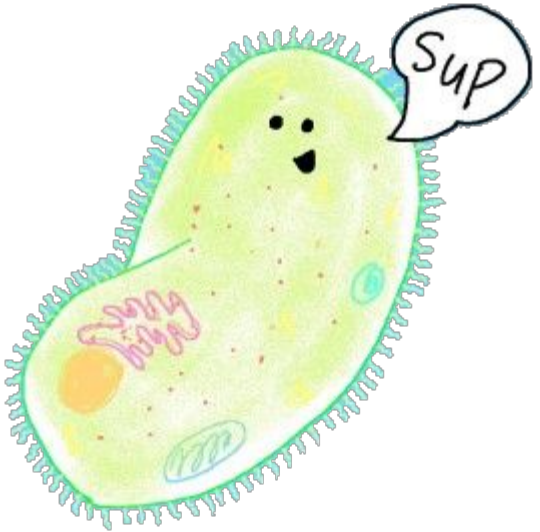
SBI3C
Meet the Protists

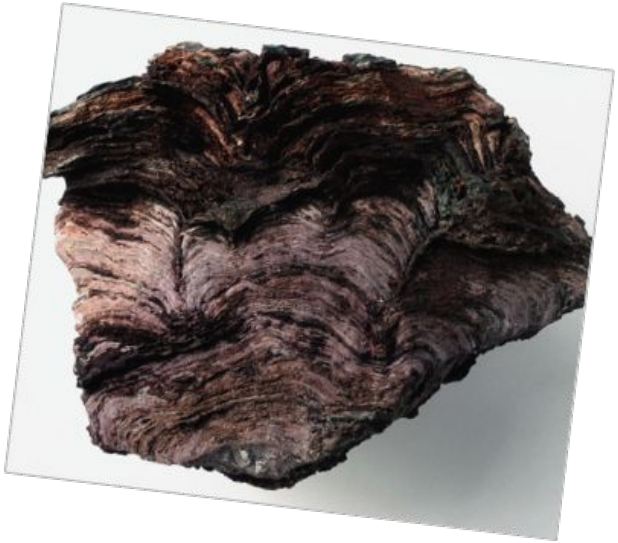
Hello!

I am a protist.
We're tiny, numerous, ancient, and weird.



Kingdom Protista

- ***Proto*** means First
- First eukaryotes on Earth
- 2.1 Billion Years old!
- Protist fossils are called *stromatolites*.



Hard to classify...

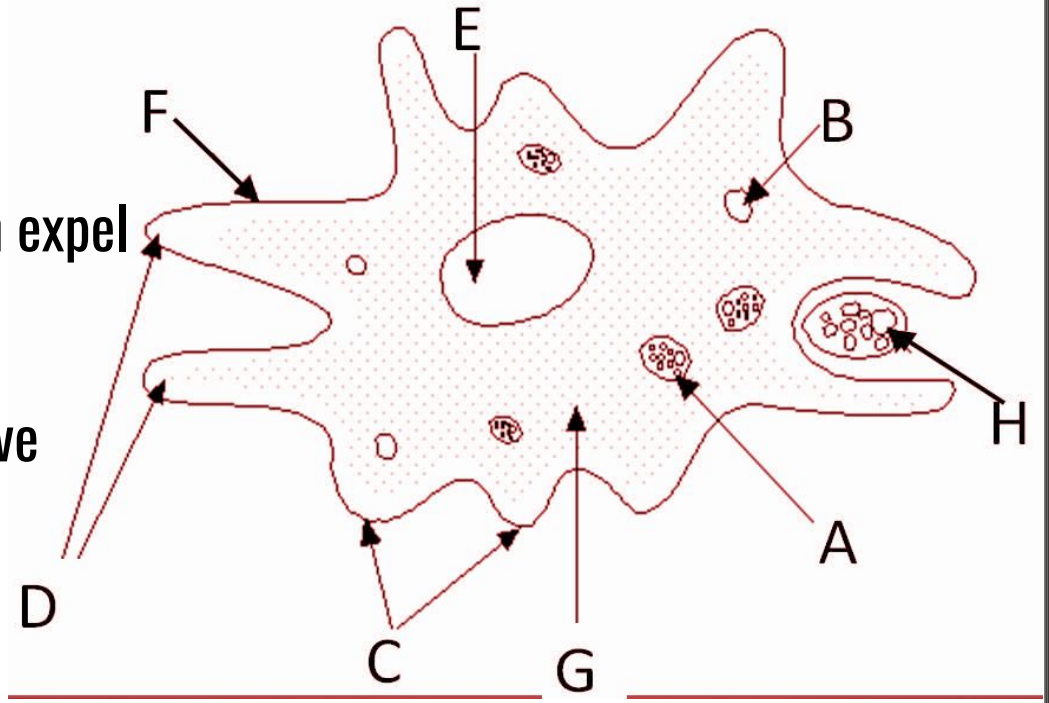
- All **unicellular**
- May be **colonial** – many single cells living together
- Some are plant-like, others are animal-like.

