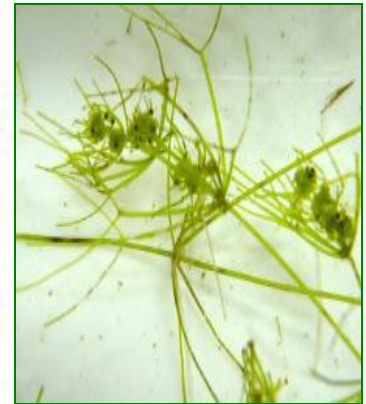
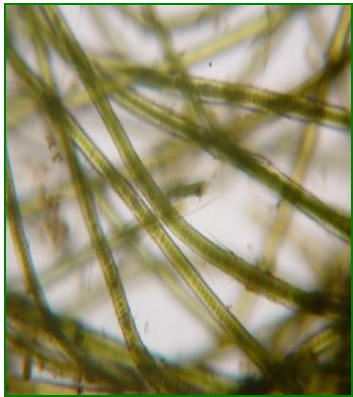
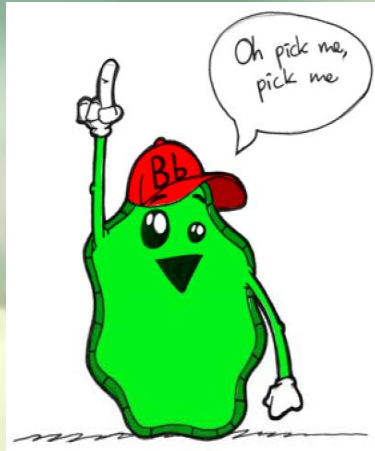
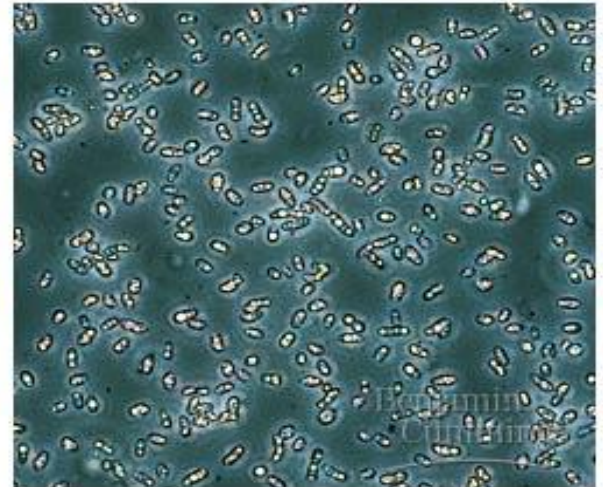


# Algae & Lichens



**102 BOT - Lab 4**

# 1 - Types of Algae



# Algae - What are they?

- ⊕ belong to the Kingdom Protista
- ⊕ eukaryotes (cells have organelles)
- ⊕ No true roots, only attachment structures (Holdfasts)
- ⊕ Produce spores (not seeds)– motile or non-motile
- ⊕ Most have sexual and asexual reproduction
- ⊕ **Non-vascular**, do not possess an internal transport system.





# Characteristics

- ✱ **Range in size from microscopic to single celled organisms to large seaweed**
- ✱ **Autotrophic**
- ✱ **Form the reproductive structures – gametangia or gamete chambers**
- ✱ **Aquatic and have flagella at some point in life**
- ✱ **Often contain *pyrenoids*, organelles that synthesis and store starch**



# Where do Algae live?

## Marine habitats:

- seaweeds, phytoplankton



## Freshwater habitats:

- streams, rivers, lakes and ponds



## Terrestrial habitats:

- stone walls, tree bark, leaves, in lichens, on snow



# STRUCTURE

❖ **Thallus (haploid)**

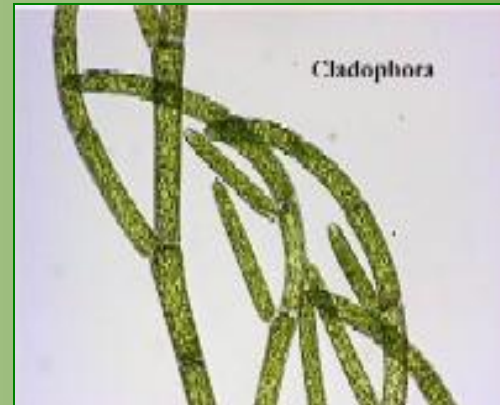
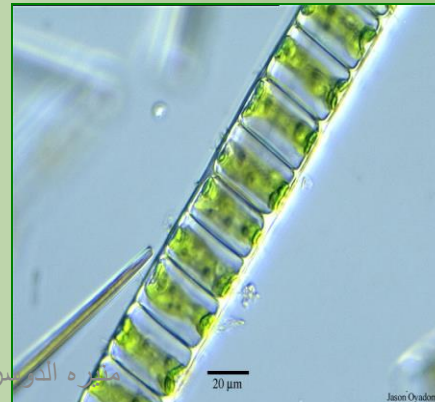
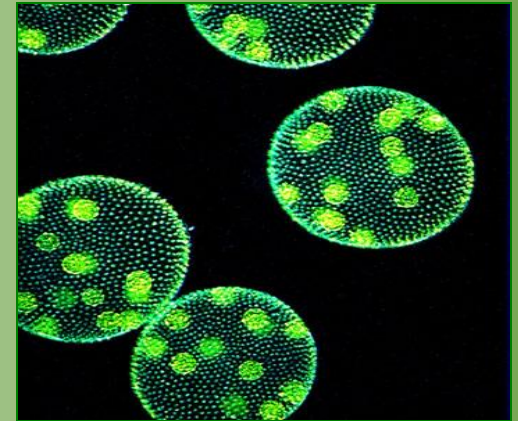
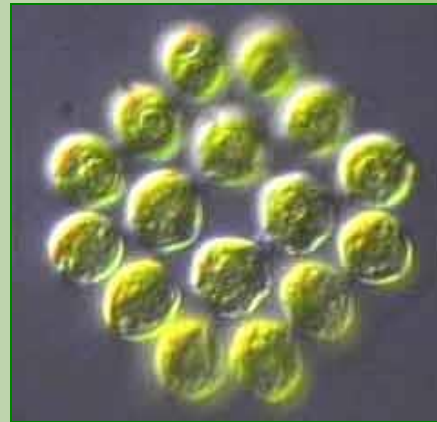
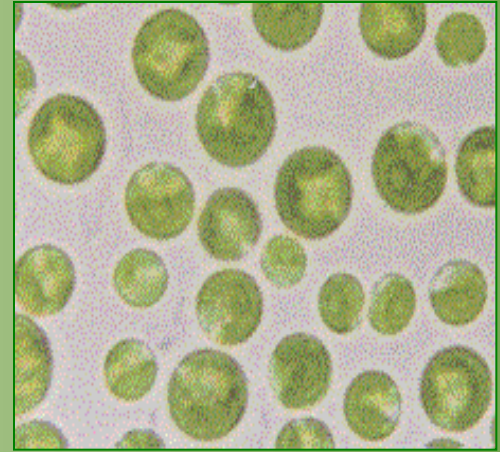
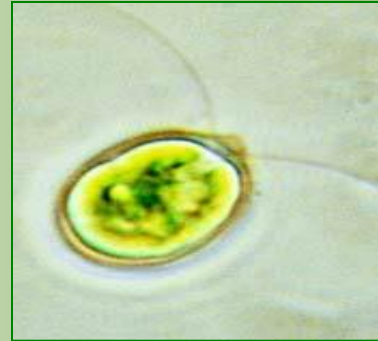
❖ **Four types of algae**

