Kingdom Protista

The world of Protists:

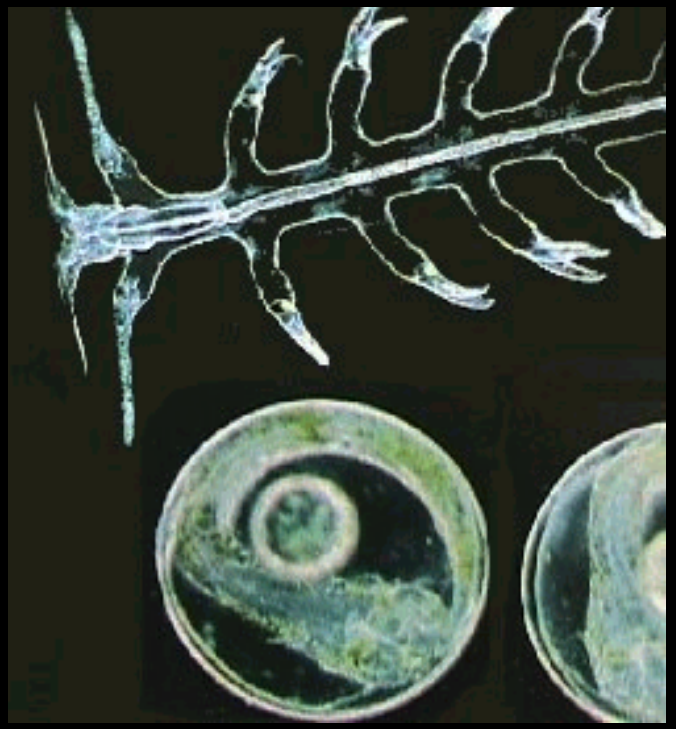
Animal-like Protists

Plant-like Protists

Fungus-like Protists

PROTISTS

- DOMAIN EUKARYA
  - KINGDOM PROTISTA
    - Any eukaryote that is not classified as a fungus, plant, or animal is a PROTIST

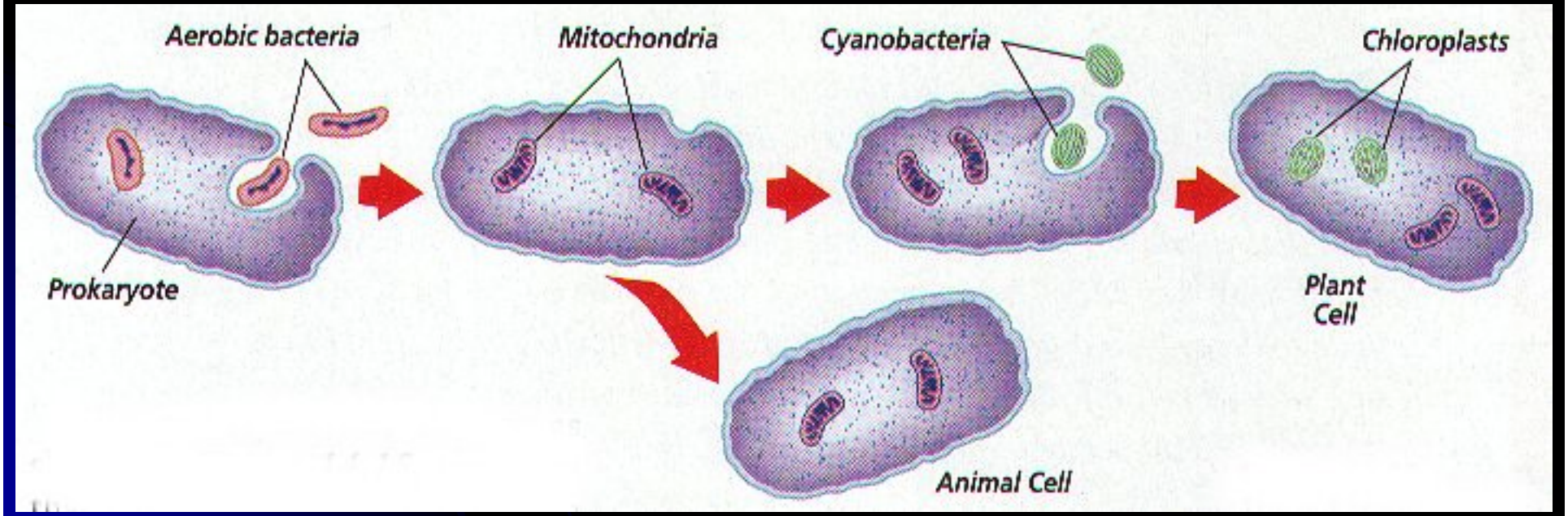


Protist Diversity

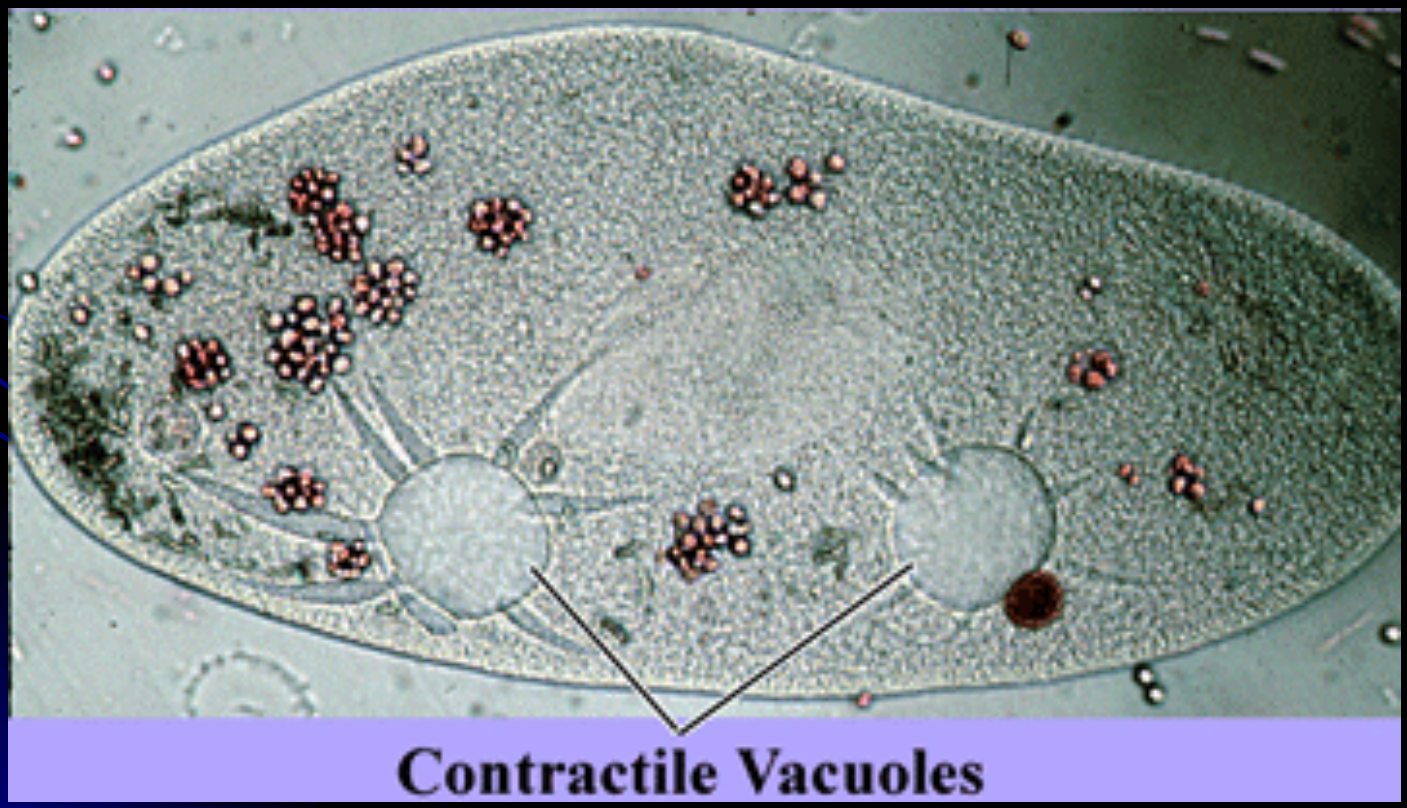
- 200,000 species come in different shapes, sizes, and colors
- All are eukaryotes – have a nucleus and membrane-bound organelles

