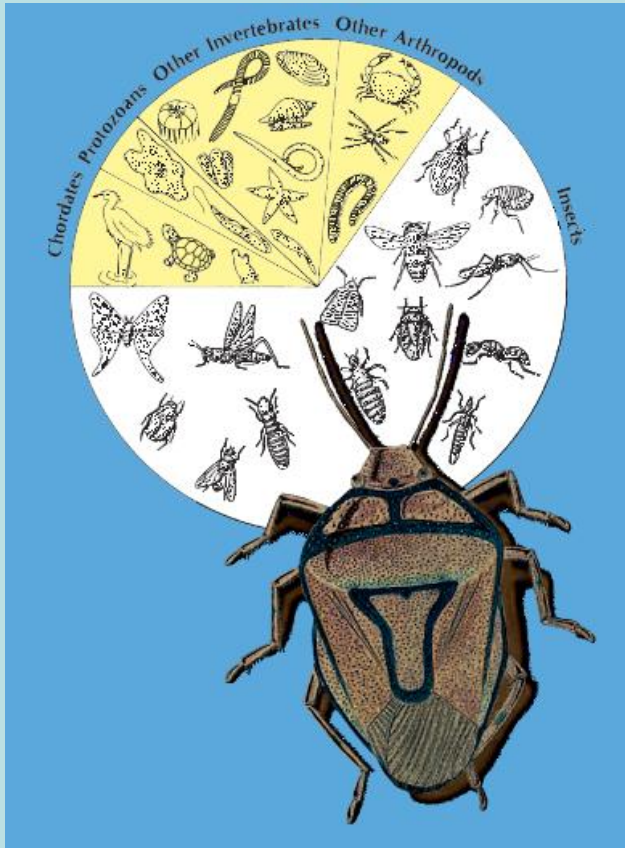


BIOLOGY

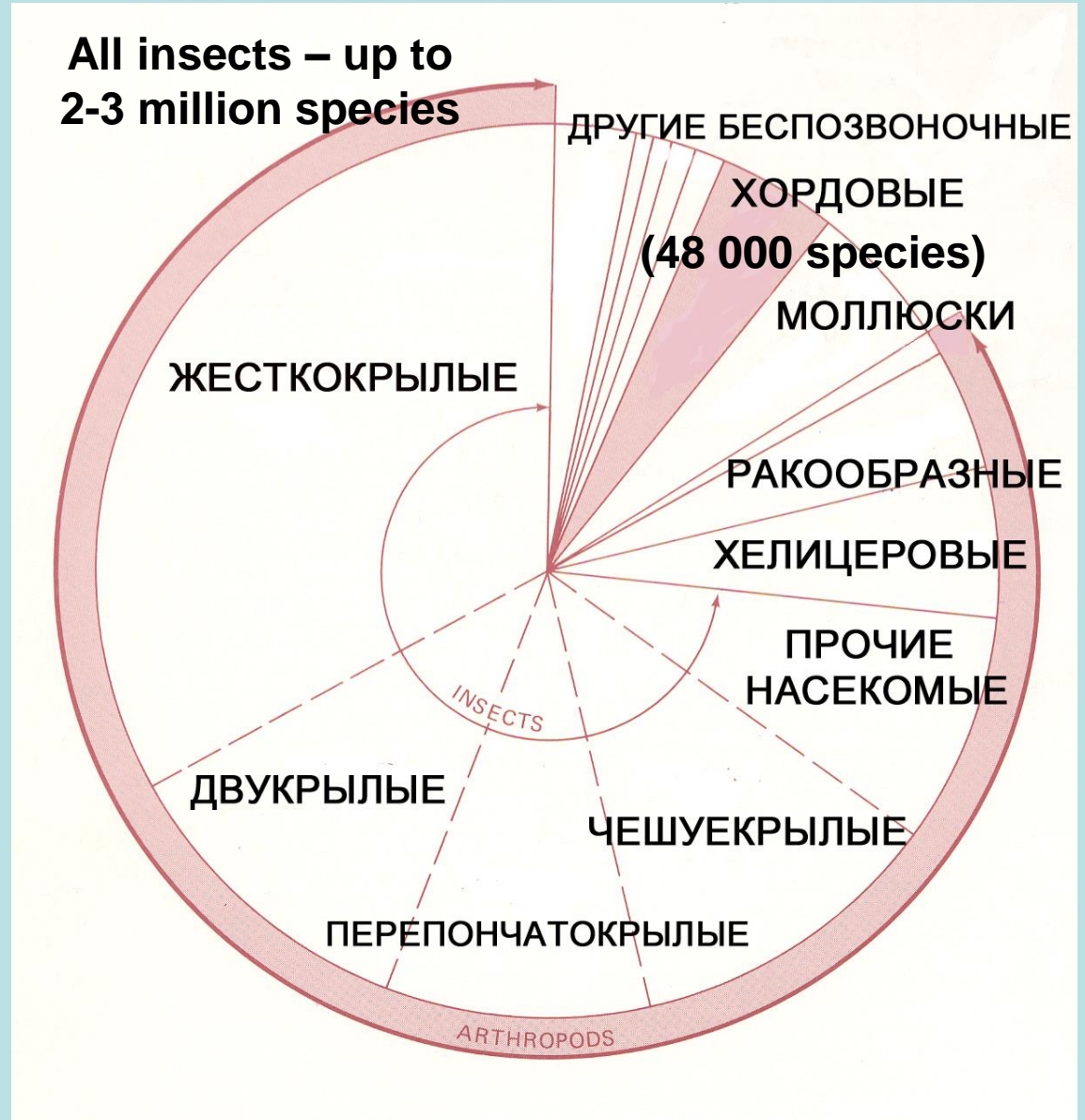


Lecture 2. Biodiversity of Animals. Part 1

Number of animal species



The estimated number of animal species – up to 3-4 million



How are animals classified?

Kingdom

Subkingdom

Division

Phylum

Class

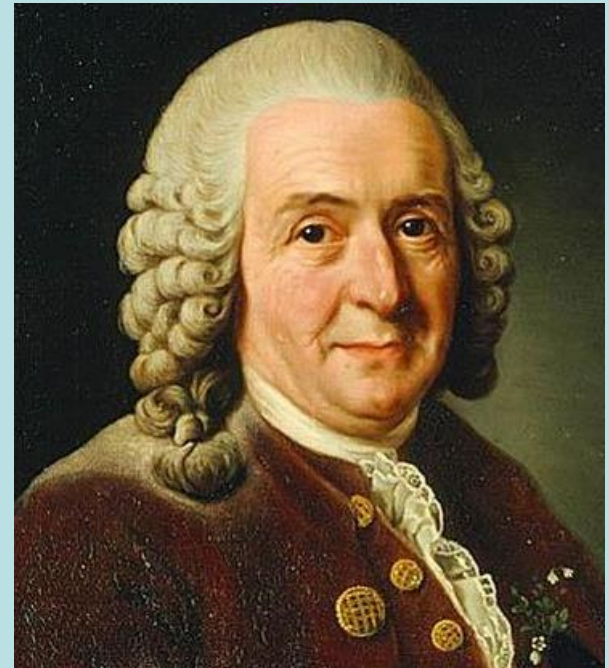
Order

Family

Genus

Species

Offered by Linnaeus



Carolus Linnaeus
(1707-1778)

Kingdom Animals (Animalia)

Subkingdom Protozoans (Protozoa)

Subkingdom Primitive multicellulars (Prometazoa)

Subkingdom Higher multicellulars (Eumetazoa)

Phylum Sarcomastigophora

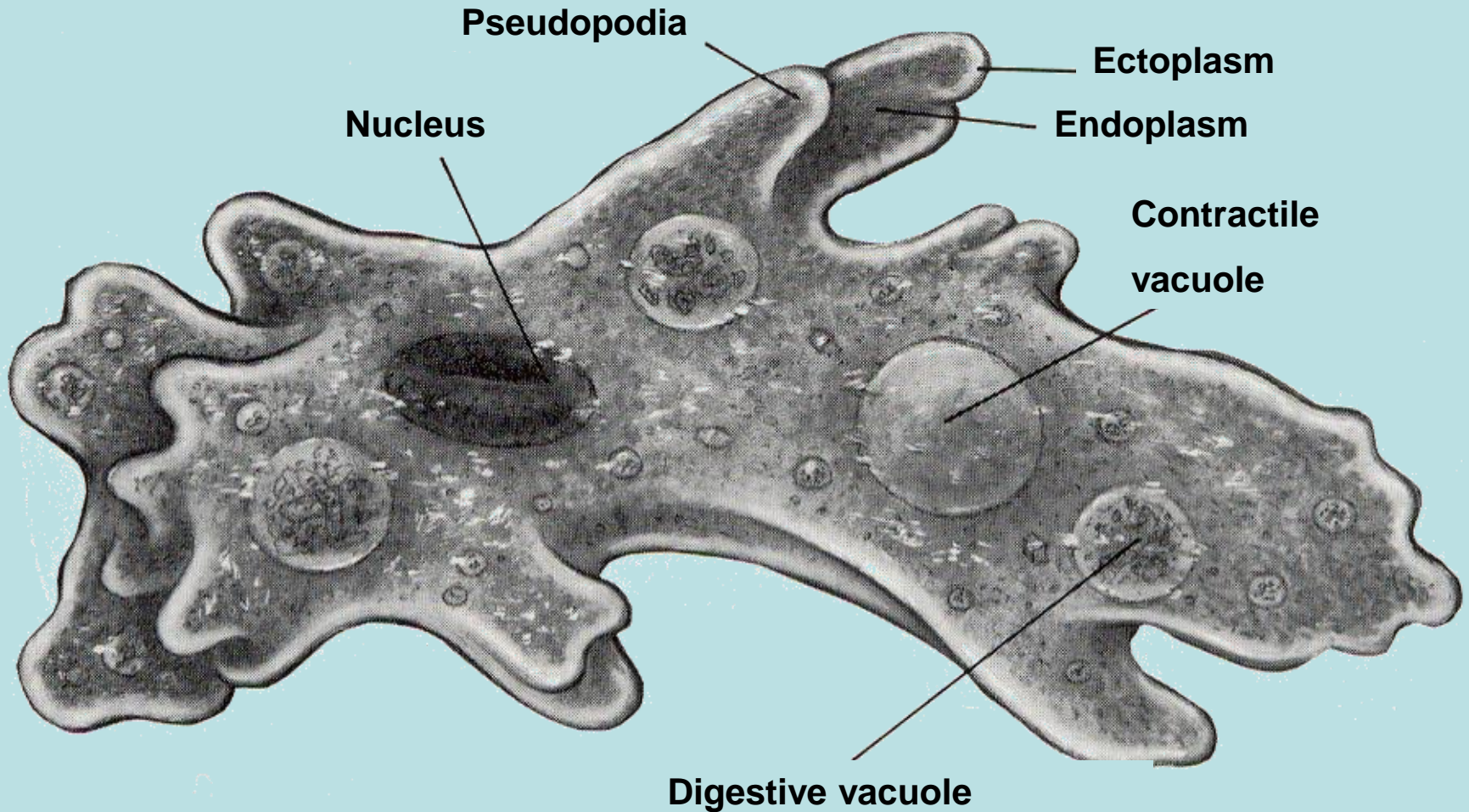
Phylum Ciliates (Ciliophora)