✧ **Unicellular**

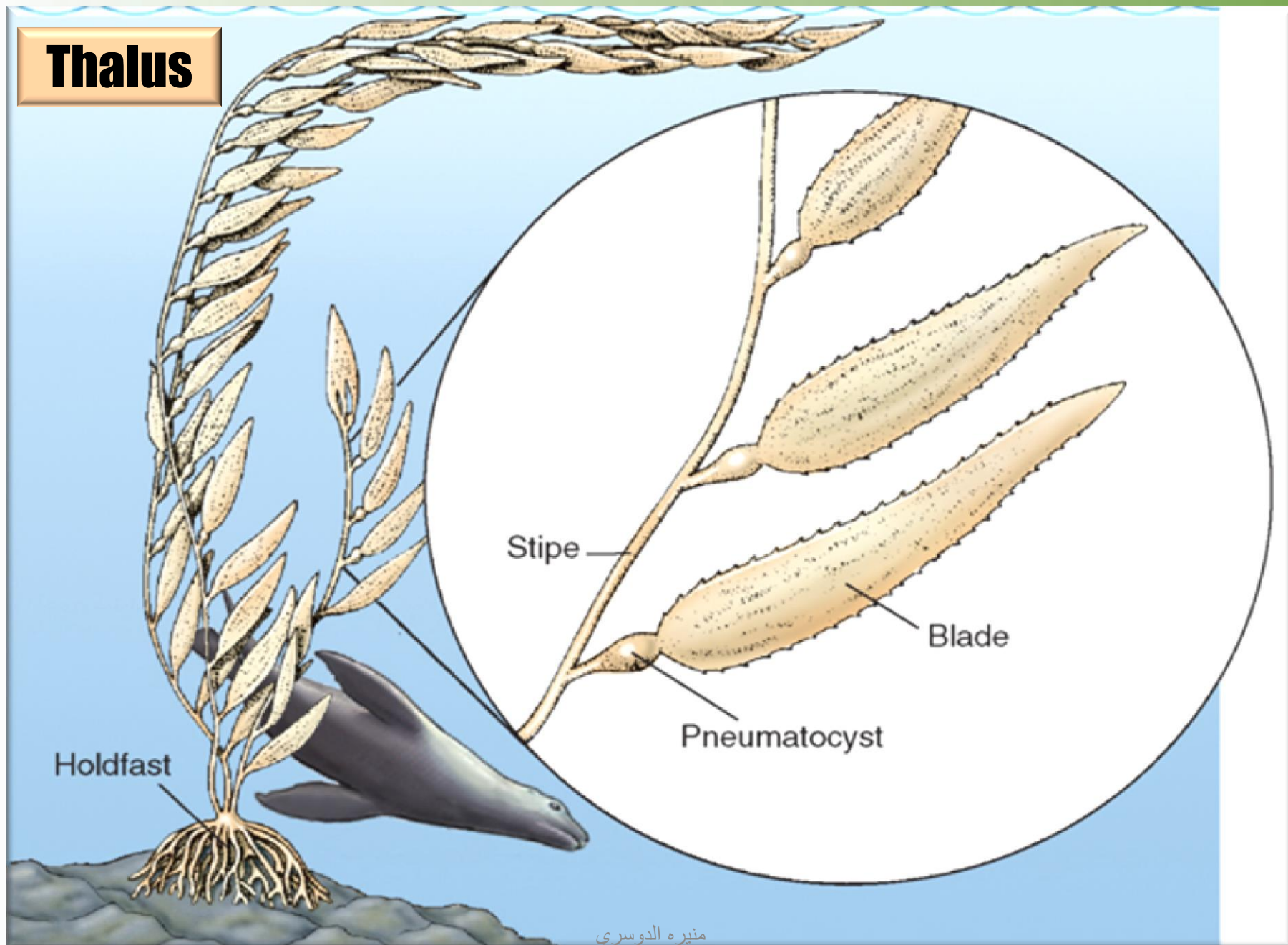
✧ **Colonial**

✧ **Filamentous**

✧ **Multicellular**



# Thalass



# CLASSIFICATION OF ALGAE

- ☀ **SEVEN PHYLUM BASED ON**
  - ⦿ **COLOR**
  - ⦿ **TYPE OF CHLOROPHYLL**
  - ⦿ **FOOD-STORAGE SUBSTANCE**
  - ⦿ **CELL WALL COMPOSITION**



