

MICRO-ORGANISMS IN POND WATER

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WELCOME
TO
SLIDE SHOW
ON
"MICROORGANISMS"
AT
NATIONAL MUSEUM
OF
NATURAL HISTORY

KEY CONCEPTS

1. Algae, fungi, and protozoa are eukaryotic organisms and as such have eukaryotic cell structures. Many of these organisms are microscopic.
2. Algae are very important in the food chain and carbon cycle but are of minor importance in causing disease in humans.
3. Fungi play an important role in the decomposition of organic materials. They also cause a great deal of damage to food crops as well as other materials, and they are responsible for some serious diseases in humans.
4. Protozoa are single-celled often motile organisms that are an important part of zooplankton and the food chain. Some species cause diseases that affect a large part of the world's population.



Pond eukaryotic microorganisms: Desmids (green), Amderia (purple), Euglena (red). Single-celled protozoans and algae are common in freshwater. ($\times 400$)

Kingdom – Protista

Organisms having a simple structure; many unicellular, others colonial or multicellular but lacking in specialized tissue; both heterotrophic and autotrophic; neither distinctly plant nor distinctly animal.

PHYLUM

ORGANISMS



Algal
Protists

Cyanophyta
Chlorophyta
Chrysophyta
Pyrrophyta
Phaeophyta
Rhodophyta
Schizomycophyta

blue-green algae
green algae
golden-brown algae, or diatoms
dinoflagellates and cryptomonads
brown algae
red algae
bacteria



Fungal
Protists

Eumycophyta
Myxomycophyta

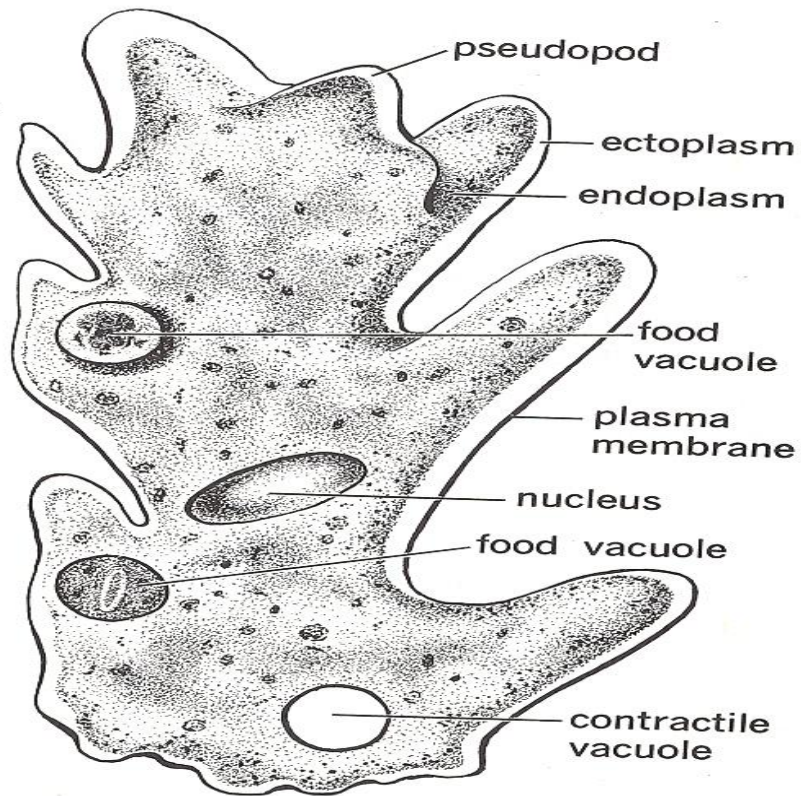
fungi
slime fungi



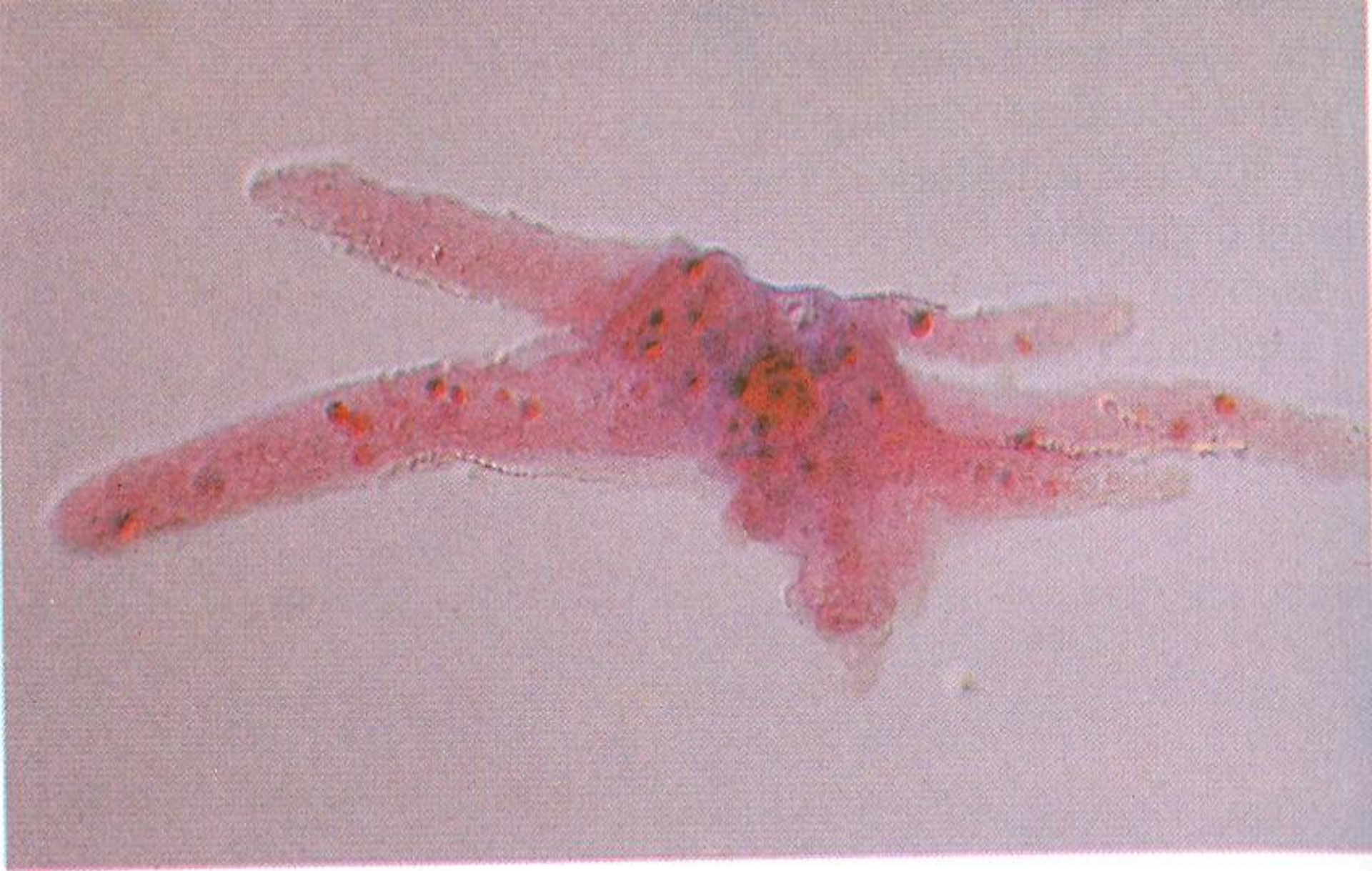
Protozoan
Protists

Sarcodina
Mastigophora
Ciliophora
Sporozoa

amoeboid organisms
flagellates
ciliates
Plasmodium



18-3 The structure of an amoeba. This protist changes its shape as it moves.