Phylum Sporozoans (Apicomplexa)

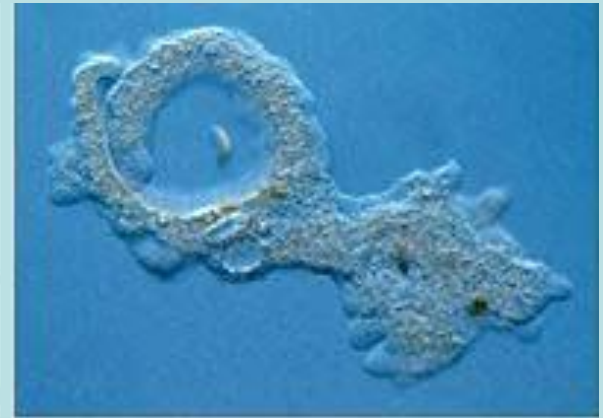


Totally over 30 000 species

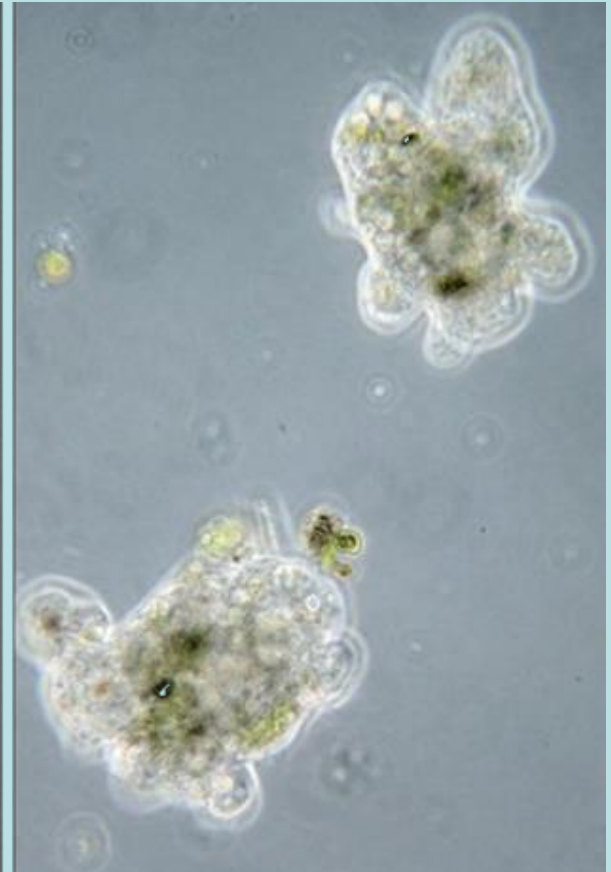
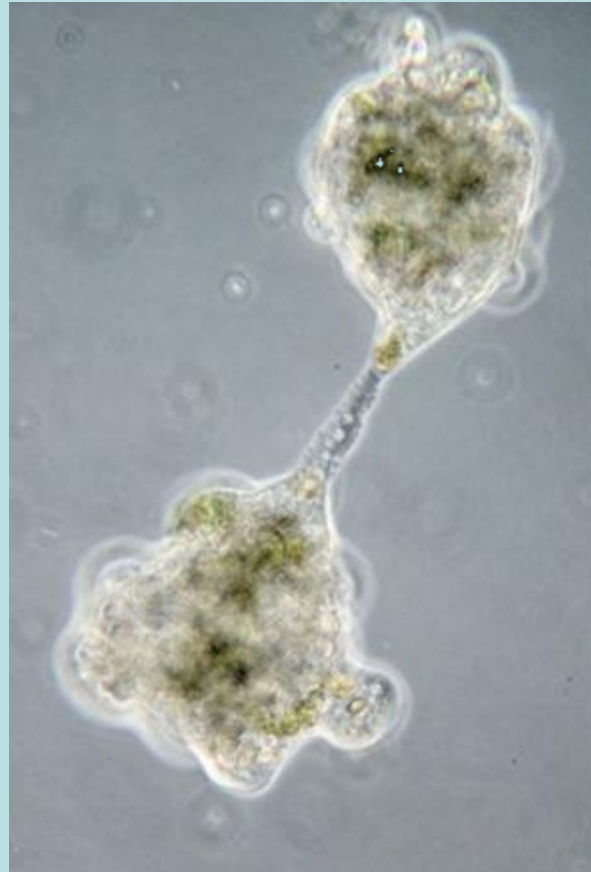
Subphylum Sarcodines (Sarcodina)



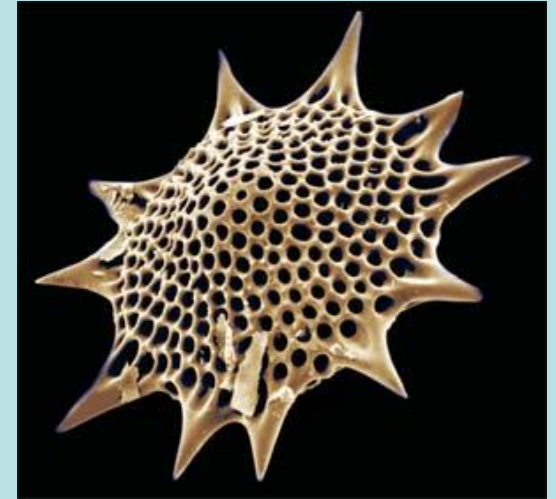
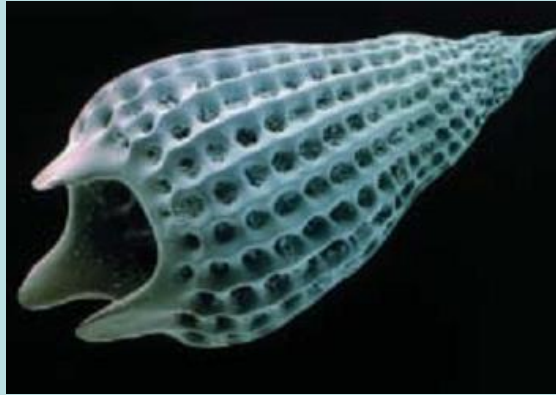
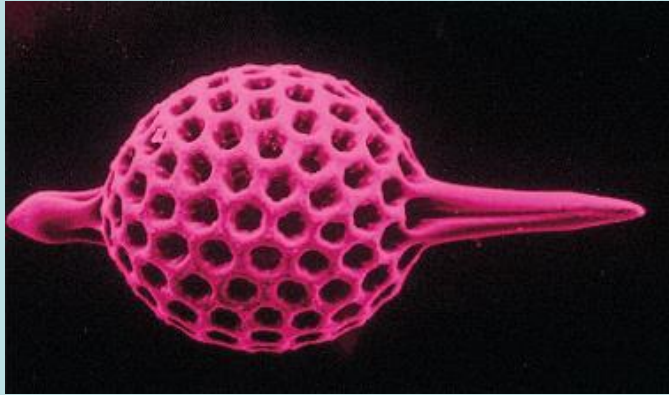
External structure of amoeba *Amoeba proteus*



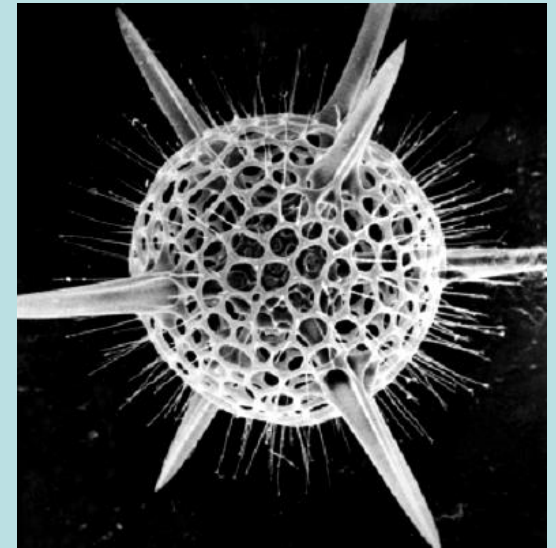
- Feeding by phagocytosis – the capture of food particles with pseudopodia
- Asexual reproduction by binary fission



Subphylum Sarcodines (Sarcodina)



