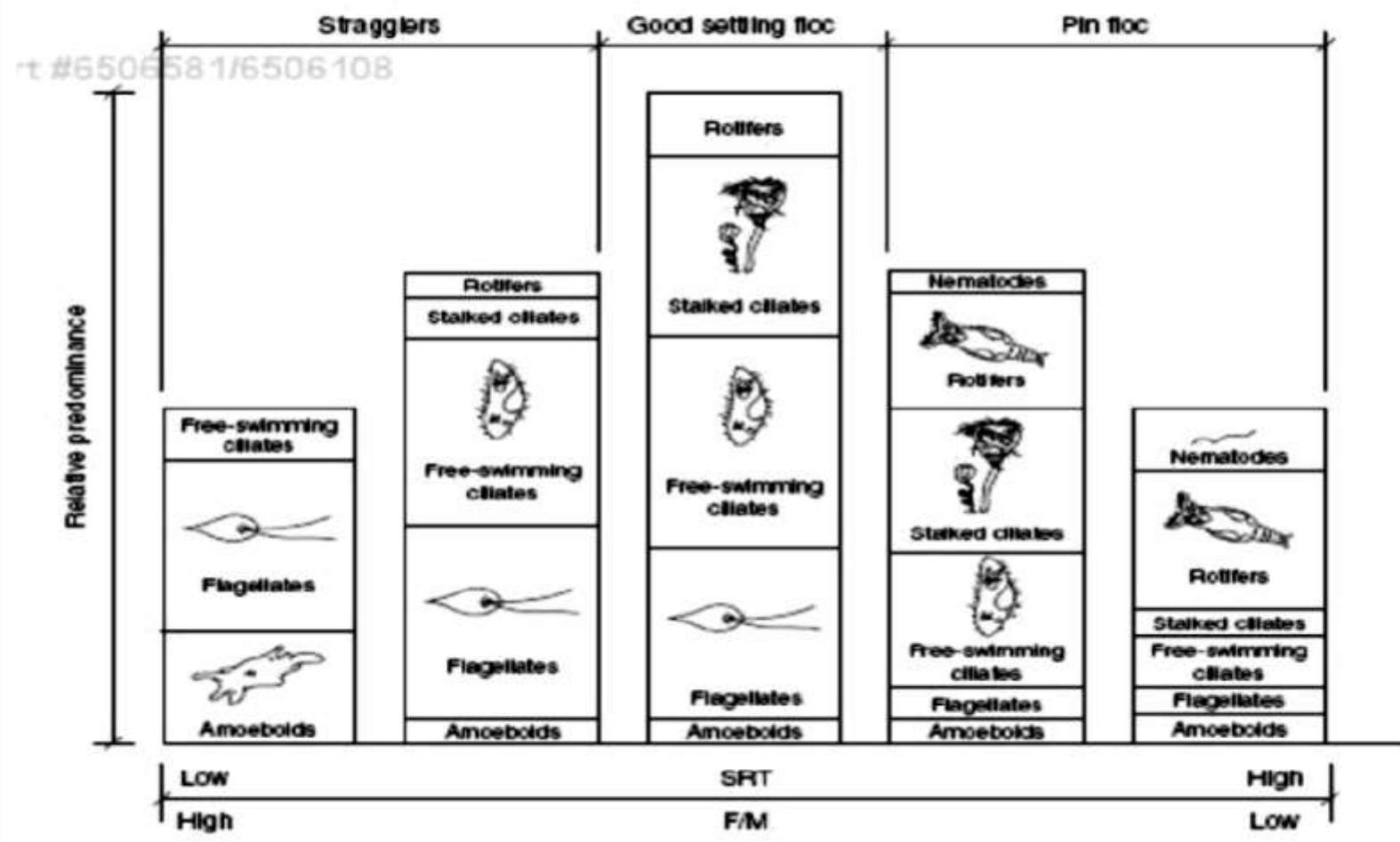
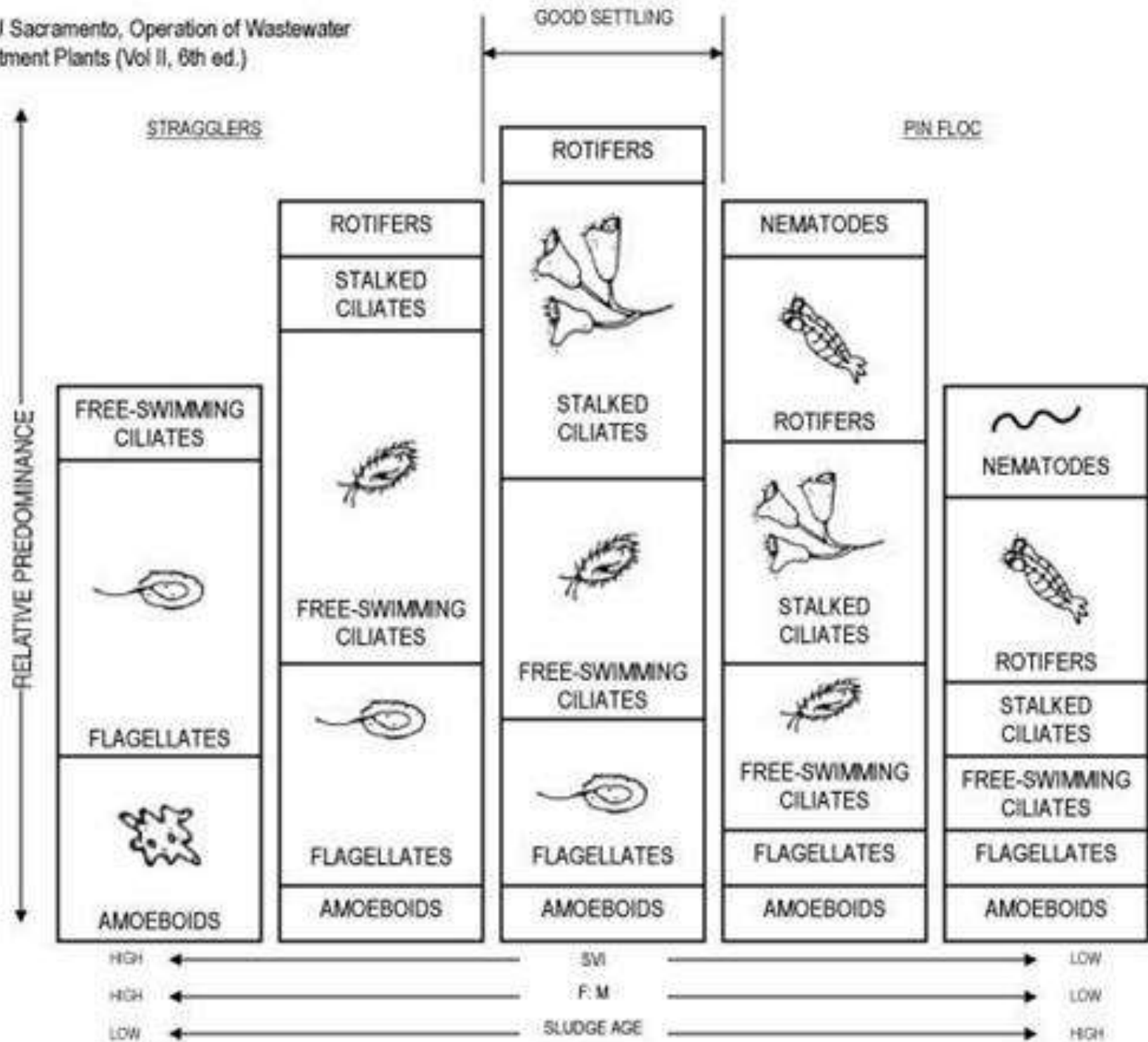


Predominance of Organisms relative to SRT

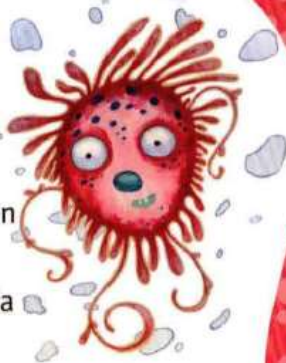


Courtesy of CSU Sacramento, Operation of Wastewater Treatment Plants (Vol II, 6th ed.)