Protozoa

- Animal-Like
- **Heterotrophs**: they must eat to live
- Can move

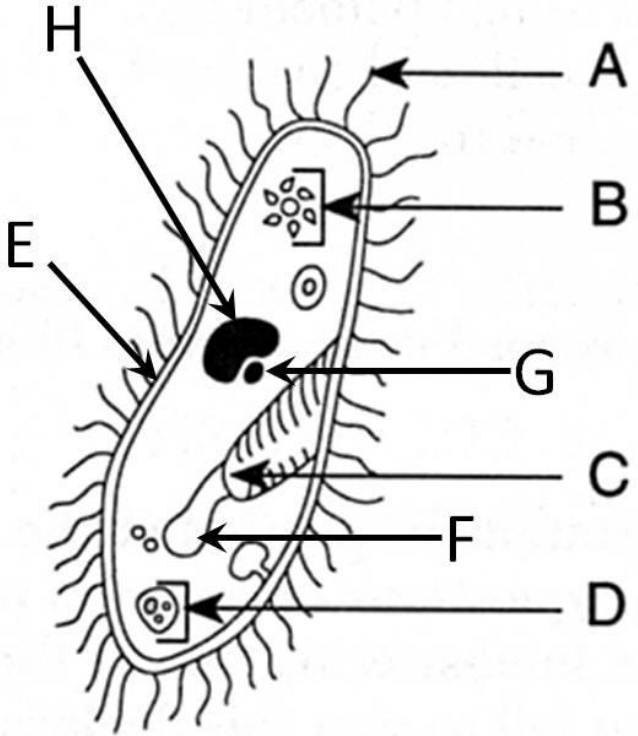
Amoeba

A. Food Vacuole
B. Contractile Vacuole can expel excess water
C. Cell Membrane
D. Pseudopodia help it move
E. Nucleus
F. Pseudopod (singular)
G. Cytoplasm



Paramecium

A. Cilia for movement, trapping food
B. Contractile Vacuole
C. Gullet - like a mouth and throat
D. Food Vacuole
E. Cell membrane
F. Cytostome
G. Micronucleus
H. Macronucleus



Movement

Several ways to move:

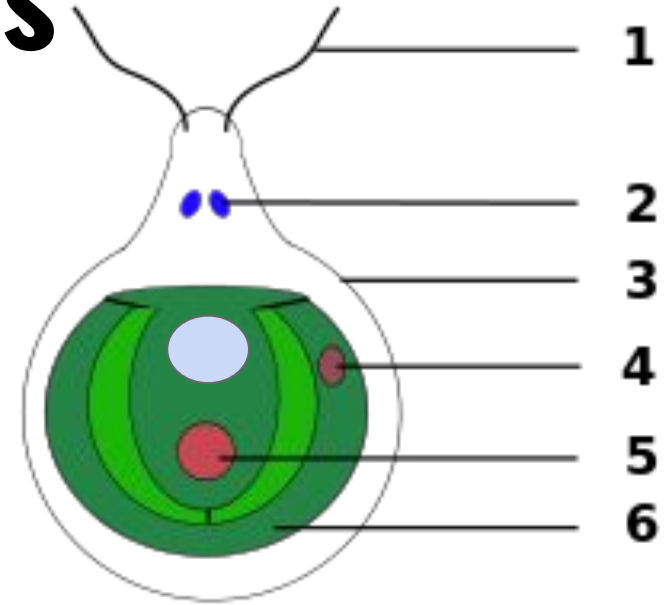
- **Cytoplasmic streaming**: by making your cytoplasm flow, you can stretch toward something. Amoebae do this.
- Use a propeller, called a **flagellum**. Euglena use *flagella*.
- Use oars, called **cilia**. Each *cilium* constantly goes back & forth. Paramecia use these.

