

# Classification of Protozoa

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# Introduction

Protozoa are unicellular, eukaryotic, heterotrophic organisms. They are either free-living or parasites. There are around 65000 species of protozoans categorised in different groups. They lack a cell wall. There are many different cell organelles, that perform various tasks performed by different organs in higher animals, e.g. mouth, anus, intestinal tract, etc.

There are many protozoa, that cause various diseases in animals and humans, e.g. Plasmodium (malarial parasite), Trypanosoma (sleeping sickness), Trichomonas (trichomoniasis), etc.

The protozoa have many stages in their life cycle. Some of the stages of the life cycle are infectious.



# General Characteristics of Protozoa

**Habitat-** Protozoa are found in the aquatic environment. They live in freshwater or oceans. Some are free-living and some are parasitic in plants and animals. Mostly they are aerobic but some are anaerobic and present in the rumen or human intestine.

**Size and Shape-** The size and shape of Protozoa vary greatly, from microbial ( $1\mu\text{m}$ ) to large enough and can be seen by the naked eye. The shell of unicellular foraminifera can have a diameter of 20 cm.

**Nutrition-** Protozoa are heterotrophic and have holozoic nutrition. They ingest their food by phagocytosis. Some of the protozoan groups have a specialised structure called cytostome for phagocytosis.

**Cellular Structure-** They are unicellular having a eukaryotic cell. The metabolic functions are performed by some specialised internal structures.



# Protozoa Classification and Examples



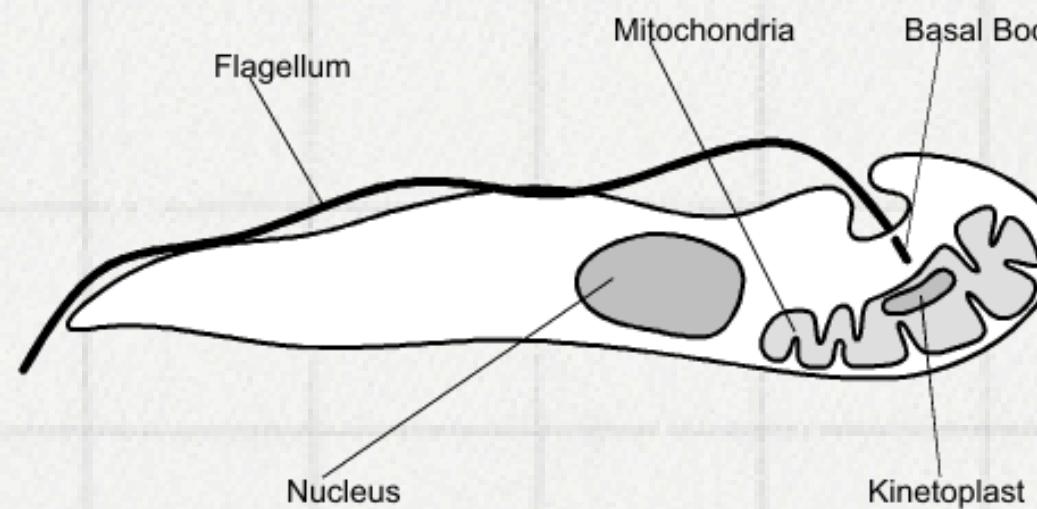
Protozoa is a phylum having unicellular heterotrophs. It comes under Kingdom Protista.

Protozoa are divided into four major groups based on the structure and the part involved in the locomotion:

## 1. Mastigophora or Flagellated protozoans:

They are parasites or free-living.