# Classification - a few Algal Phyla



red  
alga



brown  
alga



green  
alga

# Cyanophyta (Cyanobacteria)

contain blue pigment called phycocyanin in addition to chlorophyll



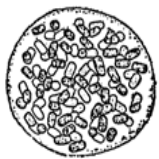
MICROCYSTIS



APHANIZOMENON



NOSTOC



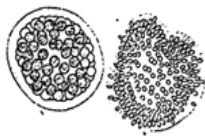
ANACYSTIS



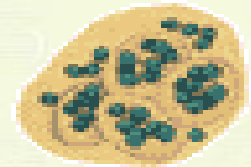
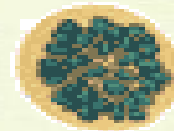
ANABAENA



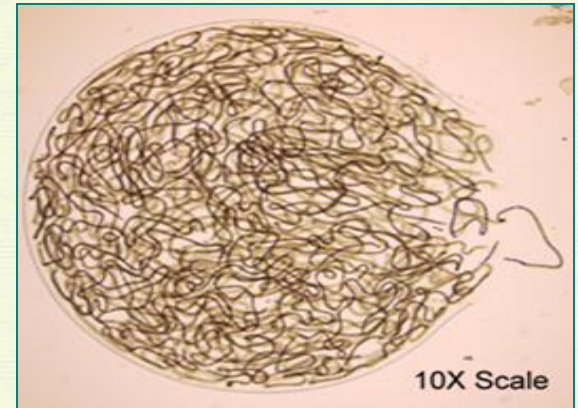
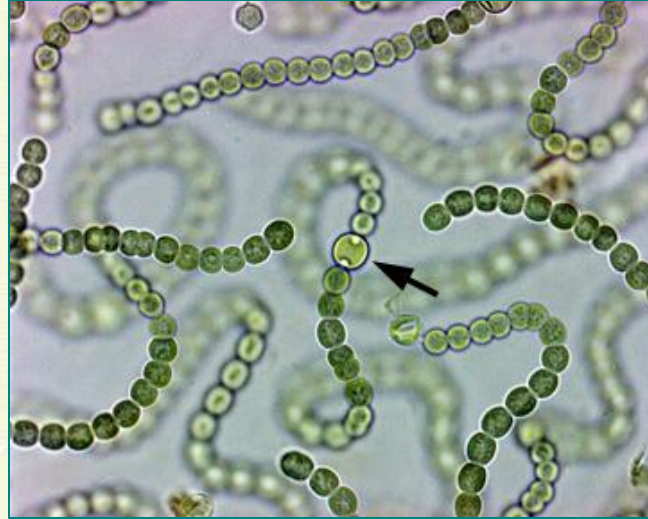
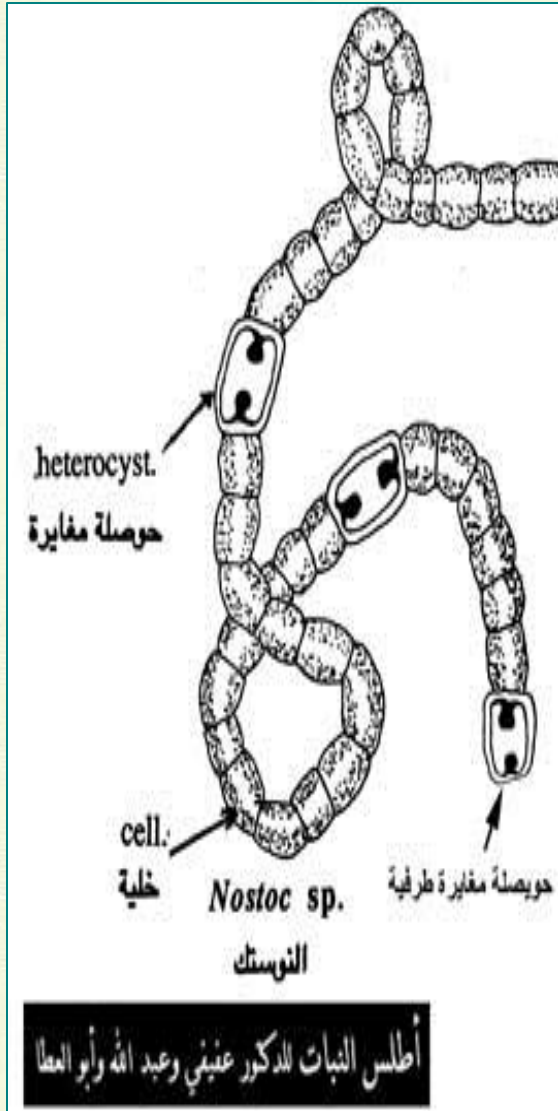
OSCILLATORIA