18-1 The ameba is a typical example of a protozoan. (Manfred Kage, Peter Arnold)



AMOEBA

Nikon MicroscopyU
Digital Video Gallery

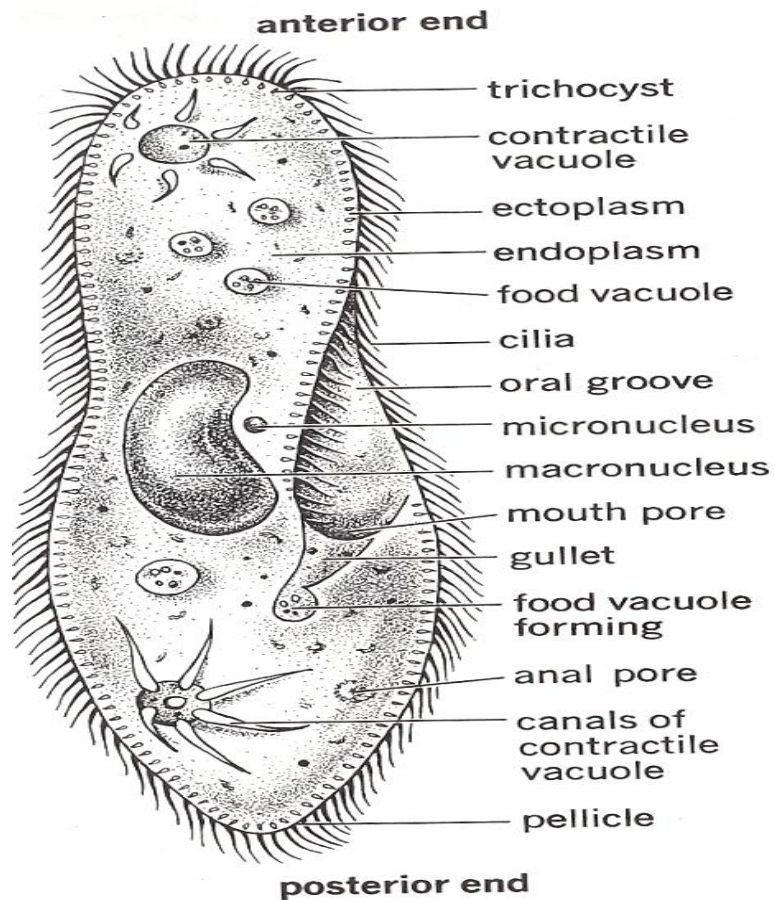
Amoeba **(Protozoan)**

Through the Nikon Eclipse
E600 Microscope with
Apodized Phase Contrast

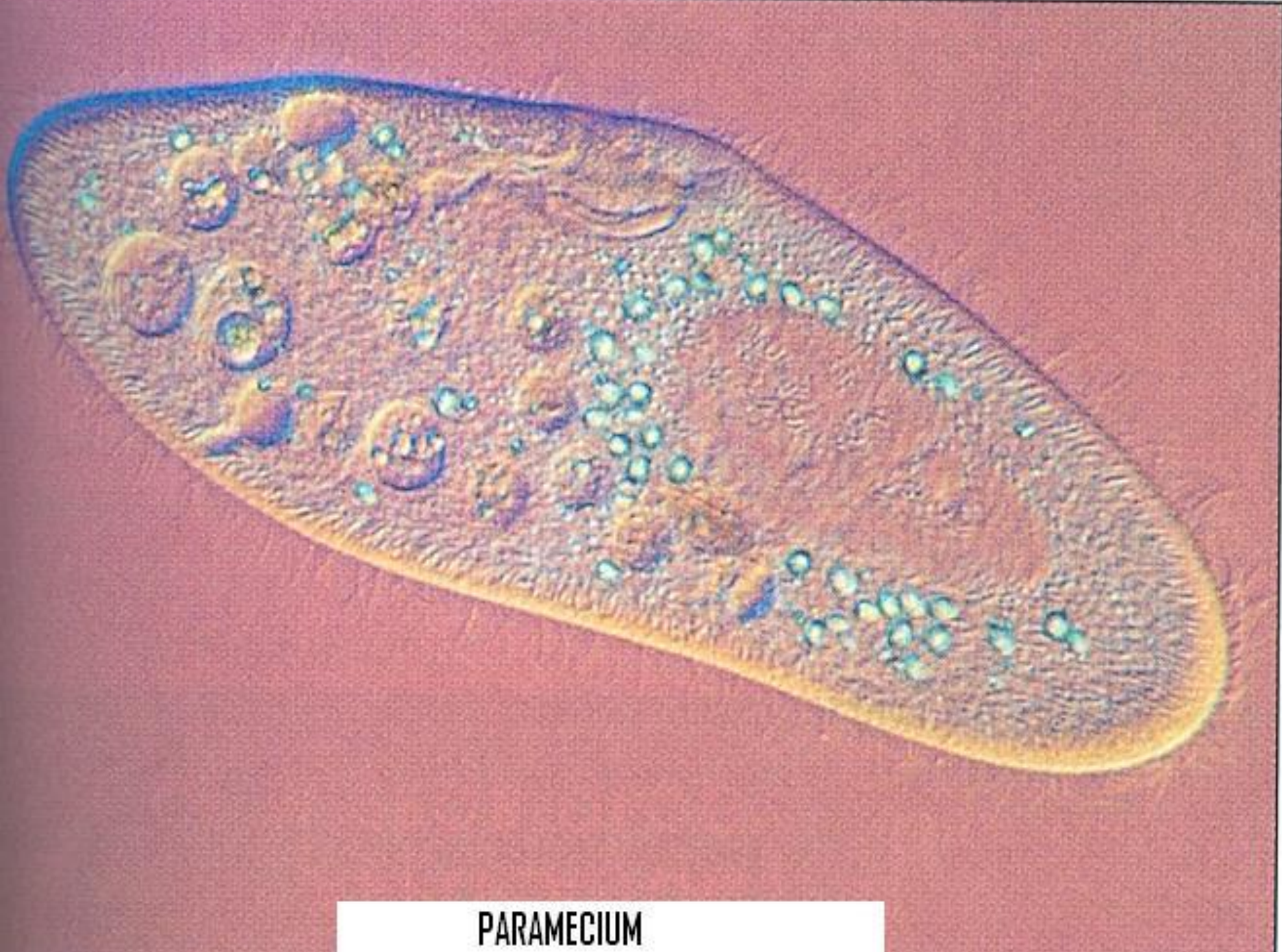


AMOEBA

- * It is an unicellular organism found in ponds and ditches.
- * It is a tiny mass of protoplasm having a small nucleus. It is bounded by a thin membrane, the plasma membrane.
- * It has contractile vacuoles, food vacuoles and pseudopodia.



18-6 The structure of the paramecium. In what ways are the paramecium and the amoeba alike? In what ways are they different?