TEAM
MIGHTY SUPERHEROES OF SLUDGE MICROBE
CRAWLING CILIATE

Mighty Power: All of my tiny hair-like cilia wave simultaneously to move me through the water. Most of my cilia are on the lower surface of my body, which can make them look like legs.



Mighty Meal: I eat bacteria and flagellates.

Mighty Measurement: I'm about 2 millimeters long (the size of the head of a pin).

Team Headquarters: I live in Secondary Treatment — in the Aeration basin with lots of sludge.

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TEAM
MIGHTY SUPERHEROES OF SLUDGE MICROBE



CRAWLING CILIATE

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Crawling Ciliates





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ALGAE


Mighty Power: I can produce oxygen from photosynthesis. Other microbes need this oxygen to consume unwanted nutrients in the sludge.

Mighty Meal: I eat nitrogen and phosphorous.

Mighty Measurement: Algae range vastly in size. They can be single or multi-celled organisms.

Team Headquarters: I live in Secondary Treatment — in the Aeration basin with lots of sludge.

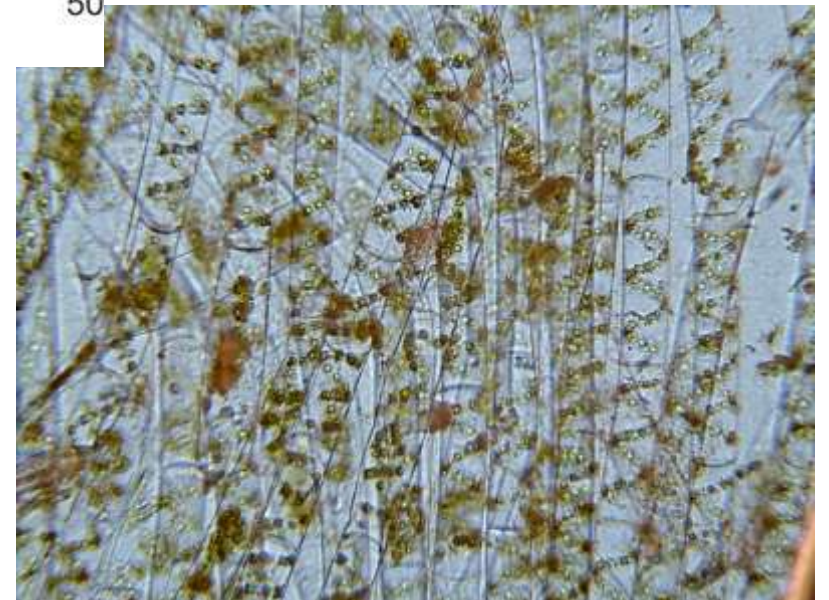
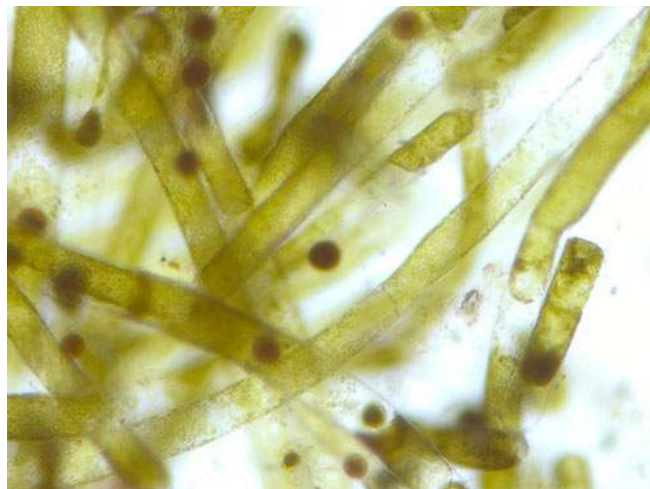
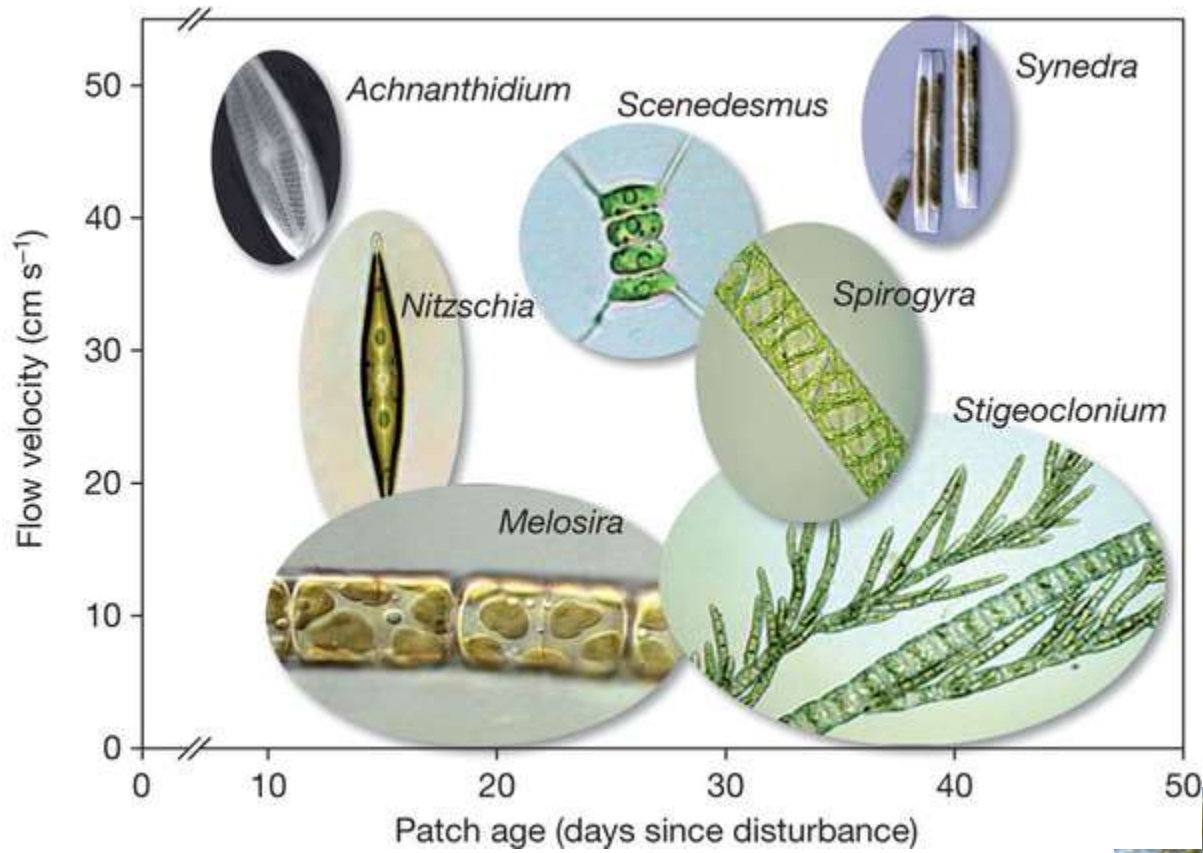
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Algae





TEAM
MIGHTY MICROBE
SUPERHEROES OF SLUDGE

AMOEBEBA


Mighty Power: I can change my body into many different shapes. When I get angry, I change into a star shape which allows me to float freely in the water.