COELOSphaERIUM



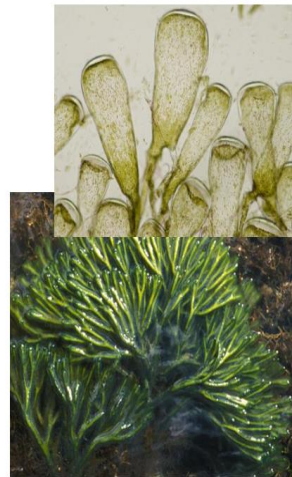
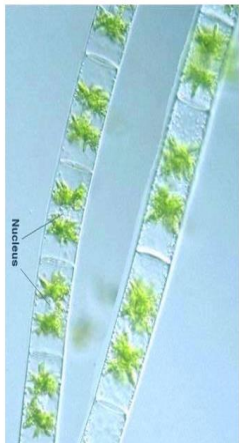
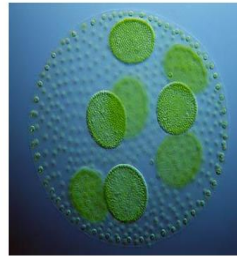
# Nostoc



# Chlorophyta - Green Algae

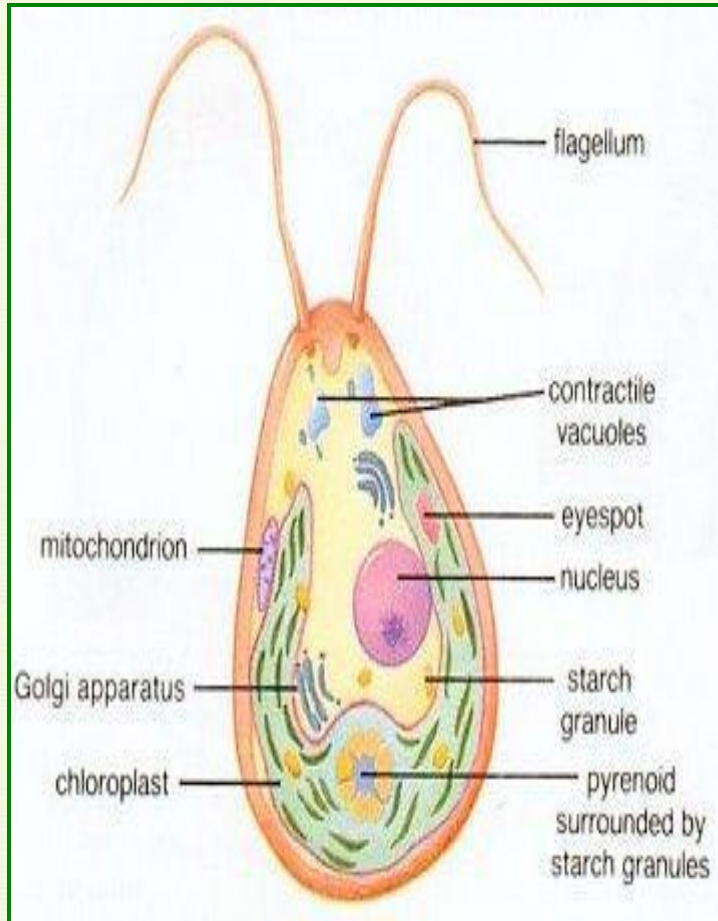
green algae have chlorophyll A and B as well as carotenoids

## Green Algae (Chlorophytes)

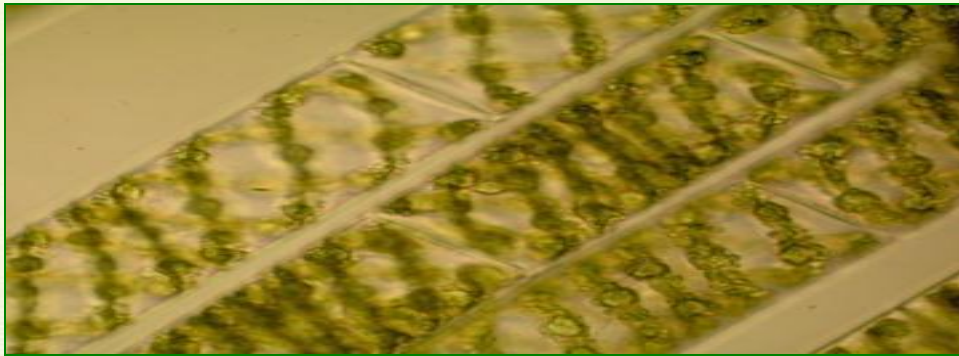
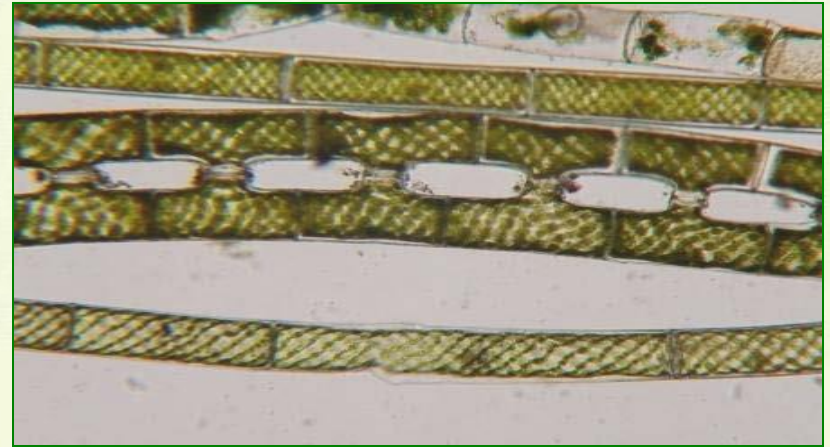
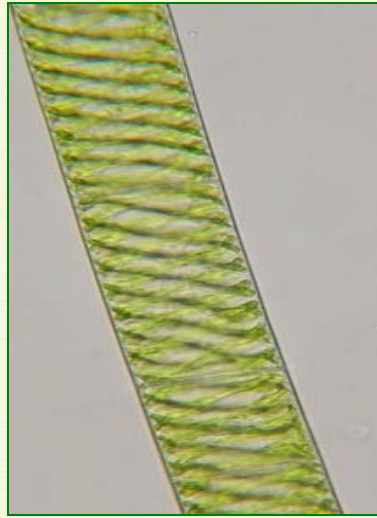
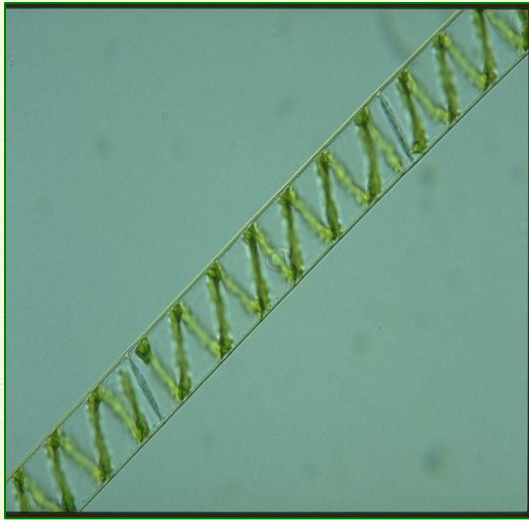