- COMMON EXAMPLES:
  - *Amoeba, Paramecium, Euglena, Volvox, Plasmodium*
- VERY DIVERSE GROUP
  - most are unicellular, microscopic, aerobic
  - Some are autotrophic, heterotrophic, sexual, asexual

- **ENDOSYMBIONT THEORY**
  - Early eukaryotes developed symbiotic relationships with prokaryotic cells
  - Prokaryotic cells lived inside eukaryotic cells
  - Over time, the smaller prokaryotic cells evolved with the eukaryotic cells to become mitochondria and chloroplasts



- EXCRETION AND OSMOREGULATION
  - Water balance = osmoregulation
  - Done by contractile vacuole
  - Wastes removed by diffusion



- REPRODUCTION
  - Asexual
    - Mitosis and cytokinesis
    - Budding – similar to mitosis except daughter cell is smaller than parent

SEXUAL REPRODUCTION

- Union of gametes forms a diploid zygote = fertilization

4 types of sexual reproduction:

1. Syngamy – fertilization between two individuals
2. Autogamy – two gametes fuse within one organism
3. Parthenogenesis – development of organism from gamete without fertilization
4. Conjugation – exchange of nuclear material between two individuals

Protozoans

Animal-like Protists

Protozoans

- **Unicellular** – made up of one cell
- **Heterotrophs** – they eat other organisms or dead organic matter
- Classified by how they move

Phyla of Protozoans

Amoebas

Flagellates

Ciliates

Sporazoans

Amoebas: the blobs

- No cell wall
- Move using pseudopods – plasma extensions

Amoebas: the blobs

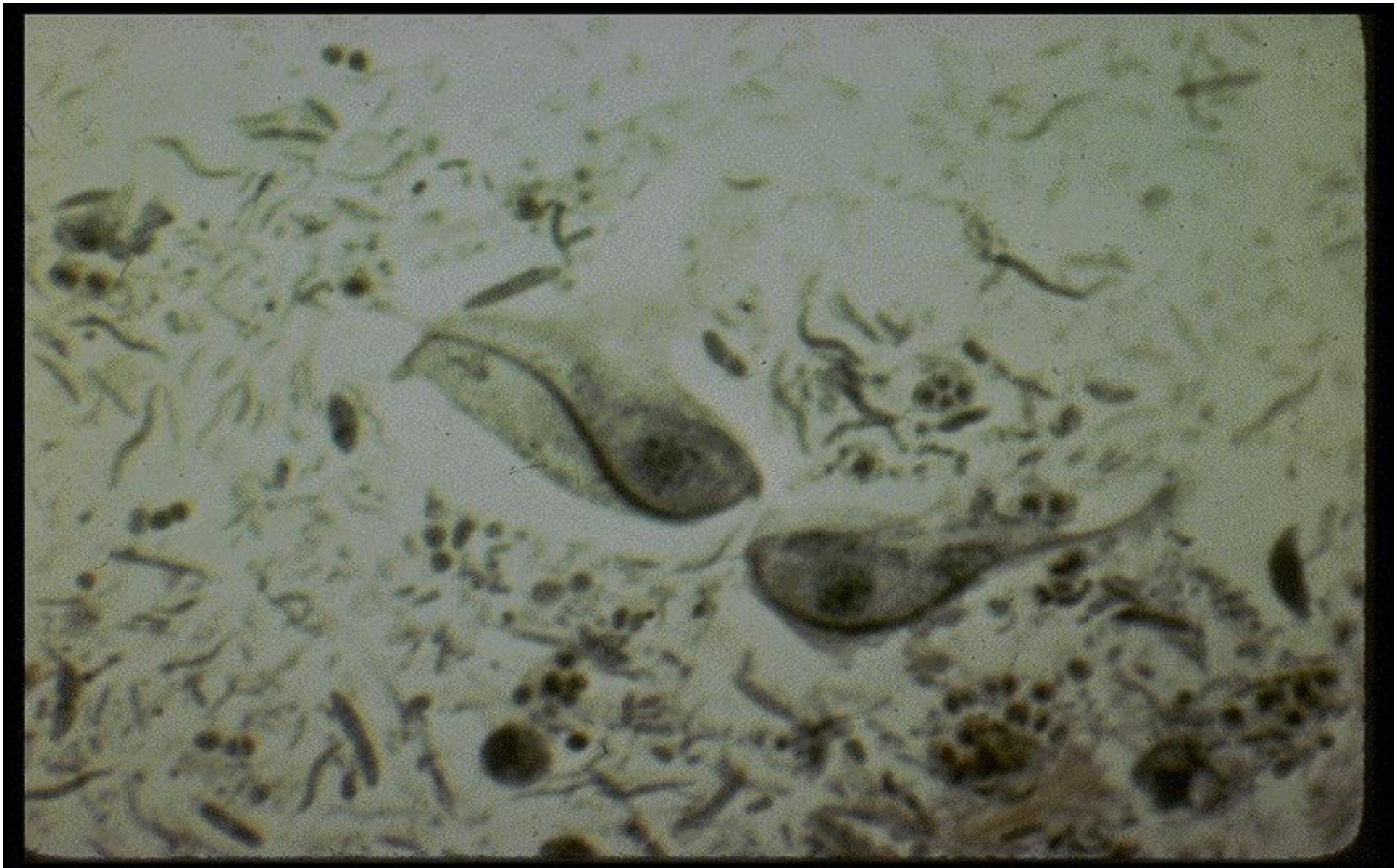
- Engulf bits of food by flowing around and over them

NOTES HIATUS:

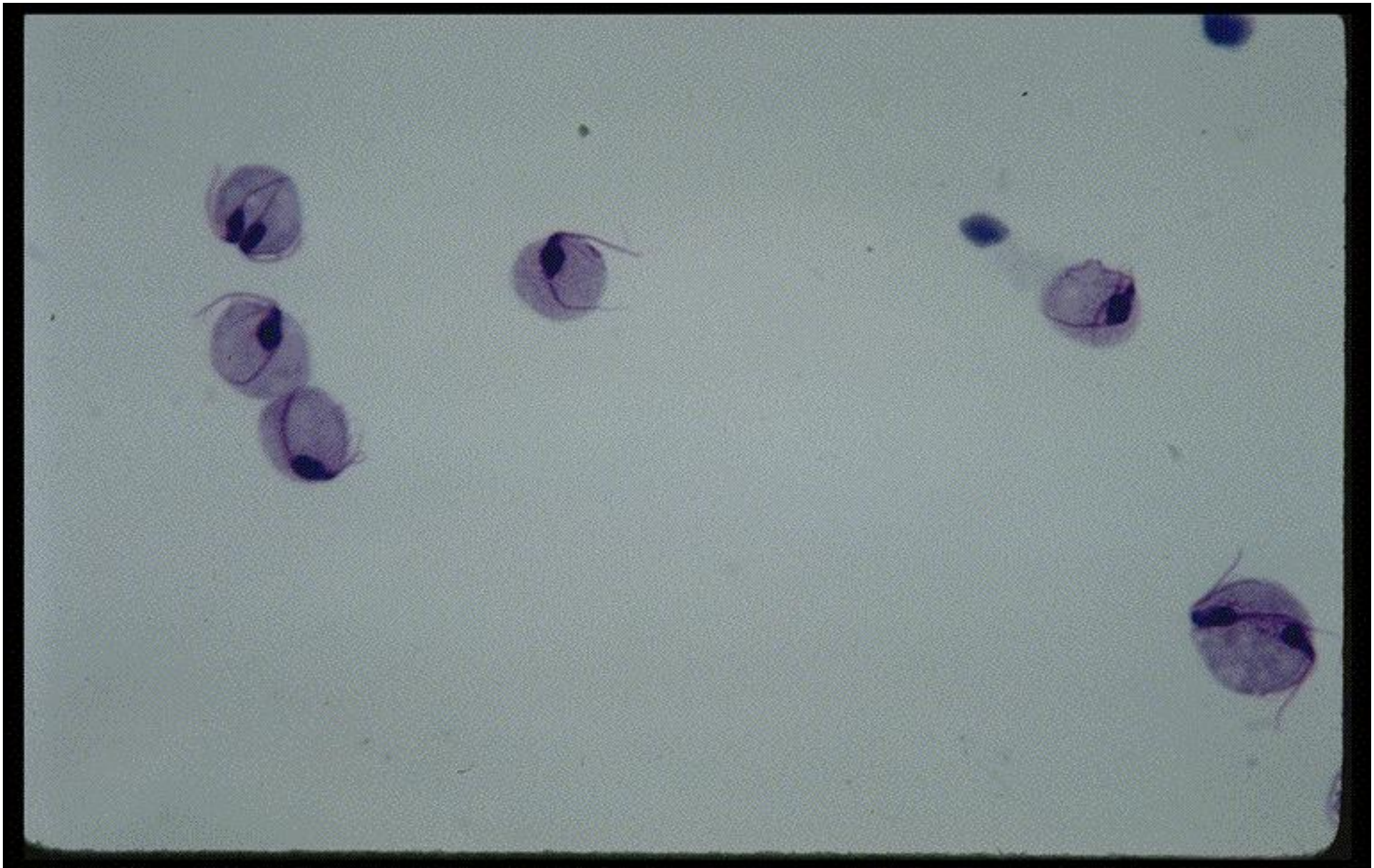
Complete the following activity: *Amoeba Anatomy Worksheet*

Flagellates: the speedboats (Phylum Zoomastigina)

- Use a whip-like extension called a **flagella** to move
- Some cause diseases
- Others aid in digestion of cellulose (**termite gut fauna**)