Mighty Meal: I eat ciliates and other bacteria. I trap my prey using my long arms, called pseudopods.

Mighty Measurement: As small as .25 millimeters or as large as 8 millimeters (from the size of a pencil dot up to the size of an adult house fly).

Team Headquarters: I live in Secondary Treatment — in the Aeration basin with lots of sludge.

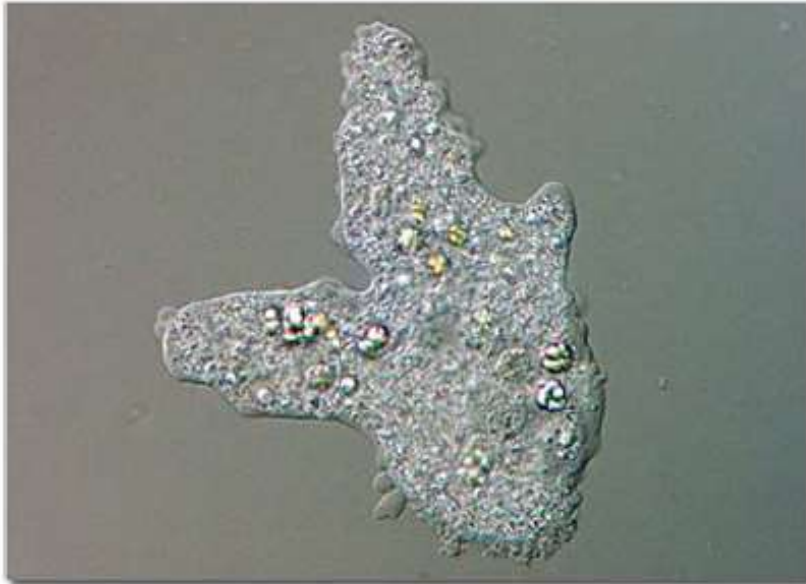
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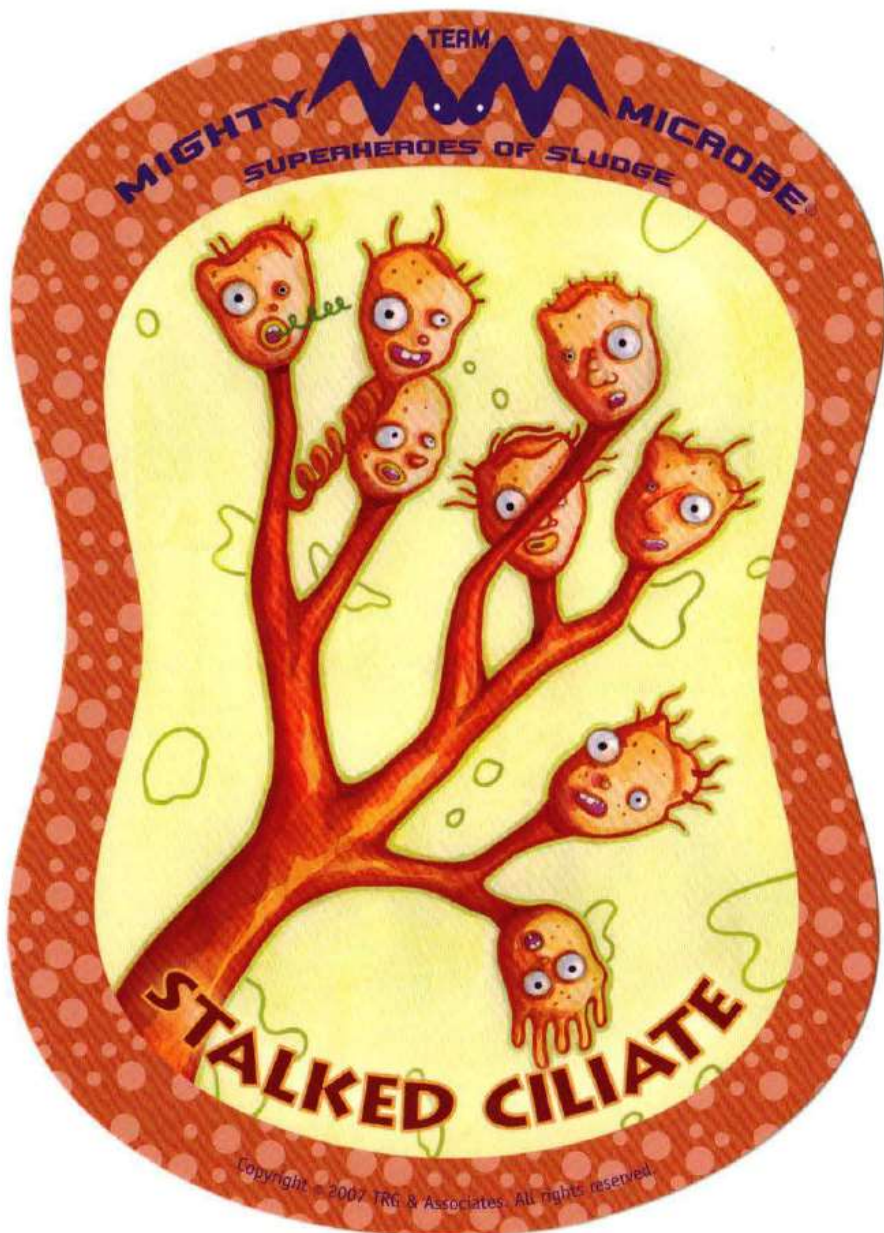


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Ameoba





TEAM
MIGHTY MICROBE
SUPERHEROES OF SLUDGE

STALKED CILIATE

Mighty Power: I save my energy by attaching to one place and using my tiny hairs (cilia) to bring food to my mouth. I can grow branches (which makes me look like a tree), and I have a muscular fiber in my stalk that lets me coil up like a spring.

Mighty Meal: I eat bacteria and algae.

Mighty Measurement: 0.2 millimeters (the size of a small pencil dot).

Team Headquarters: I live in Secondary Treatment — in the Aeration basin with lots of sludge.