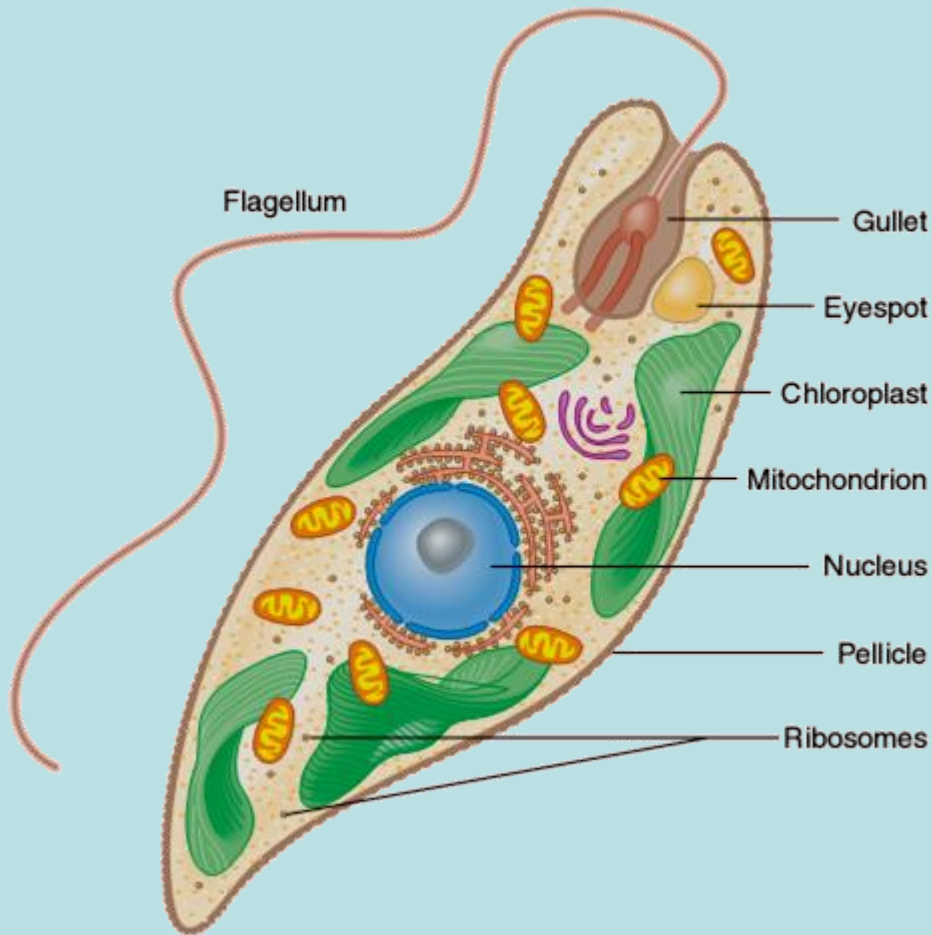
Foraminifera



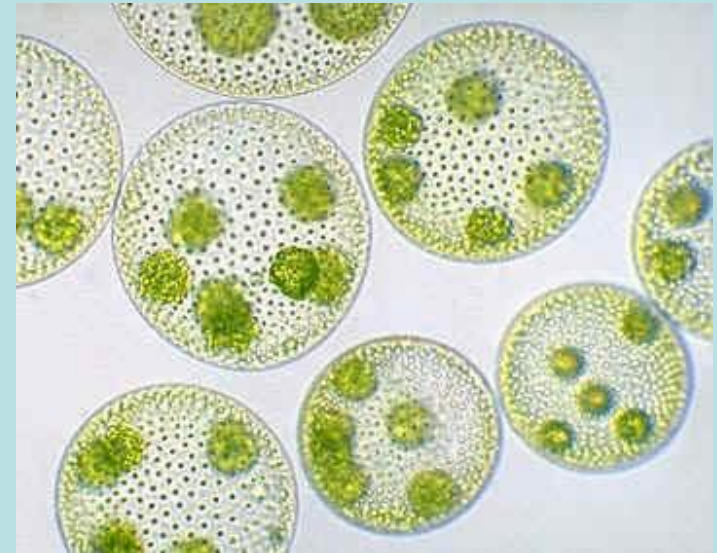
Radiolaria

Subphylum Flagellates (Mastigophora)

Class Plant flagellates (Phytomastigina)



Structure of *Euglena viridis*

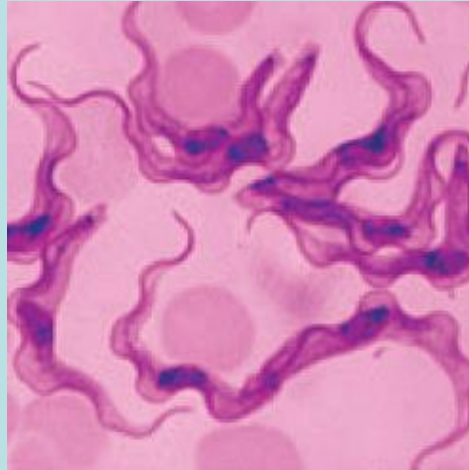


Volvox – the colonial
flagellate

Class Animal flagellates (Zoomastigina)



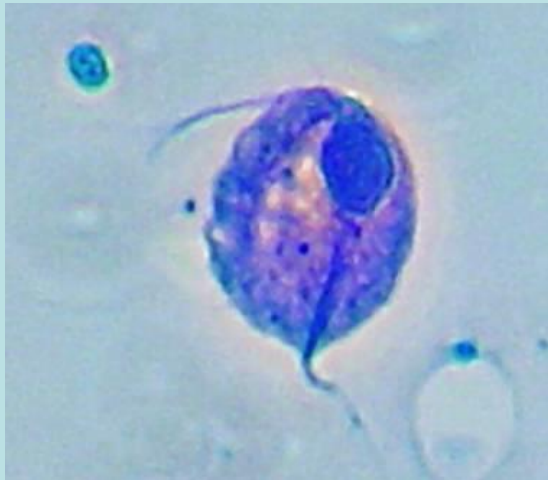
Lamblia



Trypanosoma –
agent of sleeping
sickness



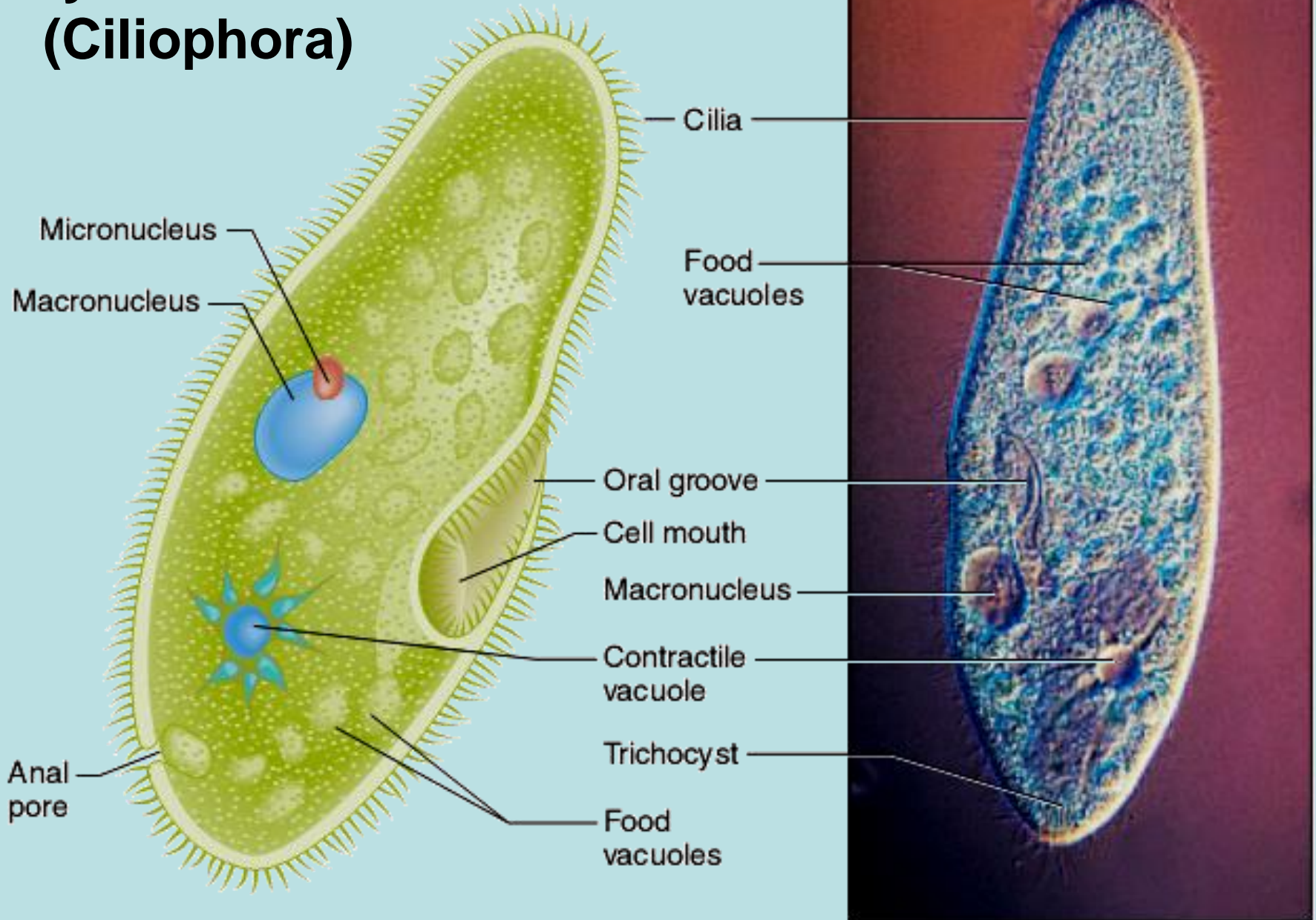
Tsetse fly – vector of
sleeping sickness