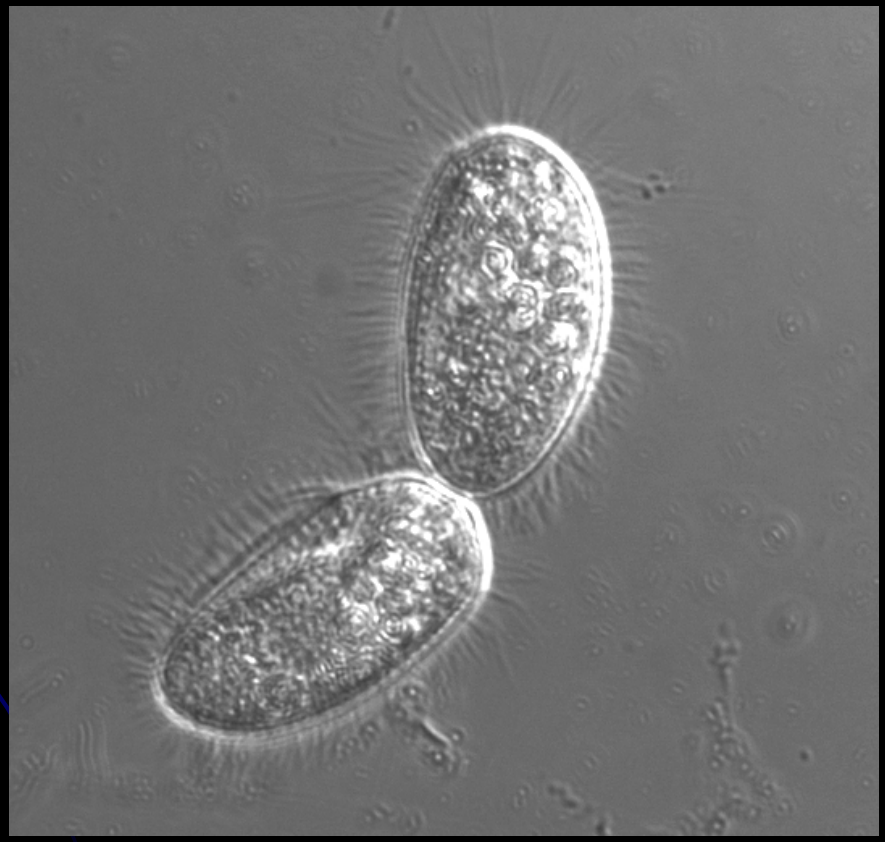
- *Trichomonas foetus* : cow disease



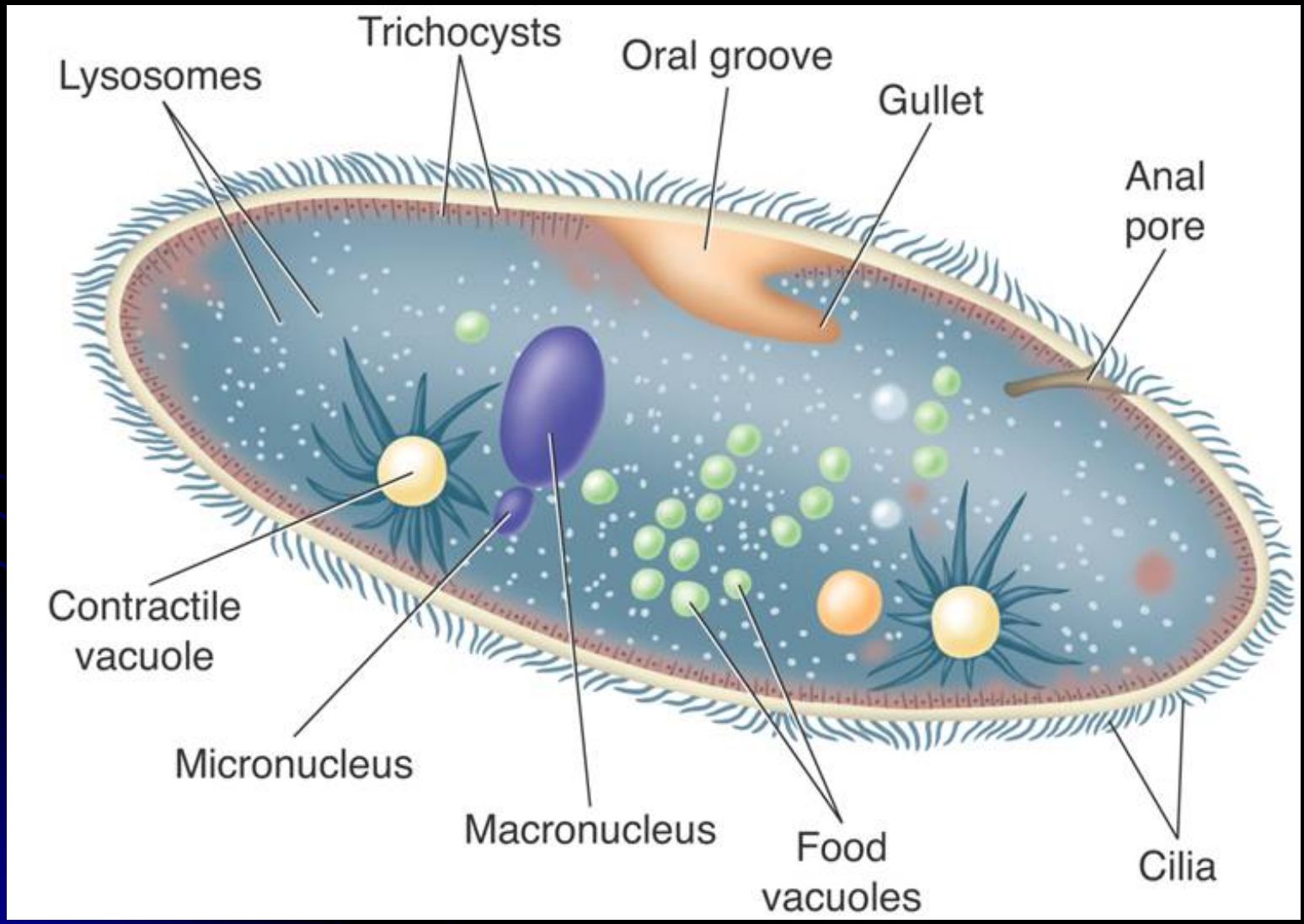
- *Trichomonas vaginalis: an STD*

Ciliates: the hairy ones

- Move beating tiny hairs called **cilia**



Ciliate anatomy



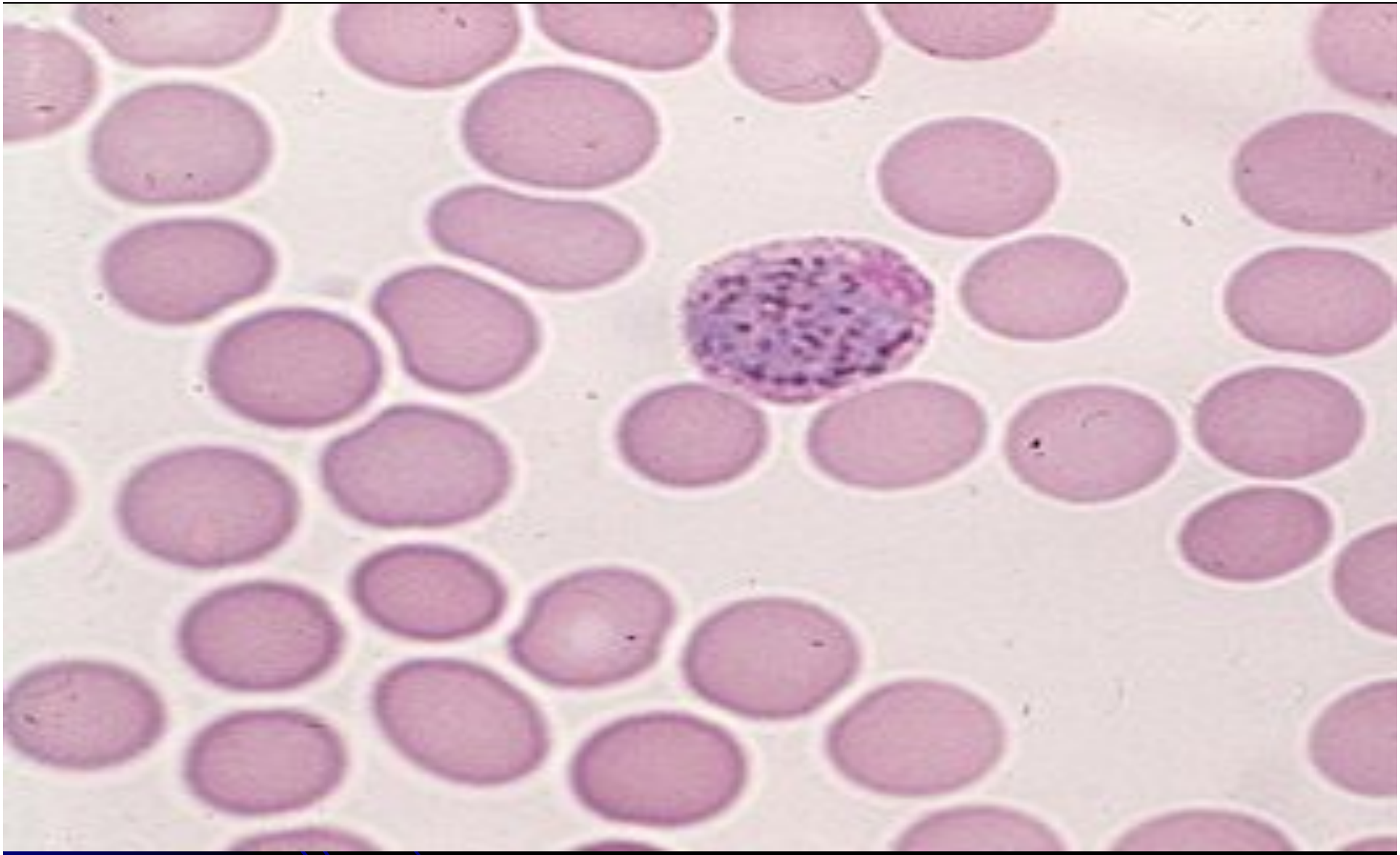
- TRICHOCYSTS – spindle shaped alternating between bases of cilia; used as anchor and to paralyze prey
- Oral groove – shallow furrow on one side of cell used to gather food
- Locomotion – cilia; avoiding reaction → contact with unfavorable conditions and will move away
  - Reacts to contact, temperature, gravity, water currents, electric currents, acidity and other chemicals

NOTES HIATUS:

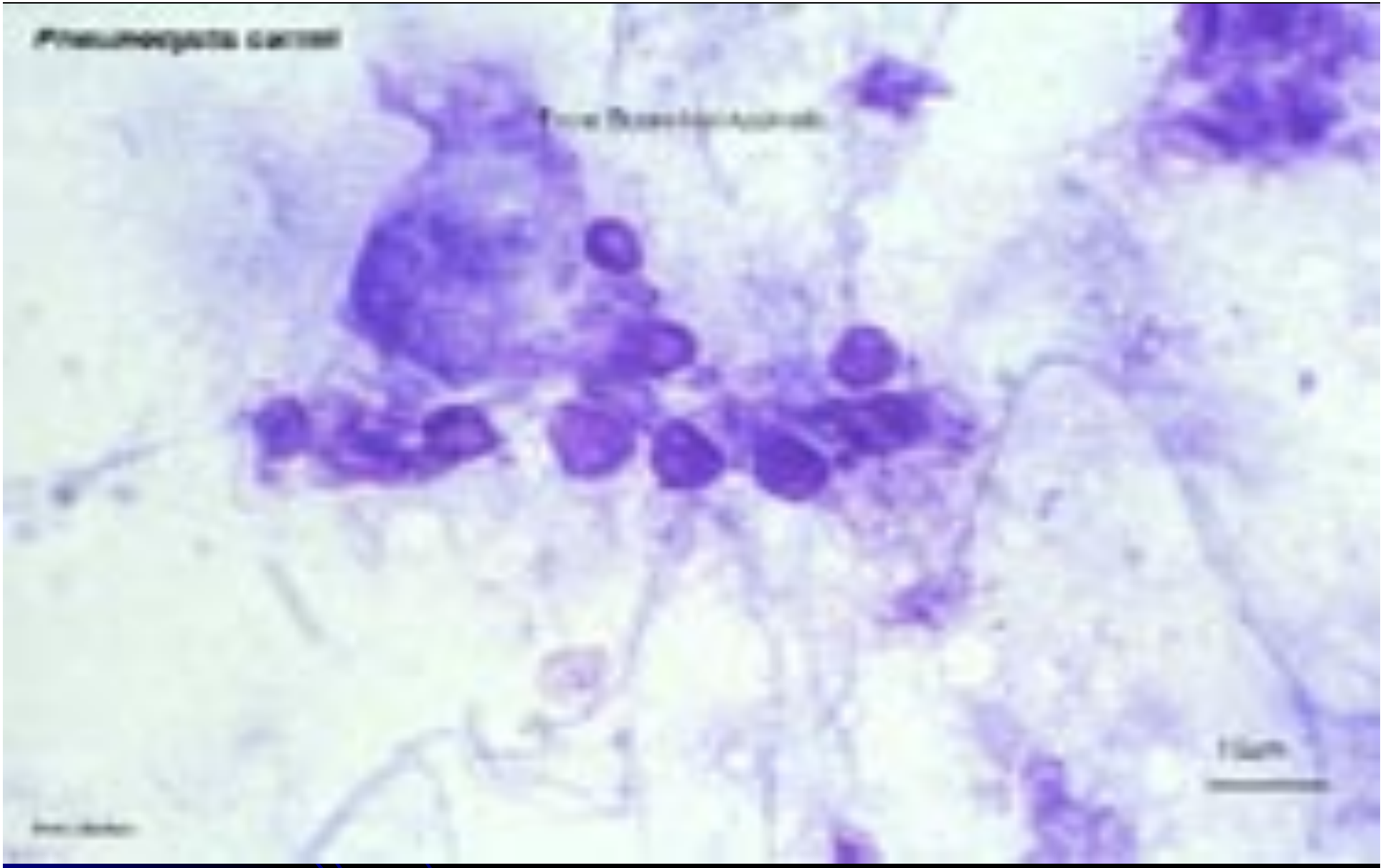
Complete the following activity: *Ciliate Anatomy Worksheet*

Sporozoans: the parasites

- Non-motile - Do not move
- Live inside a host
- One type causes malaria (*Plasmodium*)



- Malaria in red blood cells



- Pneumonia in AIDS patients

Algae

Plantlike Protists

What are Algae?

- **Multicellular** – made of more than one cell
- **Photosynthetic** – make their own food
- No roots, stems, or leaves
- Each has **chlorophyll** and other **photosynthetic pigments**