PARAMECIUM



MOVING PARAMECIUM

Nikon MicroscopyU
Digital Video Gallery

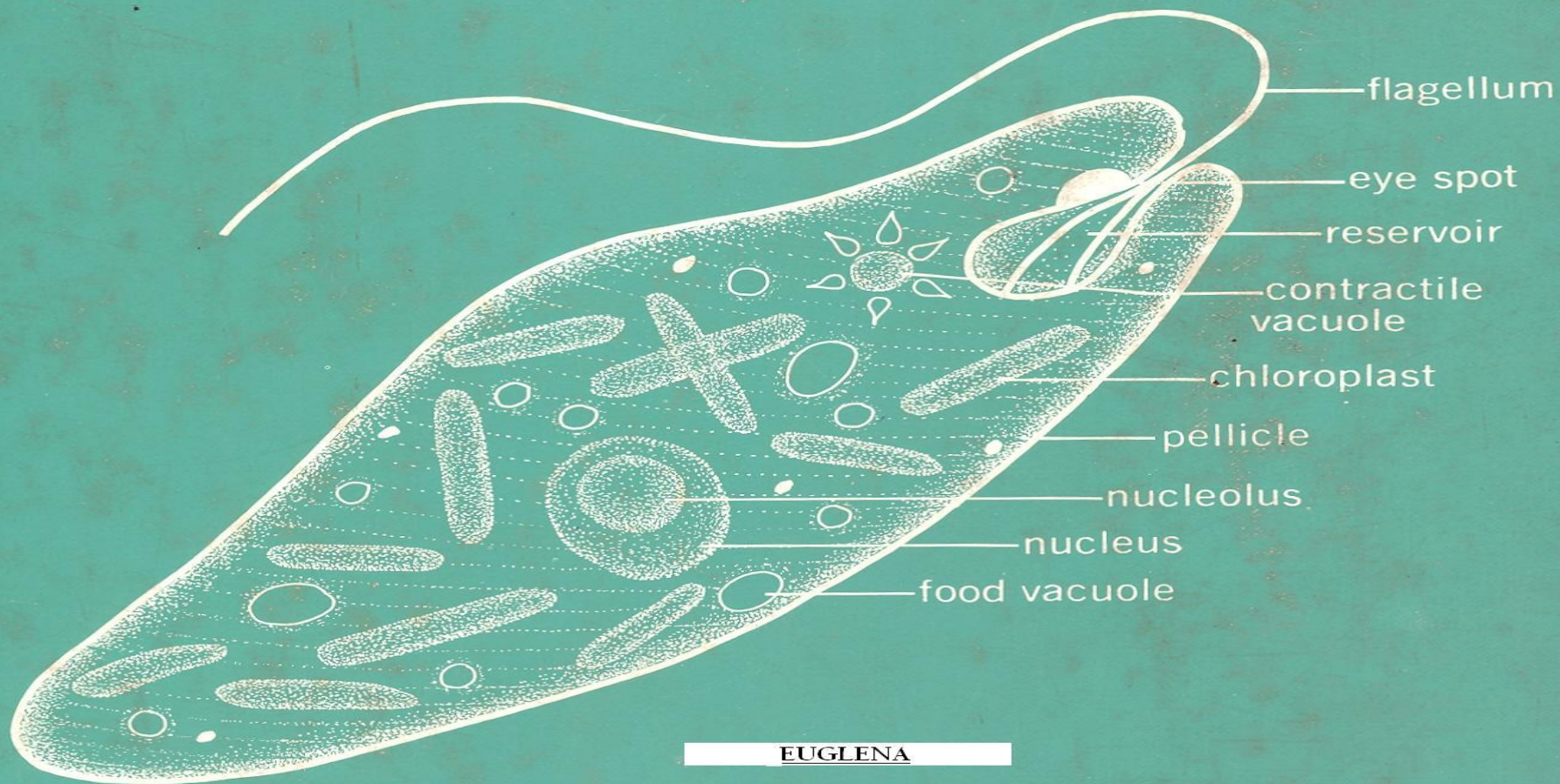
Paramecium **(Protozoan)**

Through the Nikon Eclipse
E600 Microscope with
Dark Field Illumination



PARAMECIUM

- * It is a bean shaped unicellular micro-organism found in fresh water ponds, ditches and pools.
- * It moves with the help of numerous cilia present on the outer surface of it's body.
- * It's size varies from 75 microns to 150 microns.
- * Contractile vacuoles are present to control the water content of the body.
- * Two nucleus are seen in the cytoplasm.