Trichomonas



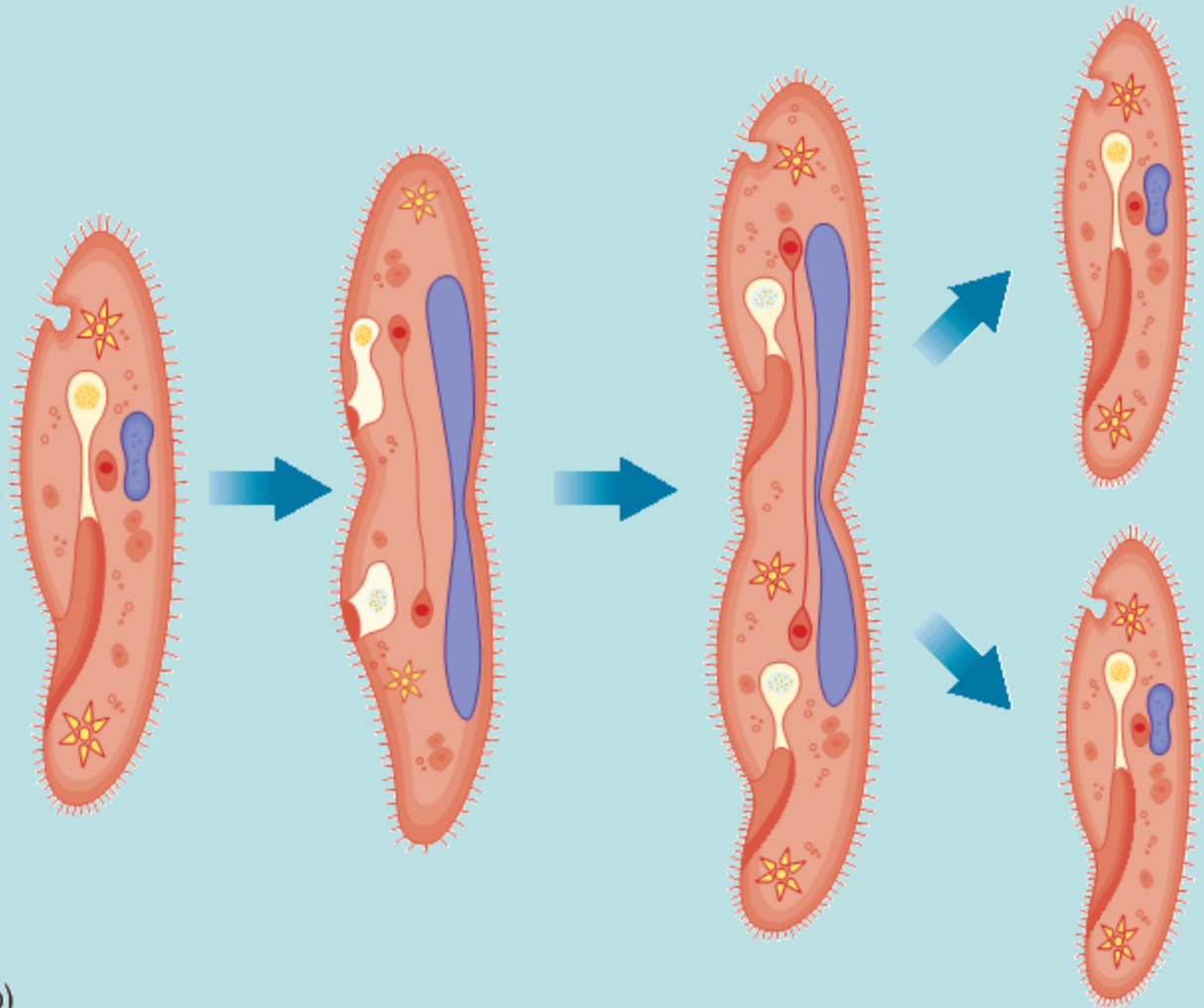
Phylum Ciliates (Ciliophora)



Asexual reproduction of ciliates

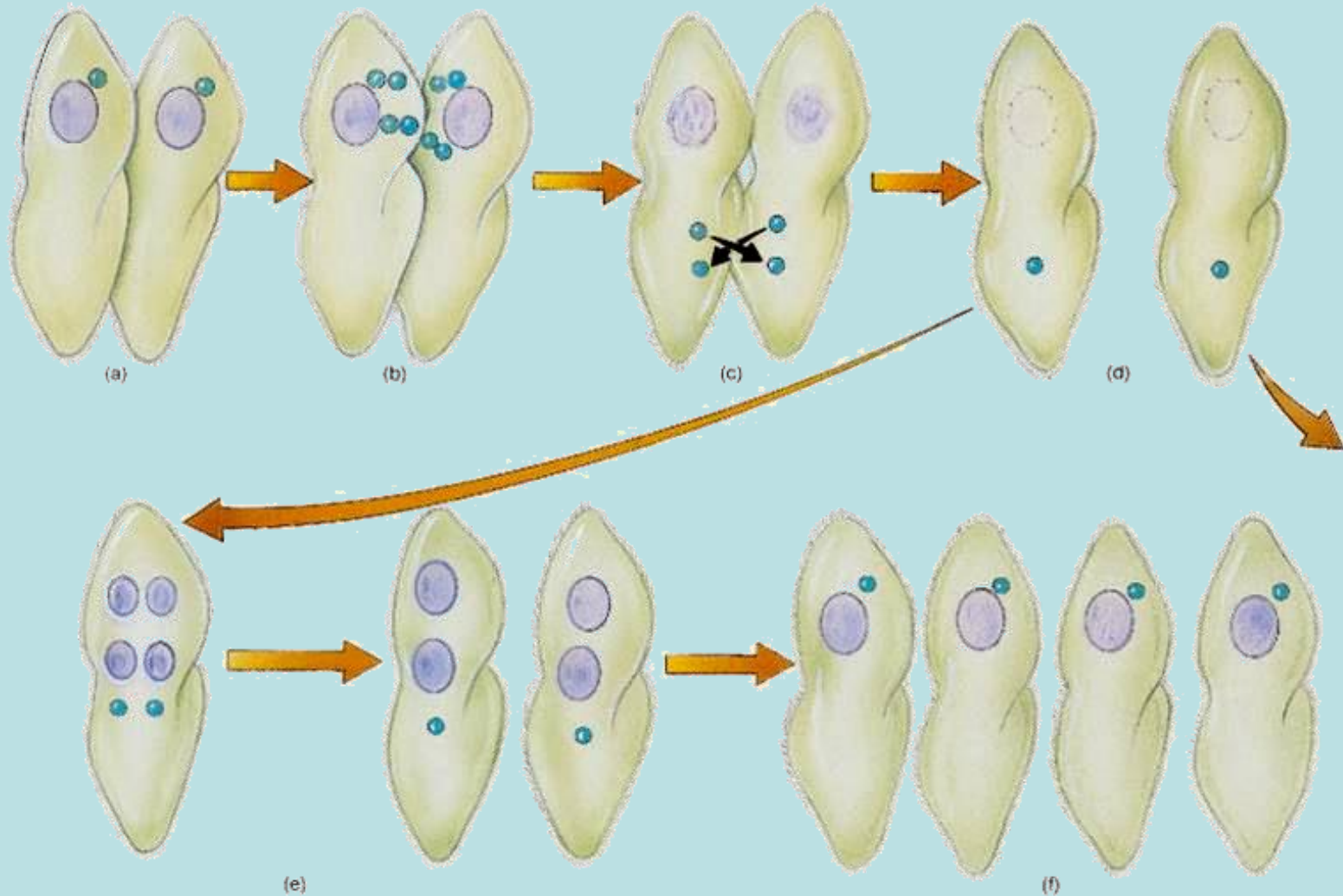


(b)



Asexual reproduction of ciliates – the binary fission

Sexual reproduction – the conjugation

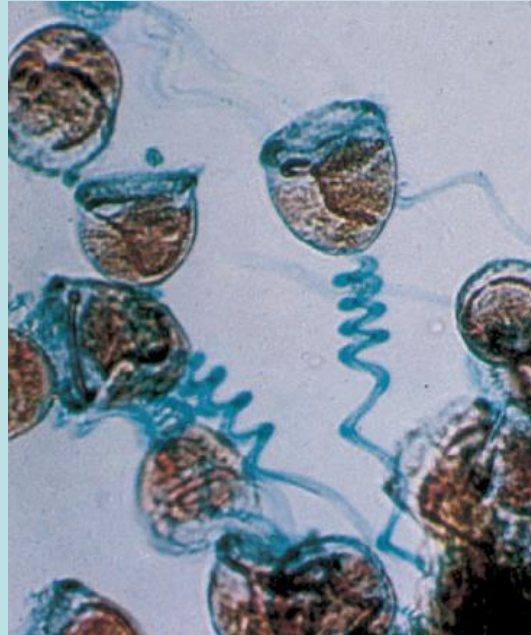


Exchange of micronuclei with hereditary information

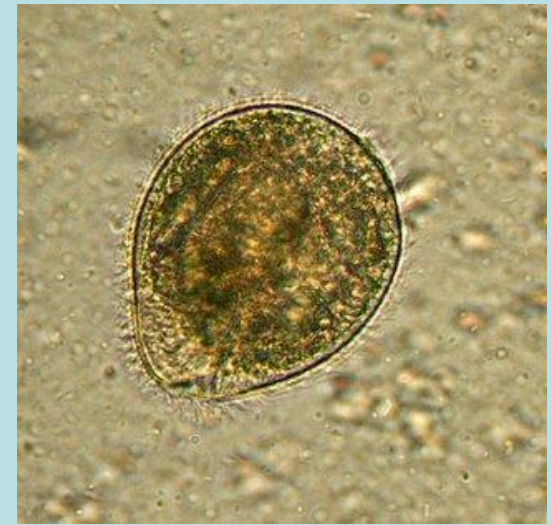
Phylum Ciliates (Ciliophora)



