

lecture NO 1

2025-2026

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Protozoa

The protozoa are unicellular animals in which the various activities of metabolism ,locomotion, etc. are carried out by organelles of the cell. The protozoa discovered by antoni van Leeuwenhoek .

Structure of protozoa

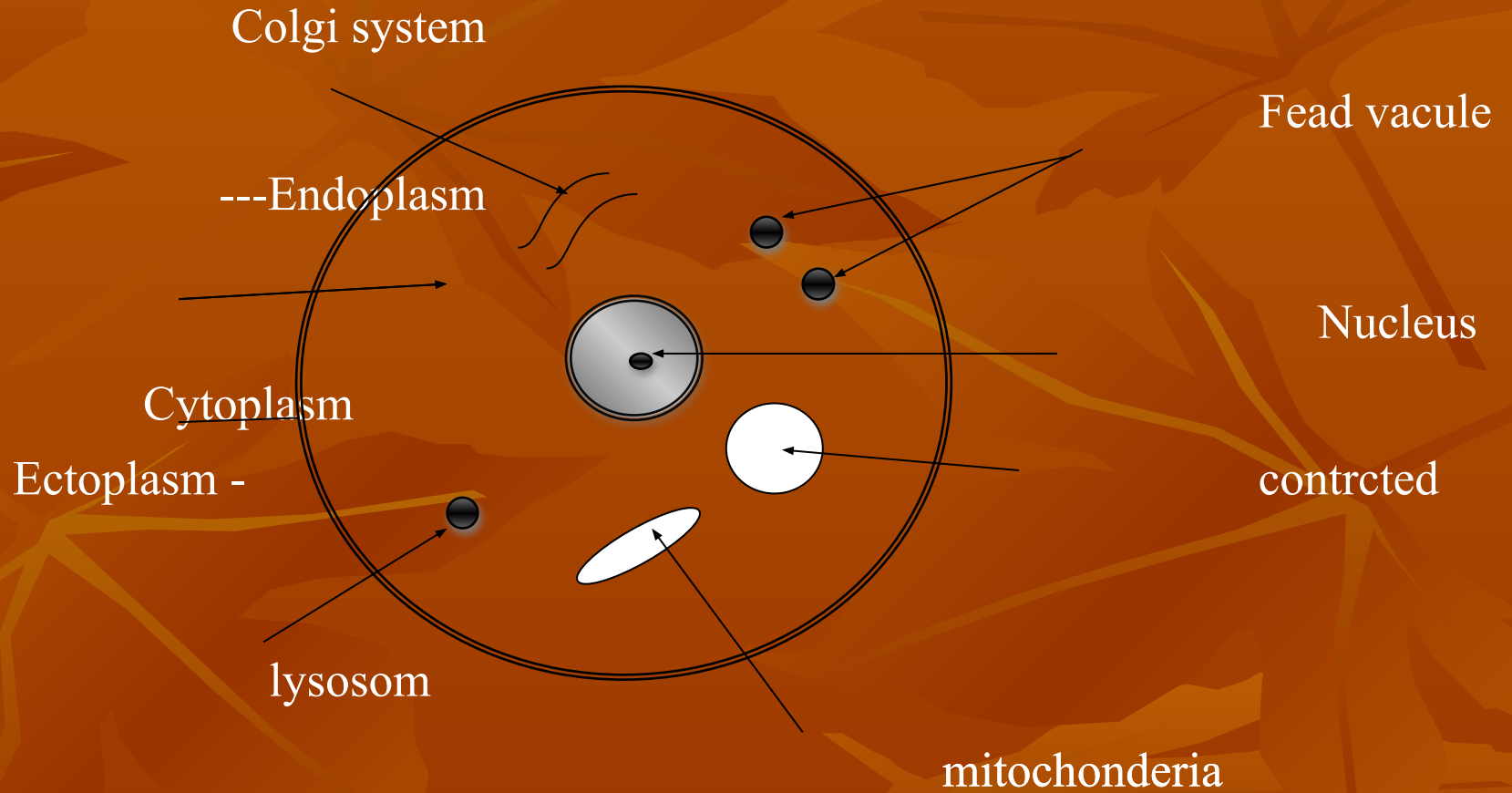
1-nucleus

Protozoa are eukaryotic(nucleus enclosed in a membrane) ,usually only one nucleus is present, although in some or all stages of development .**The vesicular type** of nucleus consists of a nuclear membrane which bounds the nucleoplasm in which lying more or less central ,is an intranuclear body ,the endosome (or karyosome) or the nucleolus. The vesicular type of nucleus is seen most commonly in the mastigophora and the sarcodina. **The compact type** of nucleus contains a large amount of chromatin and a small amount of nucleoplasm . This type found in the ciliates as a macronucleus.