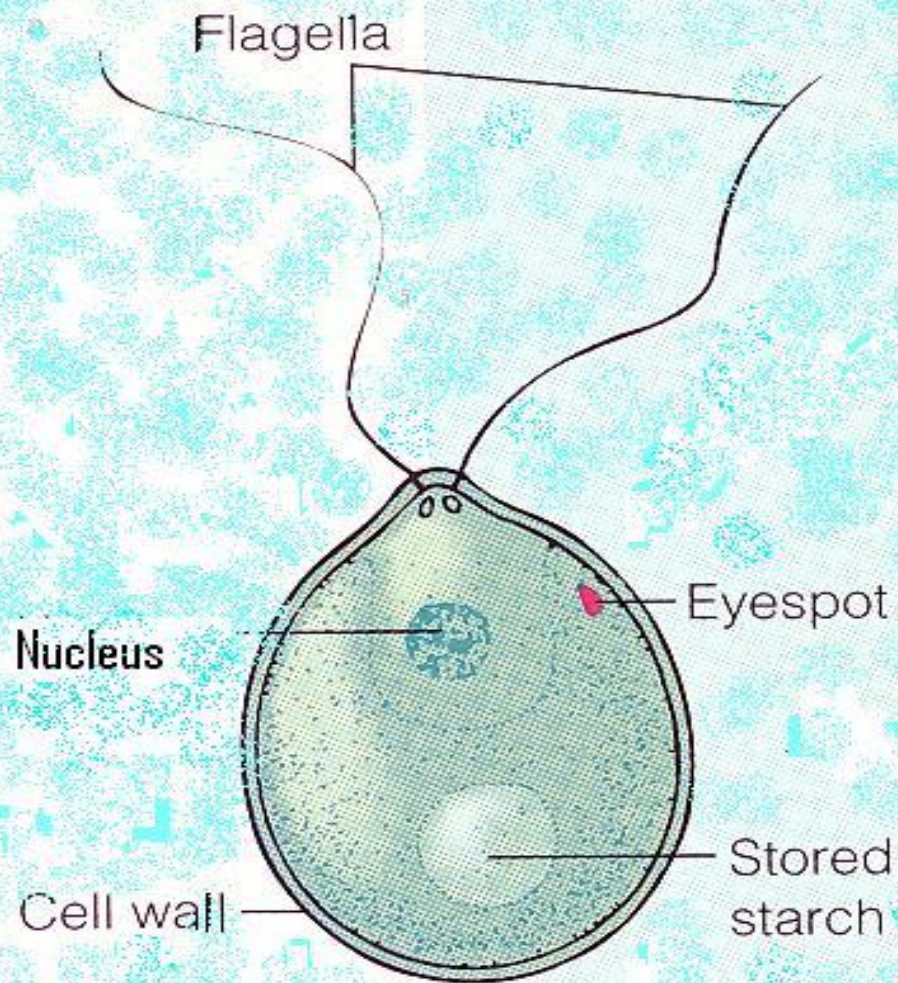


EUGLENA

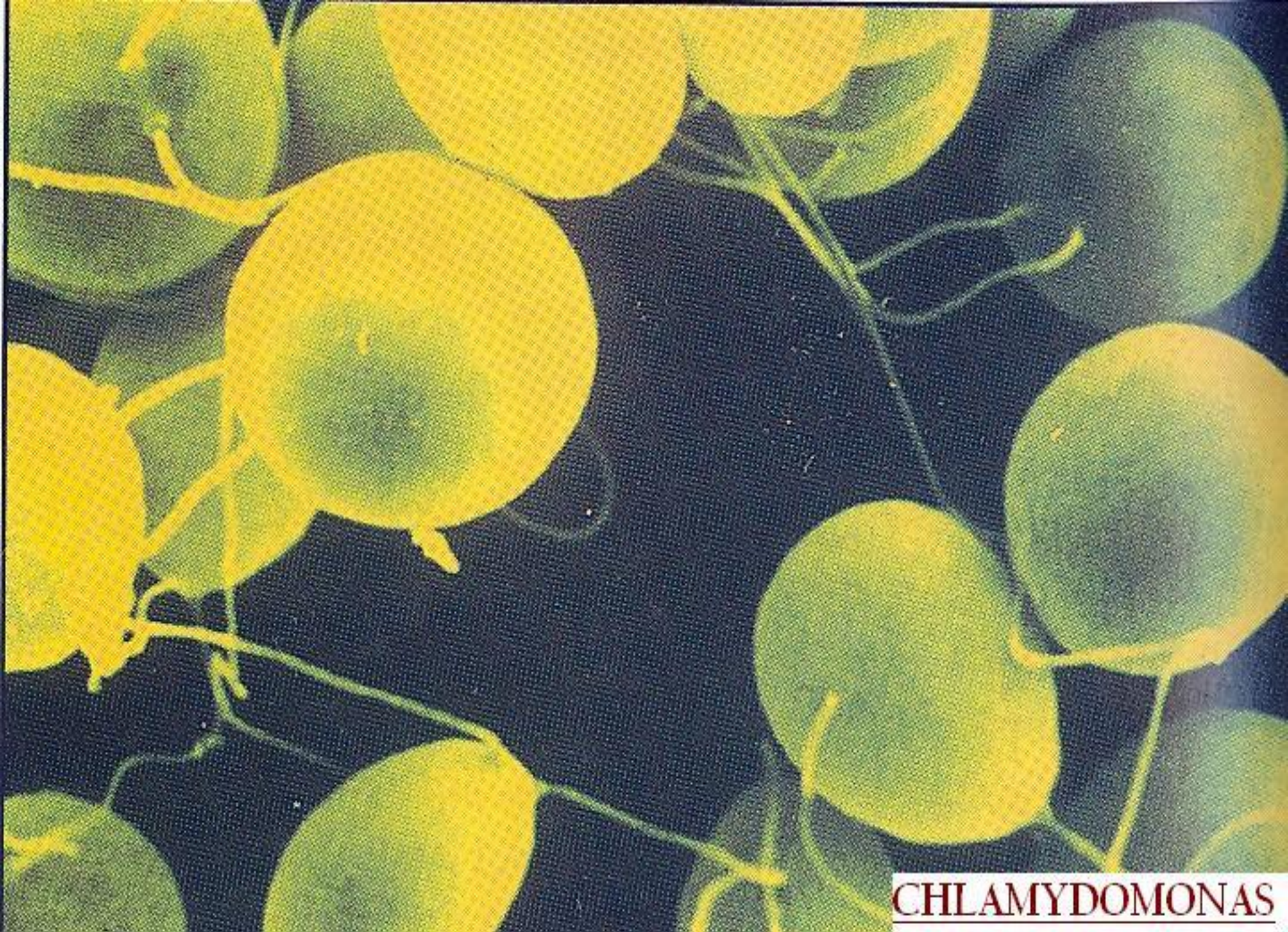


EUGLENA

- * It is one of the longest ,free living, solitary uniflagellate.
- * It's body contains green pigment the chlorophyll.
- * It is fusiform in appearance and measures between 50 microns to 300 microns in length.
- * From the mouth emerges a long thread like structure called flagellum that helps in locomotion.
- * A small spot called Stigma is also present which is considered to be a photoreceptor organelle.



Chlamydomonas



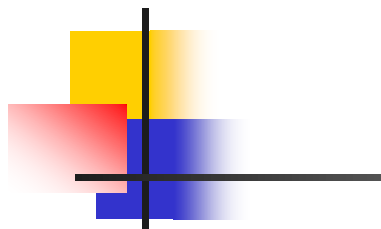
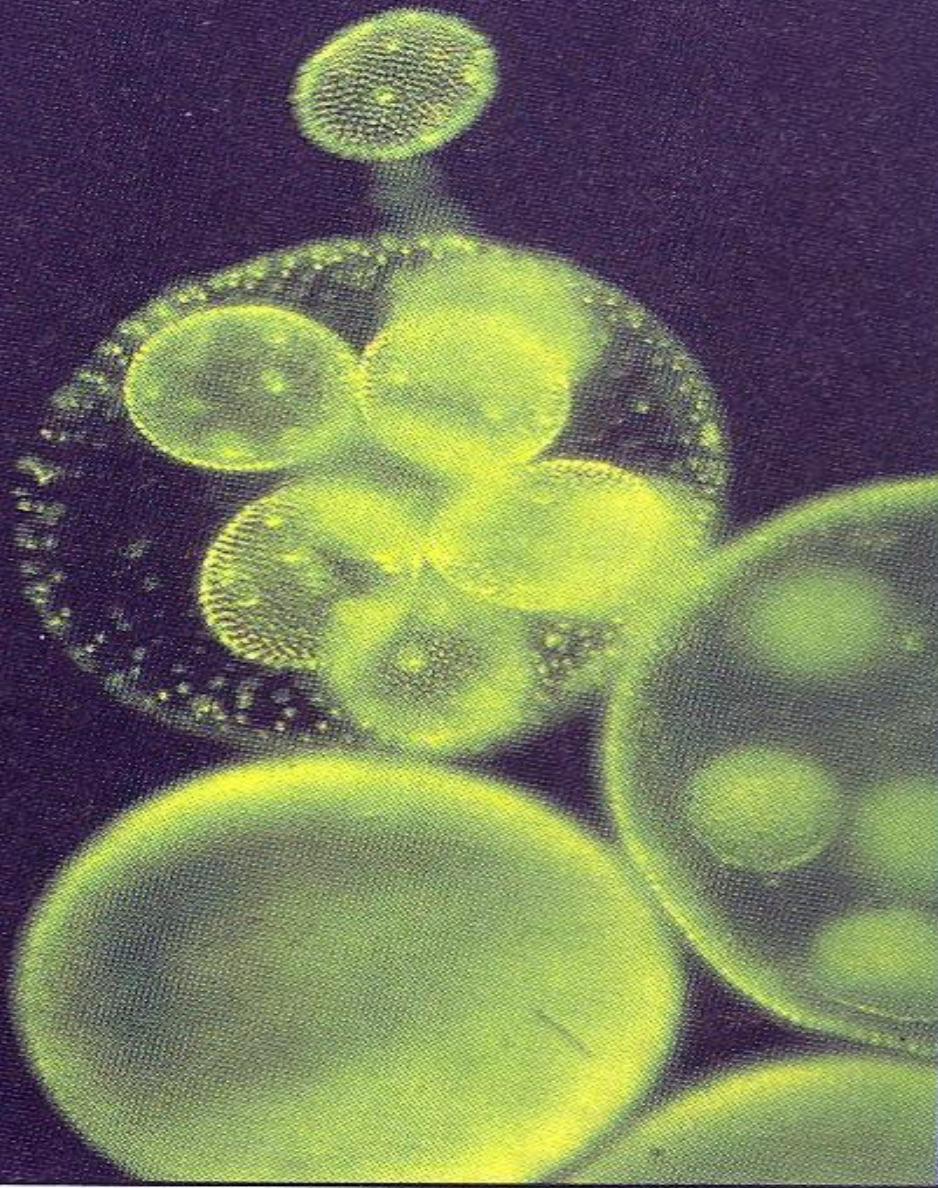
CHLAMYDOMONAS