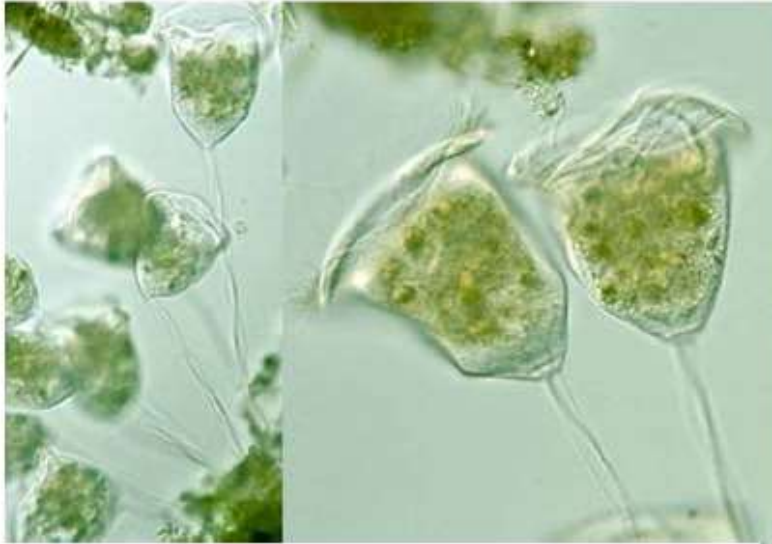
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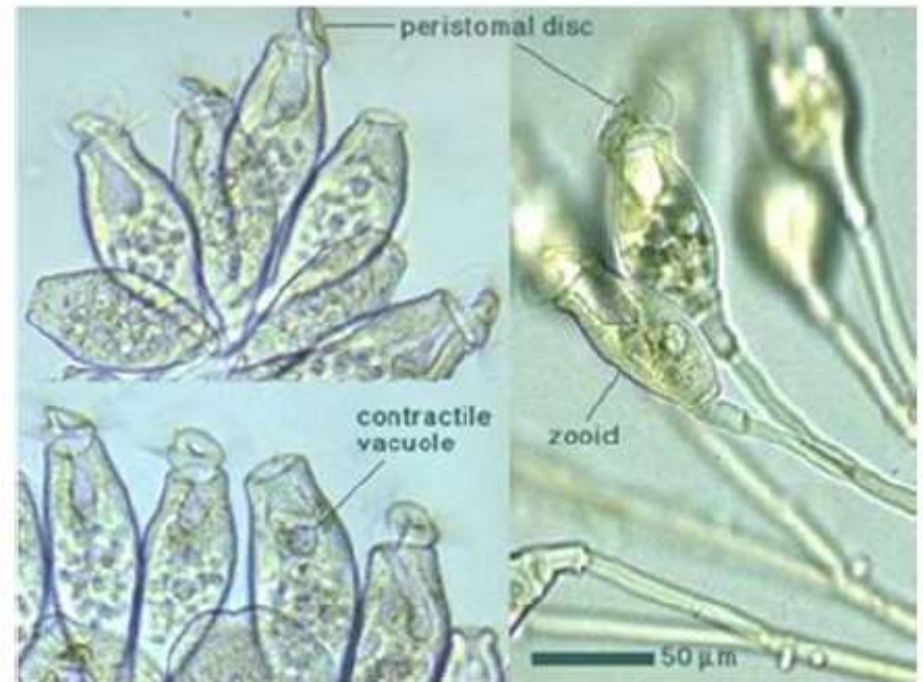
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Stalked Ciliates-Vorticella



Stalked Ciliates-*Operculararia*



Stalked Ciliates-*Epistylis*





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MIGHTY SUPERHEROES OF SLUDGE MICROBE®

ROTIFER (CROWN CILIATE)


Mighty Power: My head looks like a crown, and is made of hair-like cilia that bring food into my mouth. I also have a jaw that lets me grind up my food. My babies, which are laid as eggs, are very tough and can even survive when there is no water.

