

Protozoa

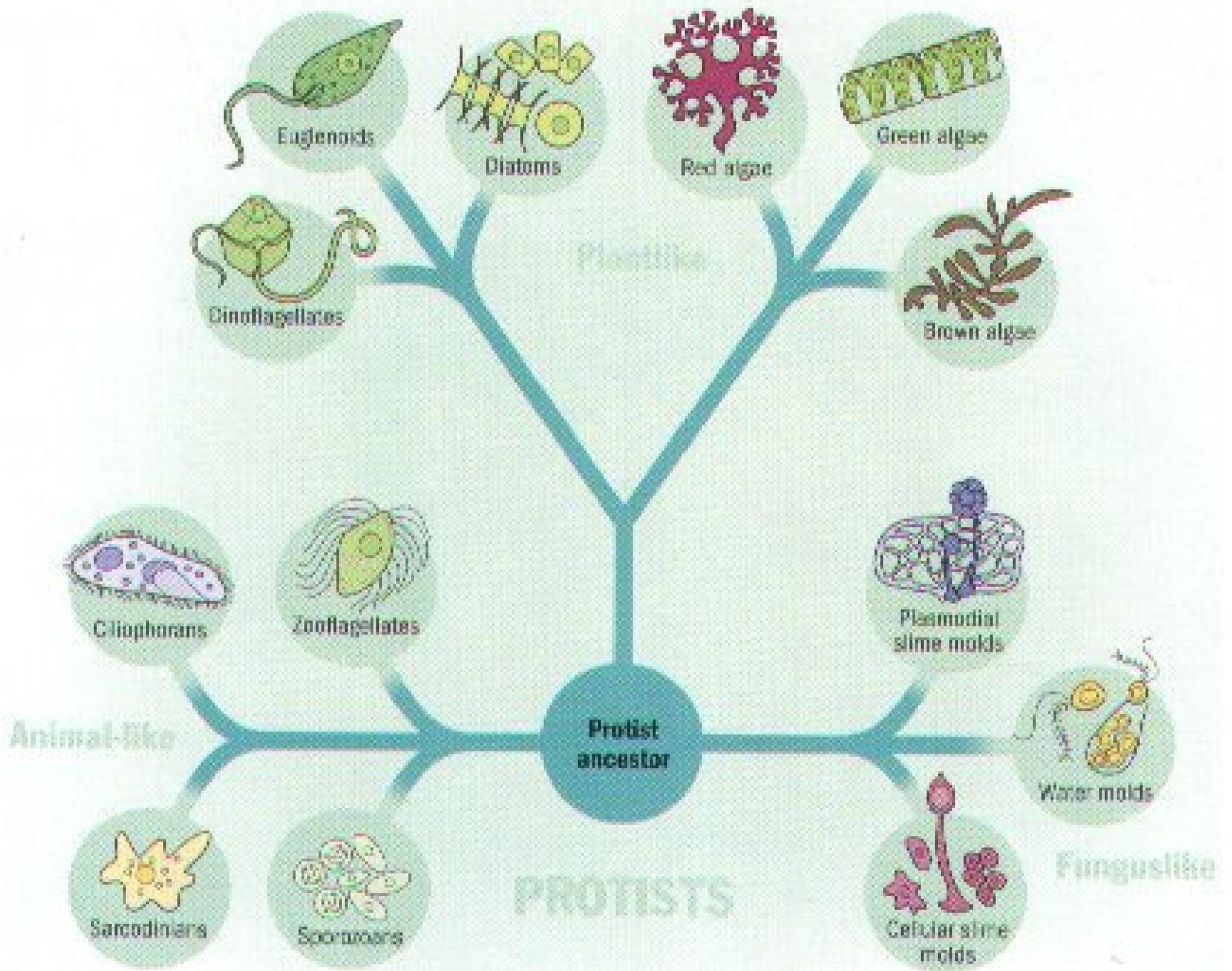
By

Ram Balak Mahto

Guest faculty

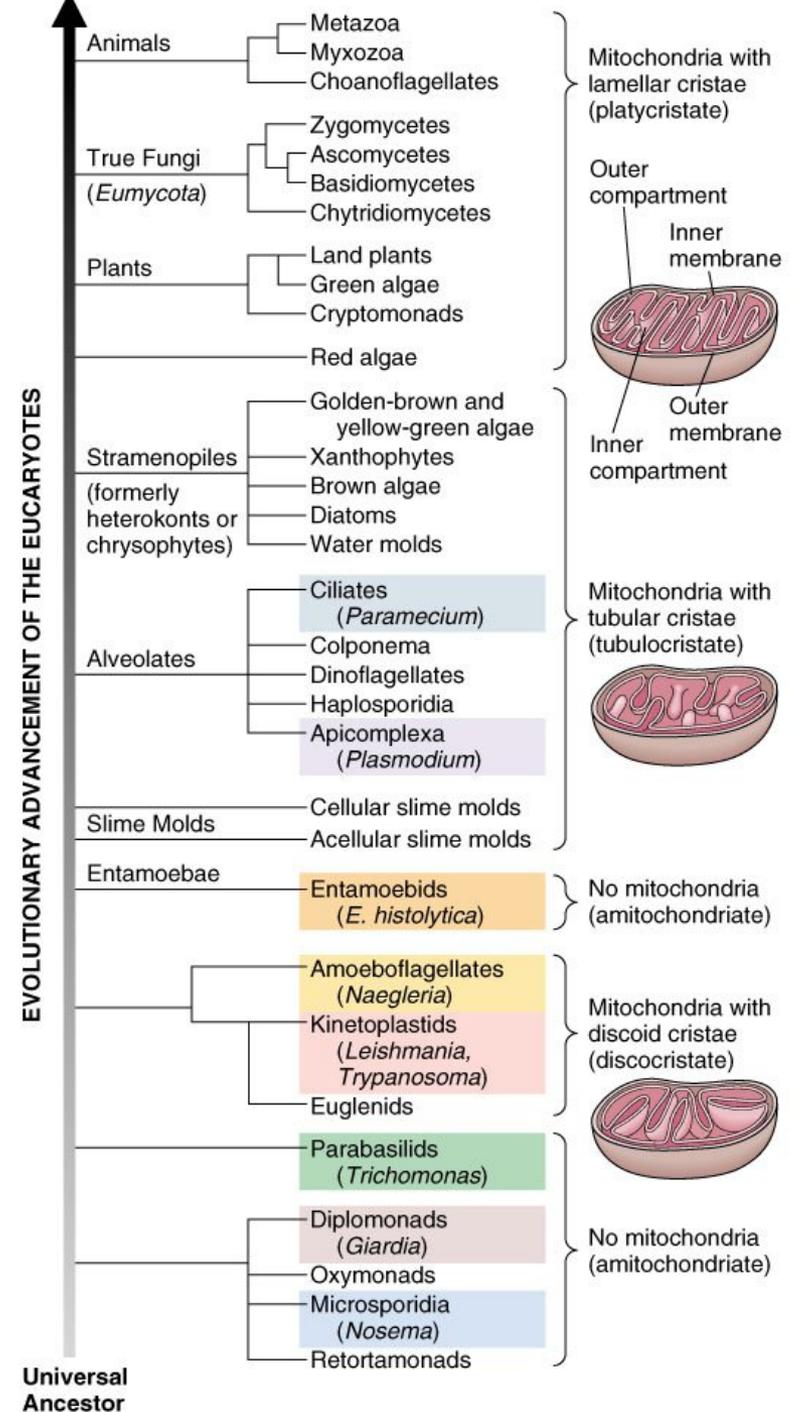
Zoology department

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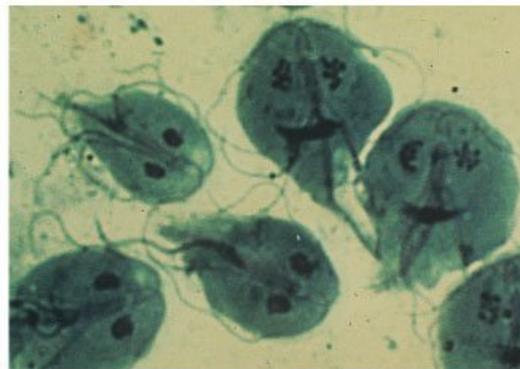
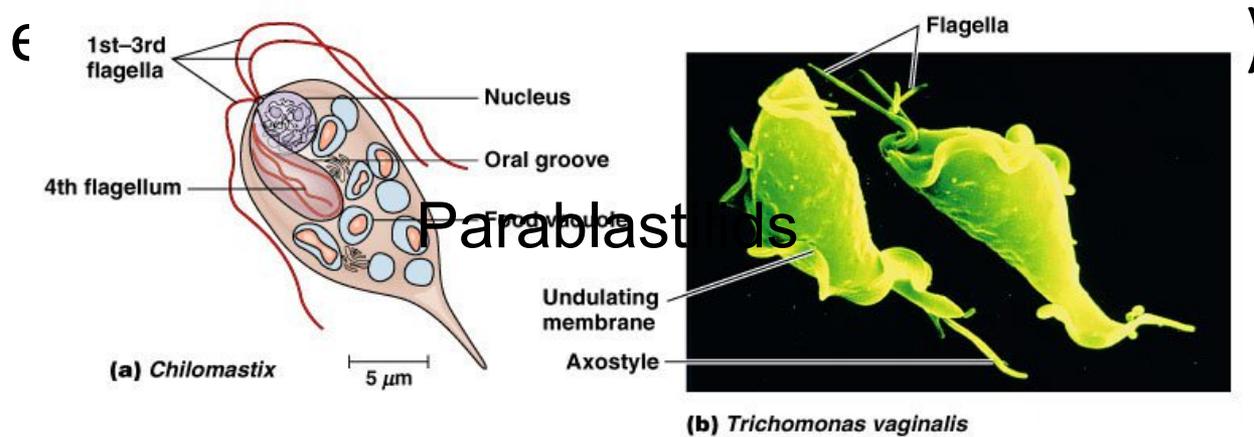
Protozoa

- Polyphyletic group of unicellular heterotrophic eukaryotes; not a single Kingdom.
- Protista is used in the five kingdom scheme and includes unicellular algae types.
- Ecologically these are saprotrophic, predatory, or parasitic (some mixotrophs)
- Traditional taxonomy; 7 phyla; based on intracellular structure, life cycle, and motility.
- Phylogeny by 18SrRNA gene sequence analysis; more phyla.