CHLAMYDOMONAS

- * It is ellipsoidal in shape and an unicellular green algae.
- * It is usually found in stagnant water of ponds or pools
- * Two flagella are present at the anterior end of the cell.
- * A single large cup shaped chloroplast is also present at the broader end of the chlamydomonas.
- * Two liquid filled spaces called, contractile vacuole are found at the anterior end of the cell.
- * A tiny orange-red pigment spot called eye-spot, which is photo receptive organ is present at the later side.
- * A single nucleus lies in the cytoplasm filling the cup of the chloroplast.

VOLVOX





VOLVOX

- * Volvox are colonial form of algae about the size of a pin head.
- * Volvox colonies are hollow spheres, whose surfaces consist of hundreds or thousands of chlamydomonas like cells.
- * Each cell is motile by two flagella as in chlamydomonas.
- * Small “daughter colonies” are formed within the original mother colony.



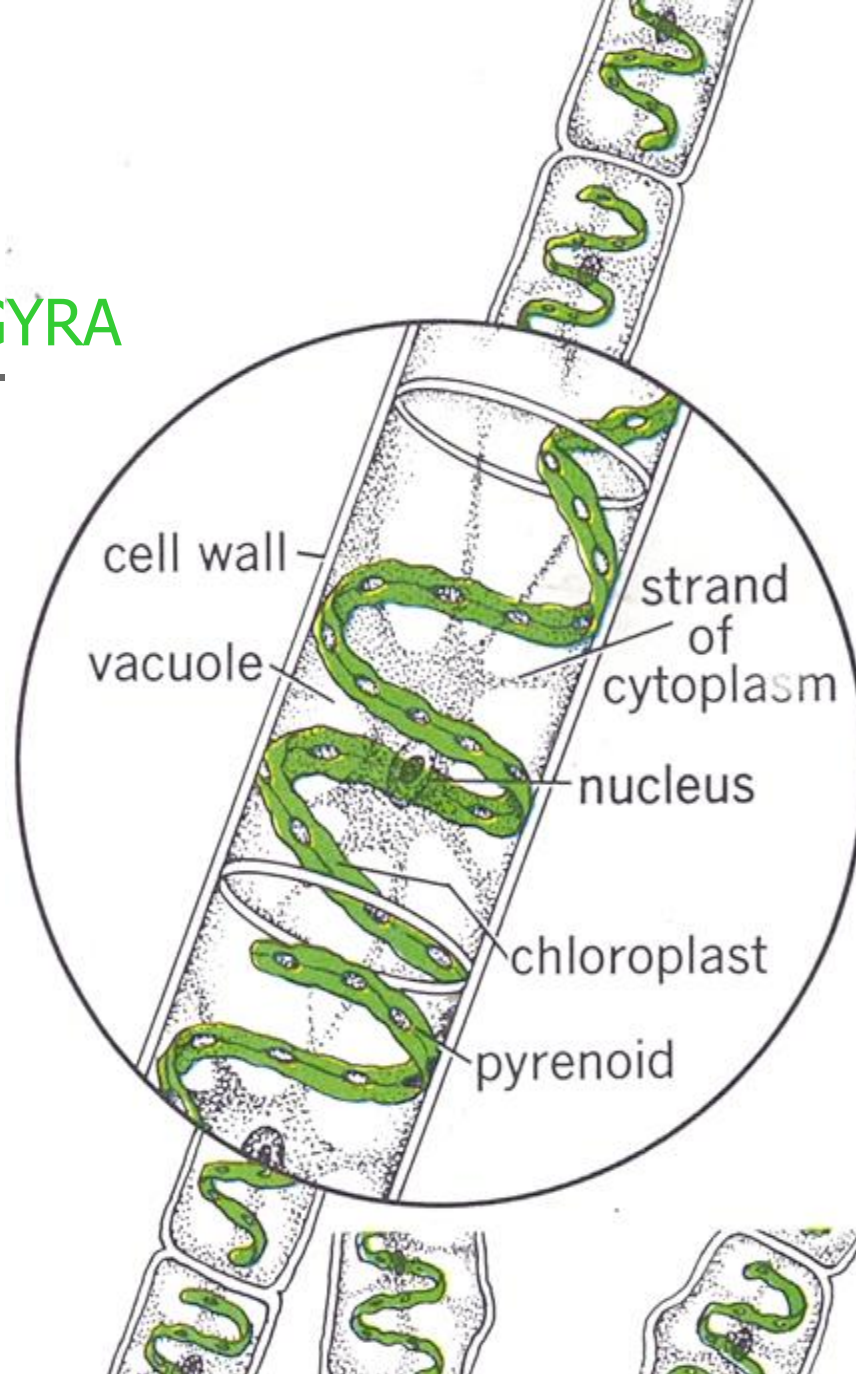
Phase contrast view of a cyanobacterium of the genus *Nostoc*, free-living, photosynthetic, oxygen-producing, nitrogen fixers.



NOSTOC

- * It is an nitrogen fixing, filamentous bacteria.
- * Nostoc are common in aquatic habits.
- * Their filaments are enclosed within a sheath.
- * They have specialised cells called heterocysts that are the sites of nitrogen fixing.
- * Heterocysts are formed in the filaments from ordinary cell.