Mighty Meal: I eat bacteria and food particles.

Mighty Measurement: 0.2 to 0.5 millimeters (the size of a pencil dot).

Team Headquarters: I live in Secondary Treatment — in the Aeration basin with lots of sludge.

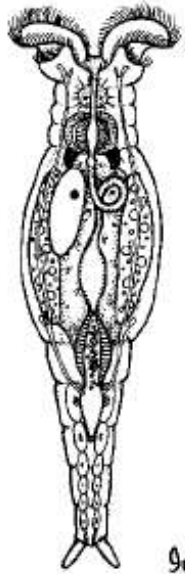
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Rotifers

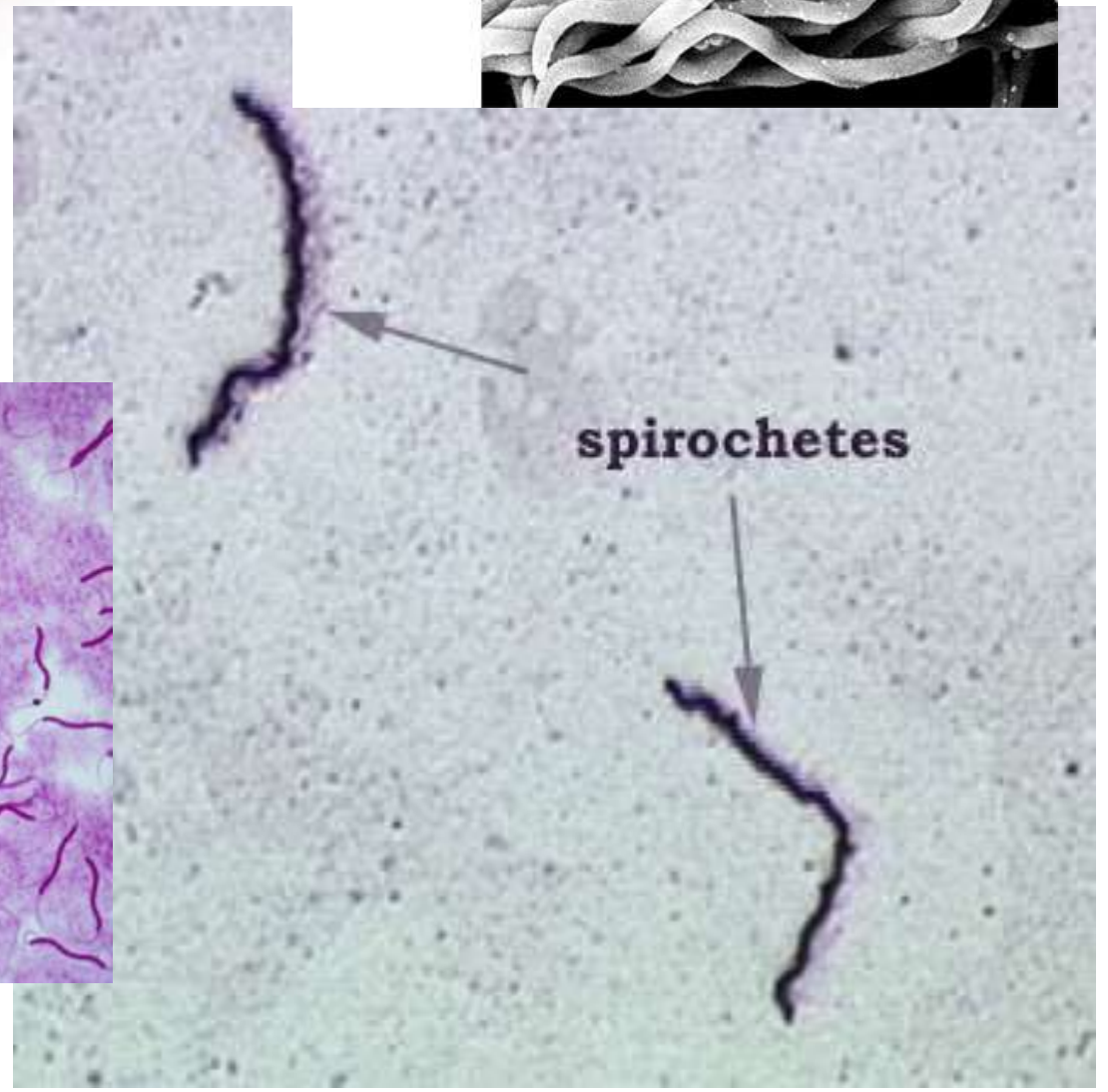
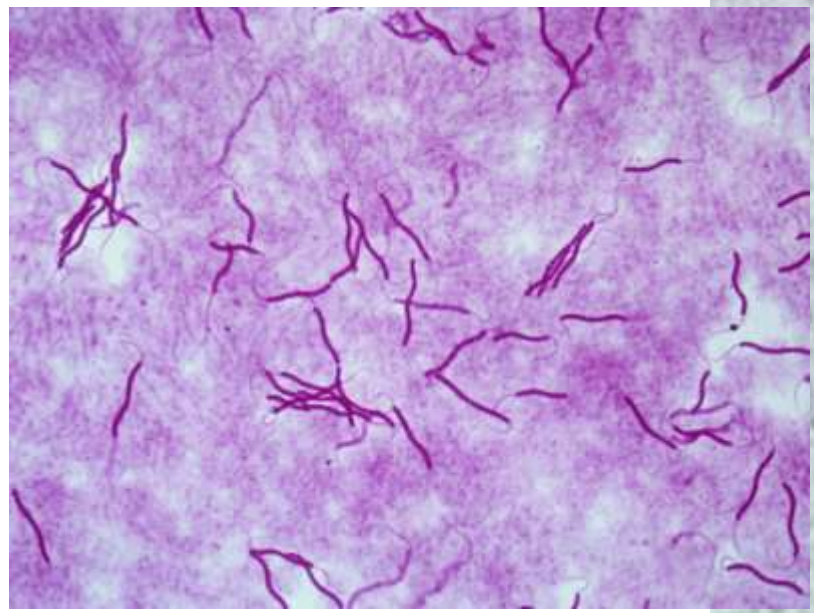
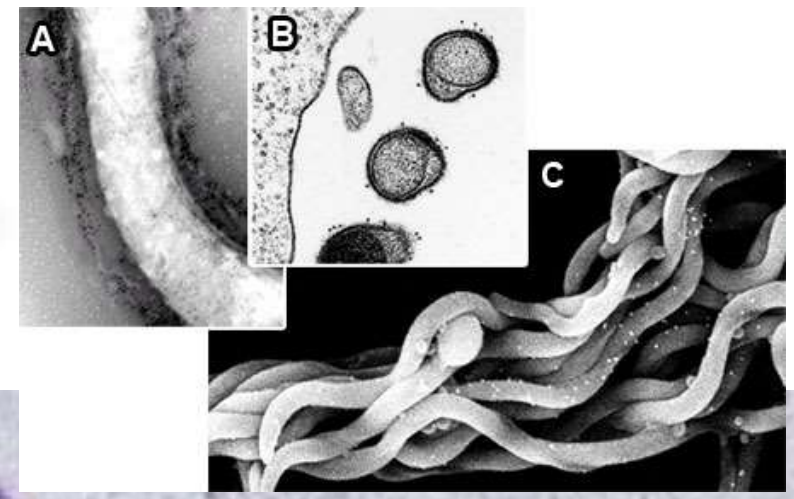
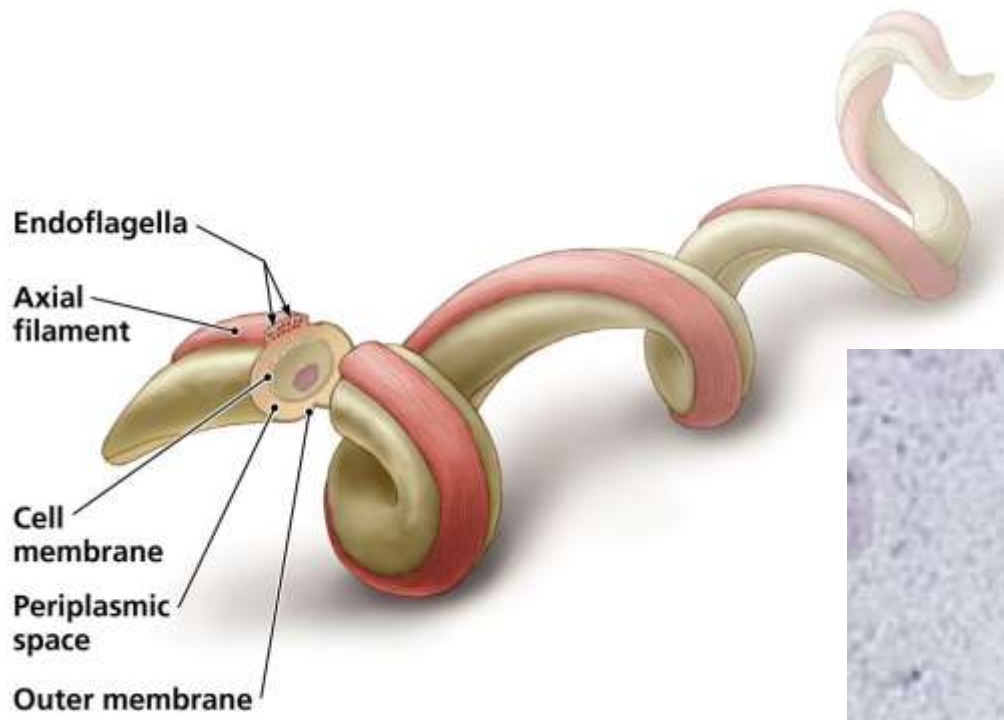