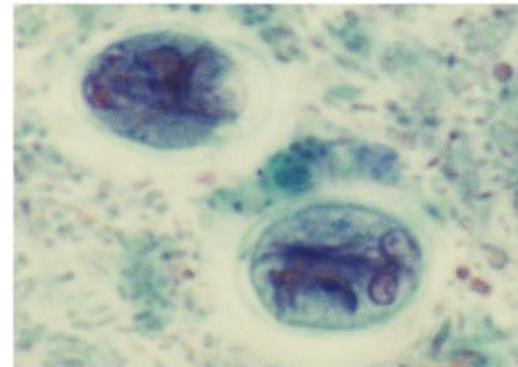


“Archeozoan” Flagellates

(The lack mitochondria suggests they may have



(c) *Giardia lamblia*

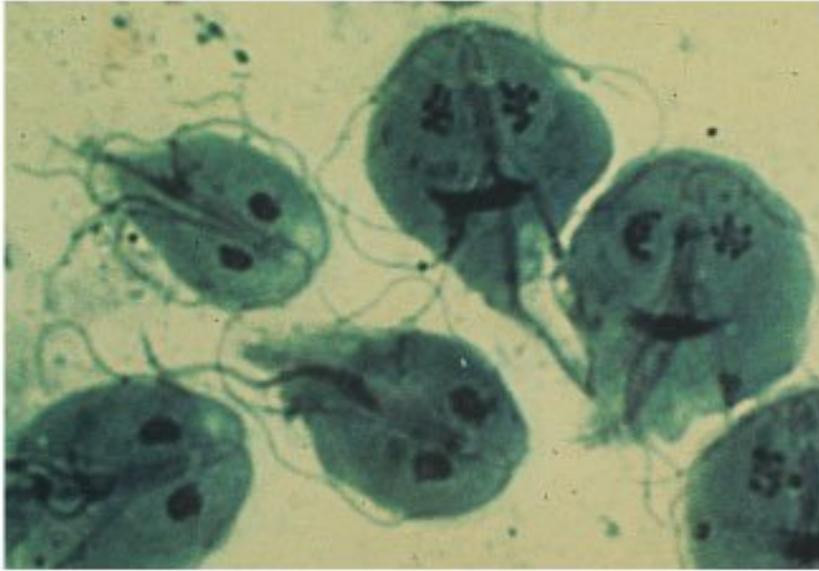


(d) *Giardia lamblia* cyst

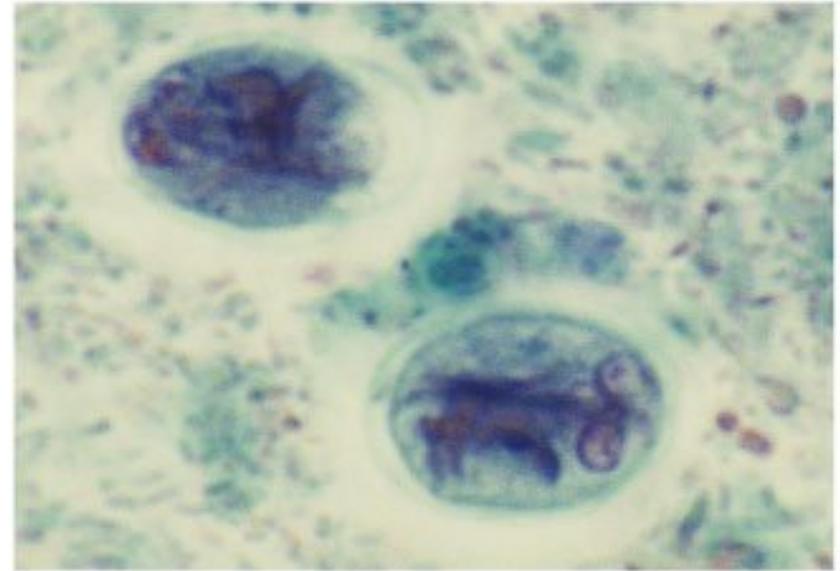
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e.g. *Trichonympha* spp in termite hindgut

Diplomonads



(c) *Giardi lamblia*

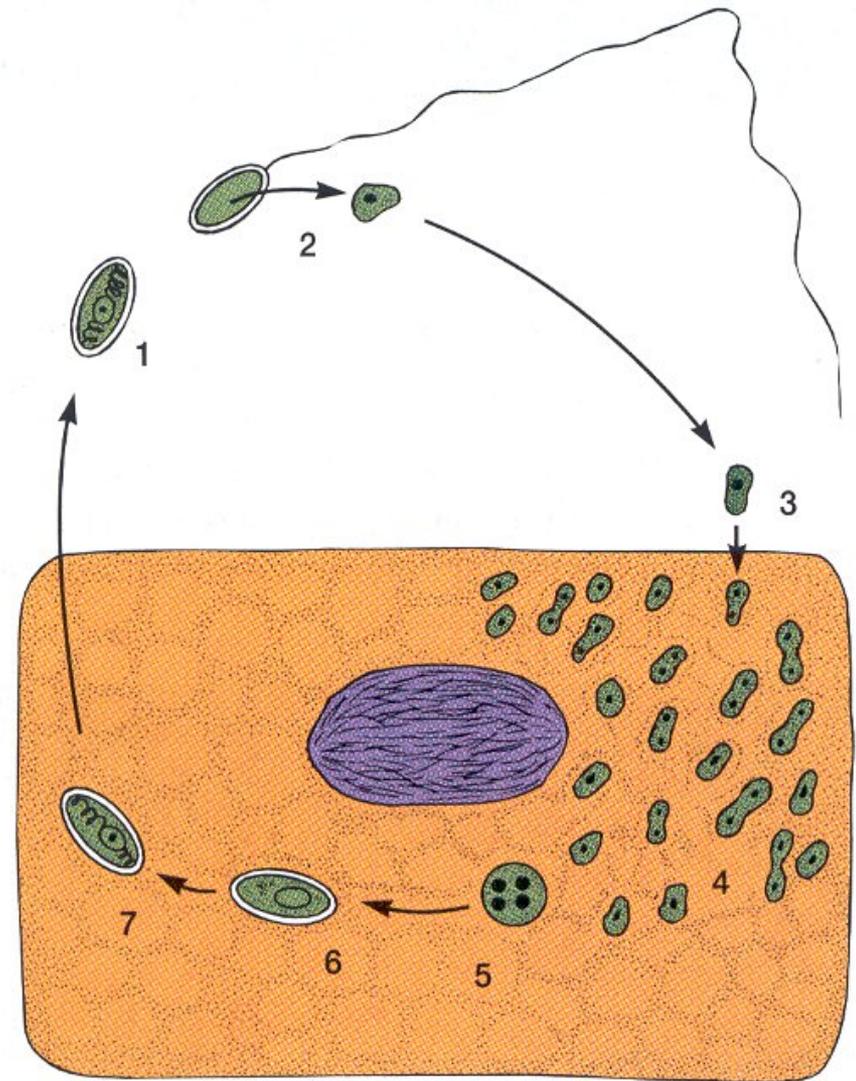


(d) *Giardialambli*a cyst

Oxymonads: Include some anaerobic flagellates with spirochete symbionts.