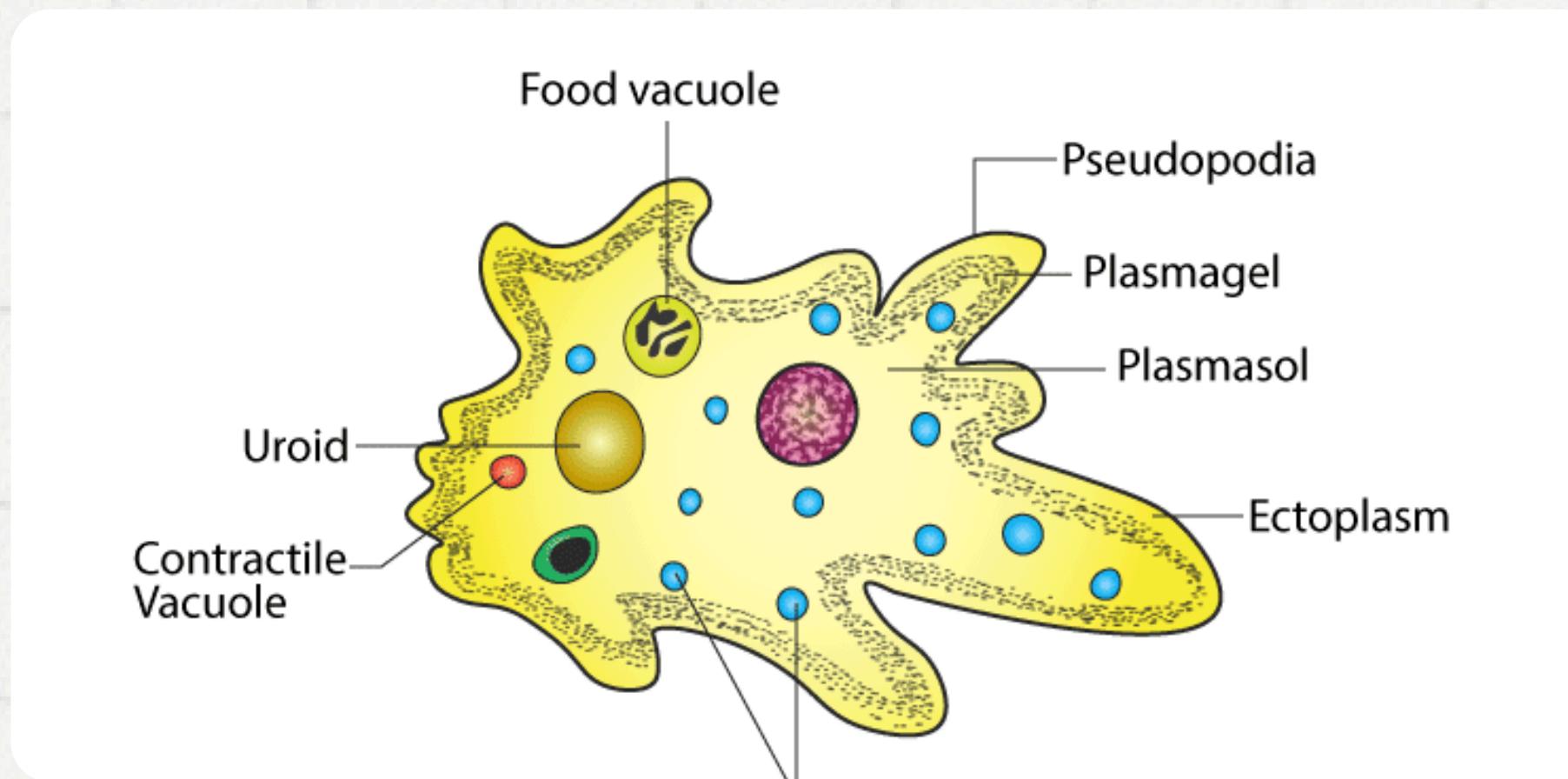
- They have flagella for locomotion
- Their body is covered by a cuticle or pellicle
- Freshwater forms have a contractile vacuole
- Reproduction is by binary fission (longitudinal division)
- Examples: Trypanosoma, Trichomonas, Giardia, Leishmania, etc.



## 2. Sarcodina or Amoebooids:

**They live in the freshwater, sea or moist soil.**

- The movement is by pseudopodia. They capture their prey by pseudopodia
- There is no definite shape and pellicle is absent
- The contractile vacuole is present in the amoeboids living in freshwater
- Reproduction is by binary fission and cyst formation
- Examples: Amoeba, Entamoeba, etc.