Livingston, • BIOIDAC

9/4/95







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SUPERHEROES OF SLUDGE



TARDIGRADE

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TEAM
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TARDIGRADE

Mighty Power: I'm sometimes called the Water Bear. Two "teeth" near my mouth puncture the skin of my prey and let me suck the contents out. I'm super tough, and can survive extreme temperatures. I can even come back to life after drying out or freezing!



Mighty Meal: I eat the body fluids of other microbes like nematodes and rotifers.

Mighty Measurement: 0.2 to 0.5 millimeters in length (the size of a pencil dot).

Team Headquarters: I live in Secondary Treatment — in the Aeration basin with lots of sludge.

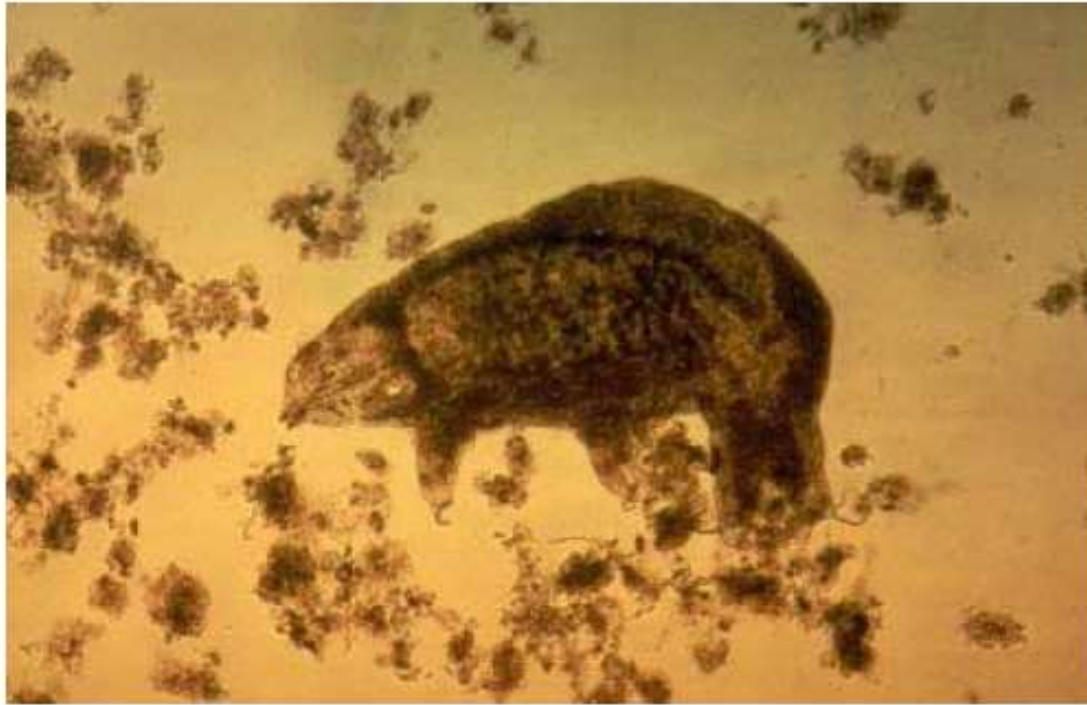
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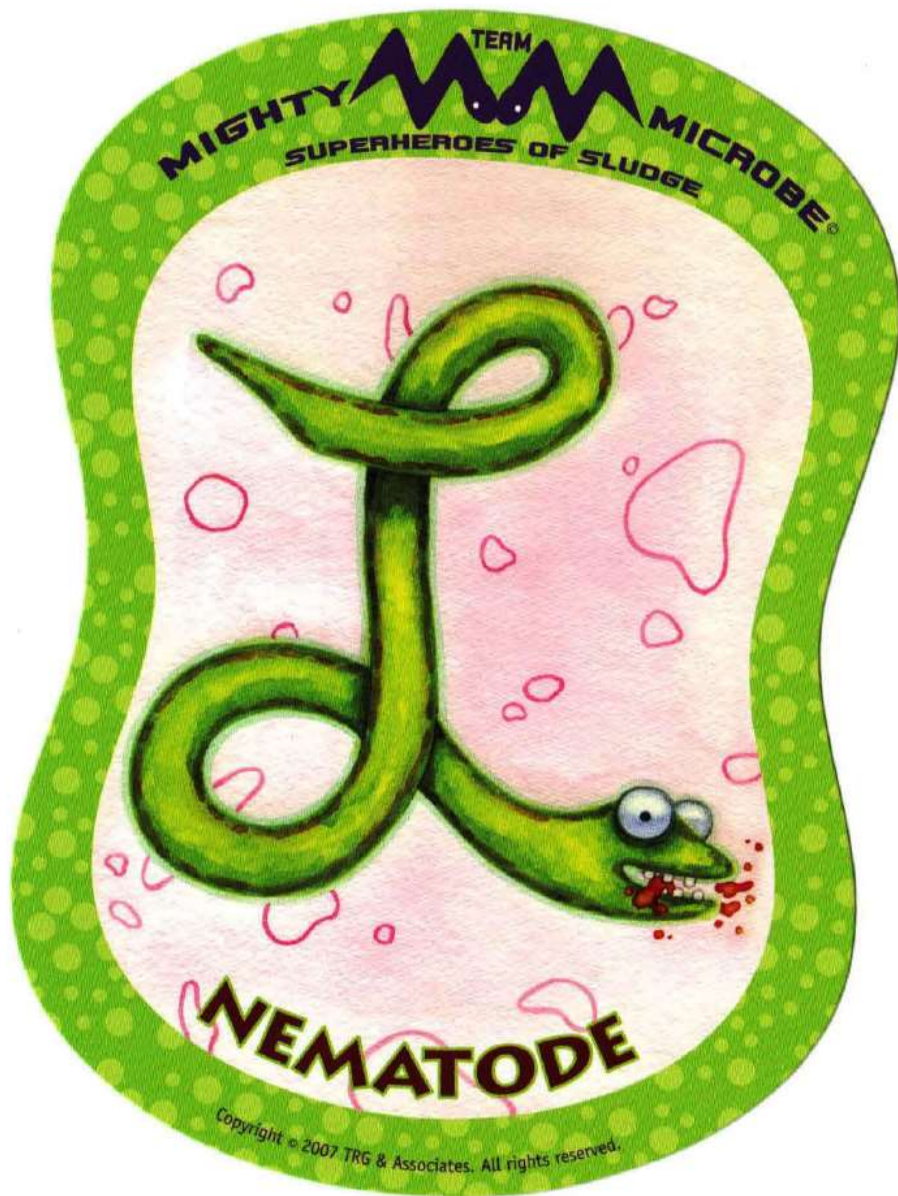


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Water Bears-Tardigrade





MIGHTY TEAM MICROBE
SUPERHEROES OF SLUDGE

NEMATODE

Mighty Power: I can bite and tear my food. I'm wastewater treatment's "early warning system" — if there are bad chemicals in the wastewater, I am the first of the microbes to die, which alerts operators to the problem.

Mighty Meal: I eat algae and bacteria.

Mighty Measurement: About 5 millimeters (the size of an ant).

Team Headquarters: I live in Secondary Treatment — in the Aeration basin with lots of sludge.

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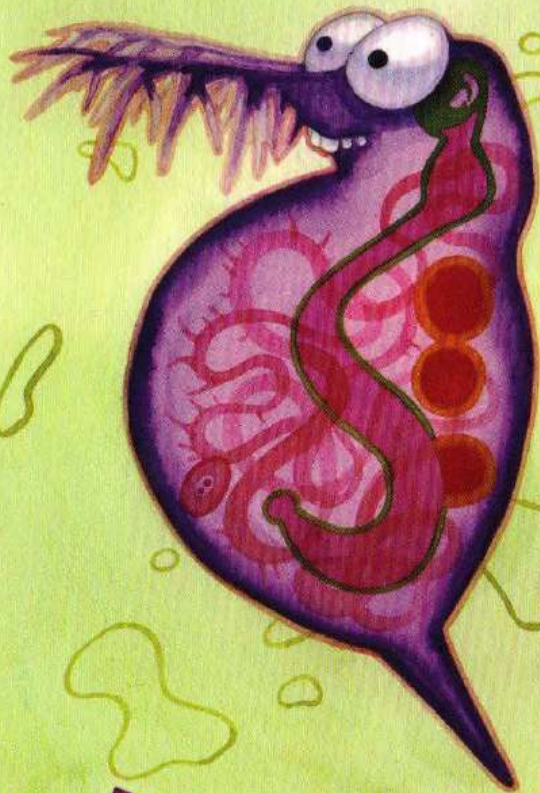
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Worms and Nematodes



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SUPERHEROES OF SLUDGE



DAPHNIA

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DAPHNIA

Mighty Power: I can clone myself! My body is transparent and often I'm very hard to find under the microscope. Sometimes, I'm called a water flea because of the way I swim.

Mighty Meal: I eat algae and bacteria.

Mighty Measurement: 5 to 6 millimeters in length (the size of an ant).

Team Headquarters: I live in Secondary Treatment — in the Aeration basin with lots of sludge.

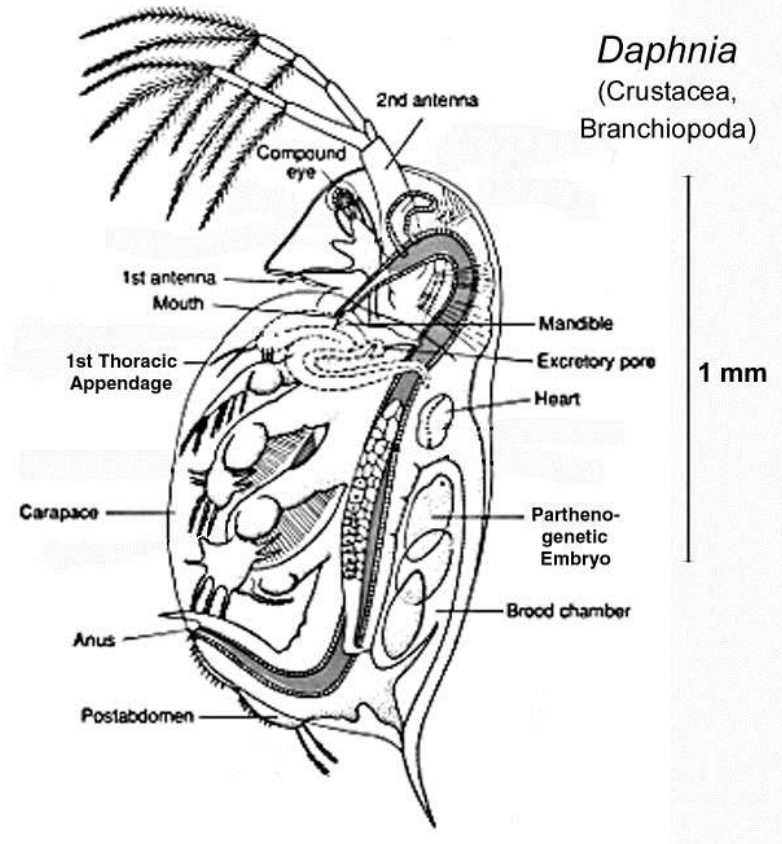


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Daphnia.