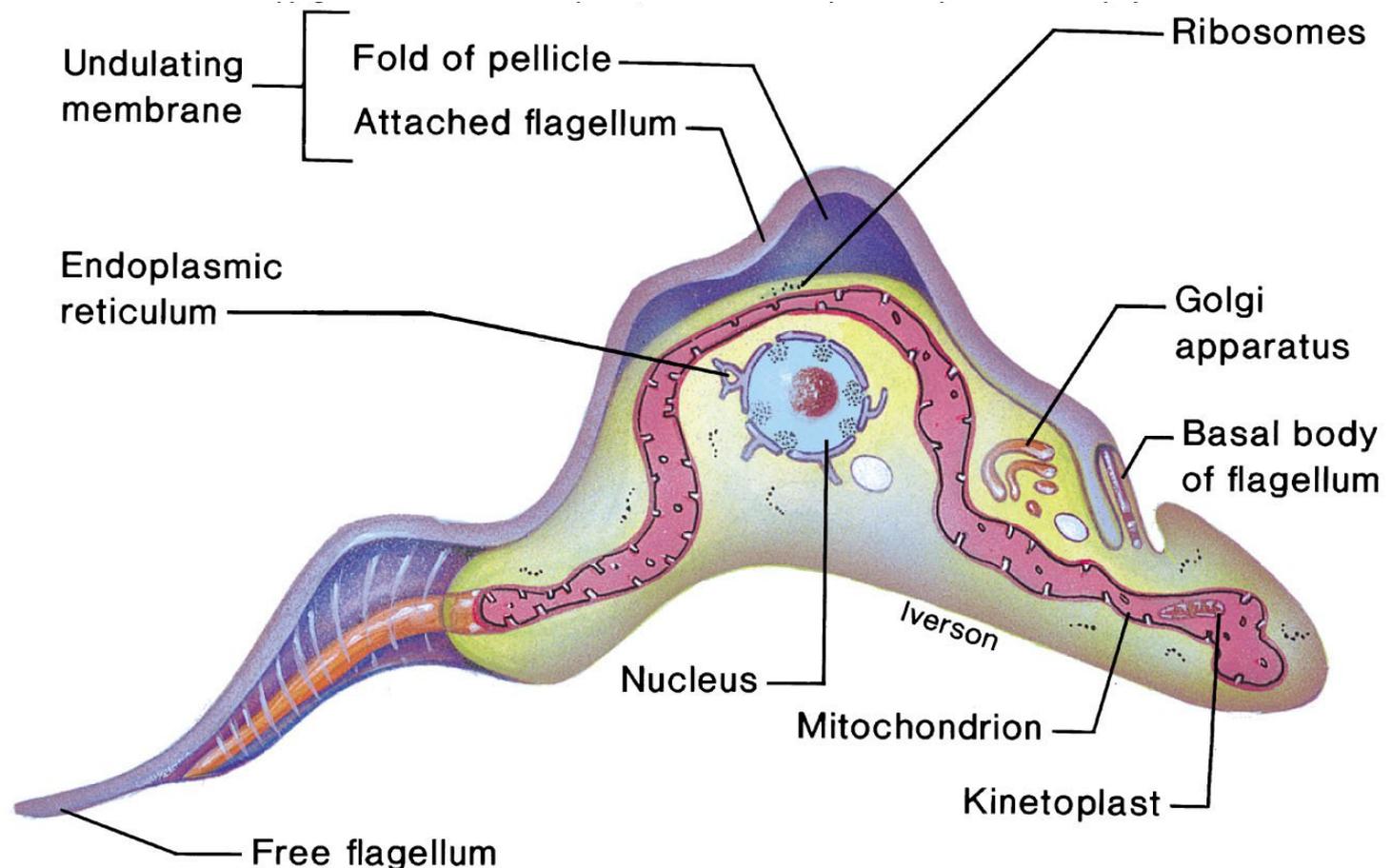
Microspora

- No mitochondria.
- All obligate intracellular parasites of animals (ca 1000 spp known).
- complex tri-laminar spore coat with long filament and small spore.
- Microsporidiosis in humans.