-Cytoplasm 2

This is extra nuclear part of the protozoan cell. ■
It may be differentiated into an outer ectoplasm (its homogeneous and hyaline in appearance) and an inner endoplasm (its containing granules ,vacuoles and some times . pigment

Structure of protozoa (Sketch)



Locomotion

The protozoa may move by

1- Gliding

is seen in *Toxoplasma*, *Sarcocystis* and other forms .

2- pseudopodia

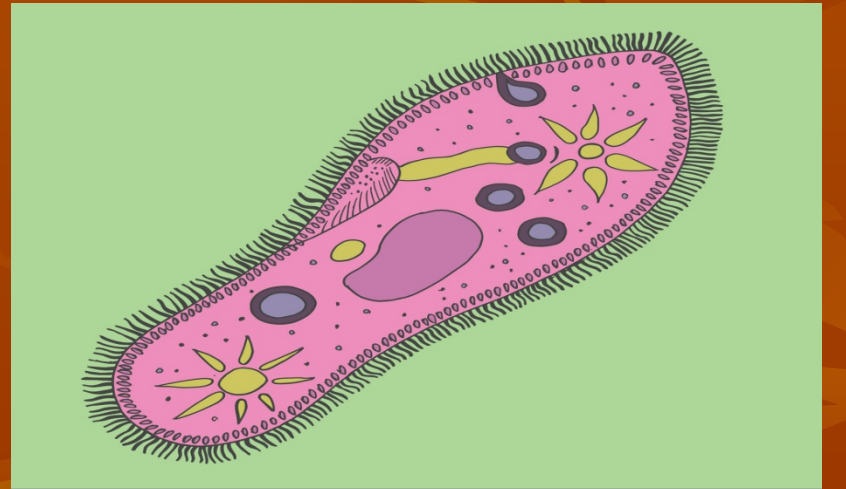
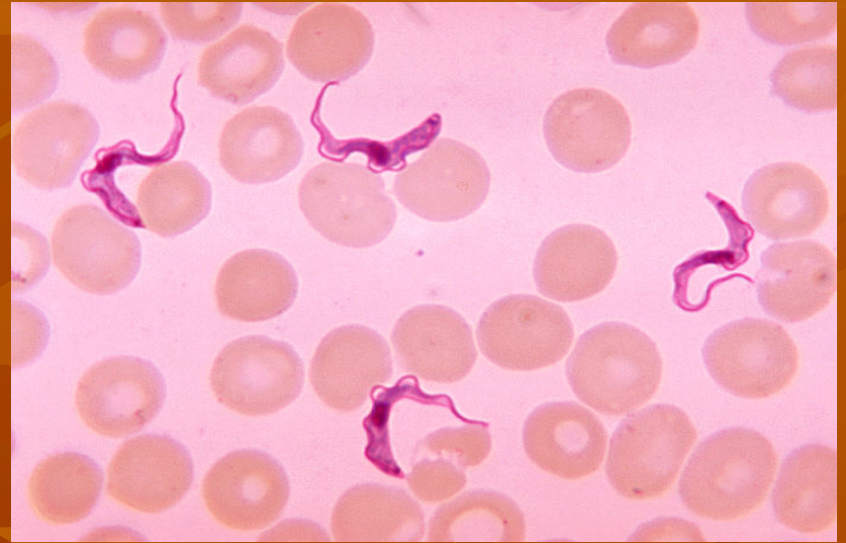
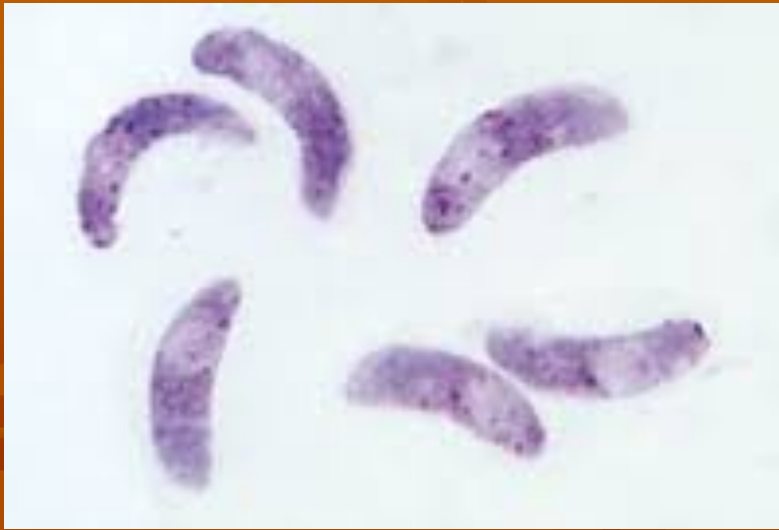
are used by the amoeba – like organisms the structure being temporary locomotor's organelles which are formed when required and retracted when not needed.