Algae

- Most **unicellular**
- Some large **colonial** – forms, like seaweed
- Plant-like - have chloroplasts, carry out photosynthesis
- **Autotrophs** - self feeding.

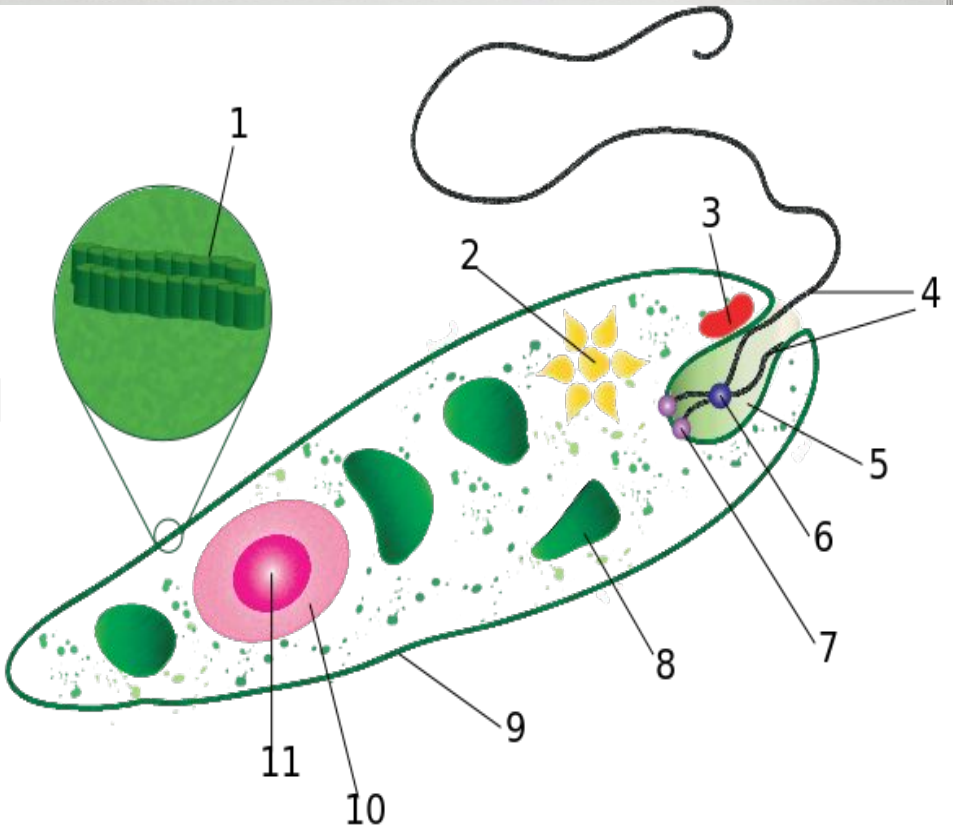
Chlamydomonas

1. Flagella for movement
2. Contractile Vacuoles
3. Cell wall
4. Eyespot is light-sensitive
5. Pyrenoid collects CO_2
6. Chloroplast is large, cup-shaped
7. *Nucleus



Euglena

1. Microtubules of protein
2. Contractile vacuole
3. Eyespot directs it toward light
4. Flagella - movement, trap food
5. Cytostome, like a mouth
6. Photoreceptor senses light
7. Basal body
8. Chloroplast
9. Pellicle, a type of cell wall
10. Nucleus 11. Nucleolus