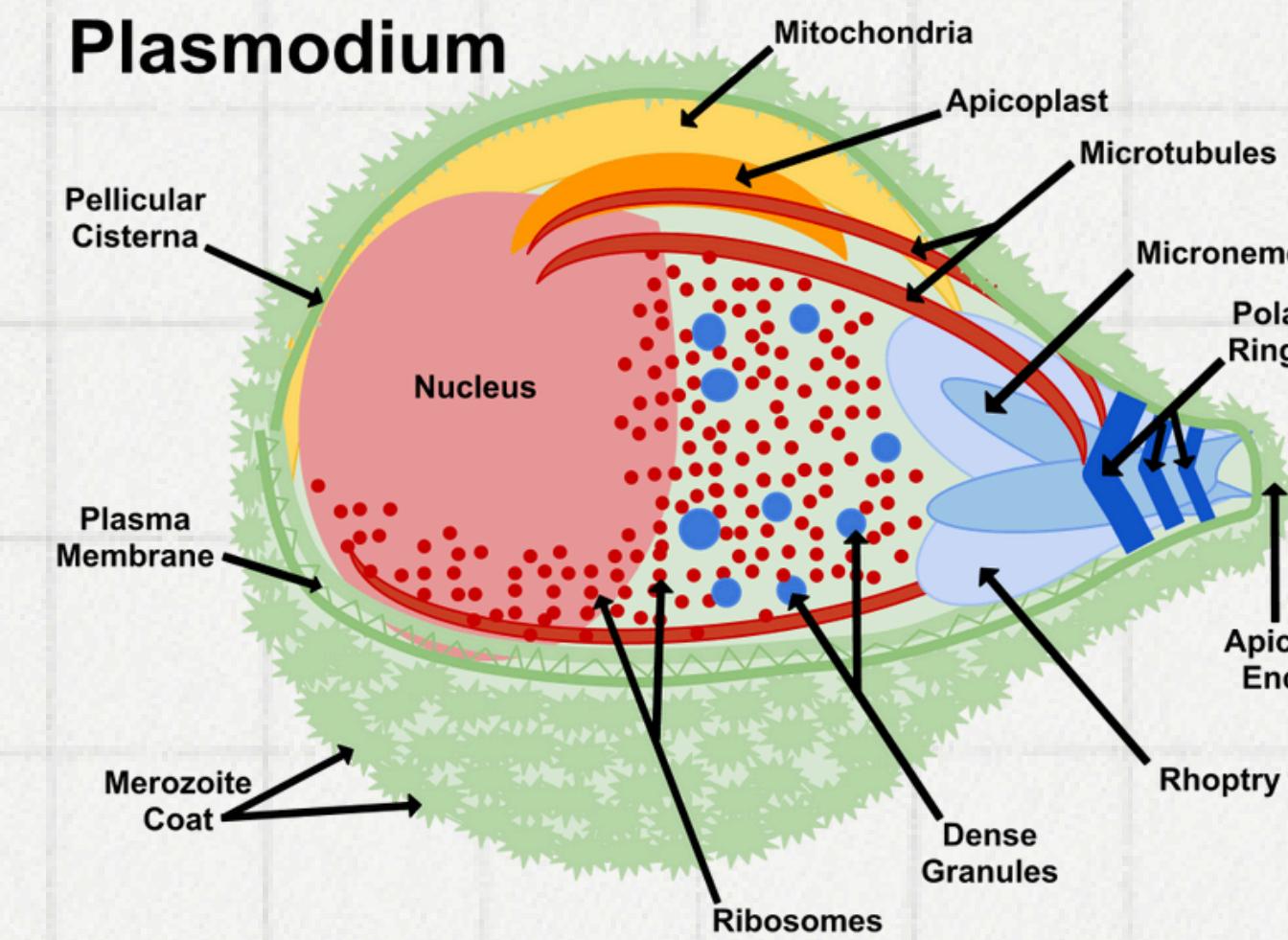




### 3. Sporozoa or Sporozoans:

**They are endoparasitic.**

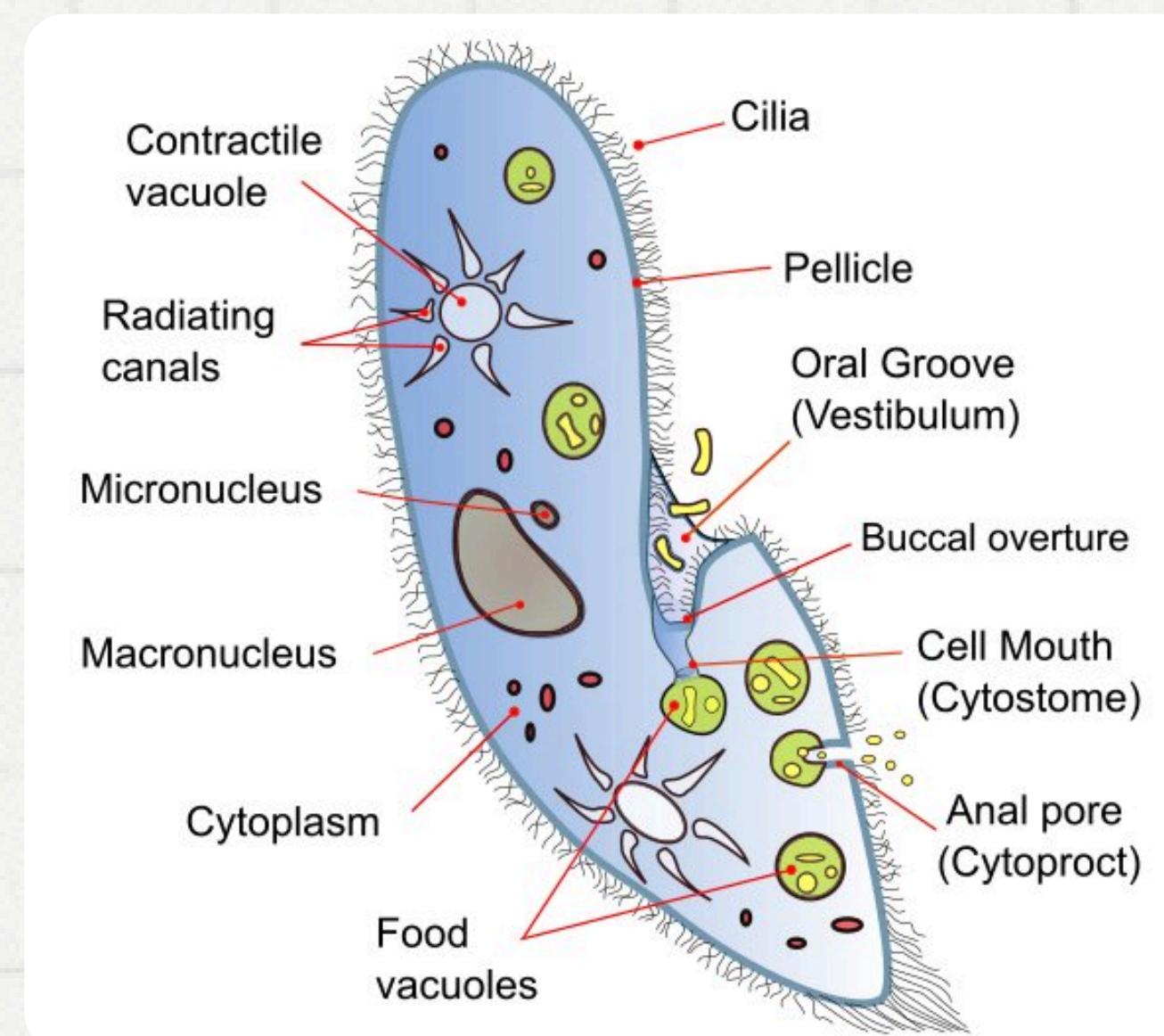
- They don't have any specialised organ for locomotion
- The pellicle is present, which has subpellicular microtubules, that help in movement
- Reproduction is by sporozoite formation
- Examples: Plasmodium, Myxidium, Nosema, Globidium, etc.



## 4. Ciliophora or Ciliated protozoans:

**They are aquatic and move actively with the help of thousands of cilia.**

- They have fixed shape due to covering of pellicle
- They may have tentacles, e.g. in the sub-class Suctoria
- Contractile vacuoles are present
- Some species have an organ for defence called trichocysts
- They move with the help of cilia and the movement of cilia also helps in taking food inside the gullet
- They reproduce by transverse division and also form cysts
- Examples: Paramecium, Vorticella, Balantidium, etc.



# Protozoan Diseases in Humans

Most of the protest diseases in humans are attributed to protozoa. Protozoa induces sickness in humans when it turns into human parasites. A majority of the prevalent and fatal diseases are caused by protozoan infections in humans such as Malaria, amoebic dysentery and African Sleeping Sickness.

These are capable of multiplying in humans, contributing to their survival, enabling the development of dangerous infections from one entity only. The transmission of protozoa found in the intestine of humans to another human usually takes place via the fecal-oral path, such as, through contaminated water or food or person-to-person contact.