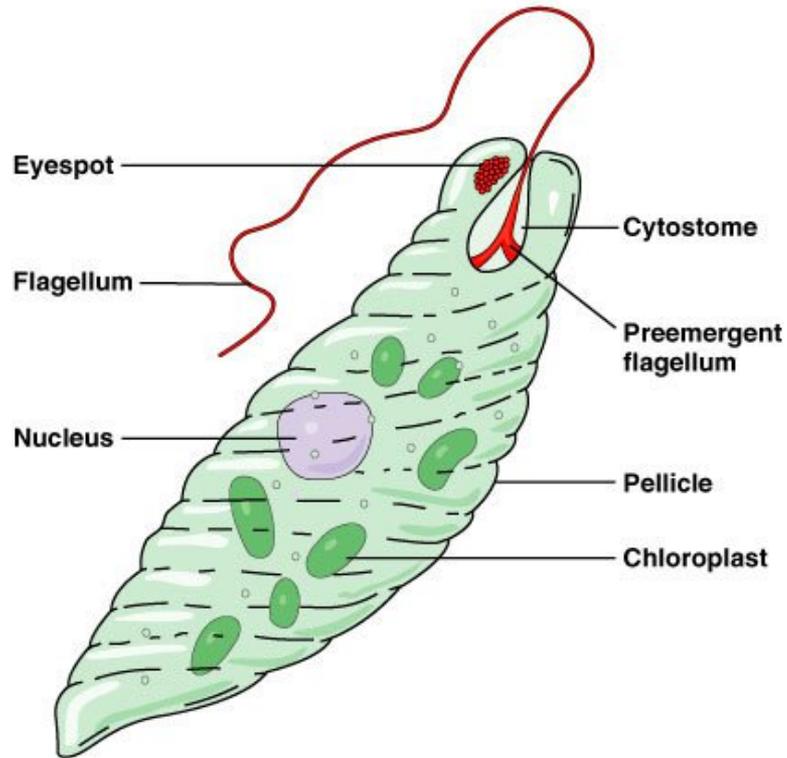
Nosema bombycis is an silkworm parasite; infect endothelial cells of intestine.

Kinetoplastic Flagellates



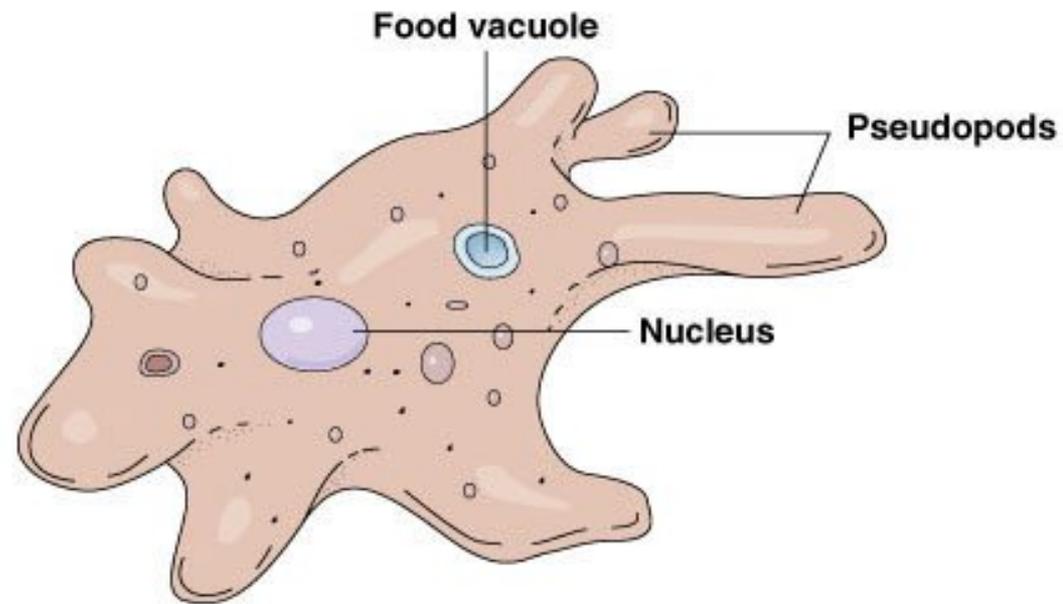
Trypanosoma spp. are hemoflagellates, transmitted by insect bites; insects are host: Tsetse fly an African sleeping sickness (*T. brucei gambiense*); Chagas' disease by "kissing bug" causes legions (*T. cruzi*).

Euglenids (mixotrophic)

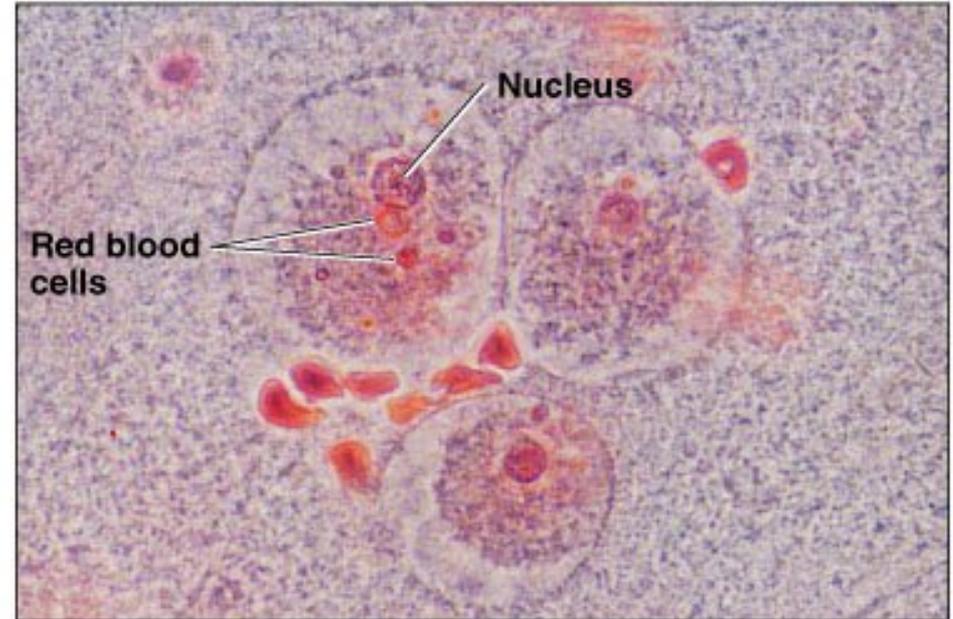


Sarcodina “Amoebae”