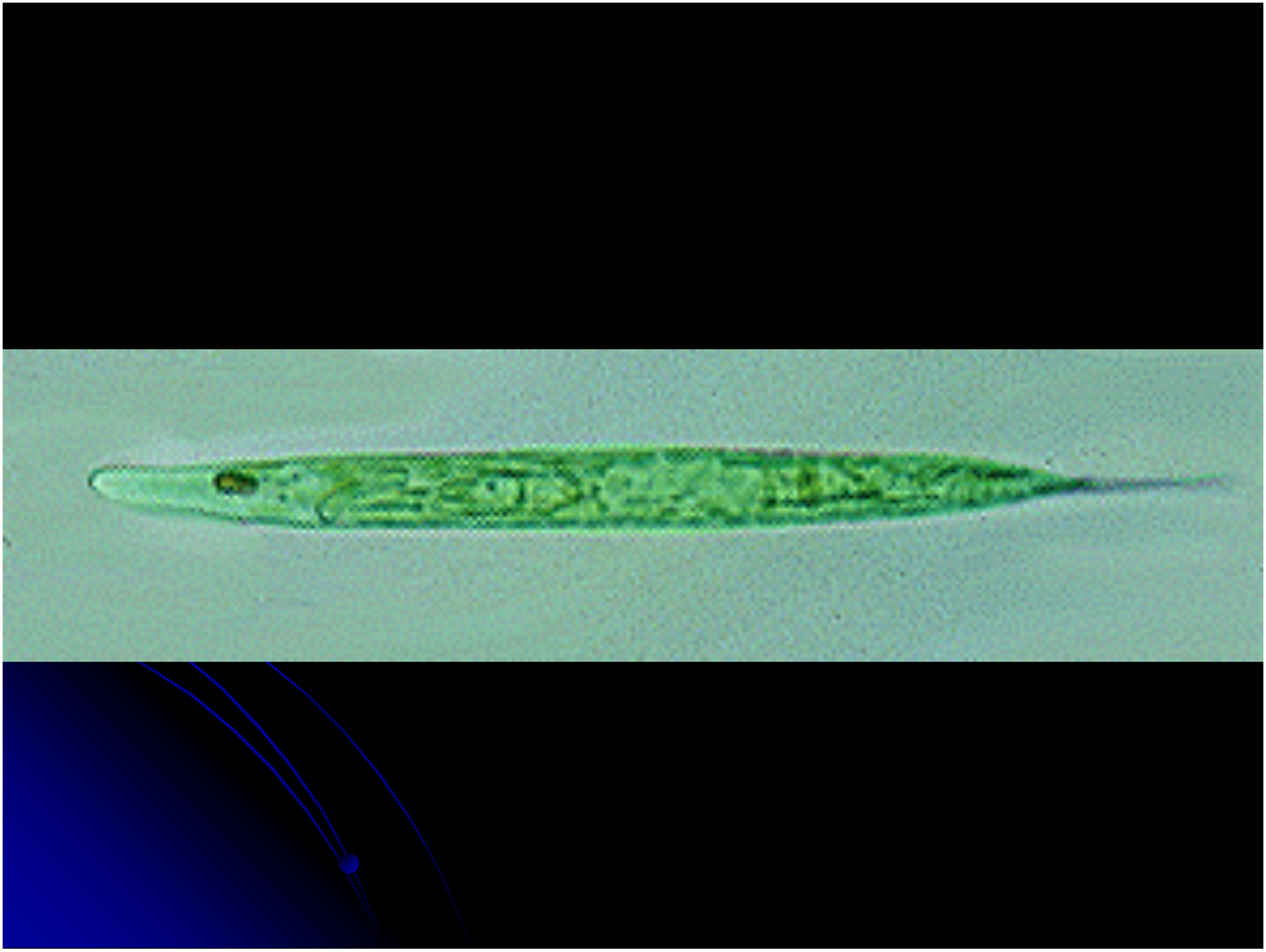
Phyla of Algae

Divided into groups by pigment color

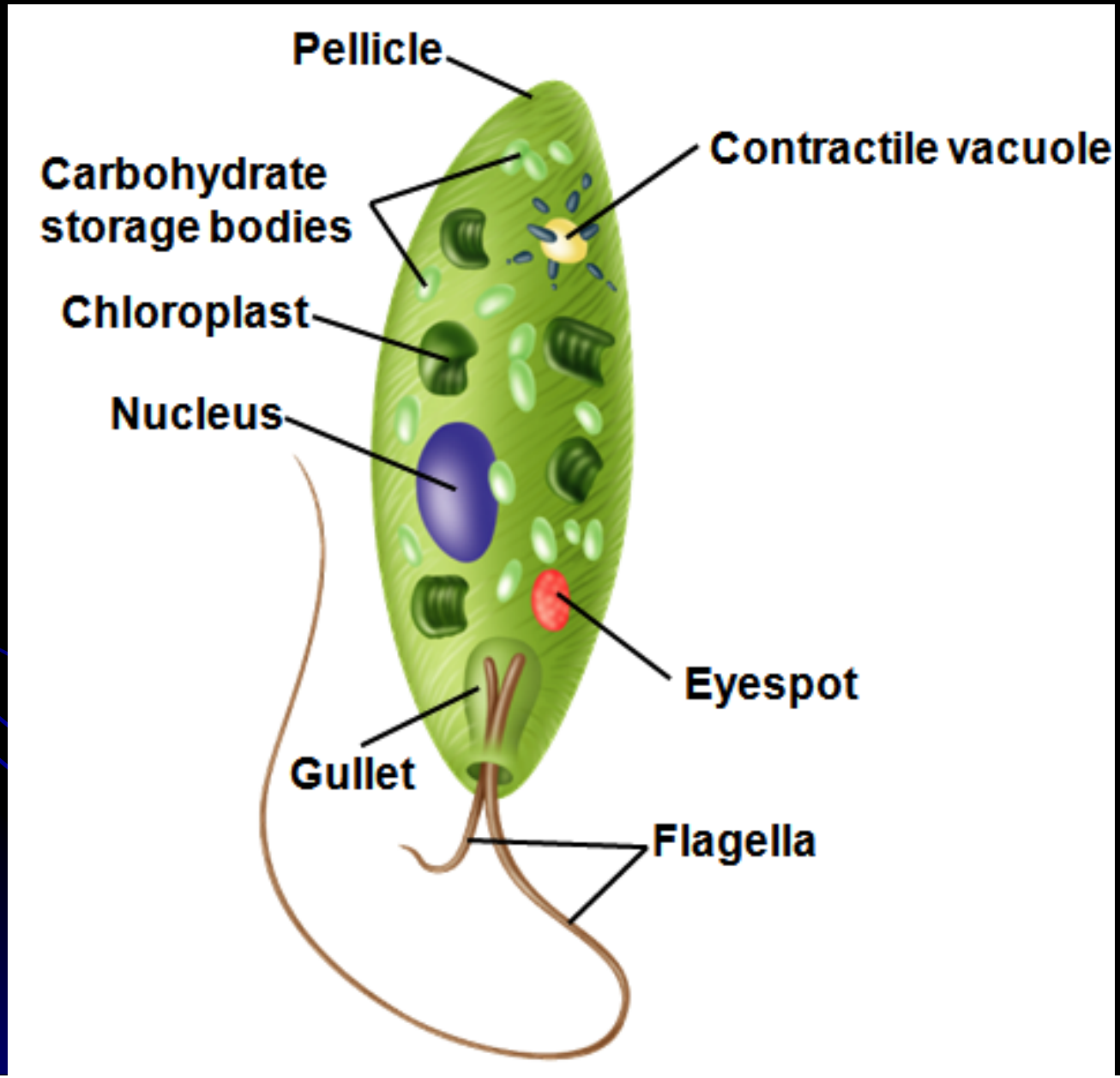
PHYLUM EUGLENOPHYTA
PHYLUM DINOFLAGELLATA
PHYLUM HETEROKONTOPHYTA
PHYLUM CHLOROPHYTA

Euglenophytes: The Survivors

- Aquatic
- Move around like animals
- Can ingest food from surroundings when light is not available



Euglenophyte anatomy

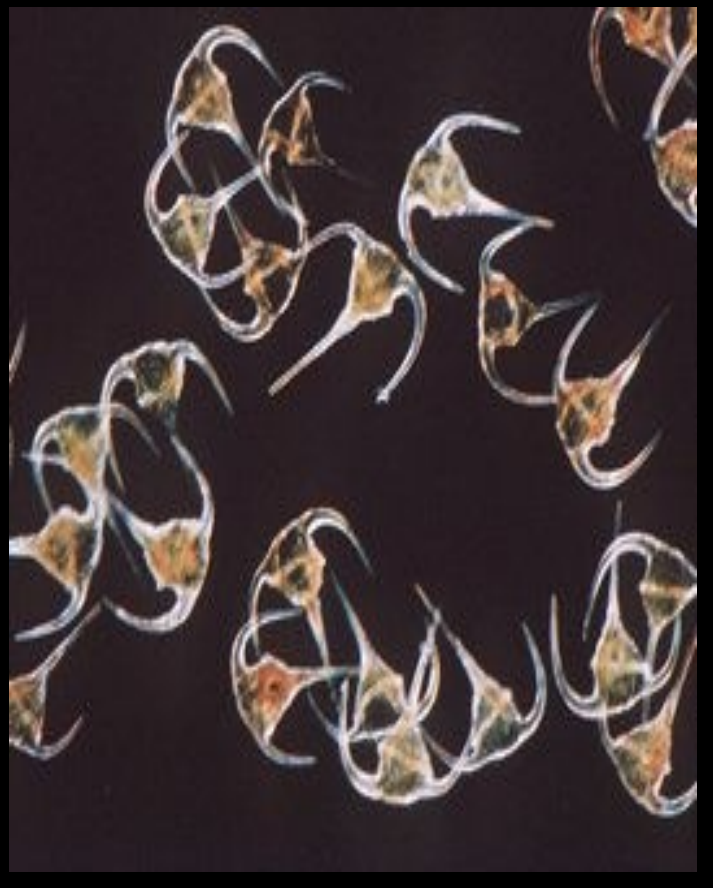


Diatoms: The Golden Ones

- Have shells made of silica (glass)
- Photosynthetic pigment called carotenoids – give them a golden color

Dinoflagellates: The Spinning Ones

- Spin around using two flagella
- Responsible for Red Tides
- Create toxins that can kill animals and sometimes people
- When agitated undergo reaction that produces light → **bioluminescent**




@ PJS Franks


Icky.

PHYLUM HETEROKONTOPHYTA
Red algae, brown algae, golden algae

- Did you know that there's algae in your house? A LOT of it? Well, there is. Here's an assignment…

"There Is Algae in Your House!"