TEAM
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FLAGELLATED PROTOZOAN

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FLAGELLATED PROTOZOAN

Mighty Power: I move very quickly using my whipping appendage called a "flagella". I trap food on the surface of my cell in a cup-like pocket, where I can gradually ingest it.

Mighty Meal: I eat bacteria and food particles.

Mighty Measurement: 0.2 to 0.5 millimeters (the size of a pencil dot).

Team Headquarters: I live in Secondary Treatment — in the Aeration basin with lots of sludge.



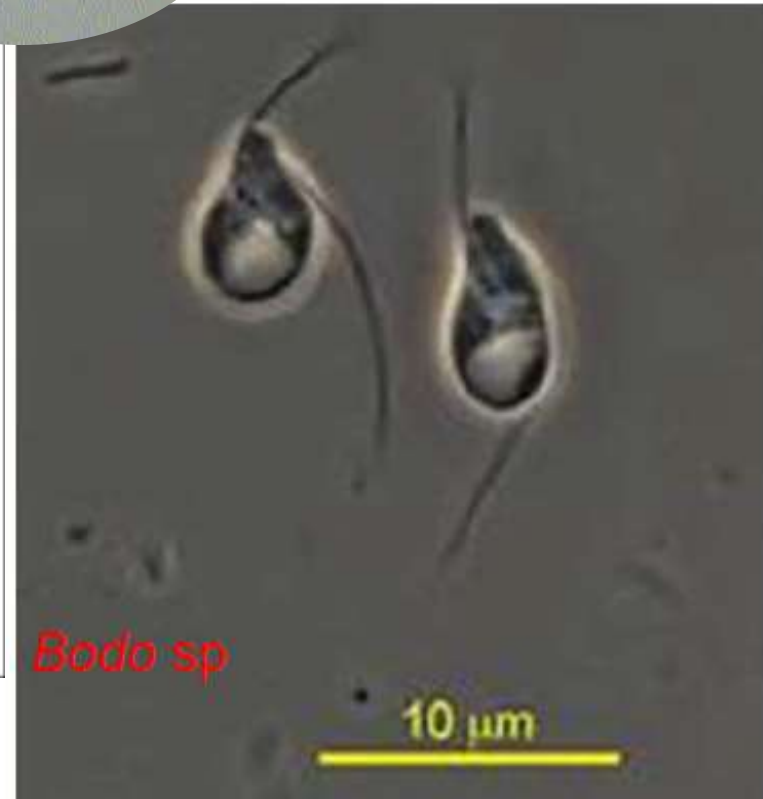
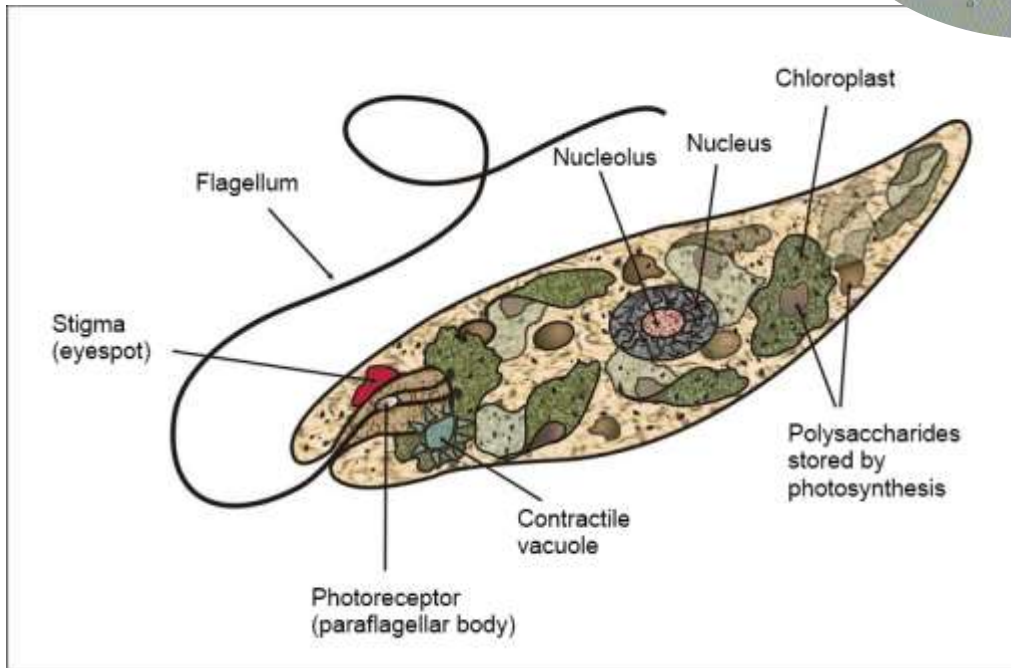
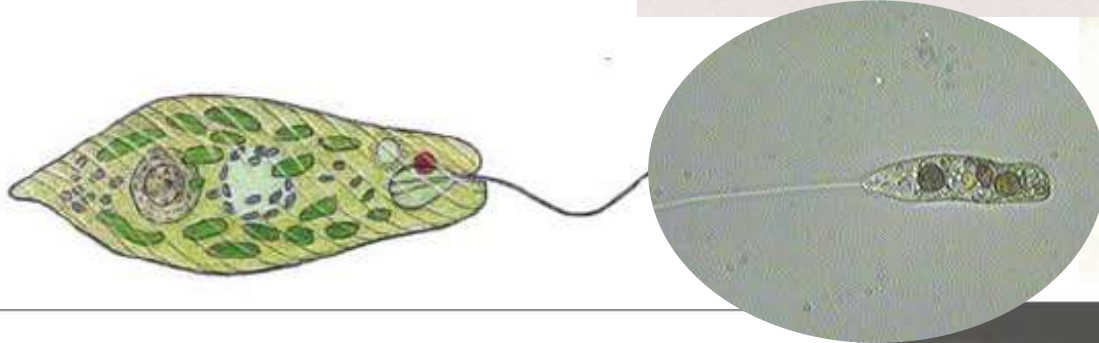
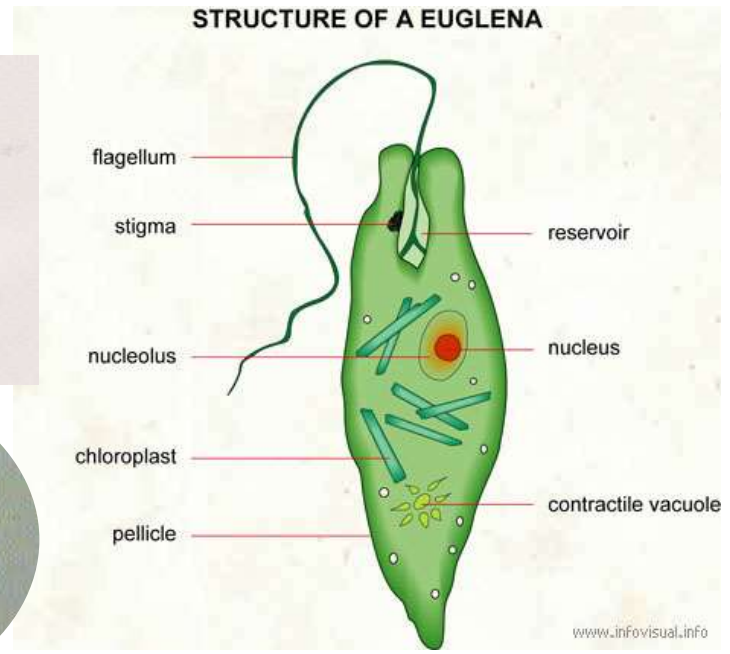
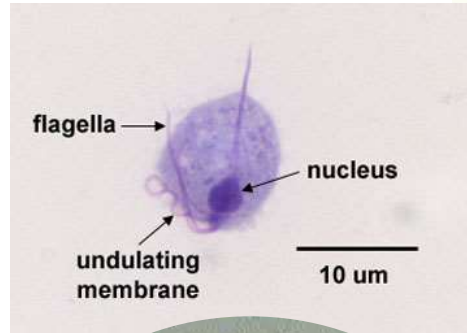
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Flagellate





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MIGHTY TEAM MICROBE
SUPERHEROES OF SLUDGE
PARAMECIUM

Mighty Power: I swim very quickly using the hair-like cilia that I'm covered in, making me really hard to see under the microscope. My cilia sweep food into my mouth. I'm smart enough to swim around obstacles and towards food.