منيره الدوسري

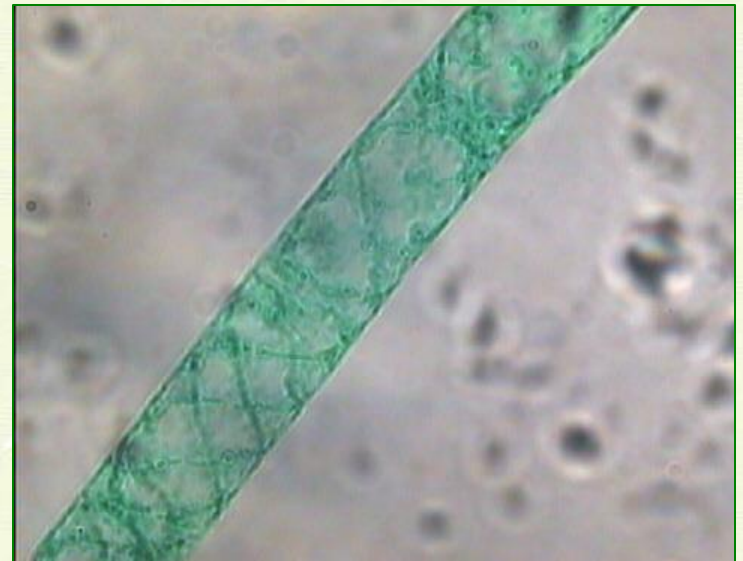
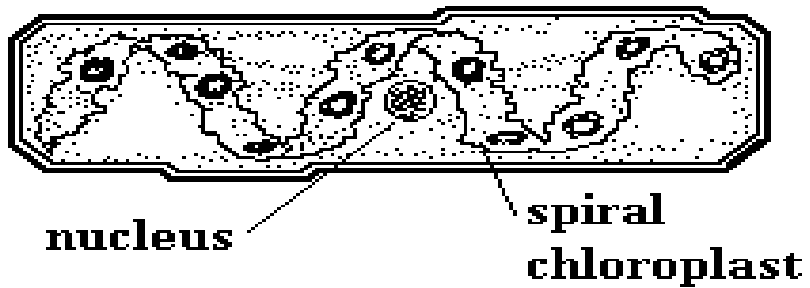
# *Chlamydomonas*



