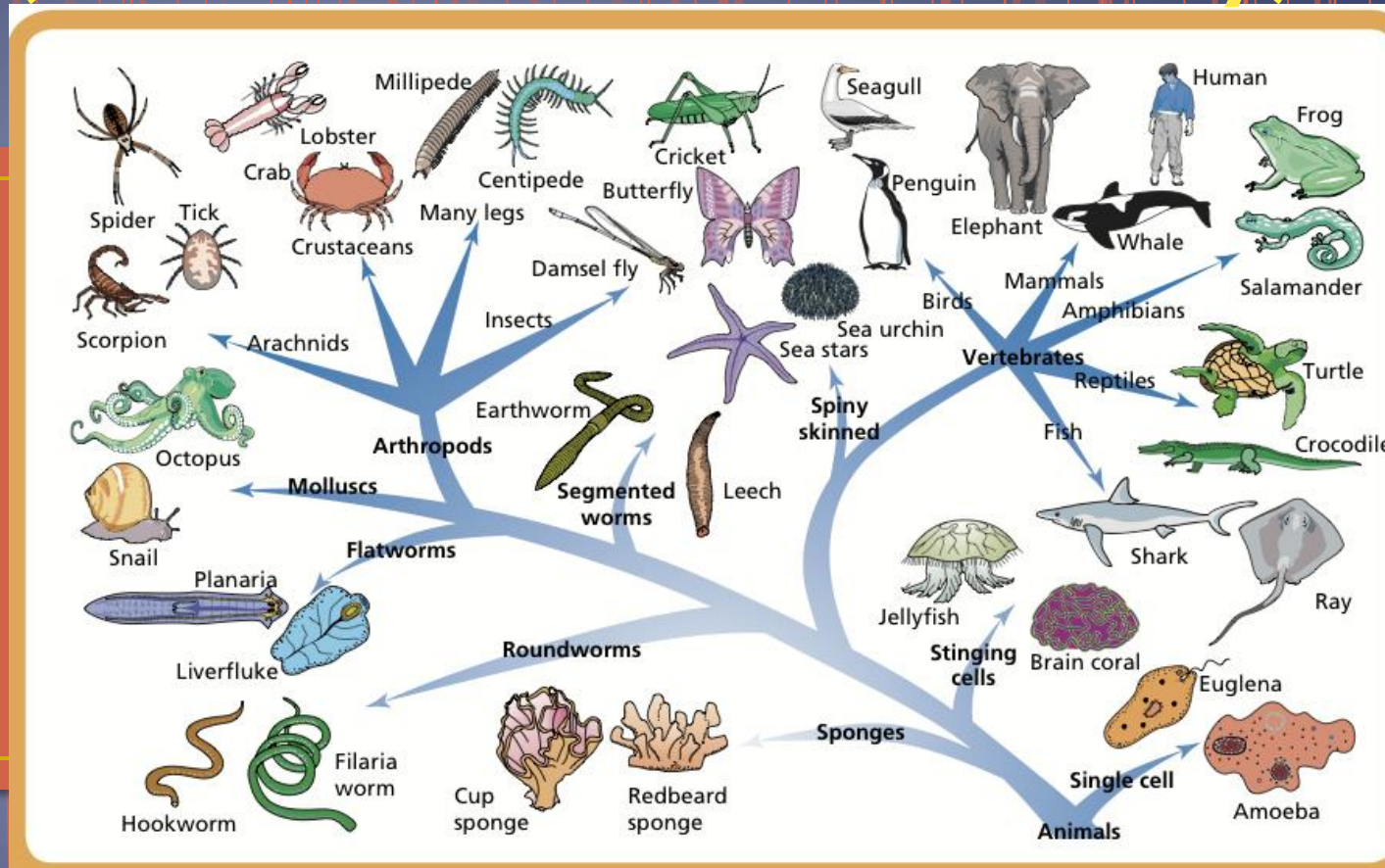


# Zoology (2)

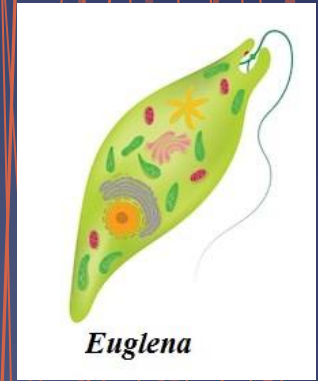
## (Basics of Animal Taxonomy)



*Dr. Shereen Ahmed Fahmy*

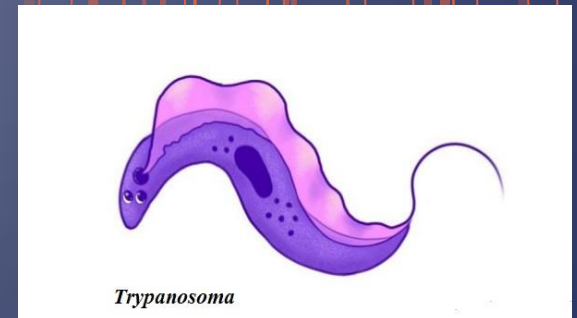
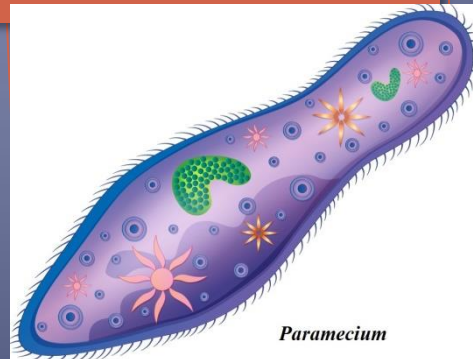
Lecturer of Parasitology, Zoology Department.