Mighty Meal: I eat bacteria.

Mighty Measurement:
 Around 0.3 millimeters (the size of a small pencil dot).

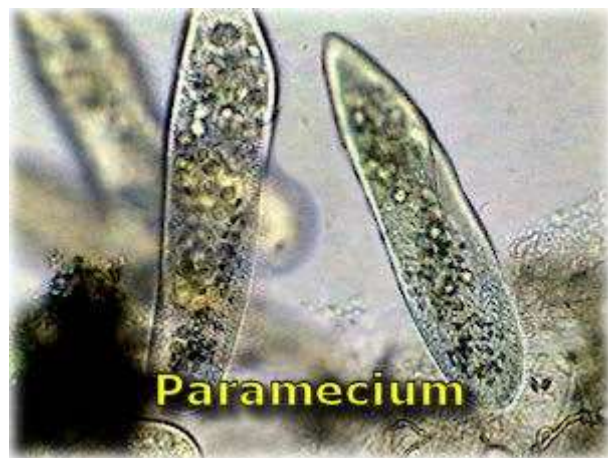
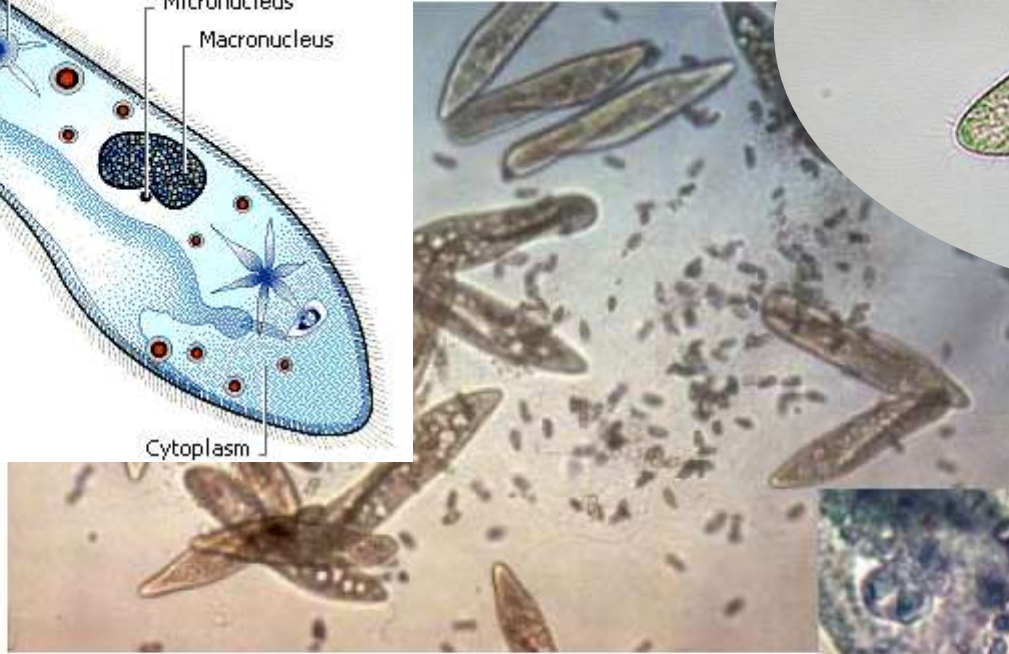
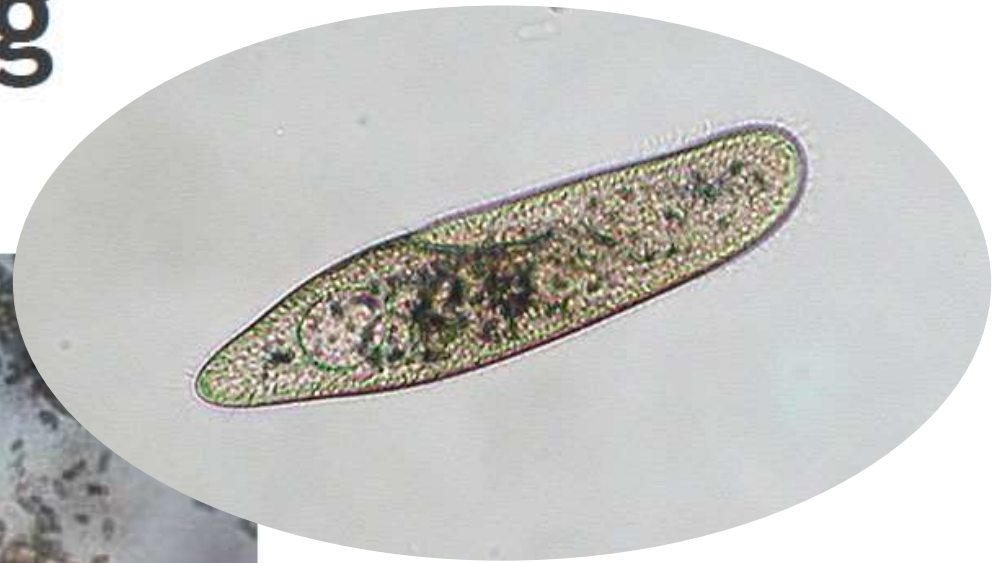
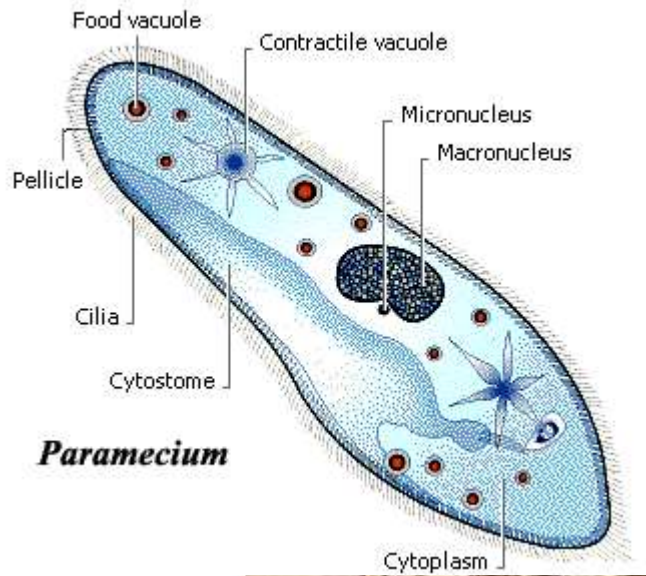
Team Headquarters: I live in Secondary Treatment — in the Aeration basin with lots of sludge.

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Free Swimming



Gastrotrich