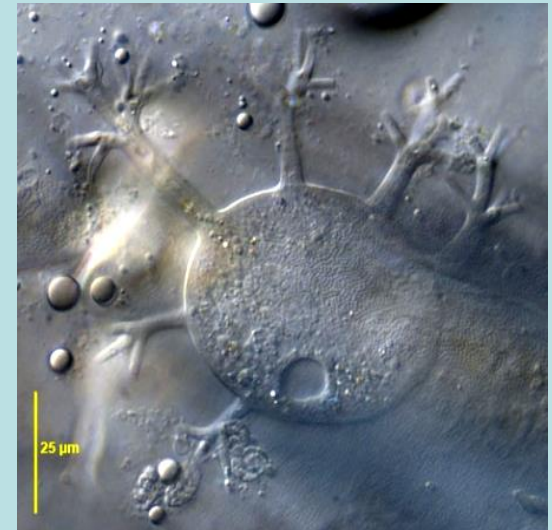
Paramecium caudatum



Vorticella

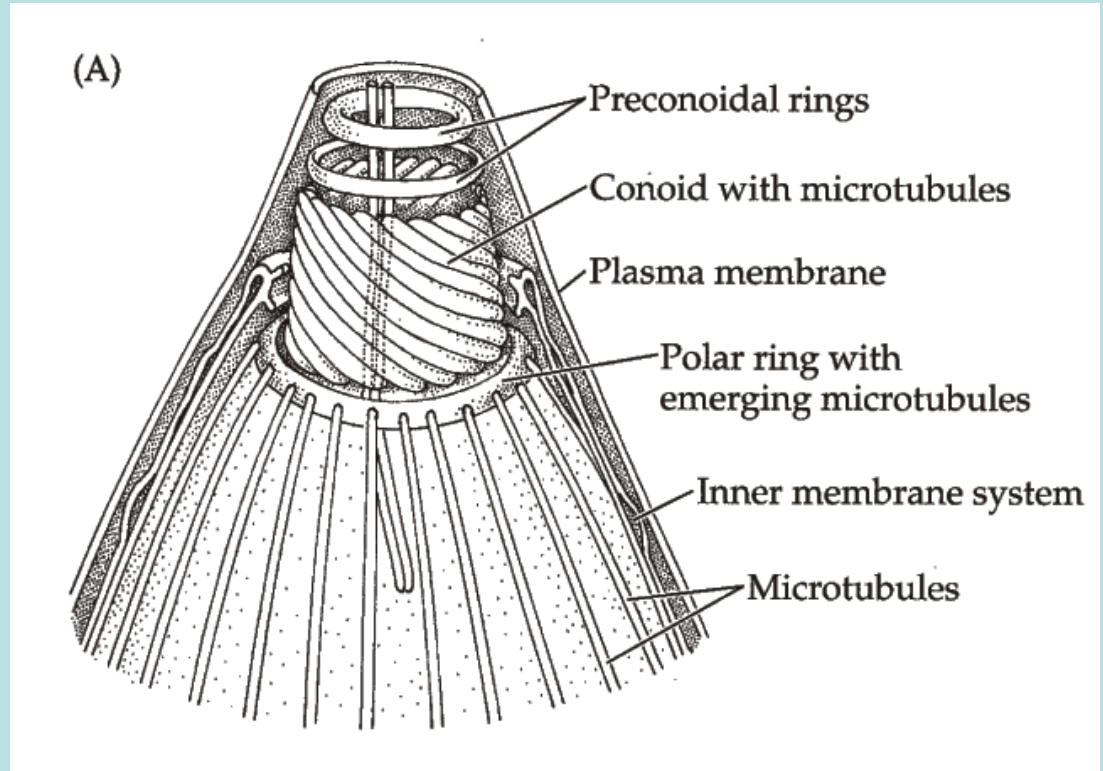
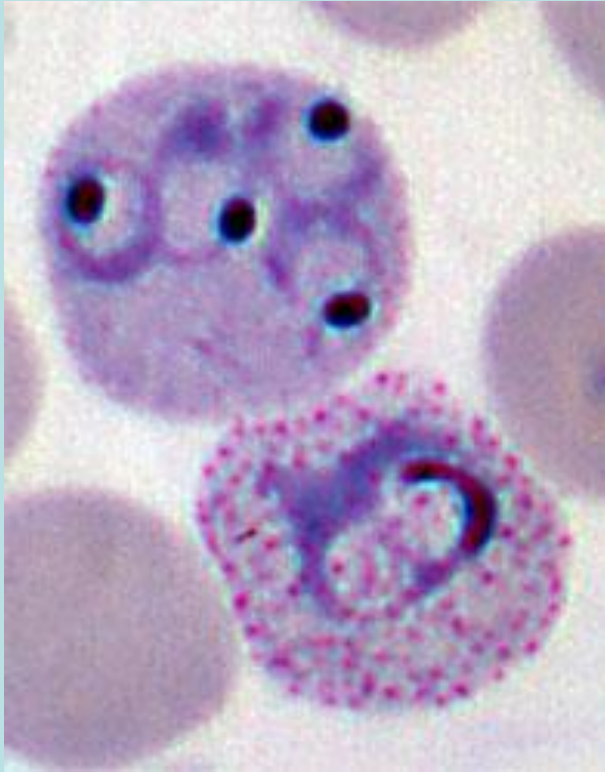


Balantidium –
intestinal parasite



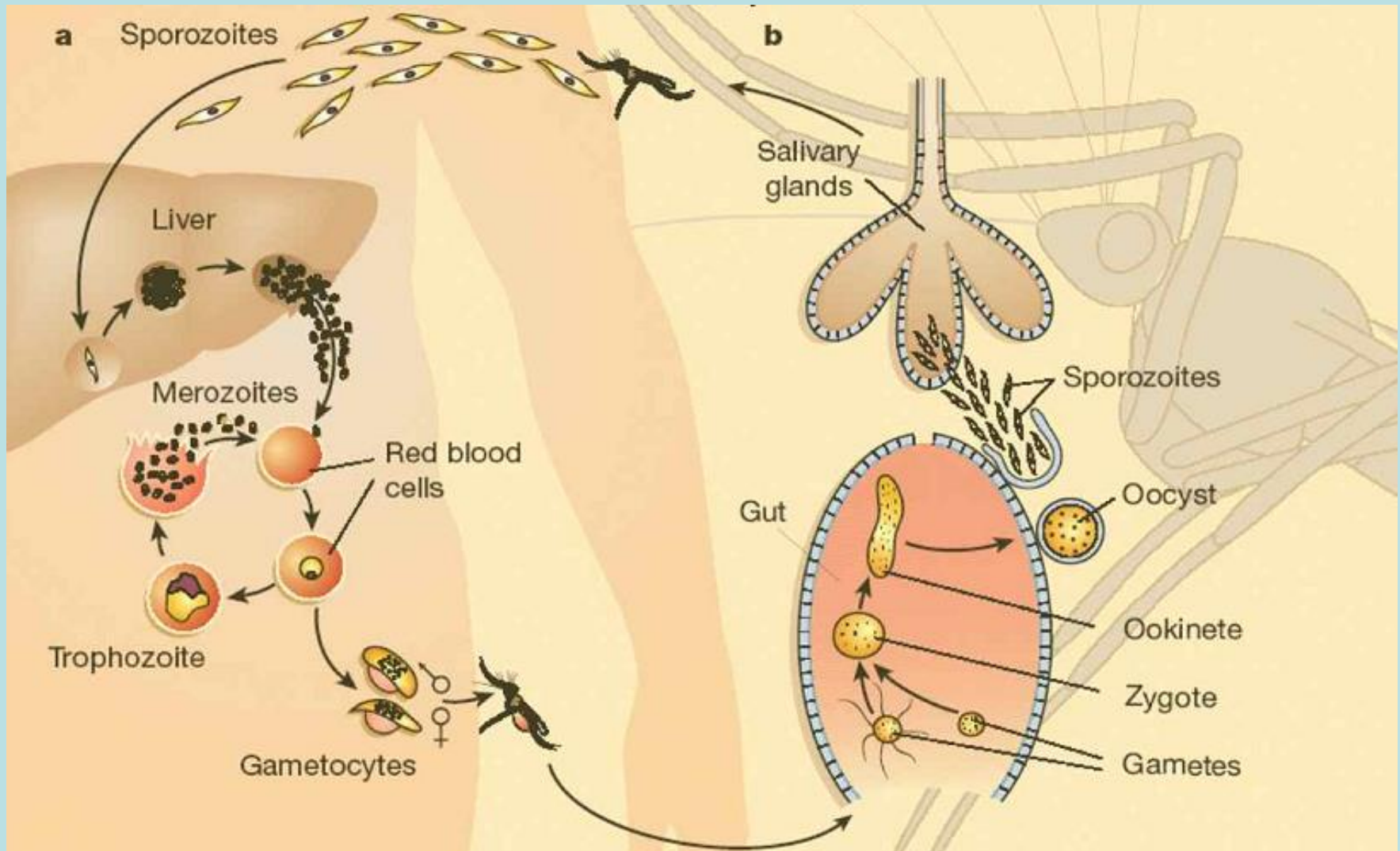
Dendrocometes

Phylum Sporozoans (Apicomplexa)



- Parasites with complex life cycle
- Do not have a locomotory organelles
- Transmissive stages (sporozoites) possess an apical complex for penetration into the host cell

Phylum Sporozoans (Apicomplexa)



Life cycle of *Plasmodium* – the agent of malaria

Kingdom Animals (Animalia)

**Subkingdom
Protozoans
(Protozoa)**

**Subkingdom
Primitive
multicellulars
(Prometazoa)**

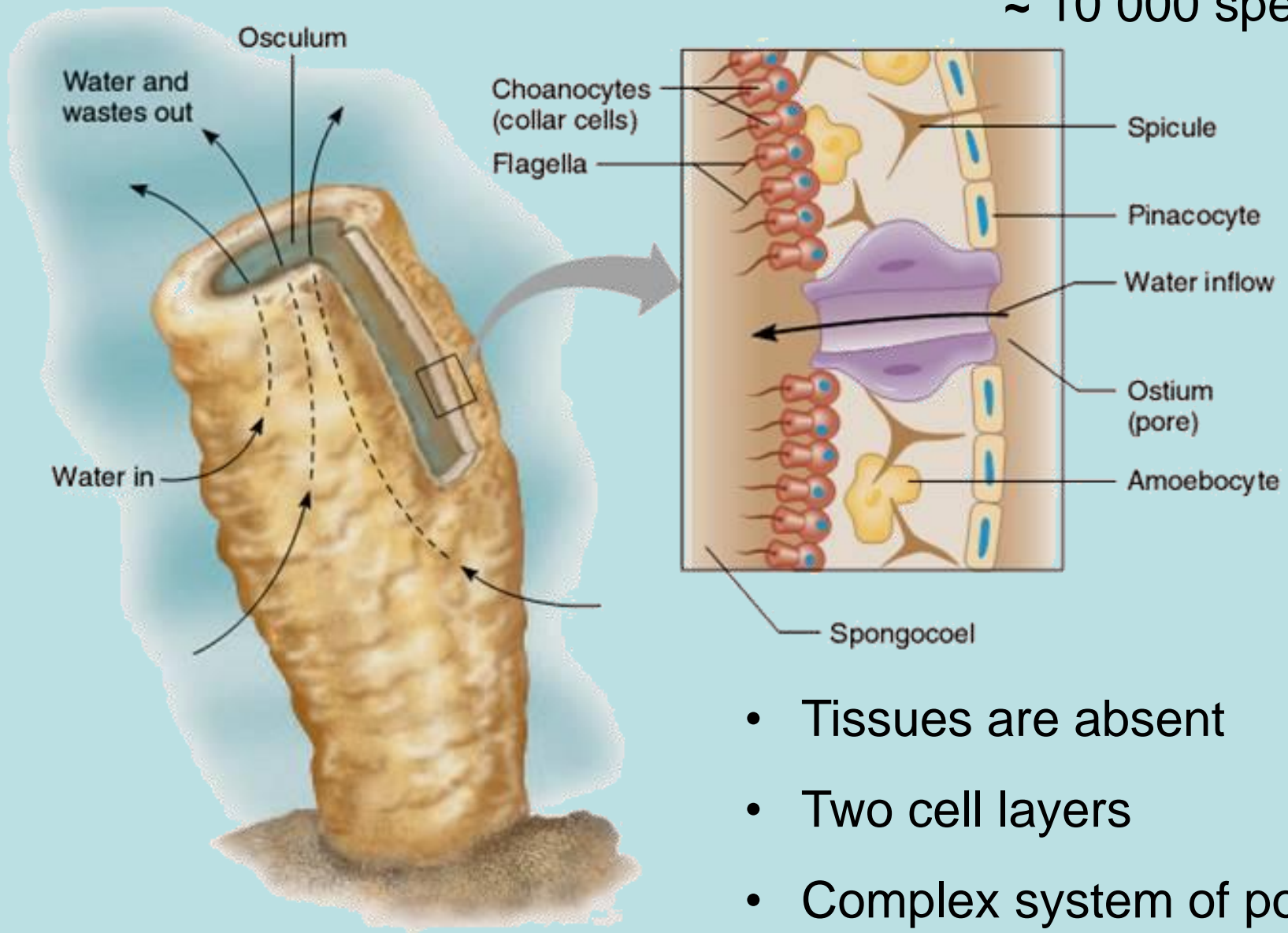
**Subkingdom
Higher
multicellulars
(Eumetazoa)**