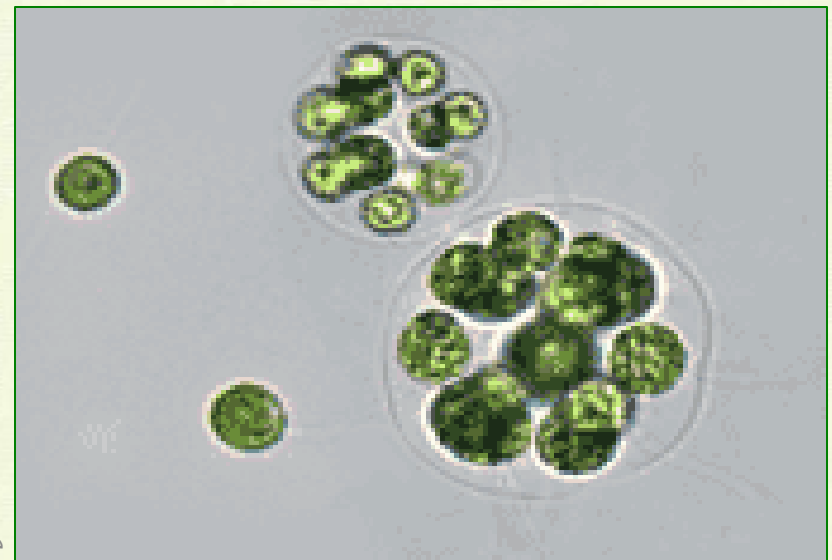
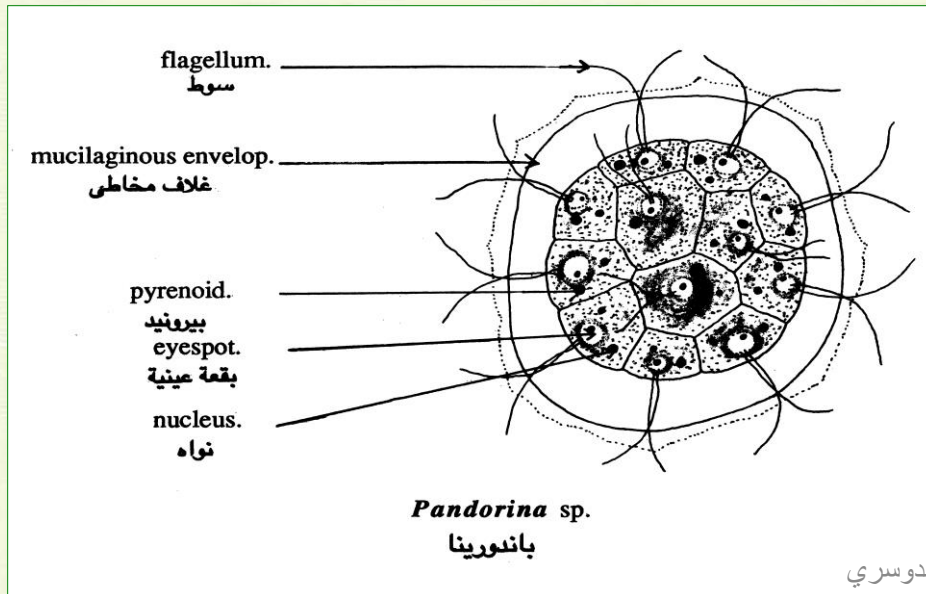
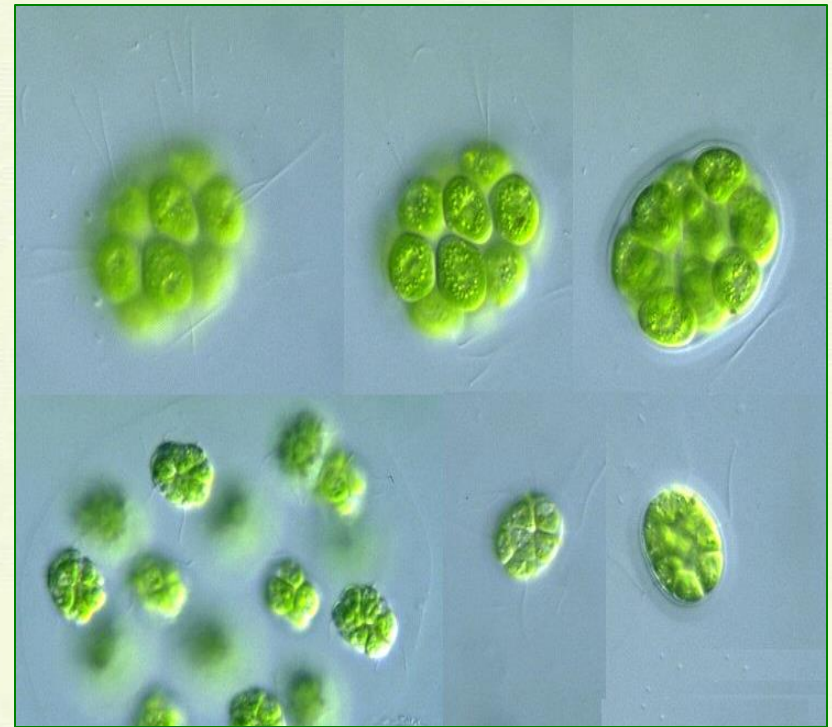
# *Spirogyra*



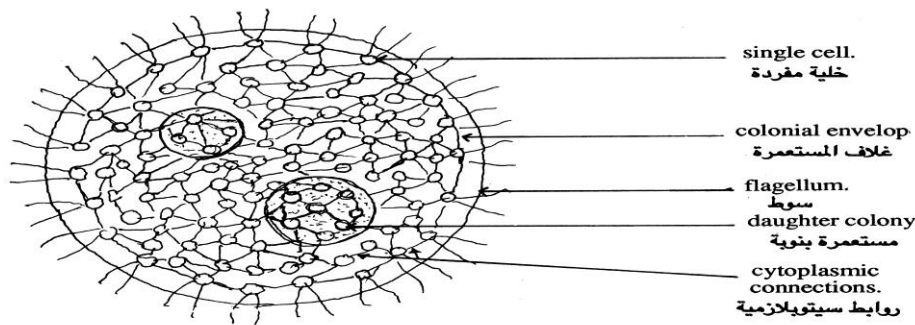
