.

Body naked and differentiated into outer vacuolated ectoplasm and inner dense endoplasm.

Nutrition holozoic.

Mostly freshwater.

E.g. *Actinophyrus, Clathrulina, Actinosphaerium.*

Subclass (2) Radiolaria

Perforated central capsule separating the ectoplasm from endoplasm.

Contractile vacuole absent.

Pseudopodia are axopodia or filopodia.

Skeleton of siliceous spicules.

Marine.

E.g. *Collozoum.*

Subclass (3) Proteomyxidia

Pseudopodia are filopodia.

Marine or freshwater.

Reproduction by binary fission or multiple fission. E. g- *Pseudospora.*

Subclass (4) Actantharia

Central capsule non chitinoid and without pores.

Skeleton of strontium sulphate.

Pseudopodia are axopodia. Eg- *Acanthrometra*.

Class 2. Rhizopodea

Pseudopodia are lobopodia, filopodia or reticulopodia, without axial filaments.

Subclass (1) Lobosia

Pseudopodia are lobopodia.

Order- 1. Amoebida

Body amoeboid shaped, without skeleton

Pseudopodia (lobopodia) short with blunt ends.

Ectoplasm and endoplasm distinct.

Largely fresh water,
some parasites. E.g.
Amoeba, Entamoeba.

Order- 2. Arcellinida (Testacida)

Body enclosed in one chambered shell.

Shell with a single opening through which lobopodia protrude.

Free living, found in
fresh water. E.g. -
Arcella, Difflugia.

Subclass (2) Filosia

Pseudopodia are filopodia, tapering and branching.

Body naked or with a shell wit single aperture.

Ectoplasm not distinct.

Marine and
freshwater forms.
Eg- *Allogromia,*
Penardia.

Subclass (3) Granuloreticulosia

Pseudopodia are reticulopodia.

Order-1. Foraminiferida

Large sized with uni or multichambered shell.

Shell with one or more opening through which reticulopodia emerge.

Reticulopodia fine and branching is forming a network.

Mainly
marine, E.g.
Globigerina
,

Subclass (4) Mycetozoia

Body large, amoeboid and multinucleate.

Pseudopodia numerous and blunt.

From sporangia

with spores. E.g.

Slime moulds.

Class-3. Piroplasmea

Small parasite in R.B.Cs. of vertebrate.

Do not form
spores. E.g. -
Babesia.

Subphylum II. Sporozoa

Exclusively endoparasites.

Body with thick pellicle.

Locomotor organelles absent in adult.

Nutrition saprozoic.

Asexual reproduction by multiple fission and sexual reproduction by syngamy followed by spore formation.

Life cycle includes both asexual and sexual phase.