**Phylum Sponges
(Spongia or Porifera)**



Phylum Sponges (Spongia or Porifera)

~ 10 000 species



- Tissues are absent
- Two cell layers
- Complex system of pores

Phylum Sponges (Porifera)

**Class Glass
sponges
(Hexactinellida)**



**Class Calcareous
sponges
(Calcarea)**



**Class Common
sponges
(Demospongia)**

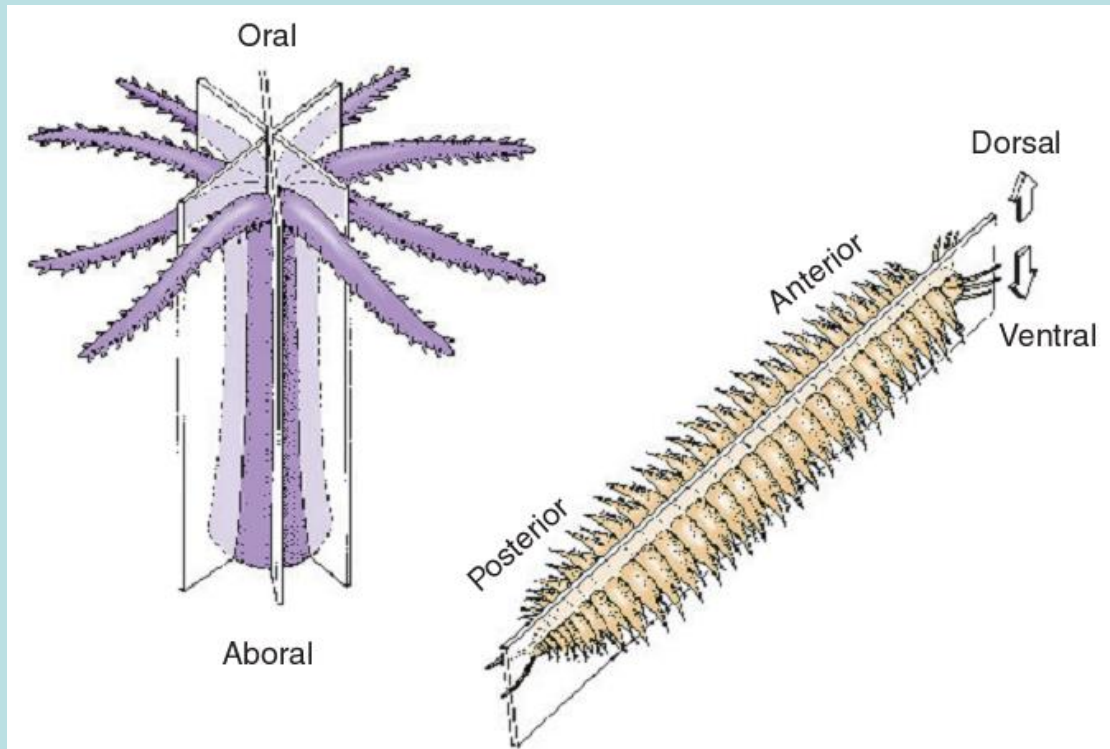


**Subkingdom Higher
multicellulars (Eumetazoa)**

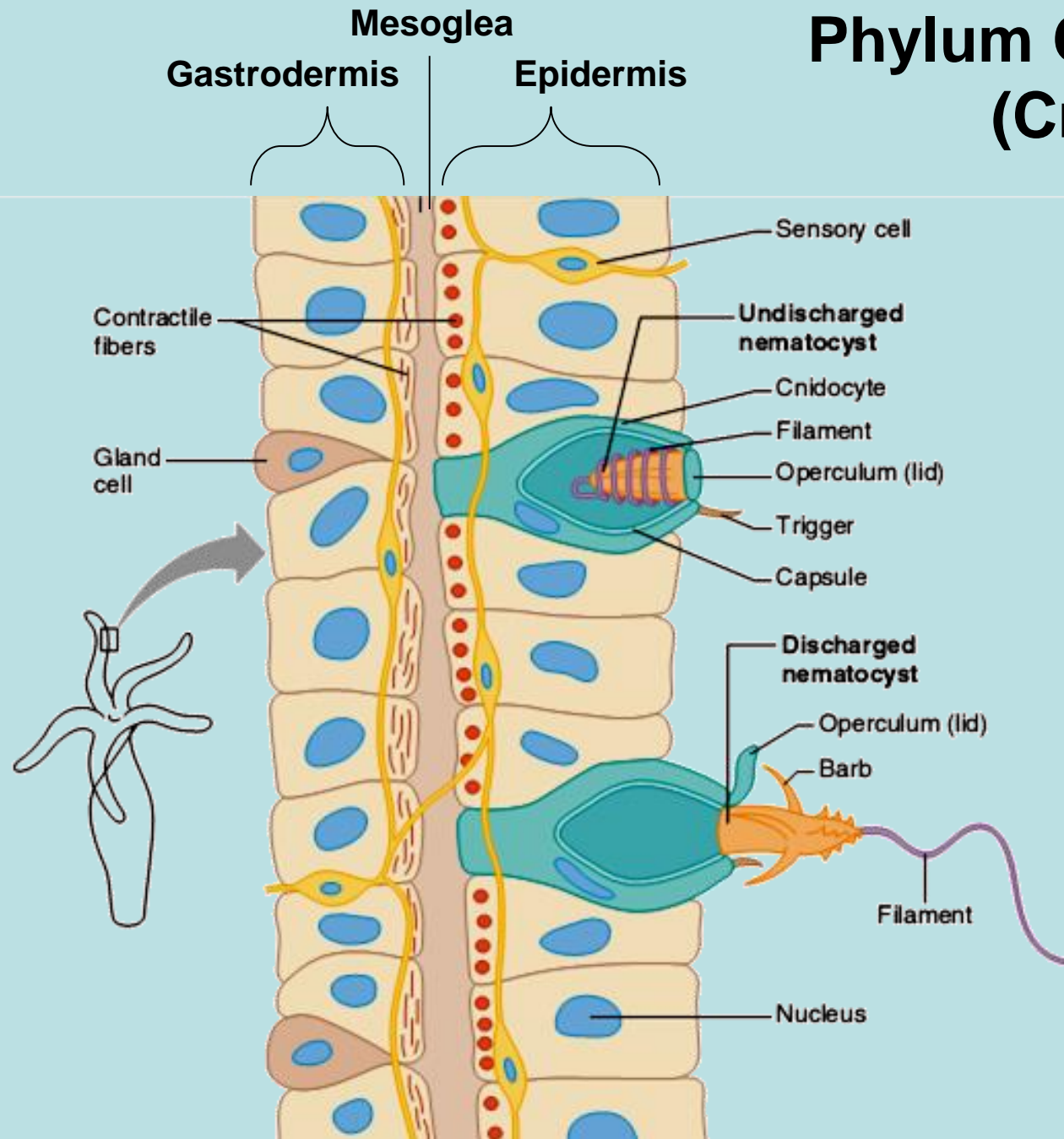
**Division Radial animals
(Radiata)**

**Division Bilateral animals
(Bilateria)**

**Phylum
Coelenterates
(Cnidaria)**



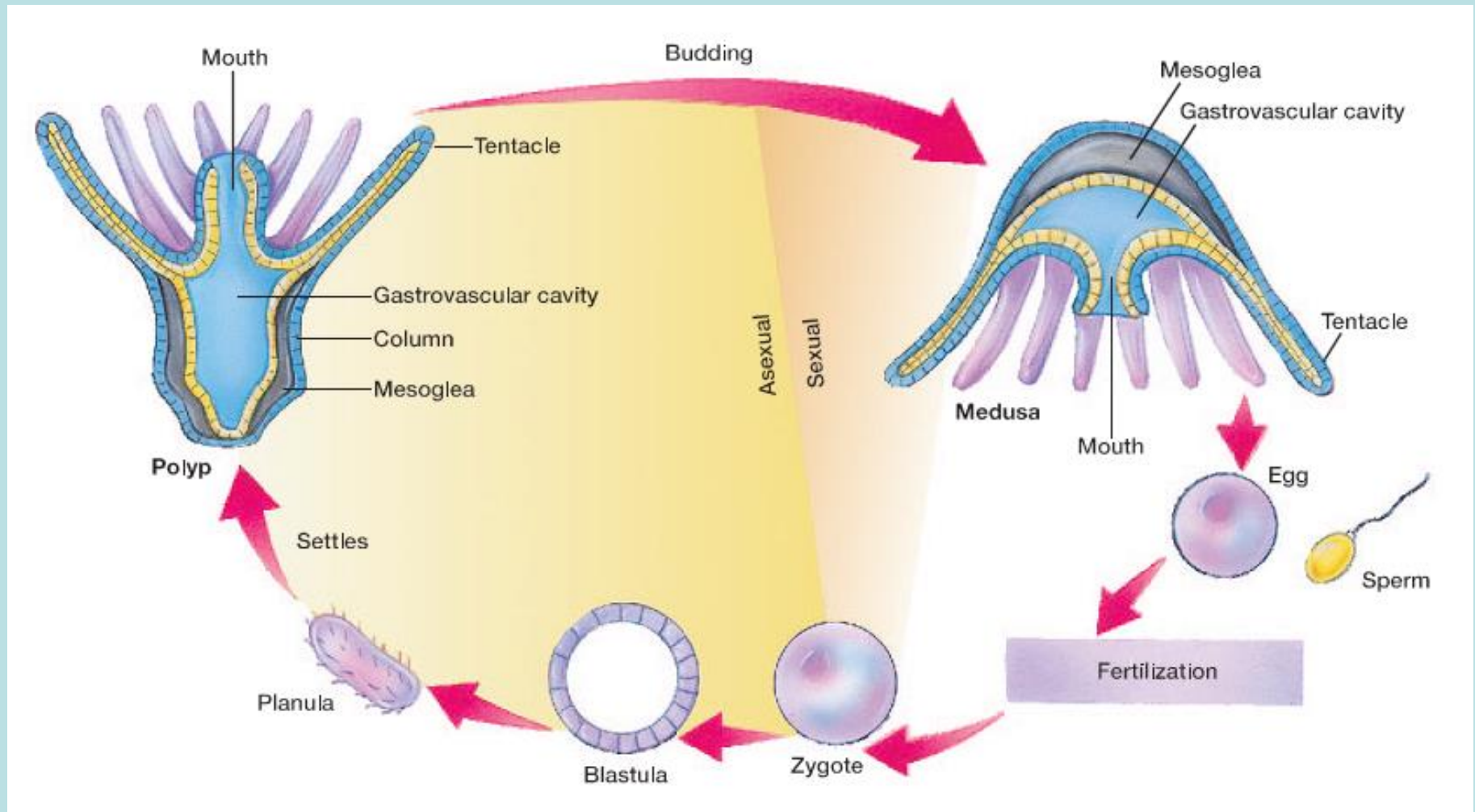
Phylum Coelenterates (Cnidaria)



- The body consists of two cell layers
- The presence of stinging cells – cnidocytes