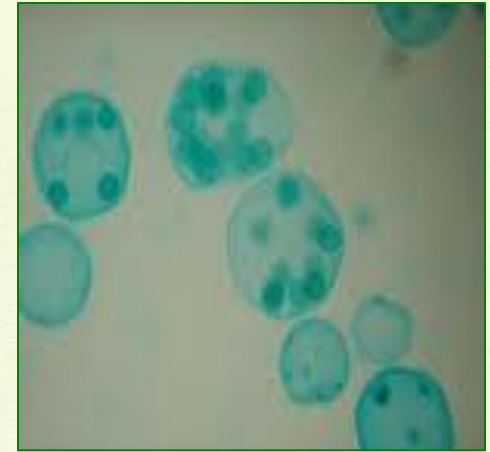
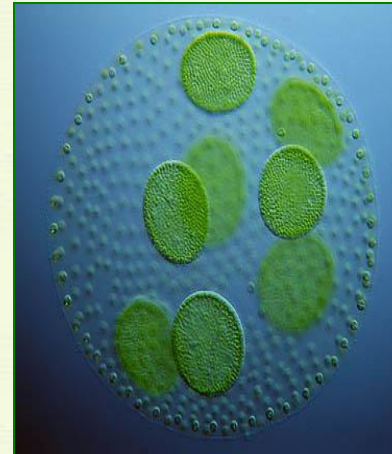
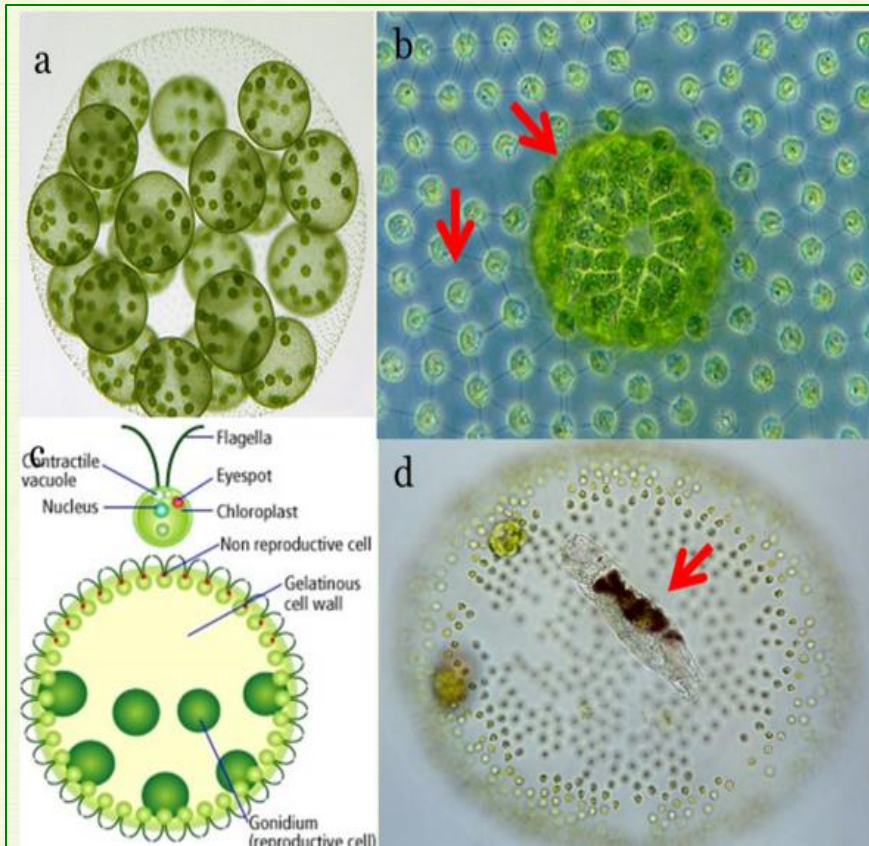
Cell of *Spirogyra*