3- Flagella

are whip-like filamentous structures which arise from a basal granule or blepharoplast in the cytoplasm of the organism, they are composed of a central axial filament, the axoneme which is surrounded by a contractile cytoplasmic sheath. Ultra-structure studies indicate the axoneme to be composed of two central filaments surrounded by nine peripheral filaments. In some forms the flagellum may be attached to the body of protozoa by an undulating membrane, flagella are typically seen in the mastigophora.

4- Cilia

Are fine ,short ,flagella-like structures originating from a basal granule embedded in the pellicle or ectoplasm ,its has two functions locomotion and nutrition



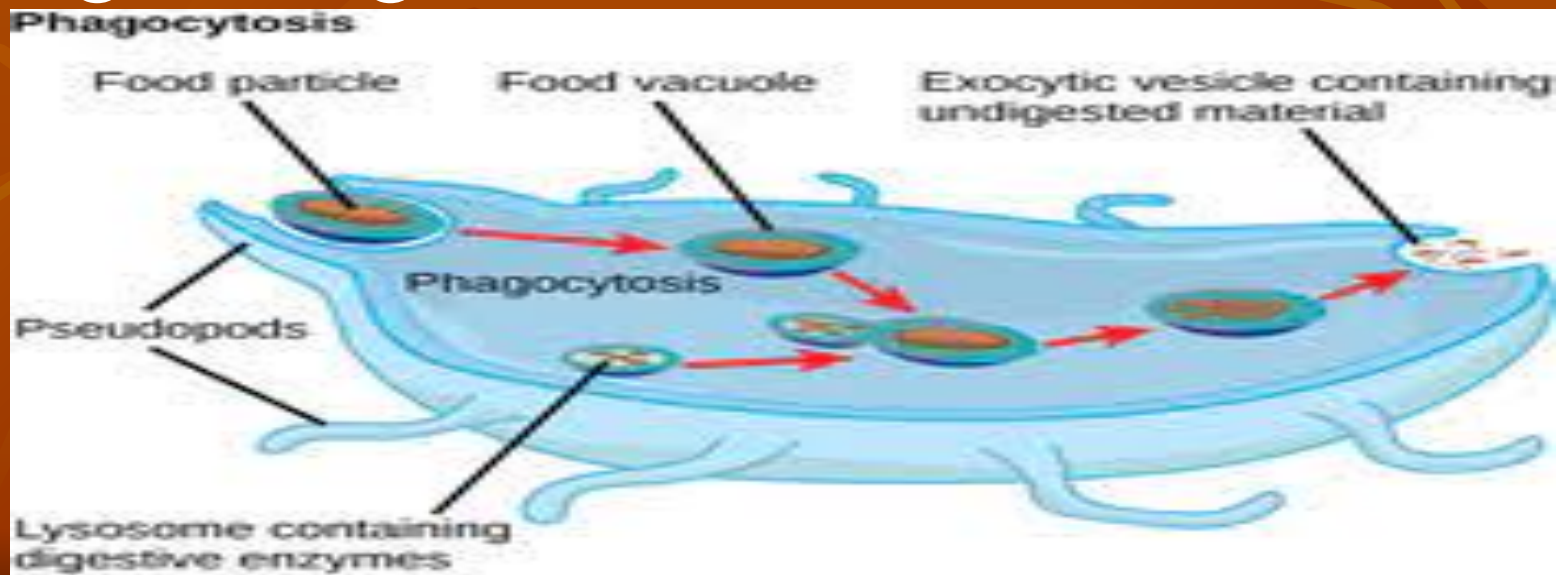
Organelles for nutrition

1- pseudopodia

In amoeba-like forms.

2- food vacuoles

Occur in the cytoplasm and contain particulate material in various stage of digestion.