- Alternation of generations - asexual one (polyp) and sexual one (jellyfish)

Phylum Coelenterates (Cnidaria)

~ 10 000 species



Body plan and life cycle of coelenterates

Phylum Coelenterates (Cnidaria)

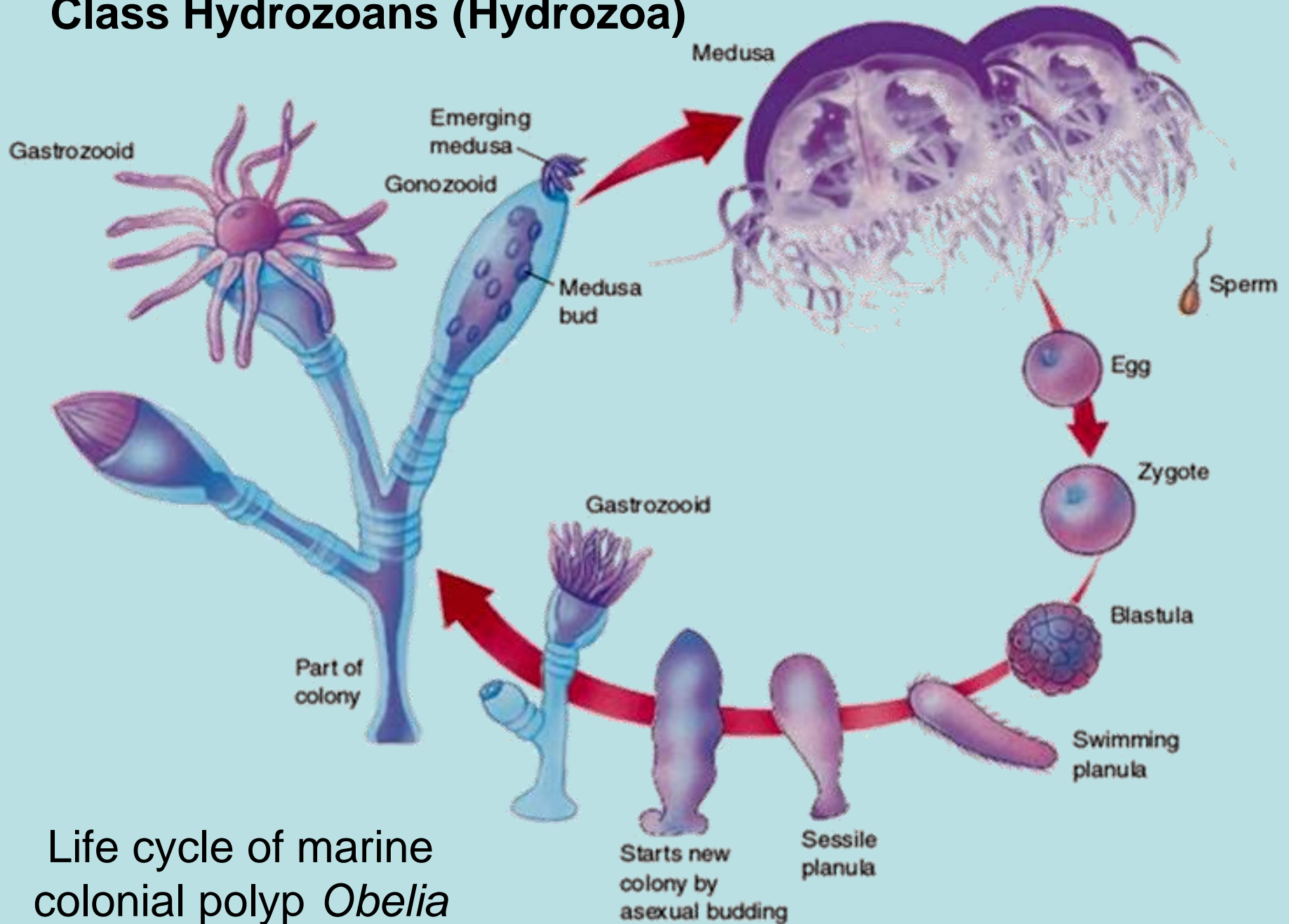
**Class
Hydrozoans
(Hydrozoa)**

**Class
Scyphozoans
(Scyphozoa)**

**Class Coral
polyps
(Anthozoa)**

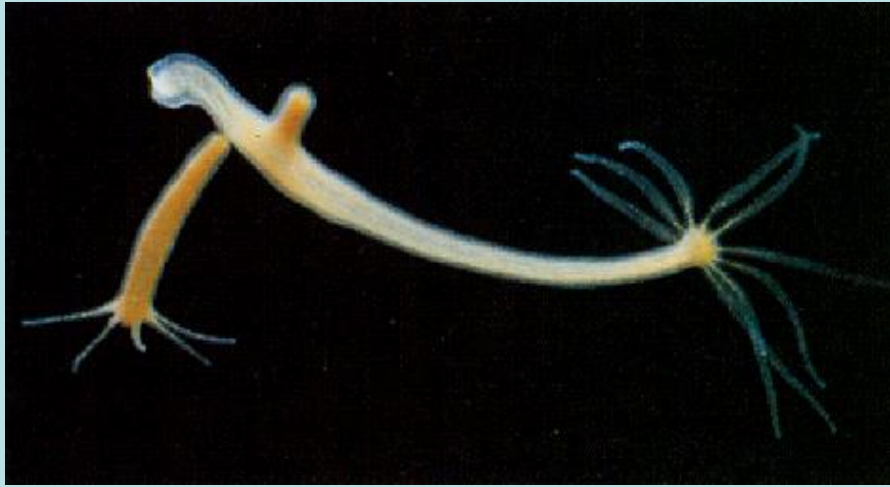


Class Hydrozoans (Hydrozoa)

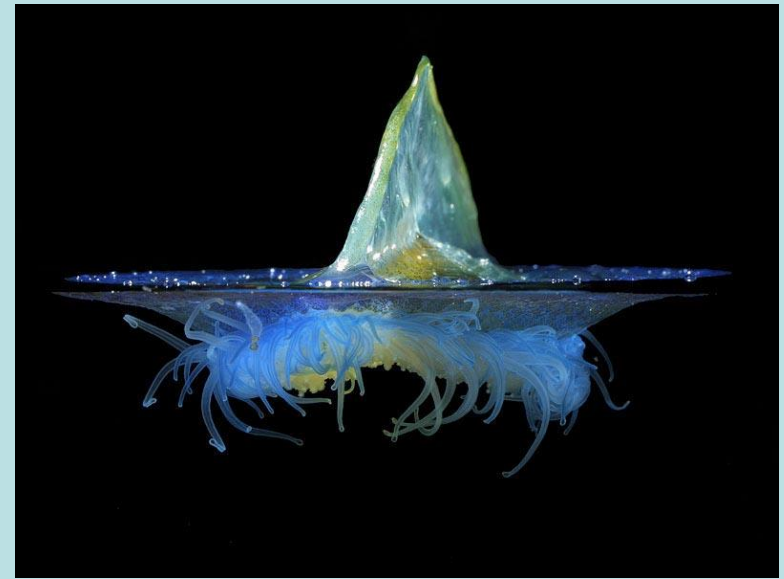


Life cycle of marine colonial polyp *Obelia*

Class Hydrozoans (Hydrozoa)



Hydra



Velella



Jellyfish *Gonionemus*



Portuguese man-of-war

Class Scyphozoans (Scyphozoa)



Life cycle of moon jellyfish
Aurelia



Class
Scyphozoans
(Scyphozoa)