Reproduction

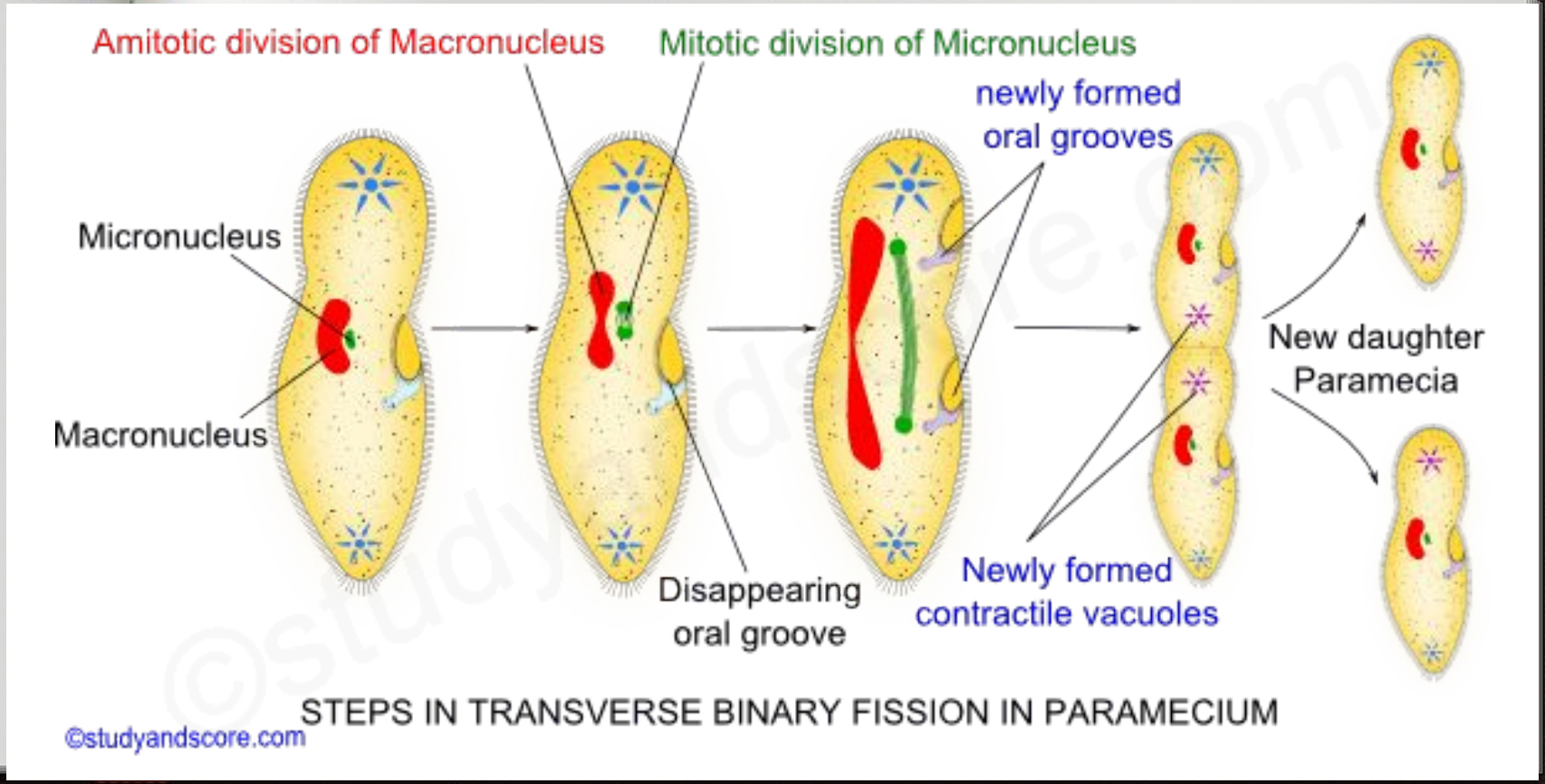
- *Method 1:* Copy your nucleus & split in two. This is **Binary Fission**.