Nutrition of protozoa

- 1-**holophytic; protozoa** are forms which possess some characteristics of plants, carbohydrates being synthesized by chlorophyll which is carried in chromatophores or in the bodies of algae or other protophyta which inhabit the cytoplasm of the protozoan. (non medical or veterinary importance).
- 2-**holozoic; protozoa** utilize preformed food material derived from living animals or plants.
- 3-**saprozoic; protozoa** absorb nutrients through the body wall, these being utilized directly by the organisms.

Reproduction of protozoa

1- binary fission

is asexual reproduction .In this two daughter cells result from a parent cell.

2-Schizogony

an asexual form of reproduction ,the nucleus divides several times before the cytoplasm dose.

3-Budding

is an asexual reproductive process in which two or many daughter form are produced by the parent cell

4-Endopolygony

is a form of asexual multiplication (internal budding).

5-Conjugation

is a form of sexual reproduction which occurs in the ciliates. In this two cells organisms pair and exchange nuclear material , the individuals separate and nuclear reorganization takes place.

6- Syngamy

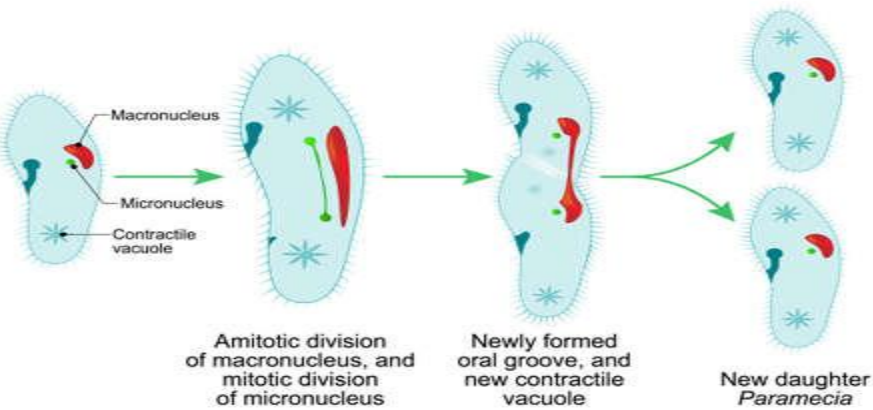
is a form of sexual reproduction in which two gametes fuse to form a zygote. The male gamete is a microgamete and female is a macrogamete which produced from microgametocytes and macrogametocytes respectively. The process of gamete formation is gametogony and the gametes may be similar in size (isogamy) or may markedly differ (anisogamy).

types of sexual reproduction

- ◆ syngamy
- ◆ isogamy
- ◆ anisogamy
- ◆ hologamy
- ◆ endogamy
- ◆ exogamy



Asexual reproduction in Protozoa (transverse)