SPIROGYRA





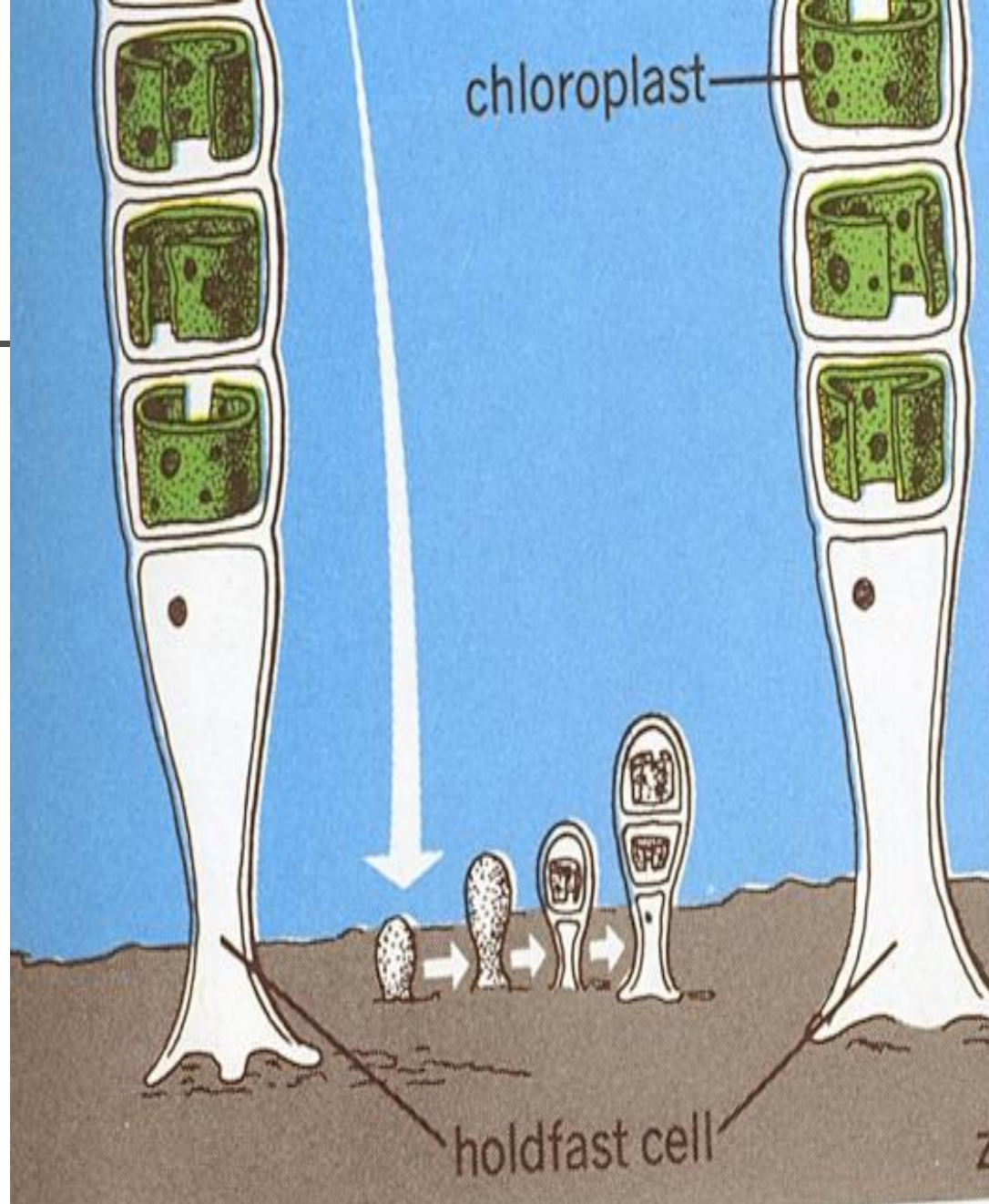
SPIROGYRA





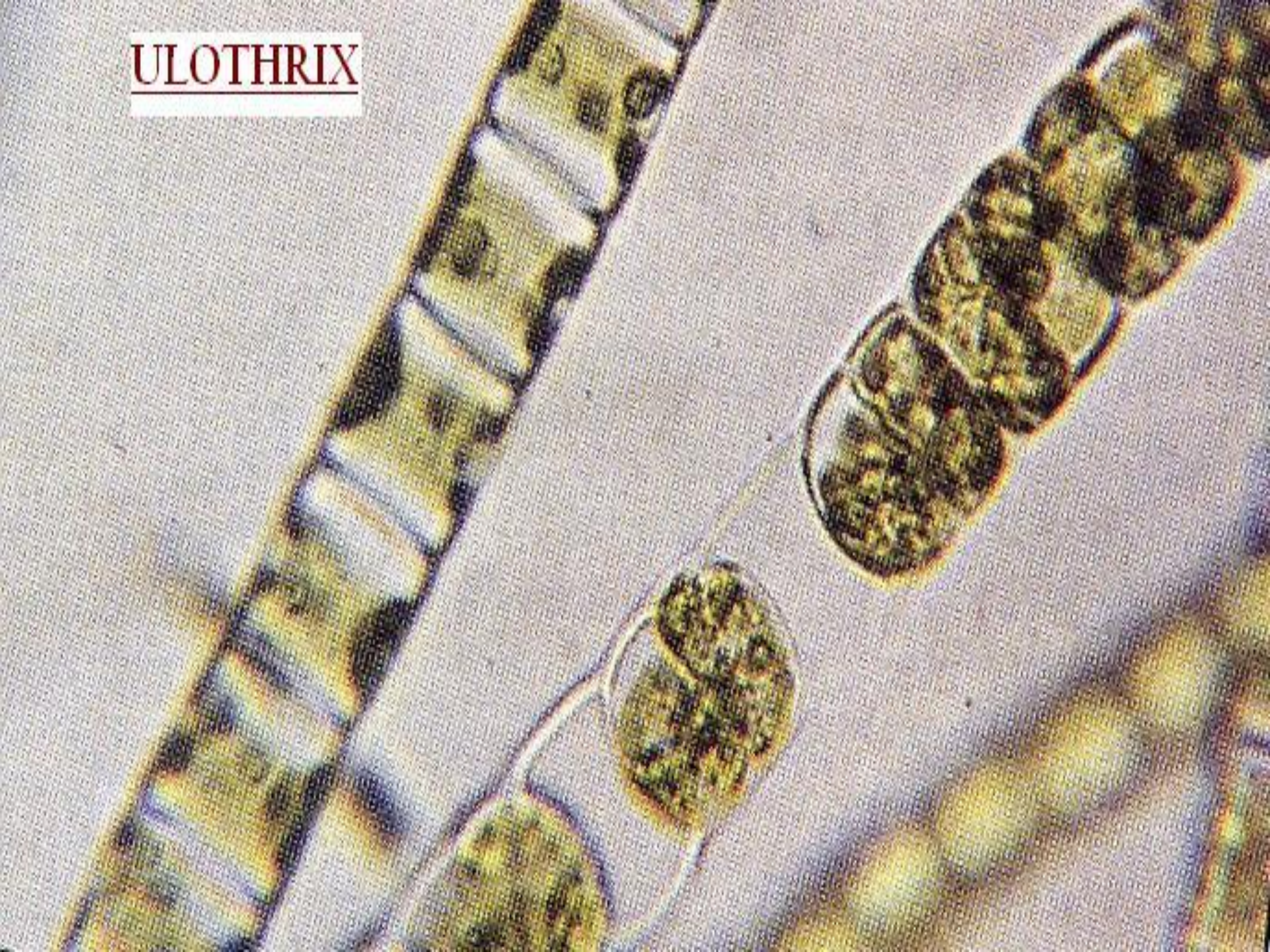
SPIROGYRA

- * Spirogyra is filamentous, green, free floating algae commonly found in ponds and ditches.
- * Each filament consists of several cylindrical cells joined in a linear fashion.
- * Each cell consists of a big central vacuole within which nucleus is suspended by cytoplasmic threads.
- * Each cell consists of one or more ribbon shaped chloroplasts spread from one end of the cell to the other end.