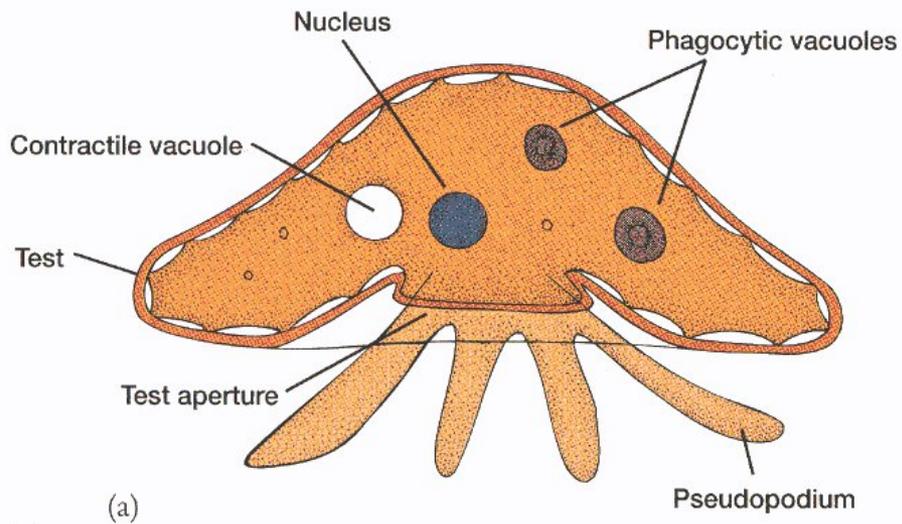
- Some naked; some with hard test of calcium carbonate; silicon; or chitin.
- Many predators; some parasitic.
- *Entamoebae histolytica* is the cause of amoebic dysentery.



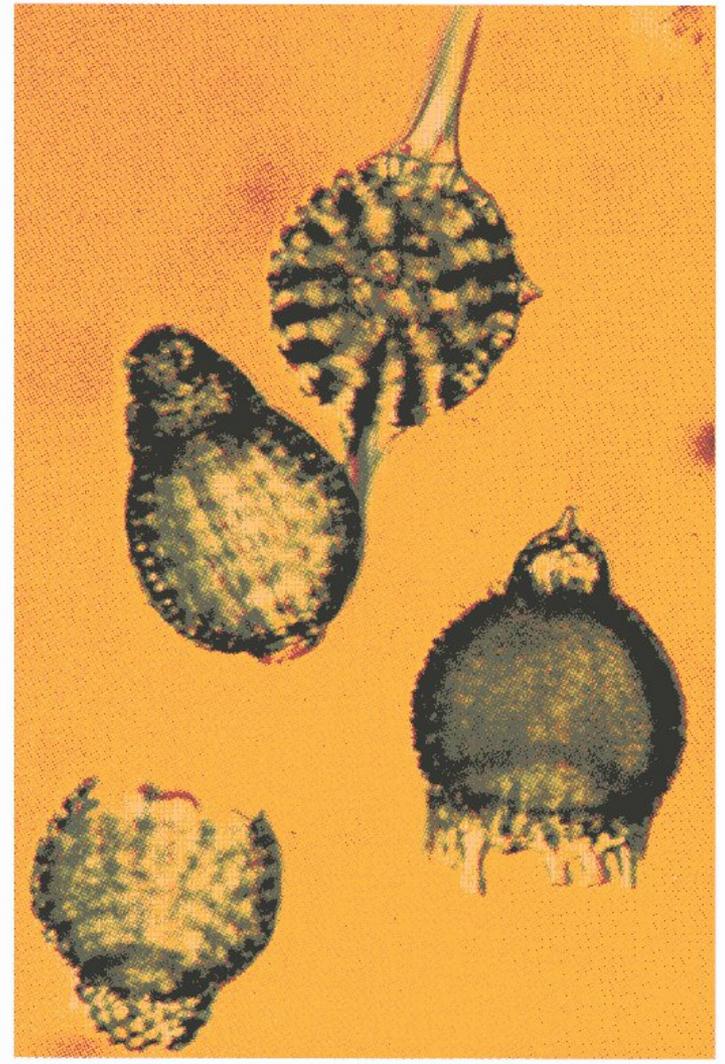
(a) *Amoeba proteus*



(b) *Entamoeba histolytica*



(a)