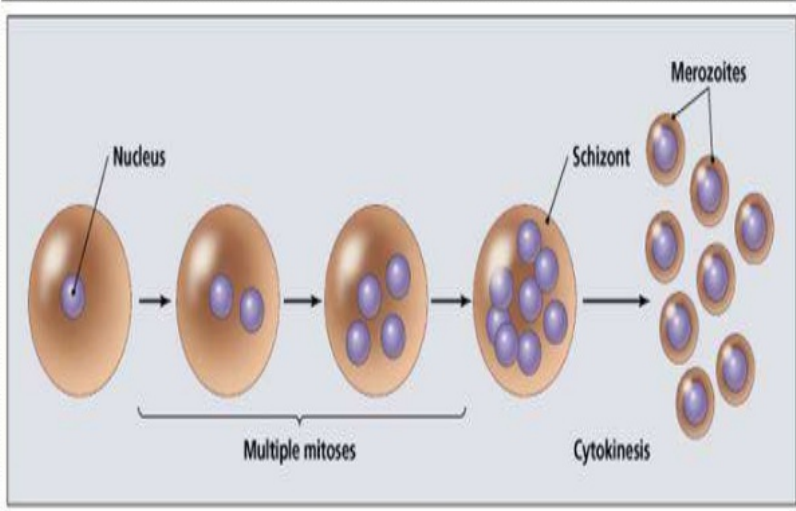
Exogenous buds Suckers



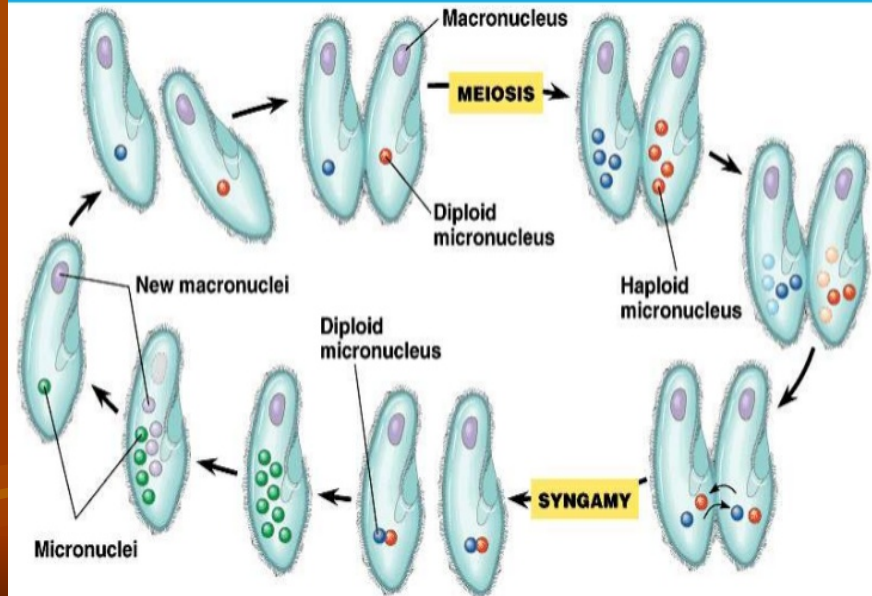
MULTIPLE BUDDING Eg: *Ephelota*

[Estudyandscore.com](http://estudyandscore.com)

Schizogony

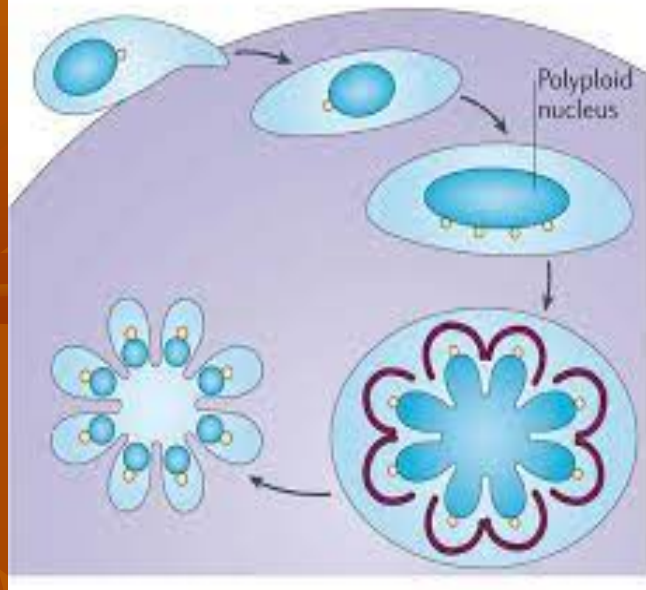


Conjugation



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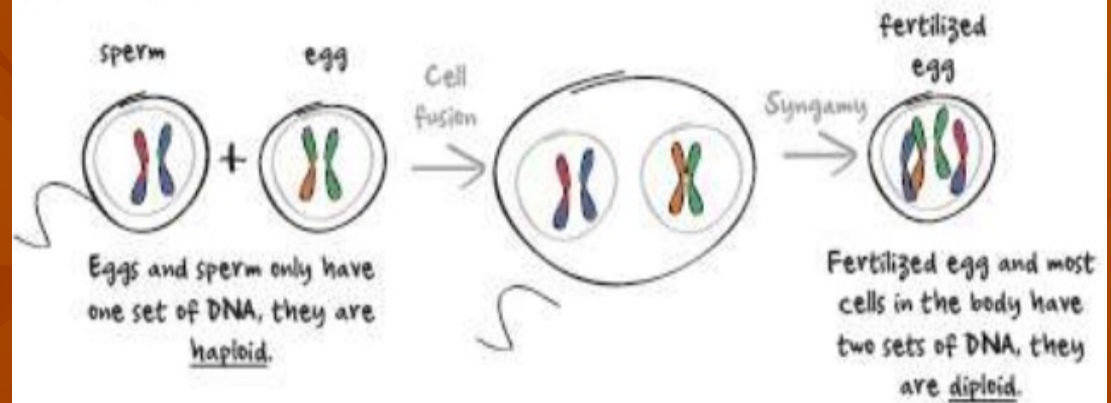
d Endopolygony



Reproduction: Syngamy (S)

Gamete + gamete = zygote
Nuclei fusion

FERTILIZATION



7-Sporogony

Normally follows syngamy ,and a number of , or very many , ,sporozoites are formed within the walls of a cyst .This is an asexual process of multiple fission.