«Lion's mane»
Cyanea



Moon jellyfish *Aurelia*



Sedentary jellyfish *Lucernaria*



«Sea wasp» *Chironex*



**Class
Corals
(Anthozoa)**

Red coral



Sea
feather



Sea anemone



Coral reef

**Division Bilaterally-symmetrical
animals (Bilateria)**

```
graph TD; A[Division Bilaterally-symmetrical animals (Bilateria)] --- B[Phylum Flatworms (Plathelminthes)]; A --- C[Phylum Segmented worms (Annelida)]; A --- D[Phylum Mollusks (Mollusca)]; A --- E[Phylum Chordates (Chordata)]; A --- F[Phylum Roundworms (Nematoda)]; A --- G[Phylum Arthropods (Arthropoda)]; A --- H[Phylum Echinodermates (Echinodermata)];
```

**Phylum Flatworms
(Plathelminthes)**

**Phylum Segmented
worms (Annelida)**

**Phylum Mollusks
(Mollusca)**

**Phylum Chordates
(Chordata)**

**Phylum Roundworms
(Nematoda)**

**Phylum Arthropods
(Arthropoda)**

**Phylum Echinodermates
(Echinodermata)**

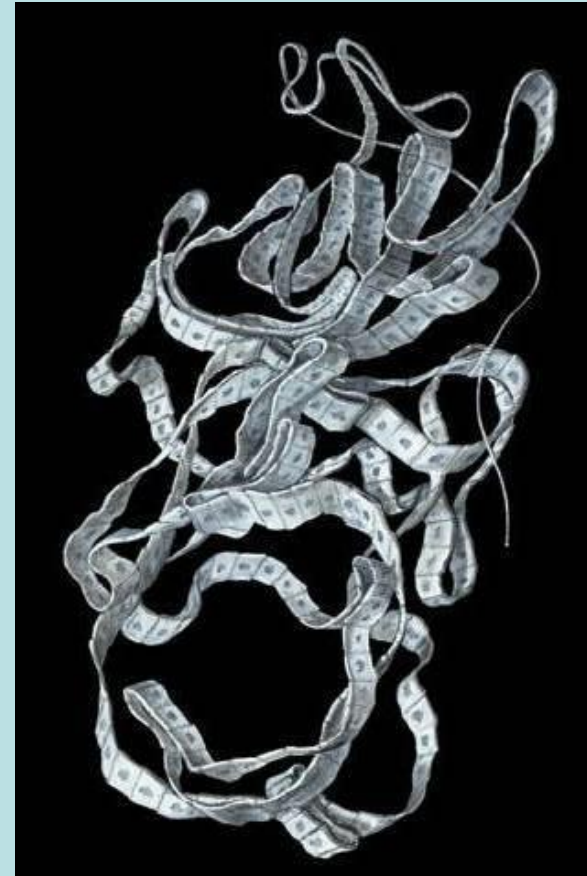
Phylum Flatworms (Plathelminthes)

~ 35 000
species

Class Turbellarians (Turbellaria)



Class Tapeworms (Cestoda)

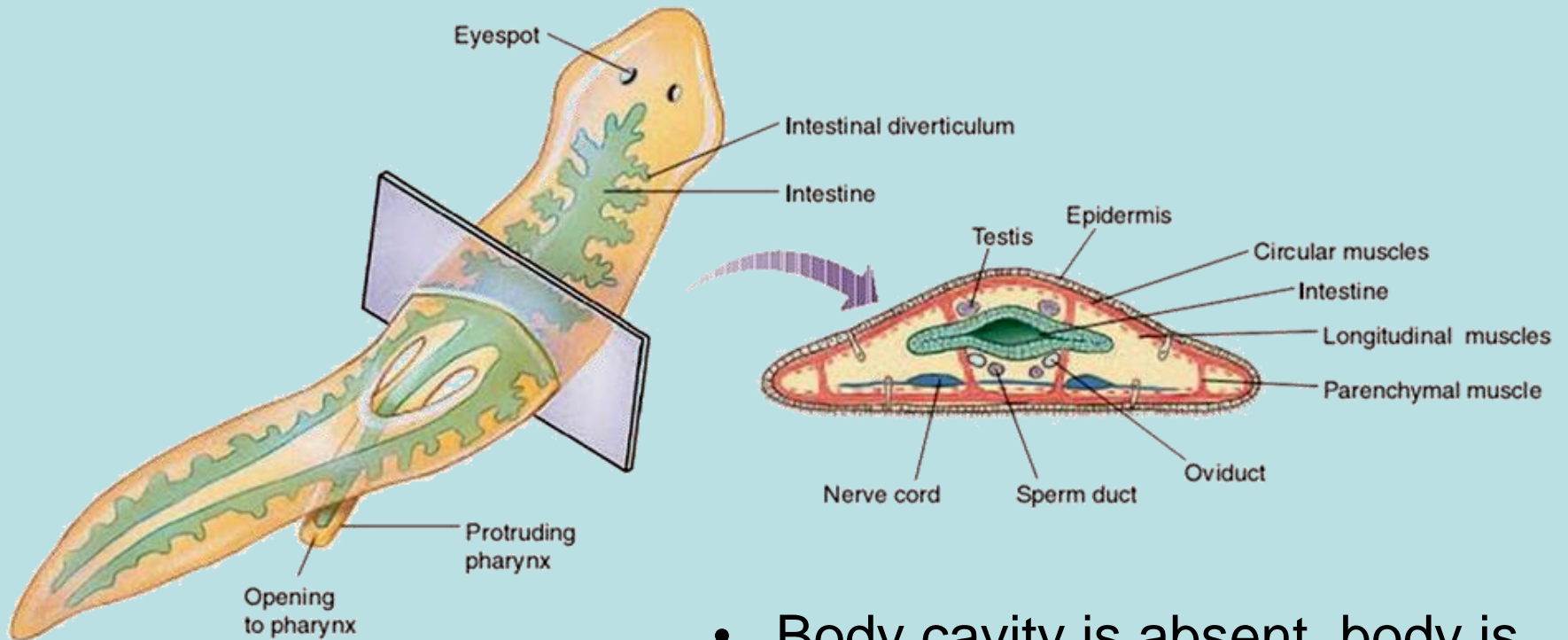


Class Flukes (Trematoda)



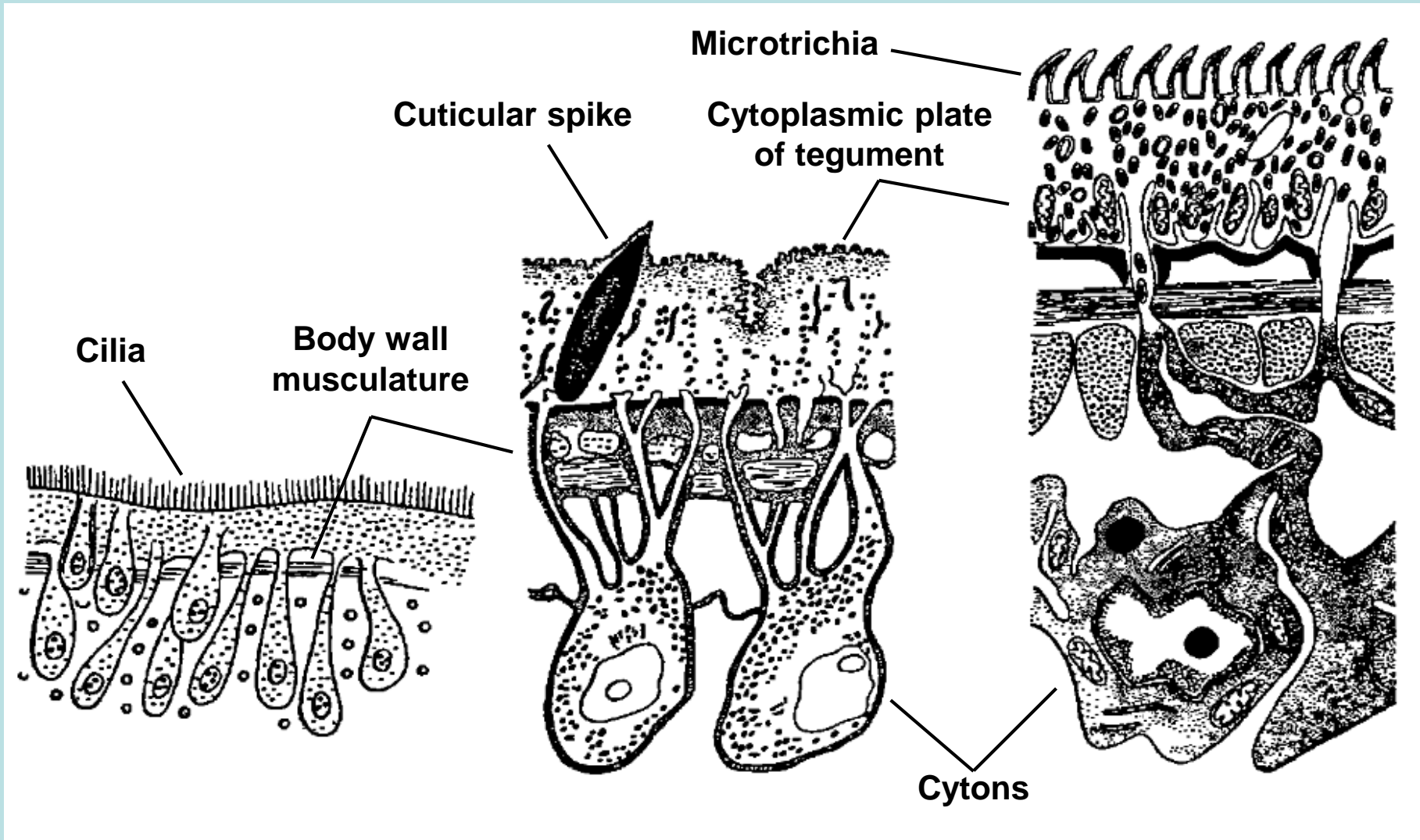
BIOIDIDAC © J. Housman, Univ. d'Ottawa

Phylum Flatworms (Plathelminthes)



- Body cavity is absent, body is filled with parenchyma
- Intestine is closed (no anus)
- Circulatory and respiratory systems are absent
- The nervous system is ladder-like (orthogon)

Phylum Flatworms (Plathelminthes)



Body wall structure of Turbellaria, Trematoda and Cestoda