Red Algae:
The…uh…Red Ones

- Seaweeds
- Multicellular, marine organisms
- Have red and blue pigments

Brown Algae:
The Brown Ones that are brown

- They have air bladders to help them float at the surface – where the light is.
- Used to make a variety of products
  - As a thickening agent in puddings, ice cream
  - Used as food for animals (processed)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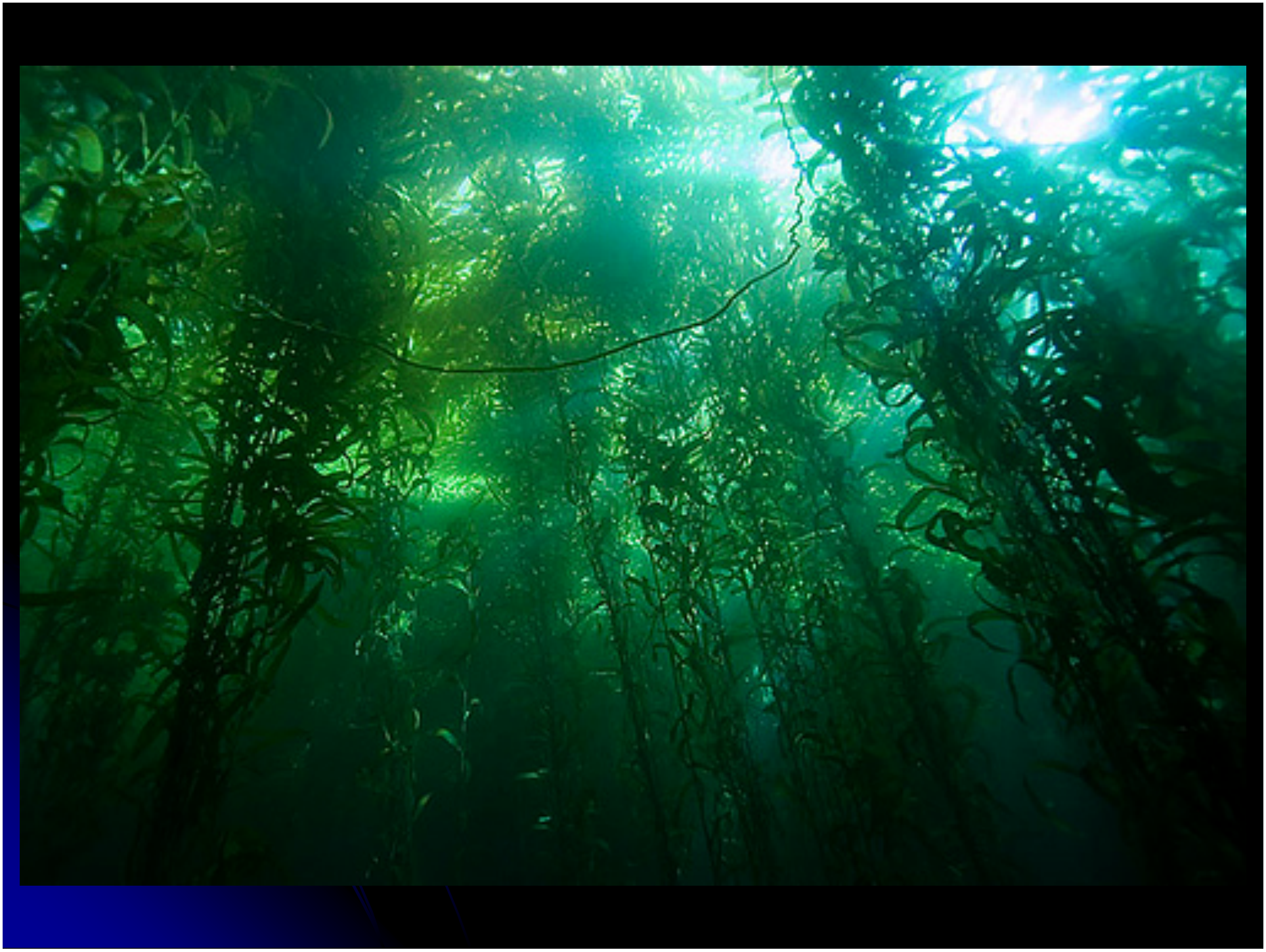
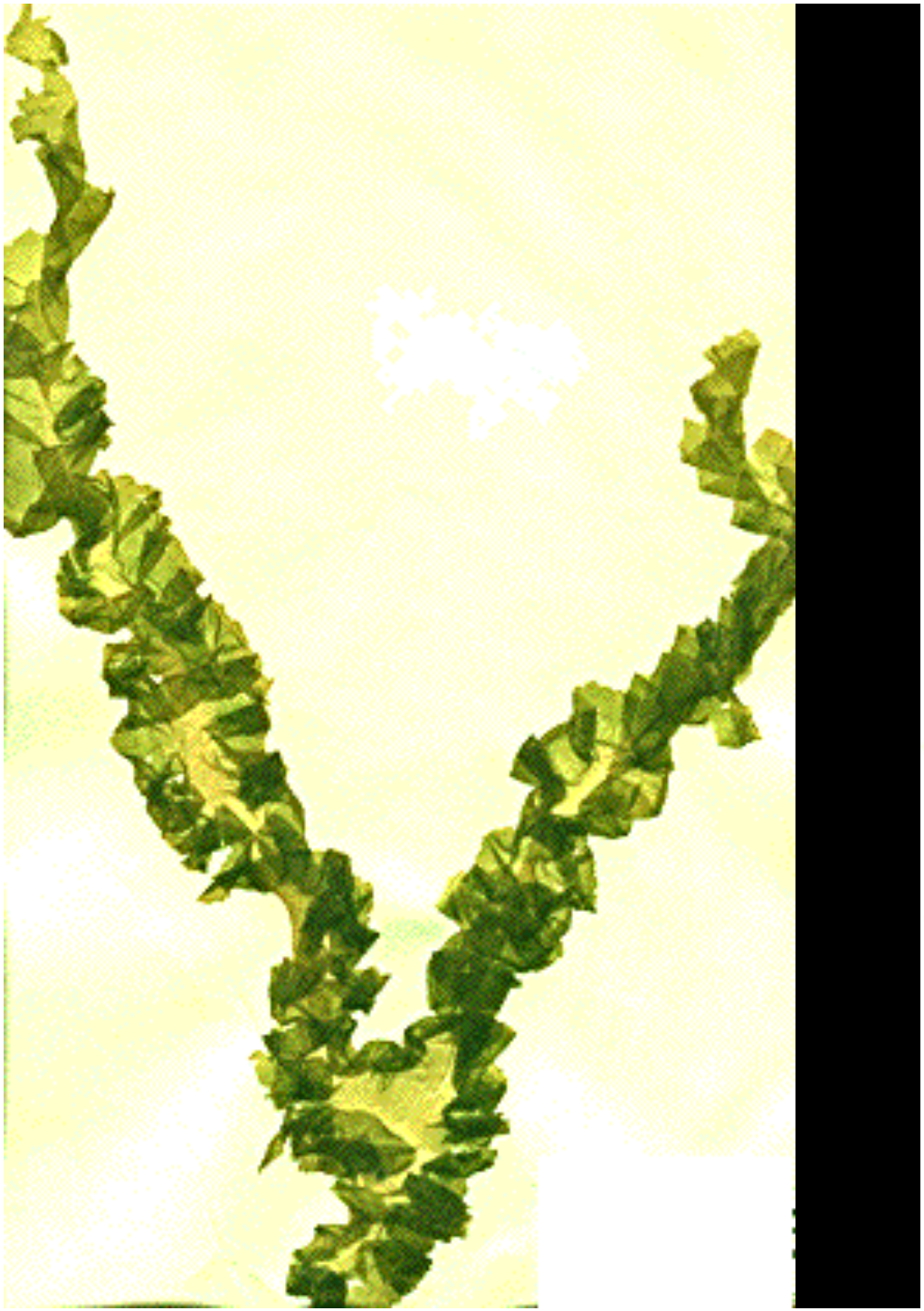


Green Algae:

Yeah, You Guessed it, the Green Ones

- Most live in fresh water
- Can be unicellular or multicellular
- Live alone or in groups called colonies
- Contain chlorophyll b is their main type (which is very similar to land plants)



Fungus-like Protists

Characteristics in Common

- All form delicate, netlike structures on the surface of their food source
- Obtain energy by decomposing organic material