**1<sup>st</sup> year Students (Credit hours)**



# Chapter (2)

# Phylum Protozoa

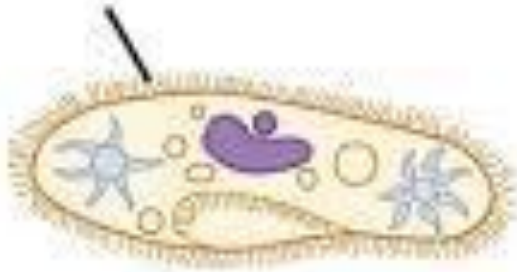


# Characteristics of PHYLUM Protozoa

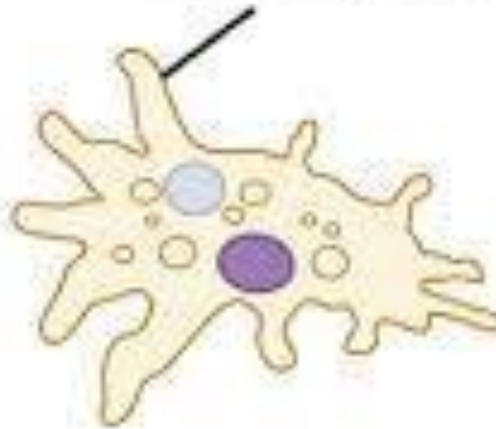
- **Single-celled or unicellular organisms.**
- **They include free-living, mutualistic, commensal and parasitic forms.**
- **Most are microscopic, Size = microscopic (3 to 1,000 microns).**
- **They move by pseudopodia, flagella, cilia and they can direct cell movements.**
- **Protozoa are heterotrophic microorganisms, and most species obtain large food particles by phagocytosis.**
- **Nutrition are holophytic (like plant) or holozoic (like animal) or saprophytic or parasitic.**
- **Digestion: digestion is intracellular, occurs in food vacuoles.**

# LOCOMOTRY ORGANS of Protozoa

**Cilia**



**Pseudopod**



**Flagellum**



# **Continued**

## **Characteristics of PHYLUM Protozoa**

- **Osmoregulation: Contractile vacuoles help in osmoregulation.**
- **Exchange of respiratory gases takes place by diffusion through the general body surface.**
- **Respiration takes place through body diffusion & anaerobic in some parasitic forms.**
- **Excretion occurs by diffusion across general body surface or by contractile vacuoles**
- **Reproduction: asexual = longitudinal and transverse binary fission, budding, multiple fission (sporogony, schizogony)**
- **Sexual = syngamy, autogamy, conjugation**

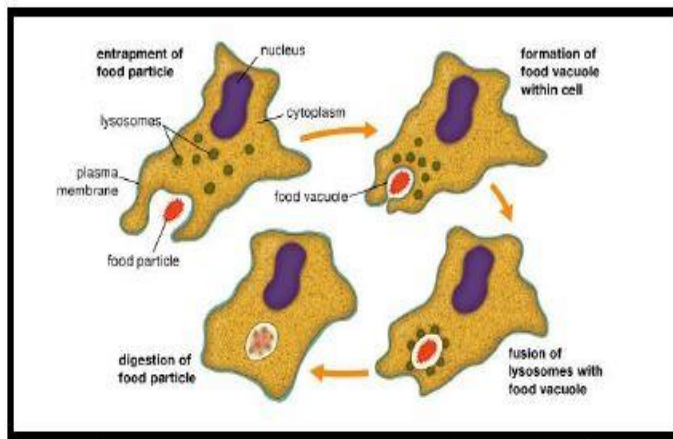


Figure 14: phagocytosis in Protozoans

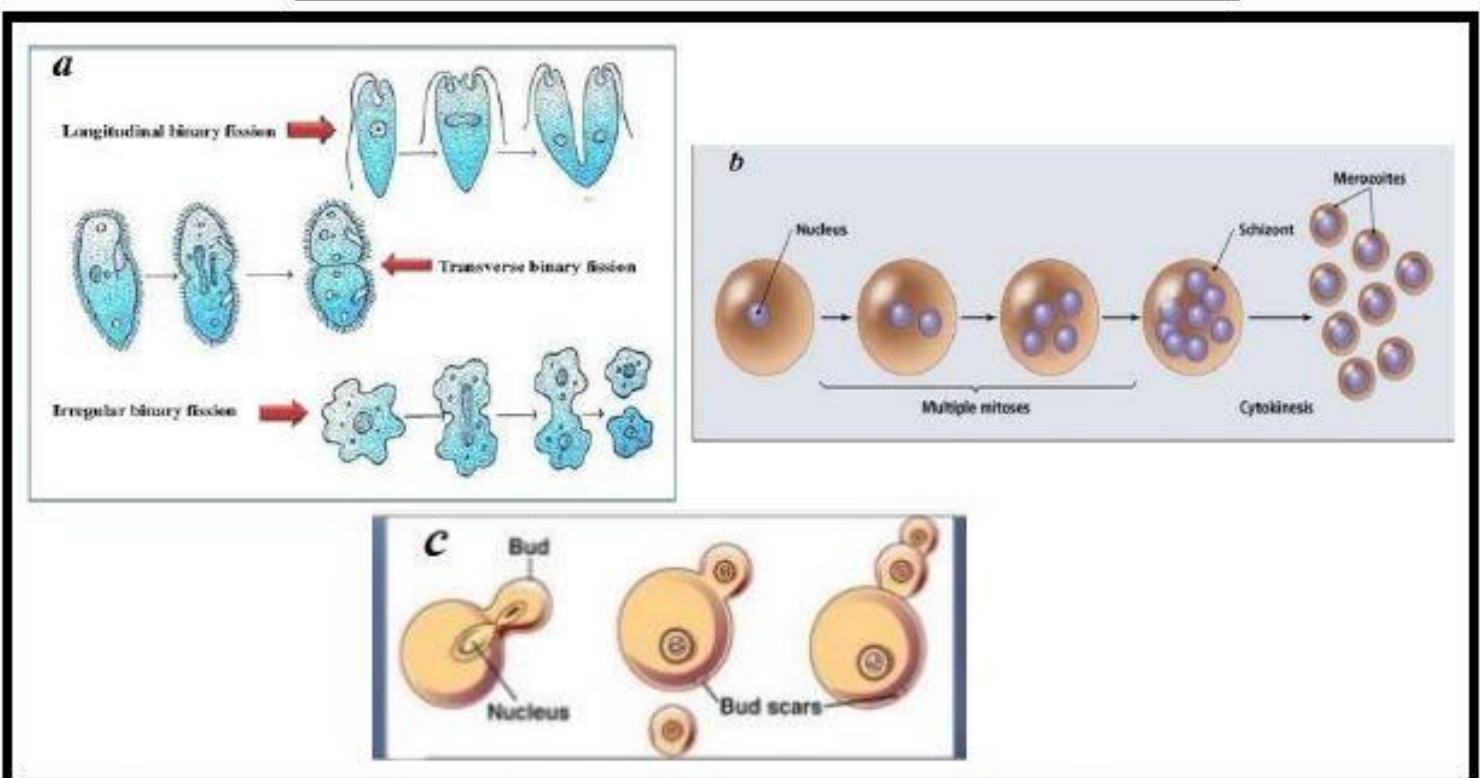


Figure 13: Asexual reproduction in Protozoans; a, Binary fission; b, Schizogony and c, Budding.