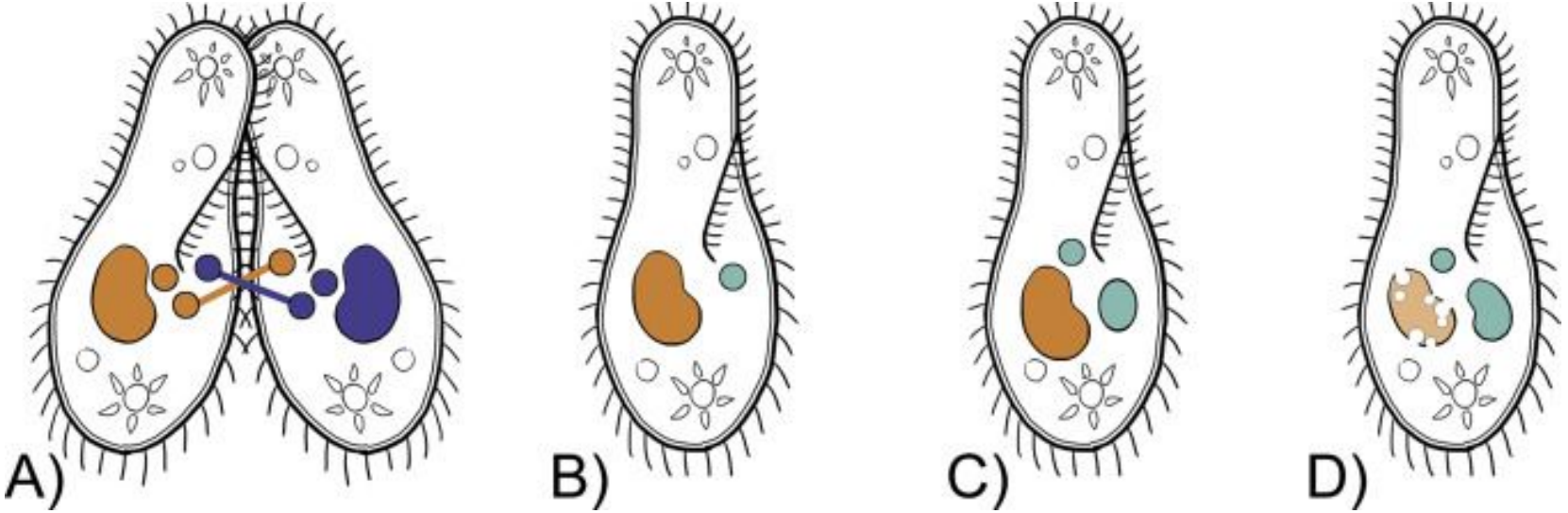
- *Method 2:* Copy your nucleus a lot, and split into many cells. This is **Multiple Fission**.

Reproduction

- *Method 3:* Join a partner & swap some DNA, then go your separate ways. This is **Conjugation**.

- *Method 4:* Make gamete-like cells and fuse them. This is a form of **Sexual Reproduction**.


Amitotic division of Macronucleus
Mitotic division of Micronucleus
newly formed
oral grooves
Micronucleus
Macronucleus
New daughter
Paramecia
Disappearing
oral groove
Newly formed
contractile vacuoles
STEPS IN TRANSVERSE BINARY FISSION IN PARAMECIUM
©studyandscore.com



Exchange micronuclei

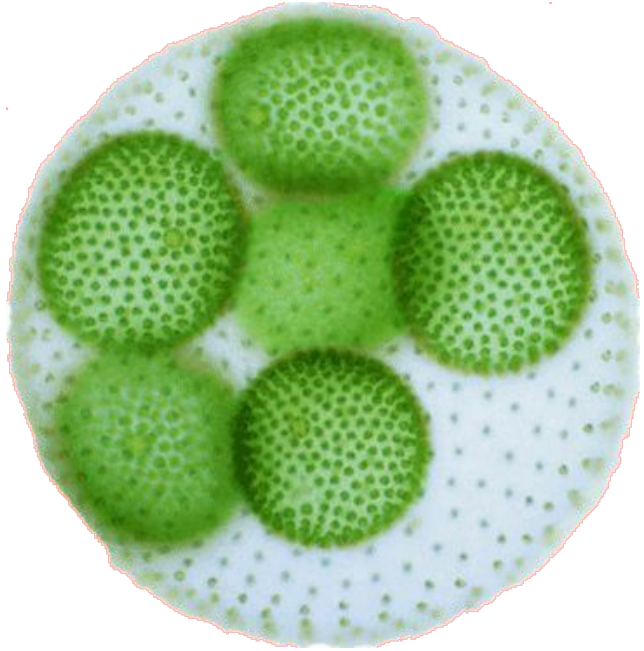
Cells separate

New macronucleus forms (mitosis)