Phyla of Fungus-like Protists

Plasmodium Slime Molds

Cellular Slime Molds

Water Molds

Downy Mildews

Slime Molds

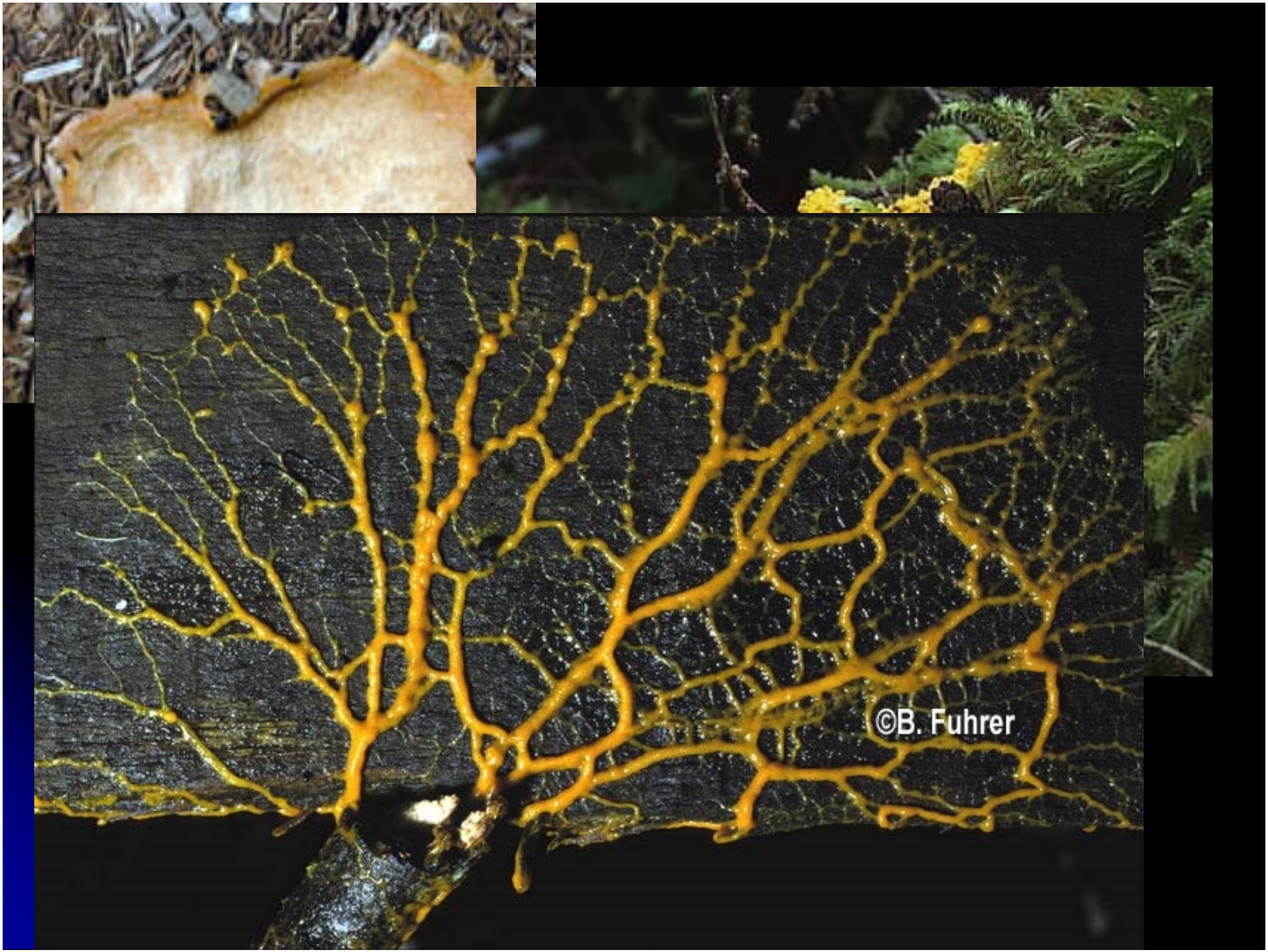
- Live in cool moist, shady places where they grow on damp, organic matter

Plasmodium Slime Molds

- Form plasmodium: a mass of cytoplasm that contains many diploid nuclei but no cell walls or membranes – its feeding stage
- Creeps by amoeboid movement – 2.5 cm/hour

Plasmodium continued…

- May reach more than a meter in diameter
- Form reproductive structures when surroundings dry up
- Spores are dispersed by the wind and grow into new plasmodium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Cellular Slime Molds

- In feeding mode, they exist as individual amoebic cells
- When food becomes scarce, they come together with thousands of their own kind to reproduce
- May look like a plasmodium

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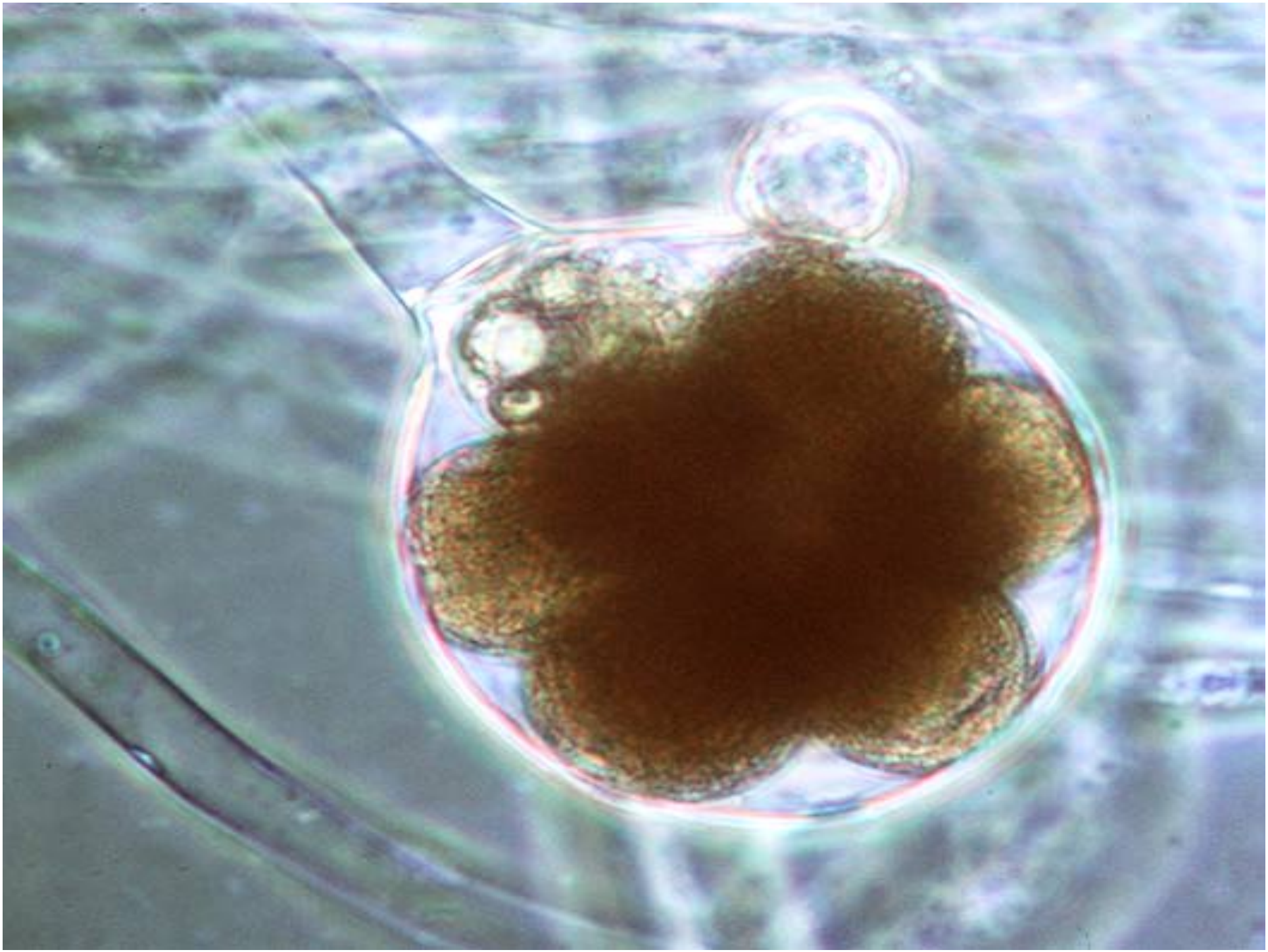
Water Molds and Downy Mildews

- Live in water or moist places
- Feed on dead organisms or parasitize plants
- Fuzzy white growths



Powdery Mildew

Grape

(Ker et al., 1990)

Ewwwwwww