## Classification of Protozoa

Phylum	Class	Subclass	Examples
<b>Protozoa</b>	Rhizopoda (Sarcodina)	.....	<i>Amoeba,</i> <i>Entamoeba</i>
	Mastigophora (Flagellata)	<div style="display: flex; align-items: center;"> <div style="border-left: 2px solid black; border-bottom: 2px solid black; width: 10px; height: 10px; margin-right: 5px;"></div> <div style="margin-left: 5px;">                     Phytomastigophora Zoomastigophora                 </div> </div>	<i>Euglena</i> <i>Trypanosoma</i>
	Sporozoa	.....	<i>Plasmodium,</i> <i>Monocystis</i>
	Ciliata	.....	<i>Paramecium,</i> <i>Vorticella,</i> <i>Balantidium</i>



*Amoeba*



*Entamoeba*

1- Class: Rhizopoda (Sarcodina)



*Euglena*

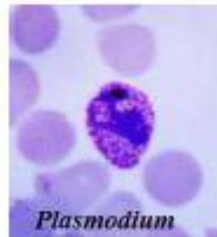


*Trypanosoma*



*Giardia*

2- Class: Mastigophora (Flagellata)

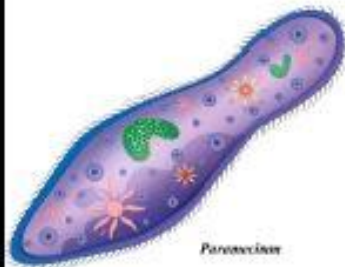


*Plasmodium*



*Monocystis*

3- Class: Sporozoa



*Paramecium*



*Paramecium*



*Balantidium*

4- Class: Ciliata

Figure 15: Examples of Phylum Protozoa



# Paramecium

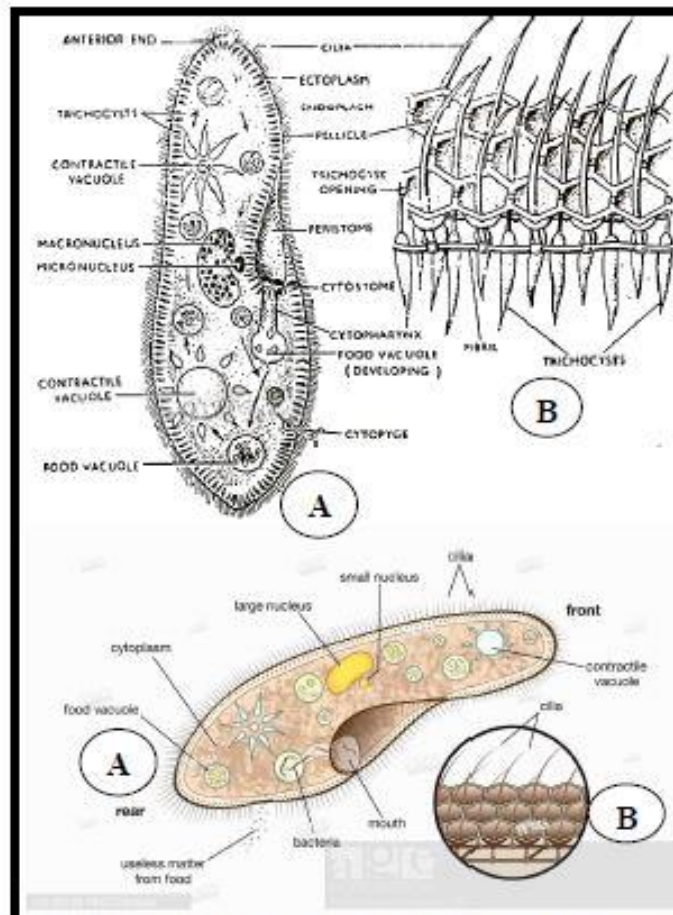


Figure 22: A, *Paramecium* sp.; B, structure of the pellicle and associated organelles.

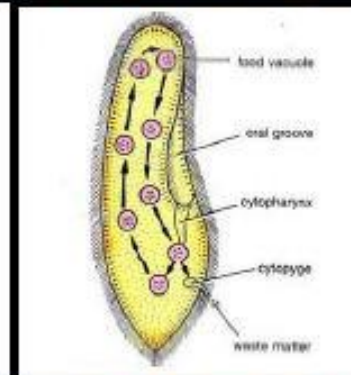


Figure 23: *Paramecium* sp. Showing cyclosis and the course of food vacuoles in the cytoplasm.

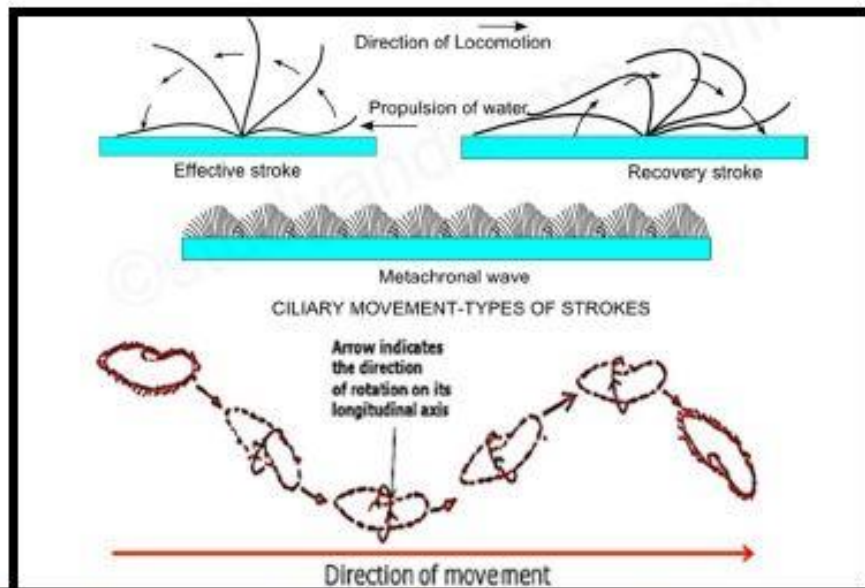


Figure 24: *Paramecium* sp. Showing ciliary movement and direction of movement.