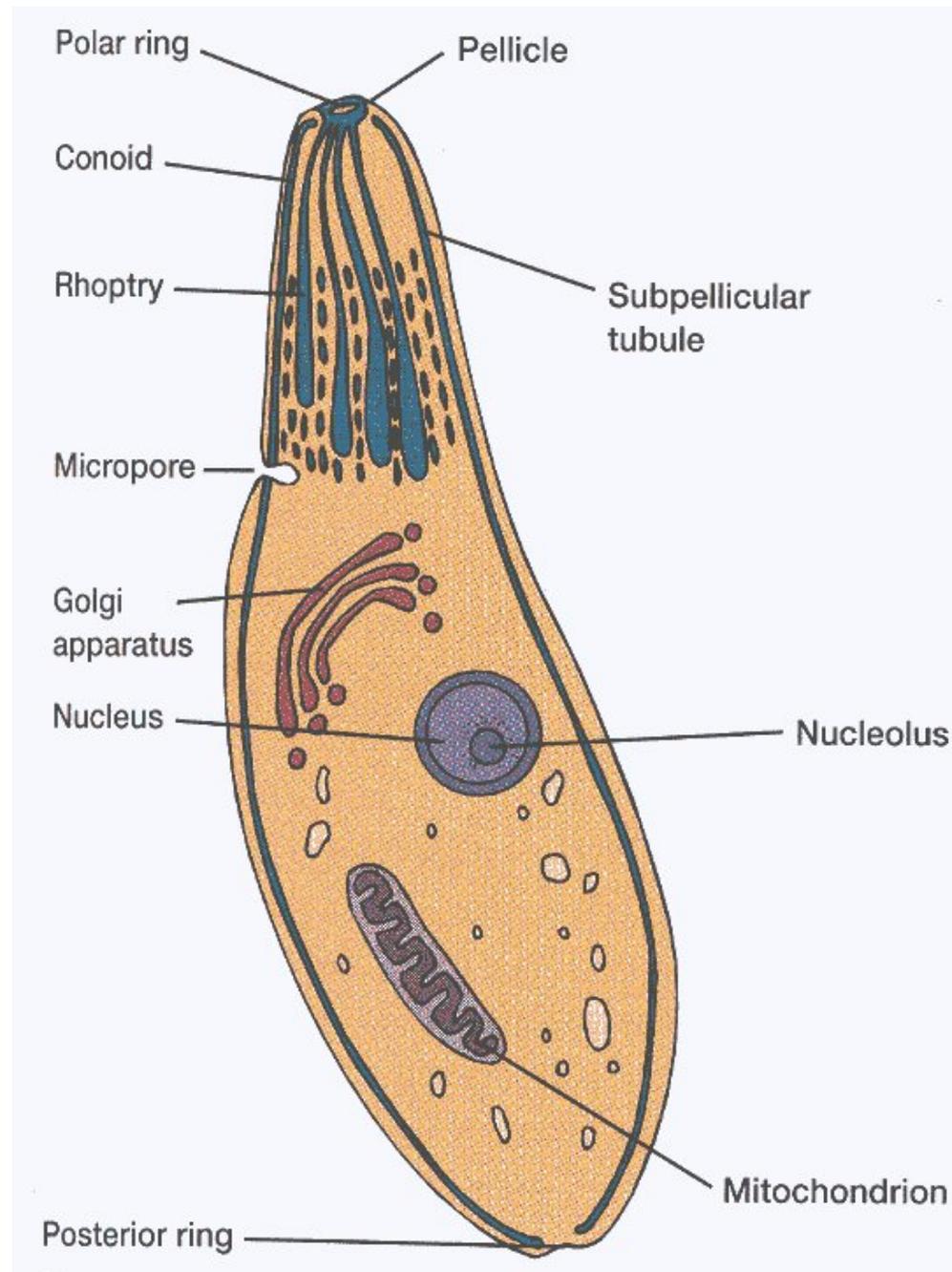


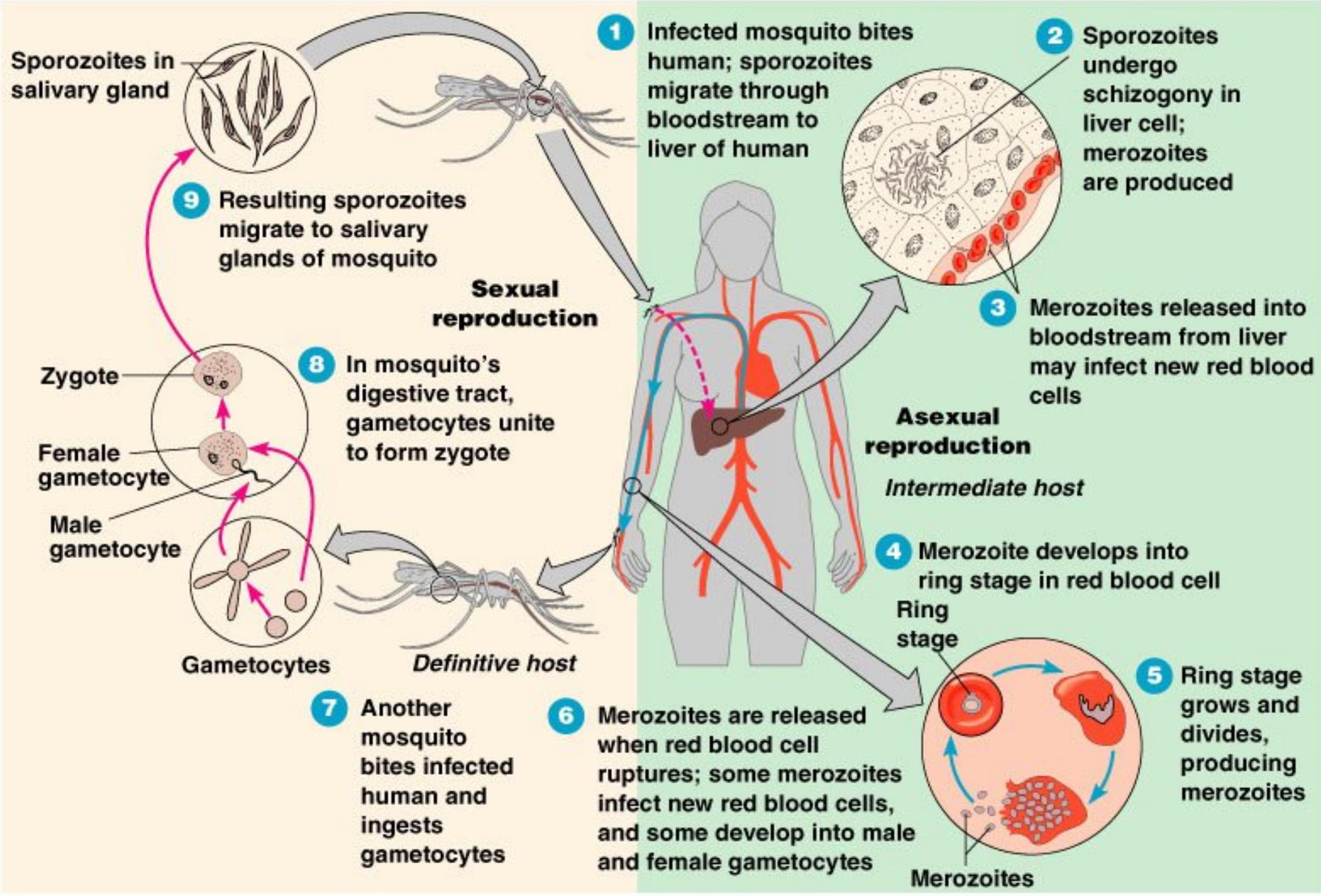
(c)