ULOTHRIX

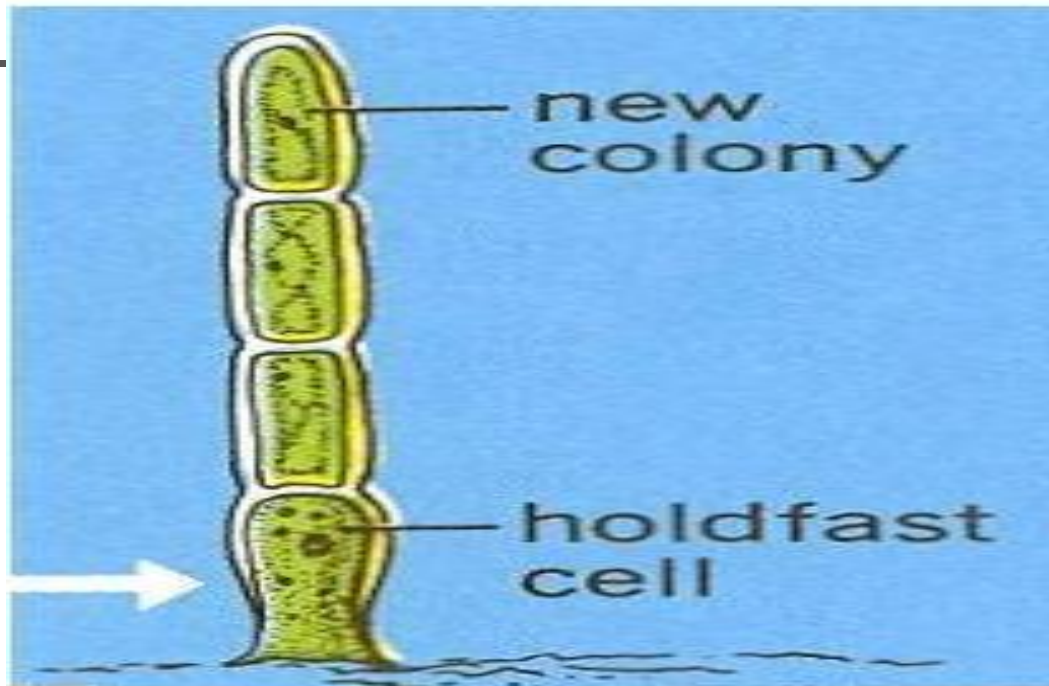
ULOTHRIX





ULOTHRIX

- * This is a green algae that lives attached to rocks in swift, shallow water.
- * Each short filament is anchored by a special cell called a HOLDFAST.
- * Each cell, above the holdfast has a large chloroplast, shaped like an open ring and also a nucleus.

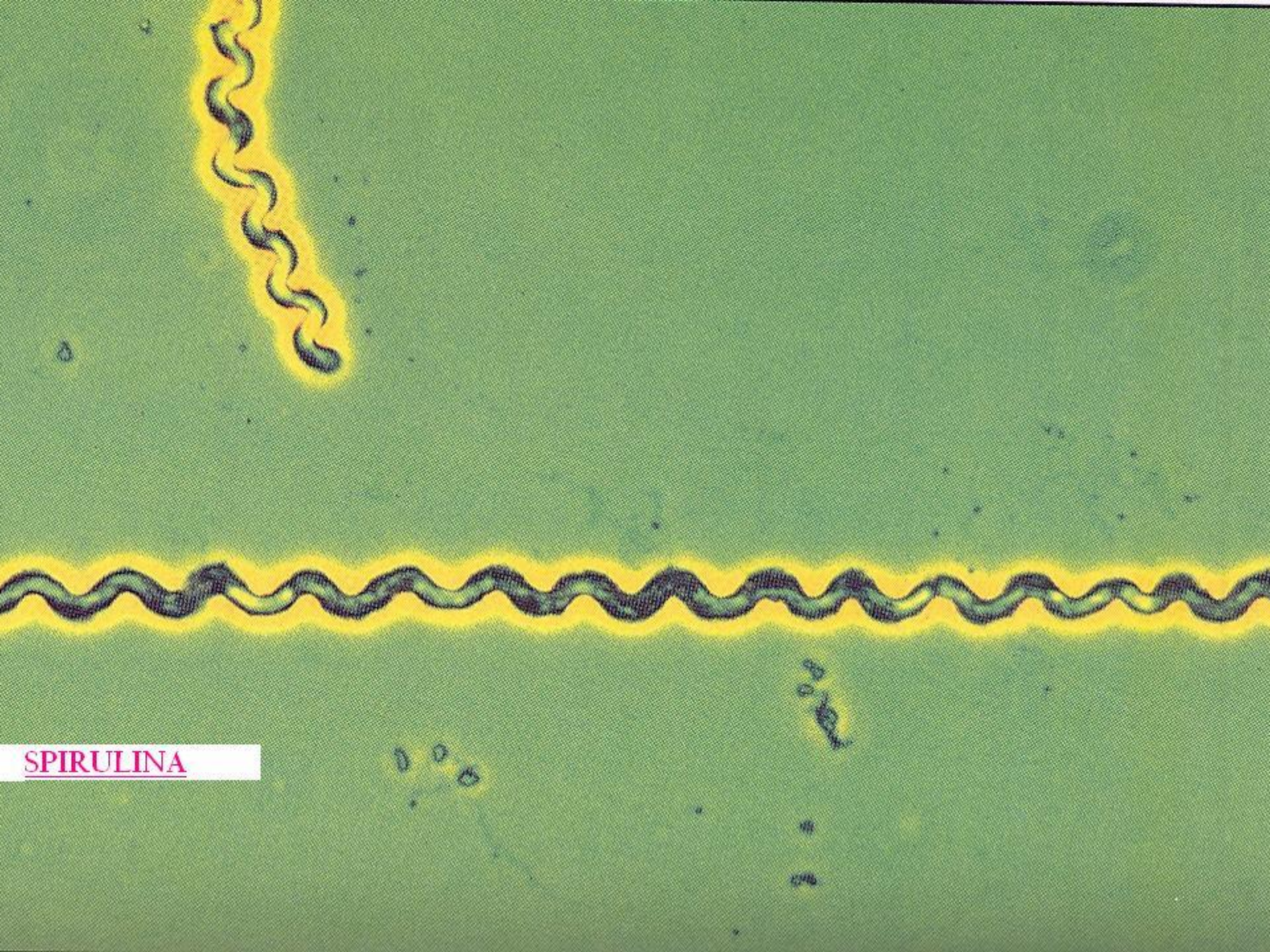


OEDOGONIUM



OEDOGONIUM

- * Oedogonium is a common green algae that grows on rocks and other objects in quite pools.
- * These are single filaments held in place by holdfast cells.
- * Each cell has a single chloroplast made up of many joined strands.
- * Each cell has a nucleus .