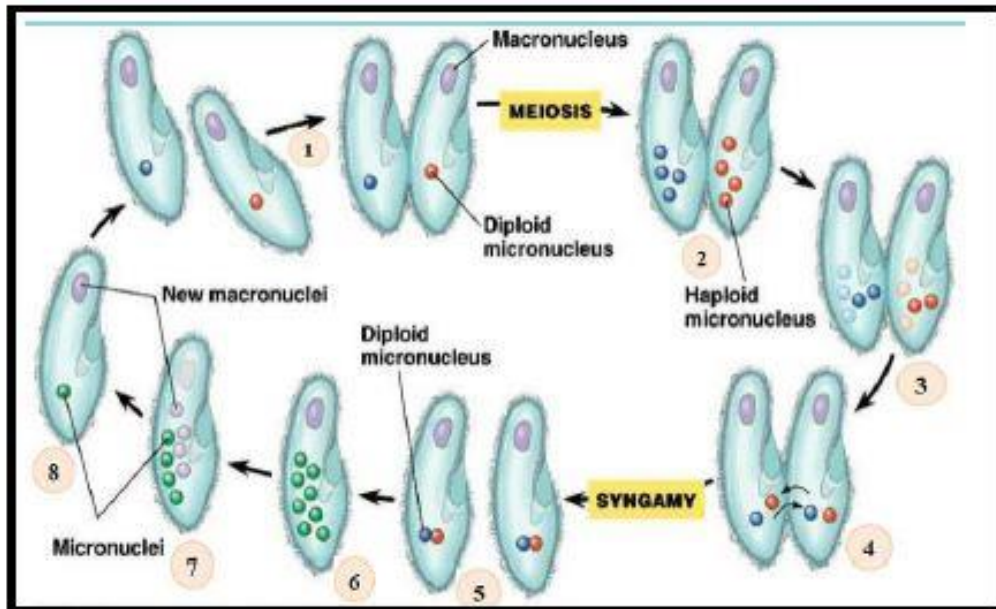
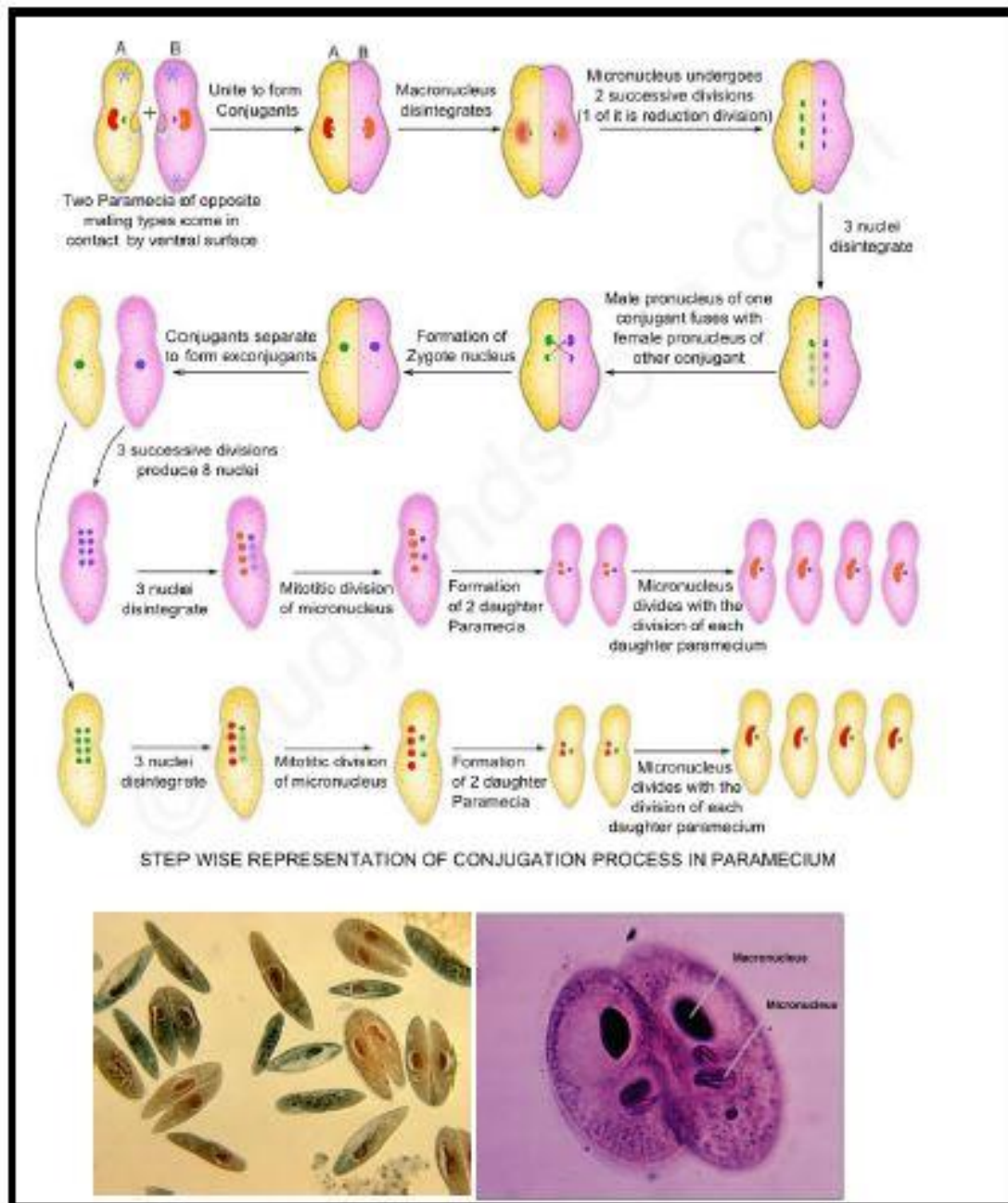
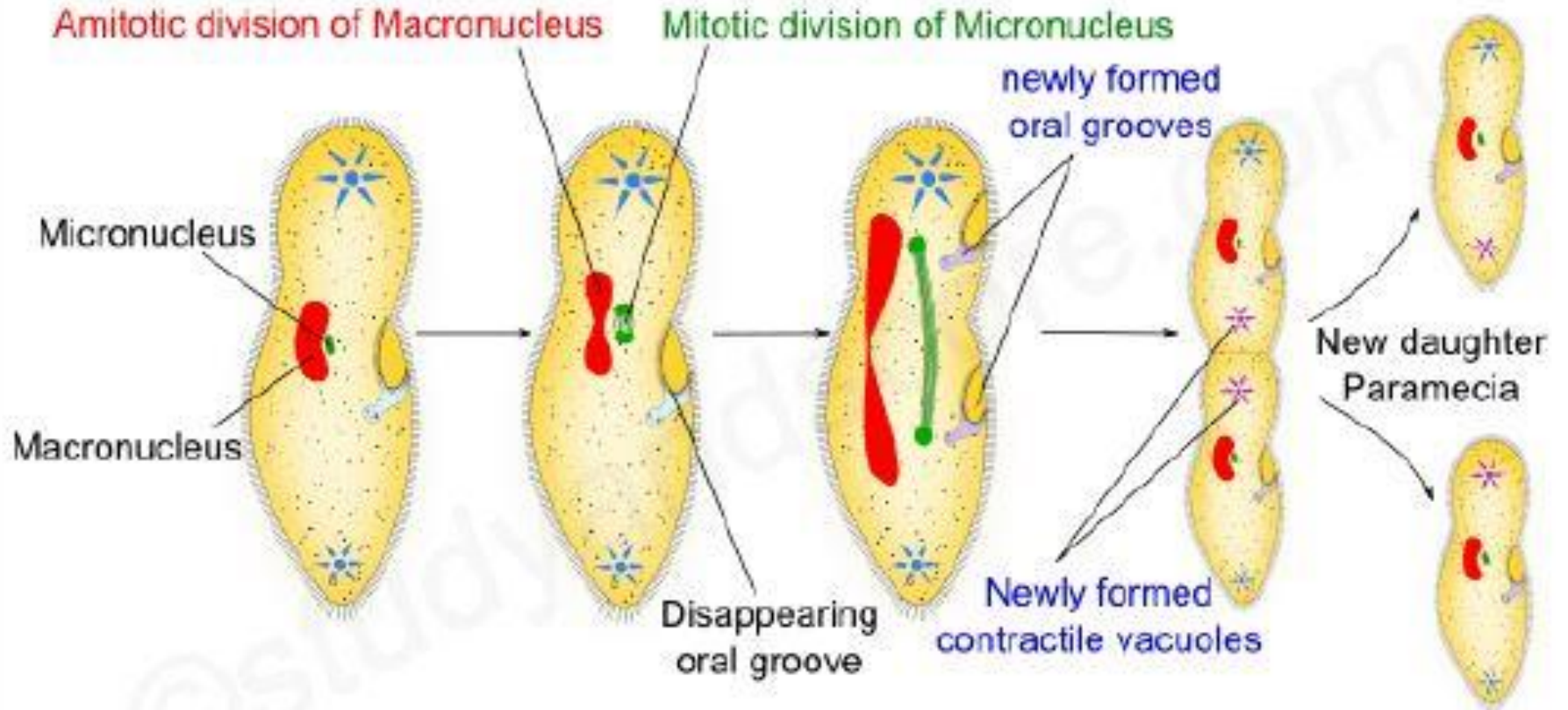