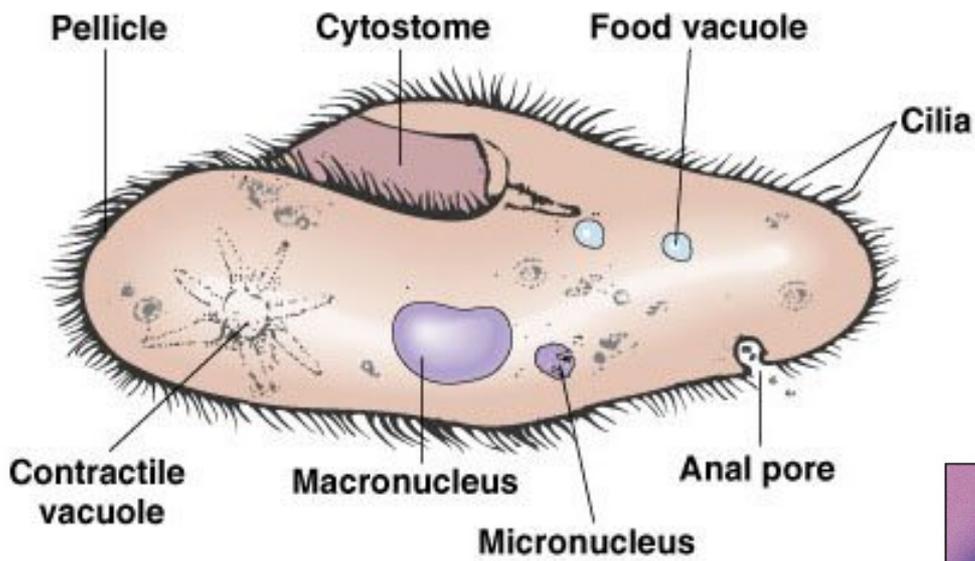
Figure 27.4 Some Free-living Sarcodines. (a) An illustration of *Acanthamoeba* showing the test or shell that is made of chitinlike material secreted by the protist. (b) The test of the foraminiferan, *Elphidium cristum* ($\times 100$).

Apicomplexa ("sporozoan")

- Possess a spore forming stage of life cycle; parasitic.
- Cryptosporidiasis.
- Toxoplasmosis caused by *Toxoplasma gondii* is transmitted by cats; may cause fetal death or blindness in immunocompromised.
- Malaria is caused by *Plasmodium vivax*.







Ciliates

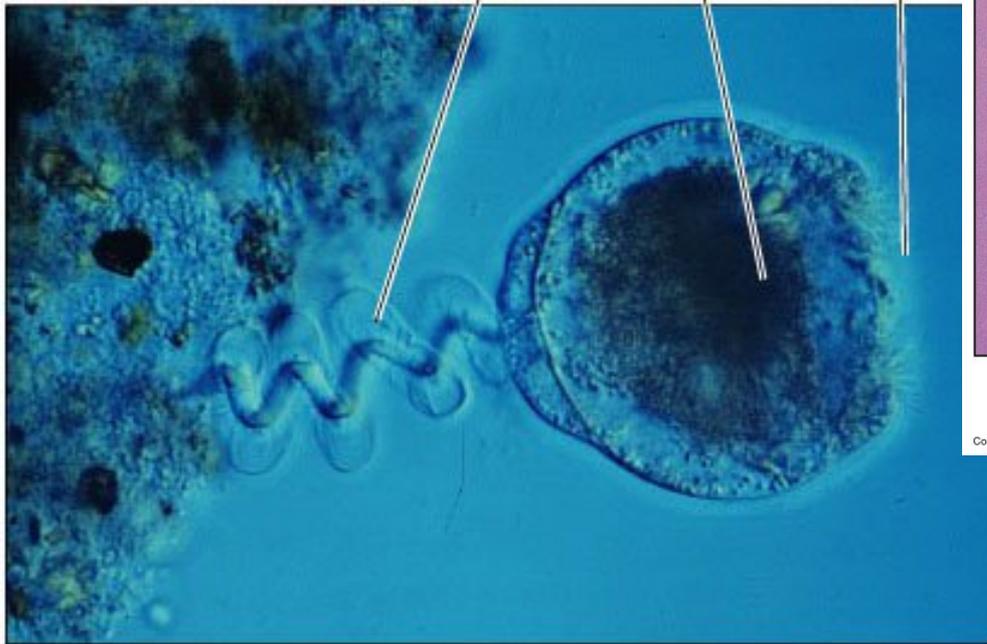
- Predators of bacteria
- Sexual reproduction by conjugation; micronucleus transfer.
- Very diverse morphology; some are colonial; free and attached forms



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(a) Paramecium

Stalk Cytostome Cilia



(b) Vorticella