SPIRULINA

Rod Shaped Bacteria

Rod Shaped Bacteria

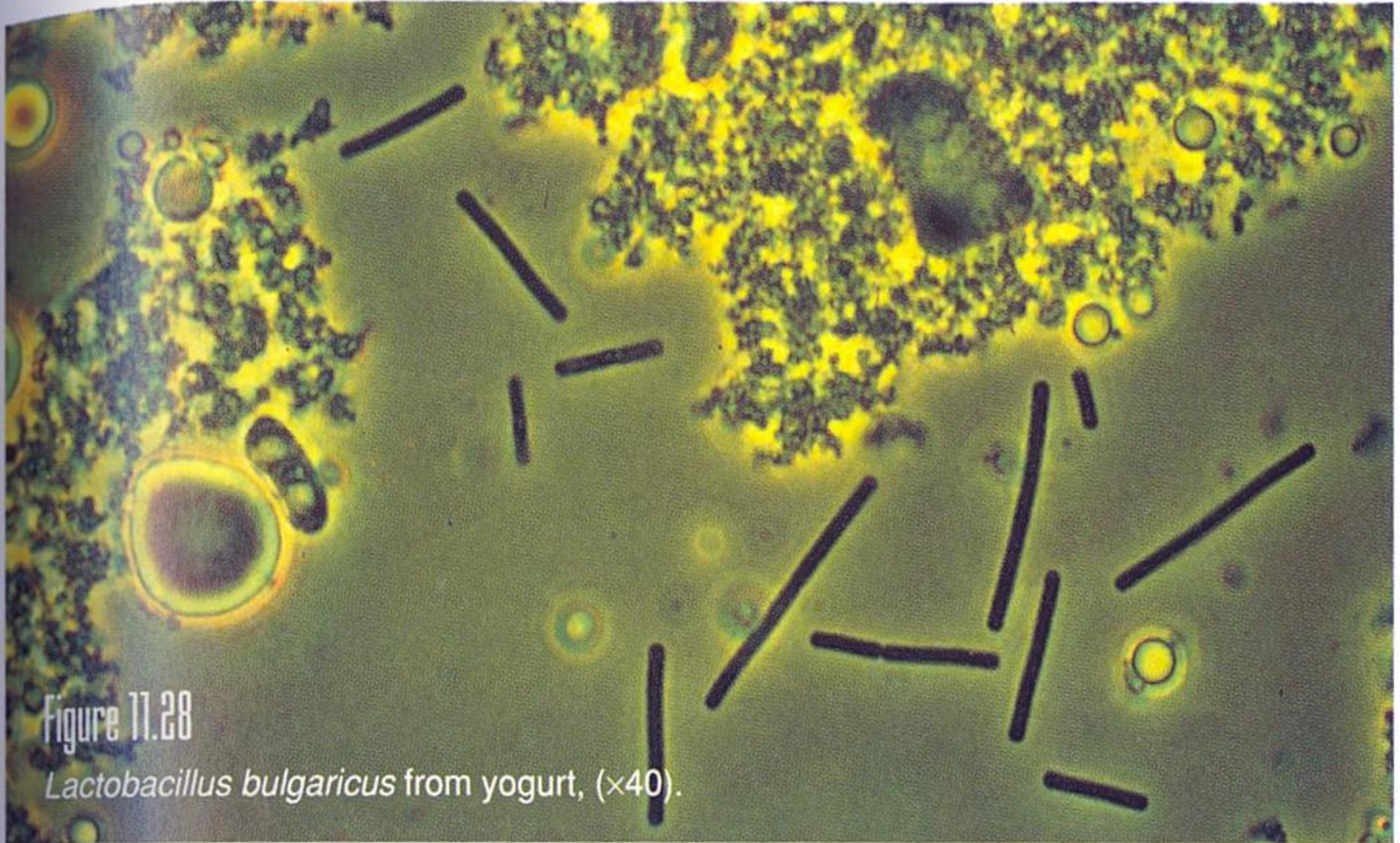


Figure 11.28

Lactobacillus bulgaricus from yogurt, ($\times 40$).

Types of Bacteria: Spherical , Rod shaped & Spiral

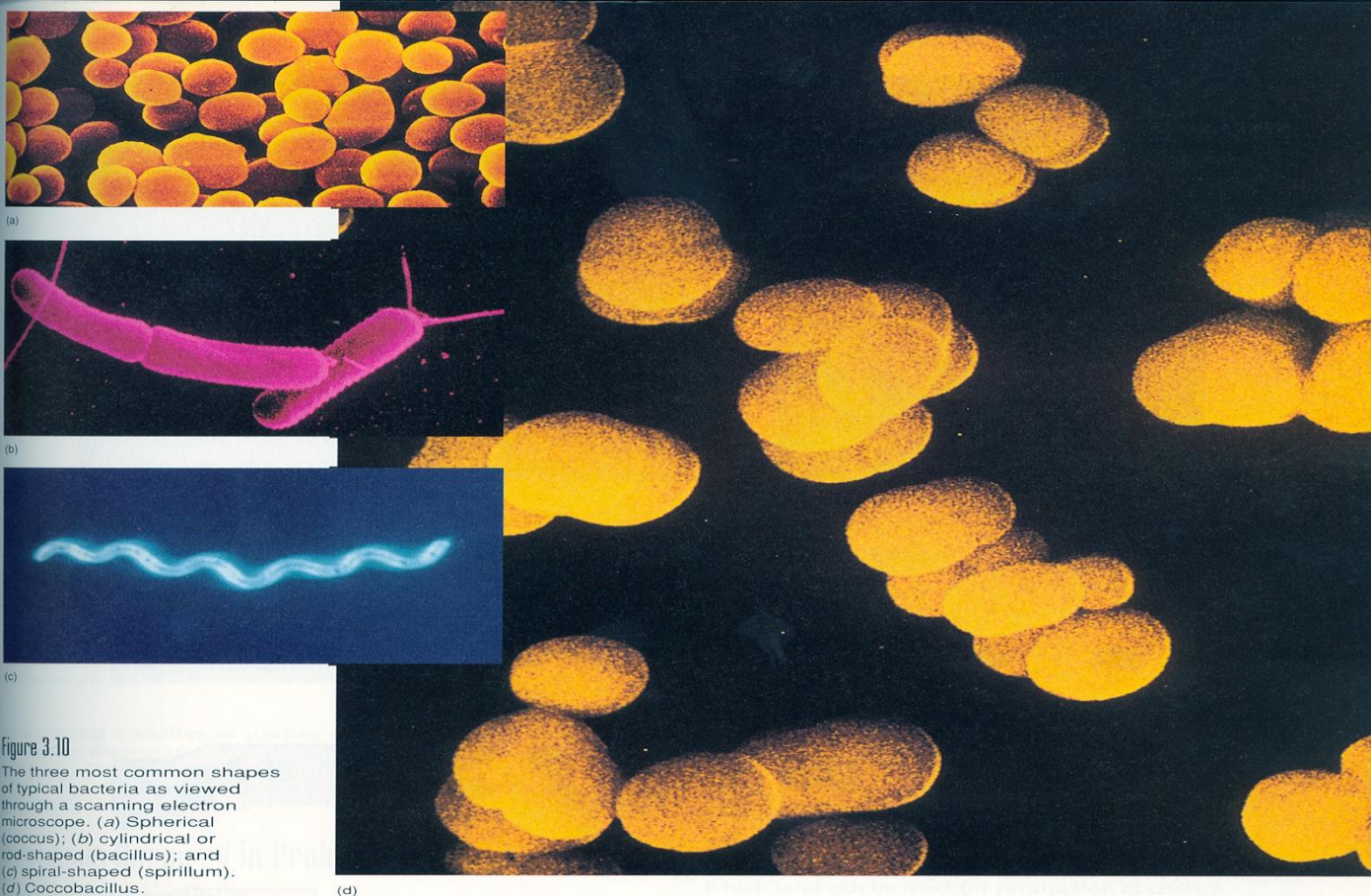


Figure 3.10

The three most common shapes of typical bacteria as viewed through a scanning electron microscope. (a) Spherical (coccus); (b) cylindrical or rod-shaped (bacillus); and (c) spiral-shaped (spirillum). (d) Coccobacillus.



THANKS

- Hope you would have enjoyed the slide show on micro organisms.
- Now, get prepared to make your own slide of micro organisms, yourself.

■ Dr. Jaya Prasoon
Sr. Educational Asst.
National Museum of Natural History
Tansen Marg, N.Delhi-110001