Figure 25: stages of *Paramecium* conjugation



**Figure 26: *Paramecium* in conjugation (steps).**



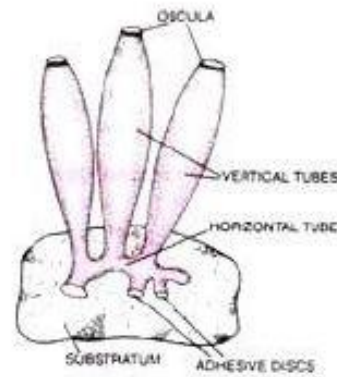
**Figure 27: Steps in transverse binary fission in *Paramecium*.**

# Chapter (3)

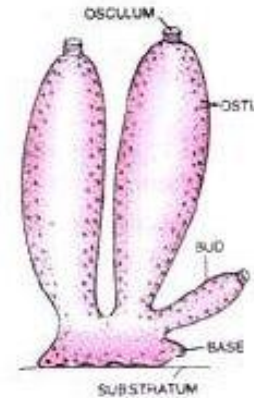
# Phylum Porifera

# Phylum: Porifera

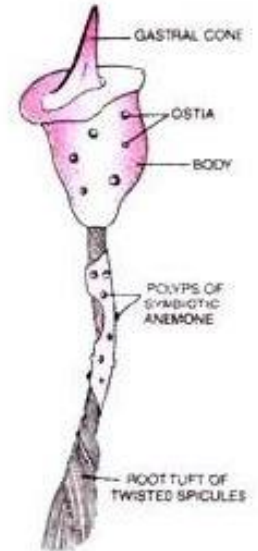
**Porifera**  
(Gr. Porous-  
Pores,  
ferry-  
bearing).



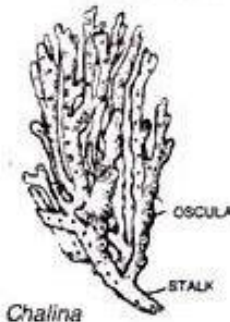
*Leucosolenia.*



*Sycon.*



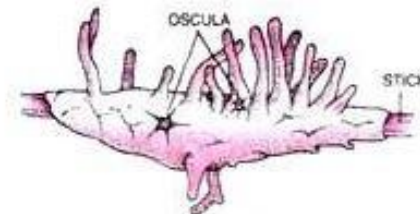
*Hyalonema.*



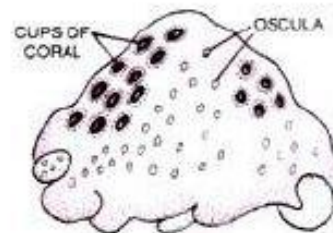
*Chalina*



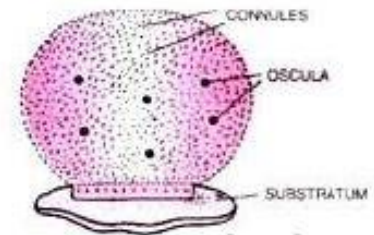
*Euplectella*— Dried skeleton.



*Spongilla.*



*Cliona*



Activate

# Characteristics of PHYLUM Porifera

❑ **Habitat:** Aquatic, mostly marine, few are terrestrial

**Habit:** They are solitary or colonial.

❑ **Grade of organization:** cellular grade of body.

❑ **Shape:** Body shape is variable, mostly cylinder shaped

❑ **Symmetry:** Asymmetrical or radially symmetrical.

- ❑ **Germ layer: Diploblastic animals. The adult body wall contains two layers, outer dermal layer and inner gastral layer. In between these two layers, there is a gelatinous and non-cellular mesogloea.**
- ❑ **In mesogloea, there is supporting endoskeleton called spicules which are made up of  $\text{CaCO}_3$  (Calcareous),  $\text{SiO}_2$  (Siliceous) or protein (Spongin fibres).**



❑ The body surface is perforated with a large number of minute inhalant pores called Ostia (for the entry of water) and one largest exhalent pore called osculum (for the exit of water).

❑ There is water canal system whose central cavity is called paragastral cavity or spongocoel. Canal system gets in food and oxygen and carries out carbon dioxide and wastes.

❑ Endoskeleton: Either calcareous spicules (calcium carbonate) or siliceous spicules (silica) or sponging fibers (protein).

❑ Nutrition is holozoic and digestion is intracellular.