Old macronucleus dissolves

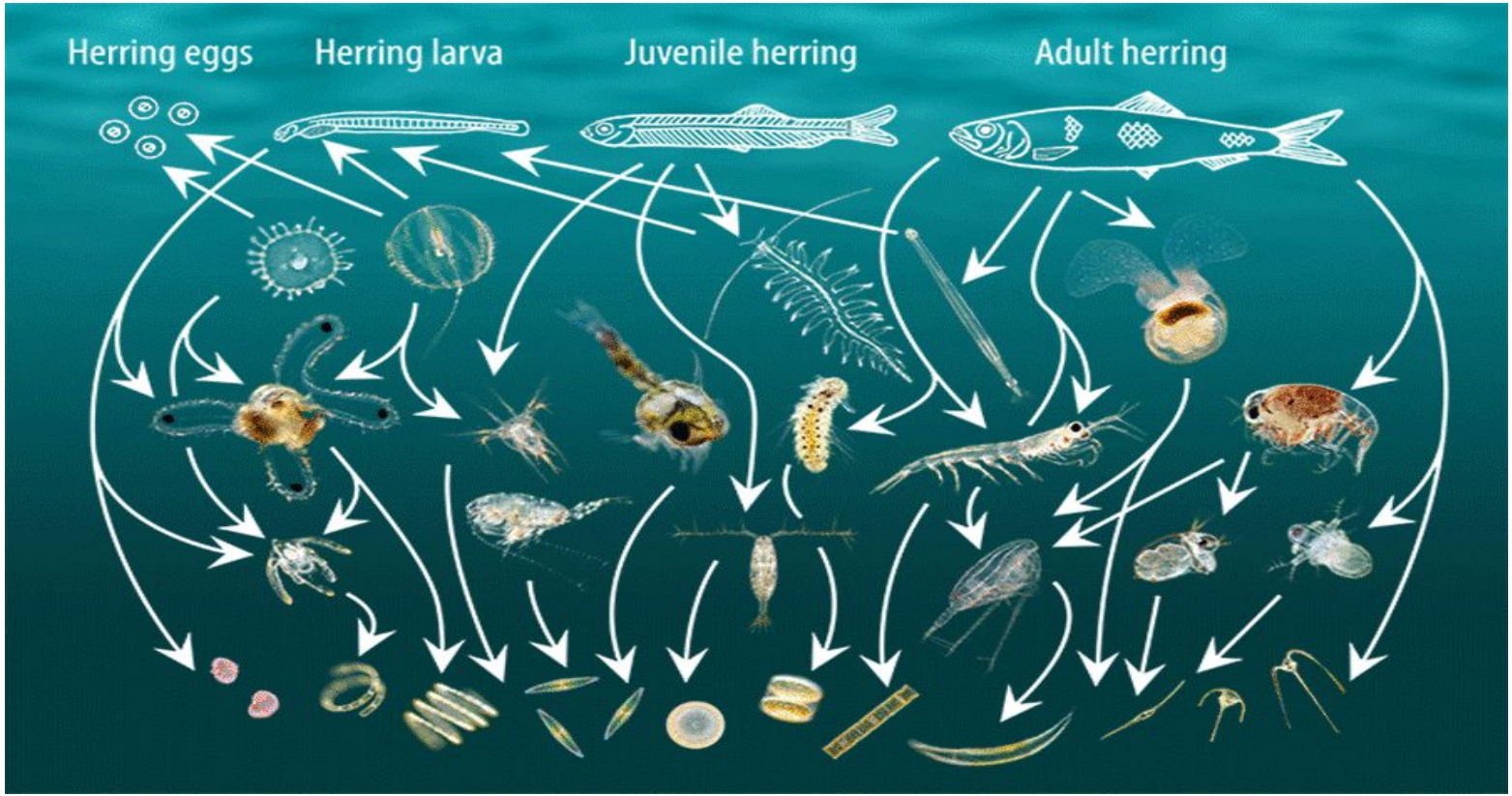
Colonial protists

- Colonies: many living together
- Allows for division of labour and specialized functions
- Safer reproduction, better chance of survival
- Example: Volvox



Ecological Role

- **Photosynthesis** releases O_2
- Food source for many aquatic & marine animals
- **Decomposers, Detritivores**
- A few are even **symbionts**, living inside other organisms


Herring eggs
Herring larva
Juvenile herring
Adult herring