**Circulation absent, respiration, and excretion through diffusion.**

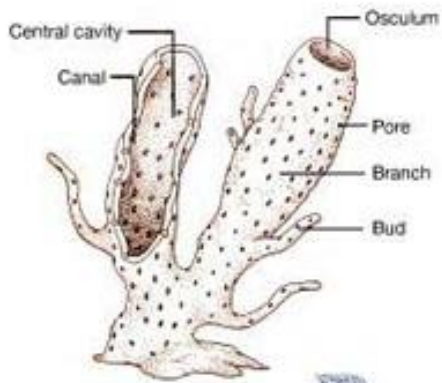
**Nervous system and sense organs completely absent.**

**Reproduction:**

**Asexual: by budding or gemmule or regeneration**

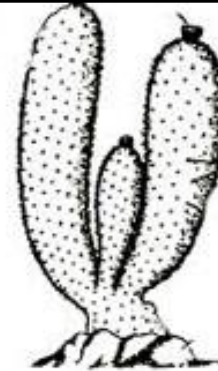
**Sexual: gamatic fusion**

**Fertilization: is internal and develop is indirect.**

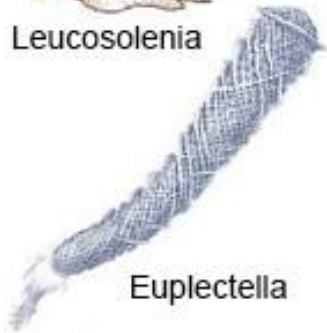


Leucosolenia

Class - Calcarea



Sycon



Euplectella

Class - Hexactinellida

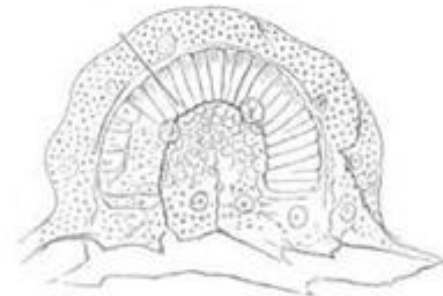


Hyalonema

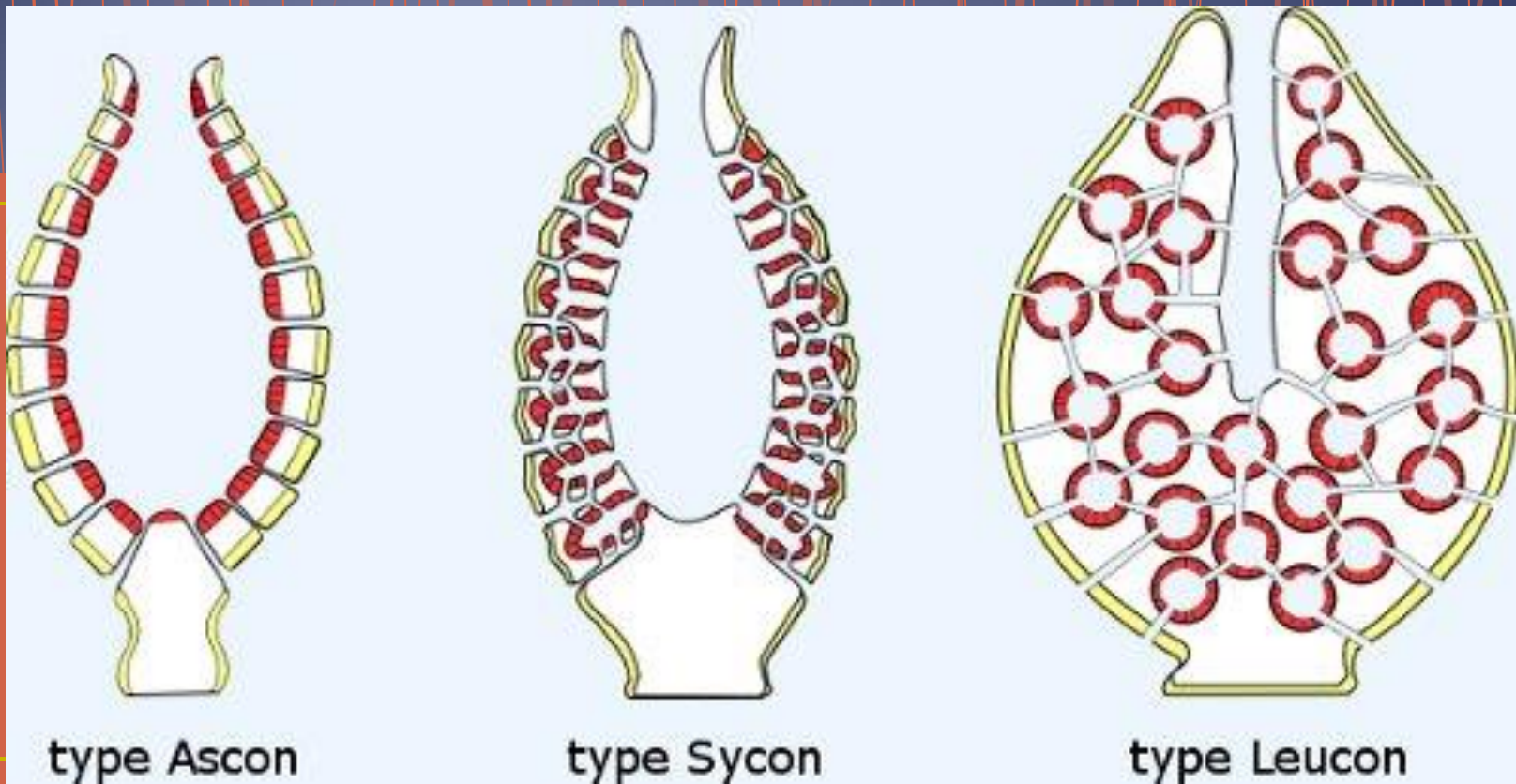


Spongilla

Class - Demospongia



Euspongia



**Figure 29: Sponge organizational grades (choanocytes in red).**

# Leucosolenia

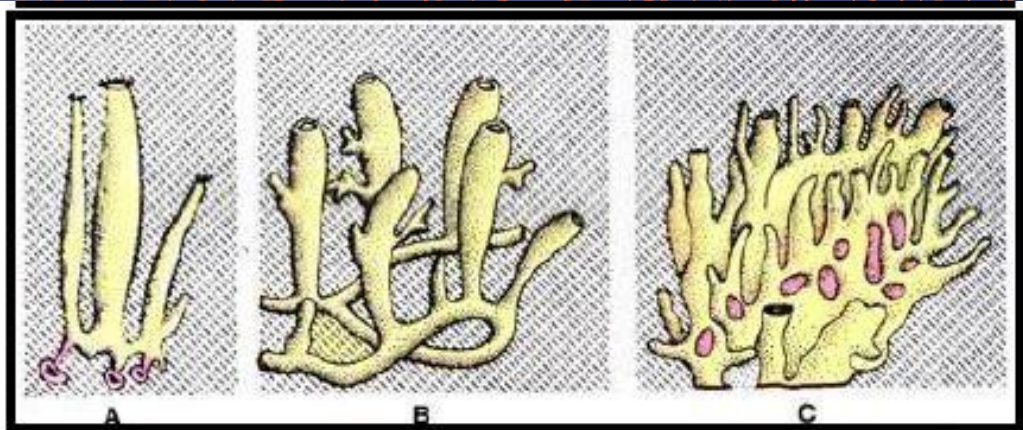


Figure 30: types of *Leucosolenia*, A: Simple, B: Branching, C: Reticulate.

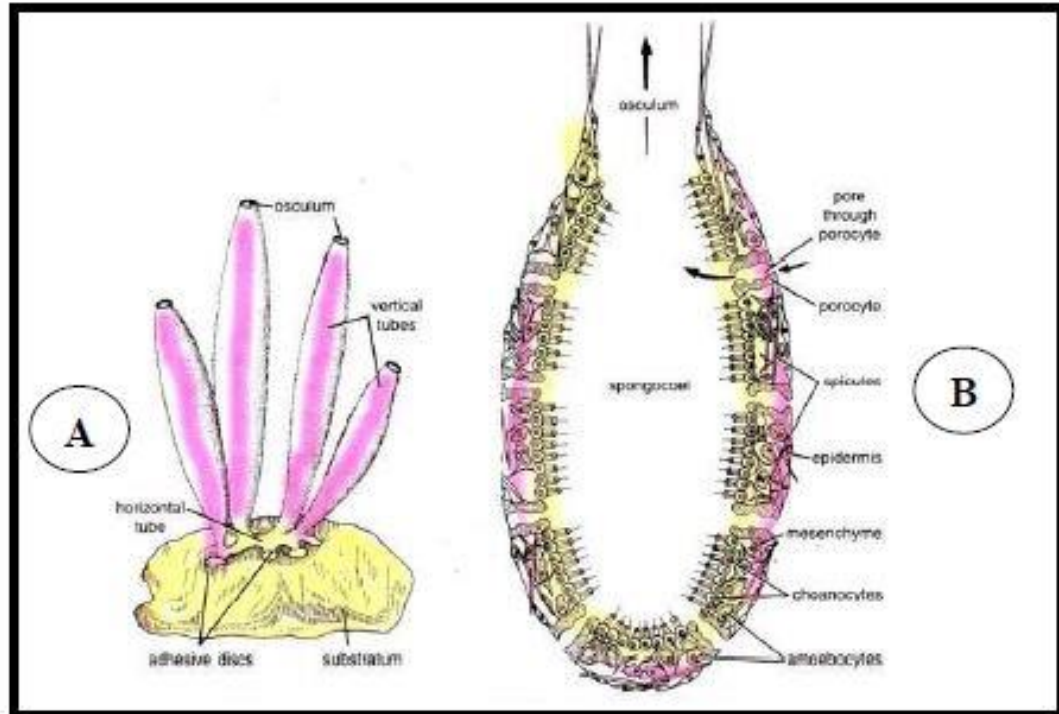
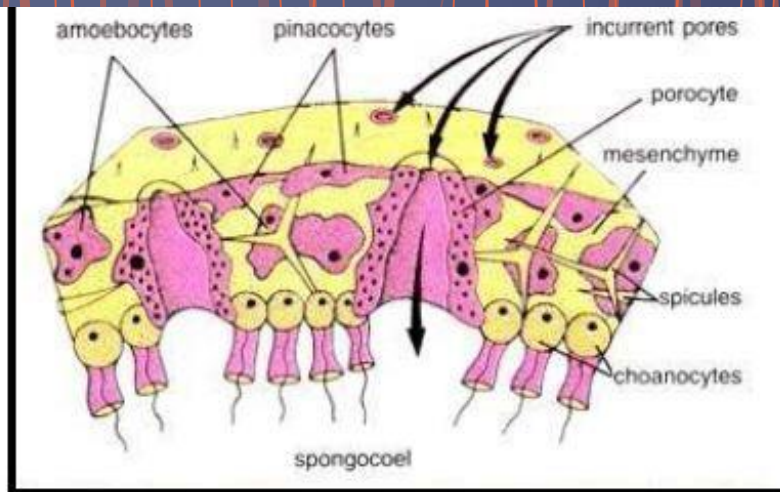
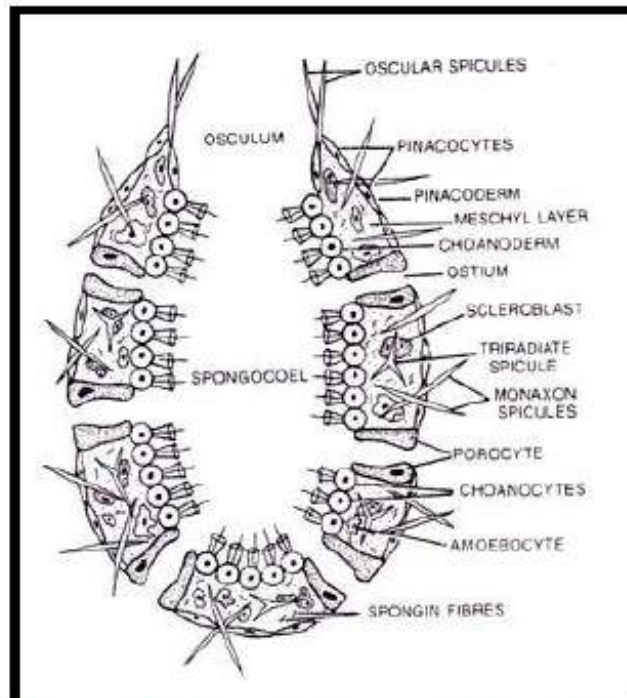


Figure 31: A: *Leucosolenia* colony, B: Longitudinal section of *Leucosolenia*.

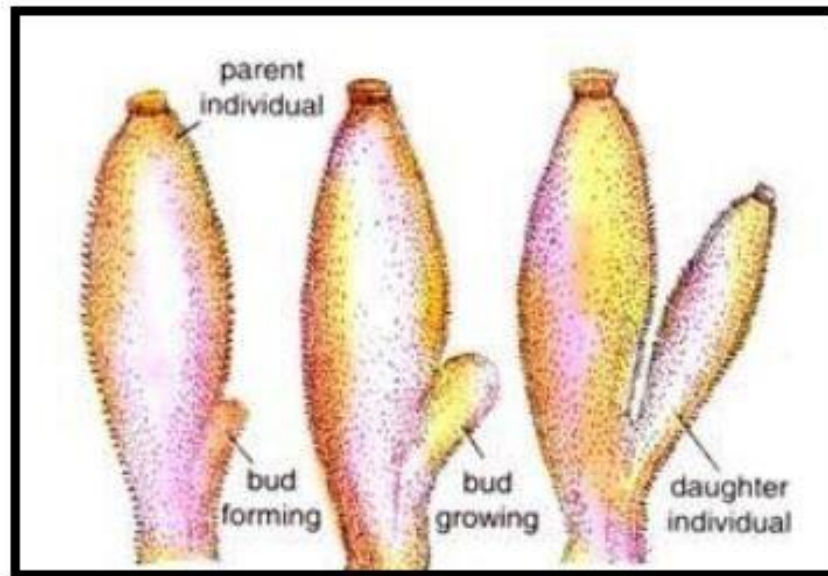


**Figure 32: Diagrammatic cross section of apportion of body wall of *Leucosolenia* to show the cellular structure.**

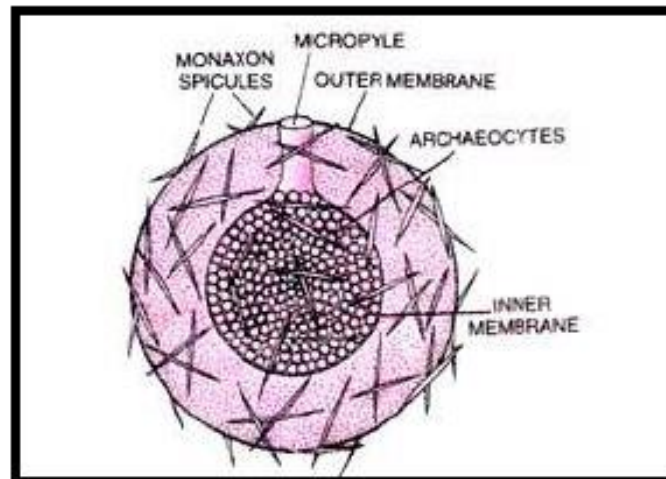


**Figure 33: Longitudinal section of *Leucosolenia*.**

Activat  
Go to PC



**Figure 34: Diagram showing budding stages of *Leucosolenia*.**



**Figure 35: Gemmule of Spongy.**

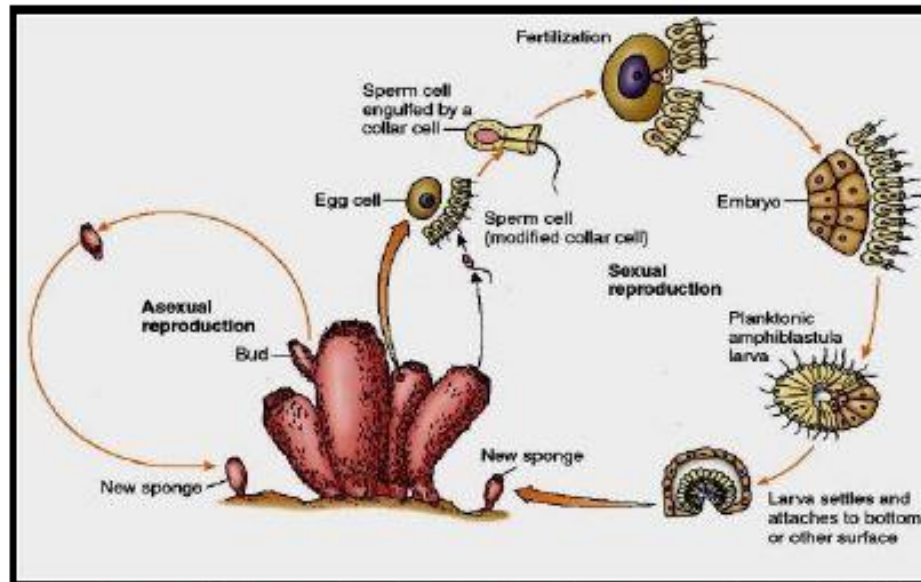


Figure 36: Diagram showing asexual and sexual reproduction of *Leucosolenia*.

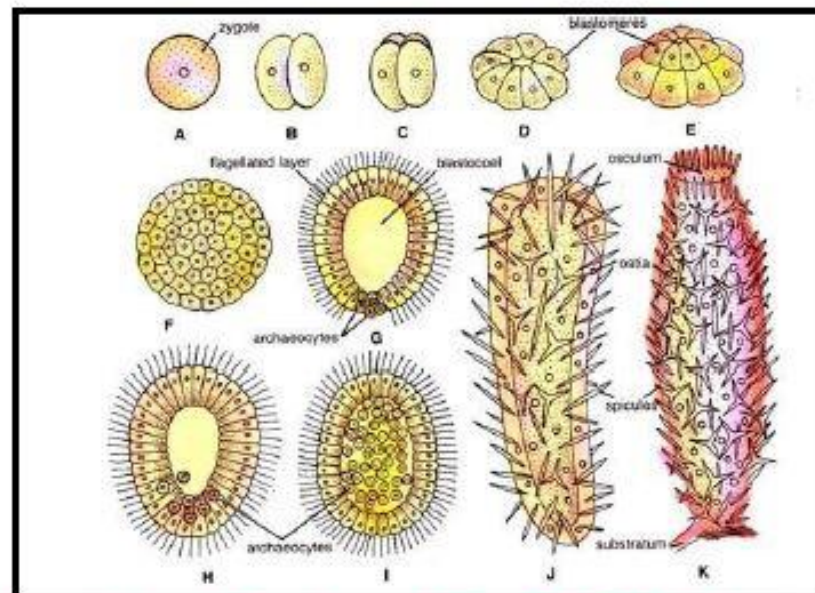


Figure 37: *Leucosolenia*, stages in development. A, Zygote; B to E, Cleaving Stages; F, Early blastula; G and H, Coeloblastula; I, Parenchymula; J, Young spongy; K, Adult spongy.





Sponges as swabs.



Sponges as commensals (protective houses)



Sponge fishing in Florida.



Sponge culture (*Teichhexinella* sp).



Sponge fishing in Kalymnos.



*Proterospongia*.



*Euplectella* brooch.



Nudibranch feeding on sponge.

Sponges are economically important.

**THANKS**

THANKS