# *Pandorina*



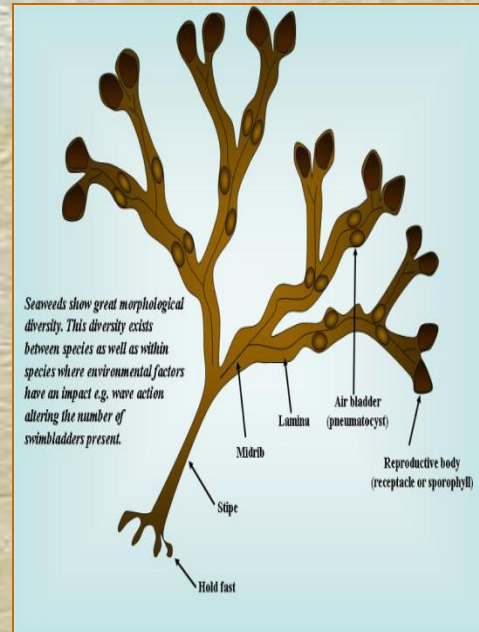
# *Volvox*



*Volvox* sp. parent colony with daughter colonies.  
مستعمرة أبوية بها مستعمرات ابوية

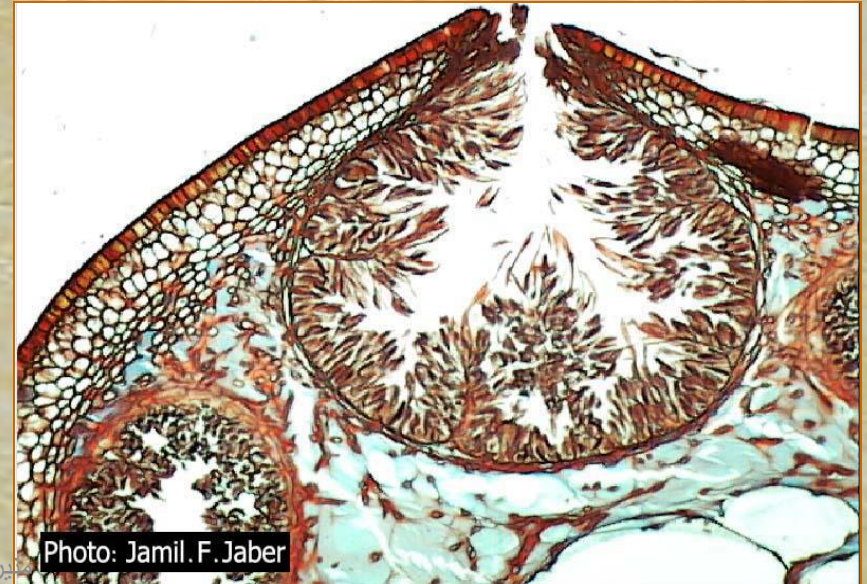
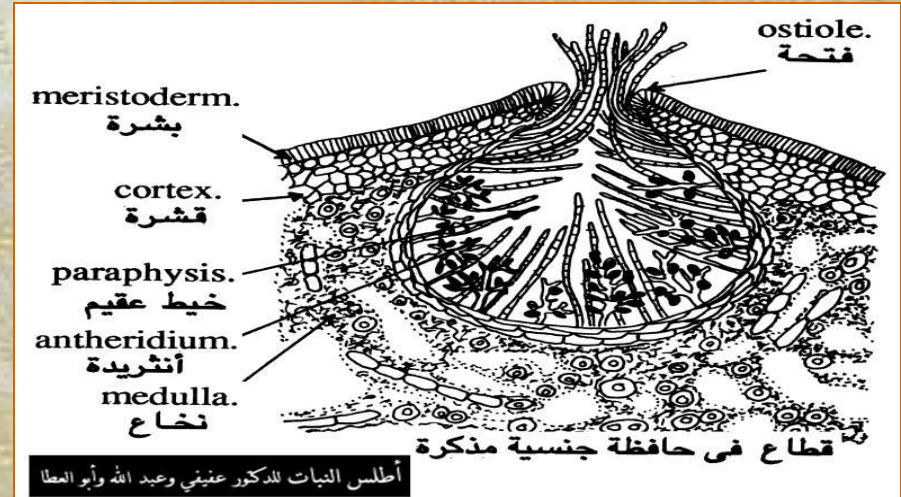
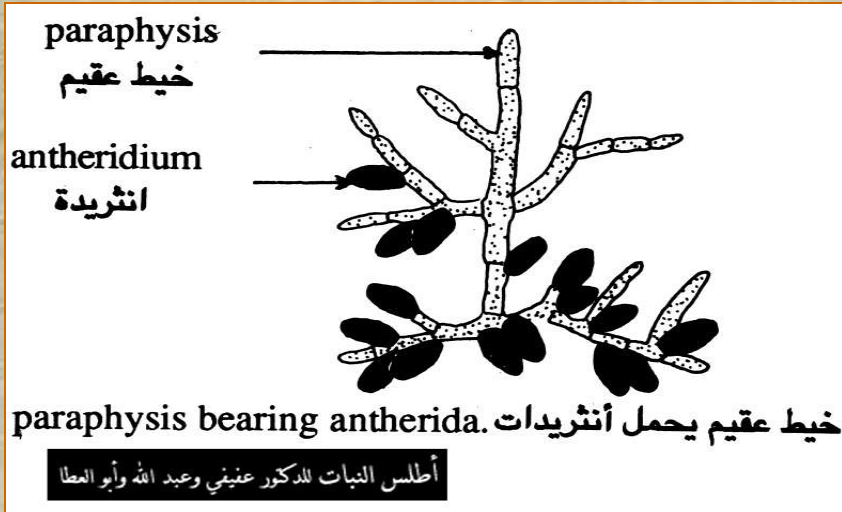
# Phaeophyta - Brown Algae

Brown color comes from pigments (fucoxanthin)

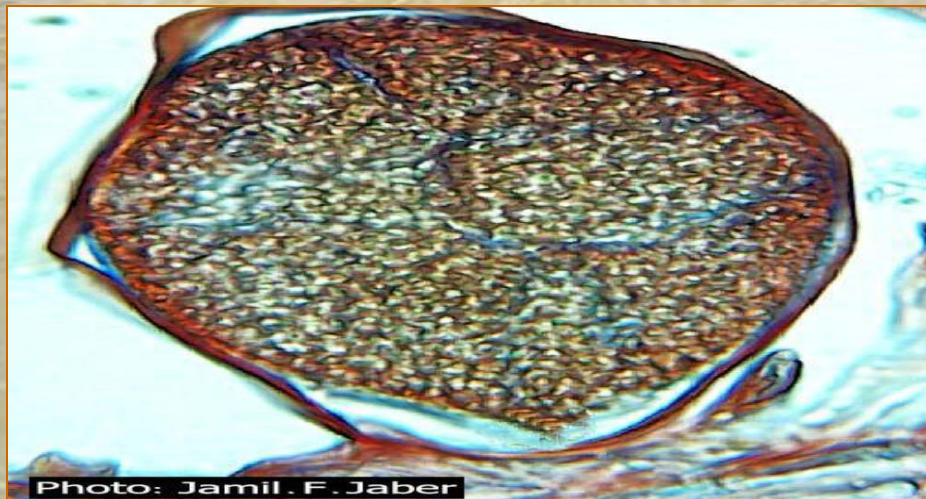
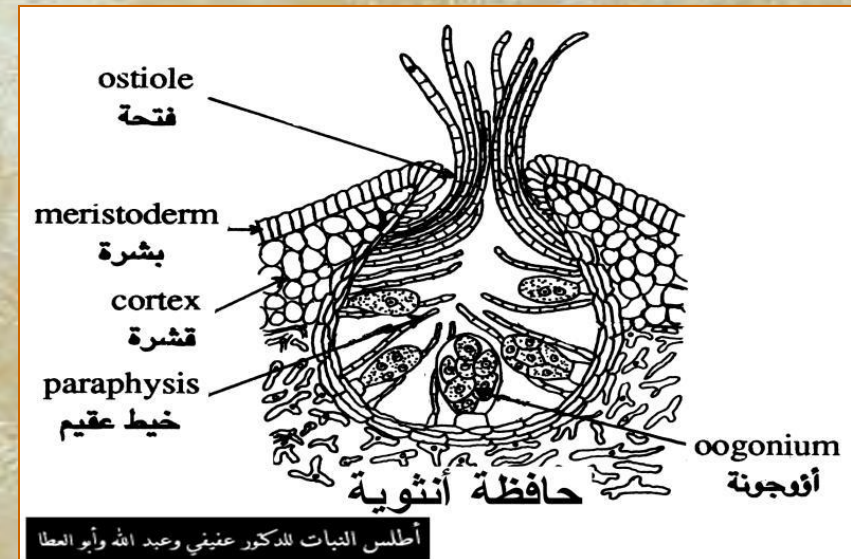
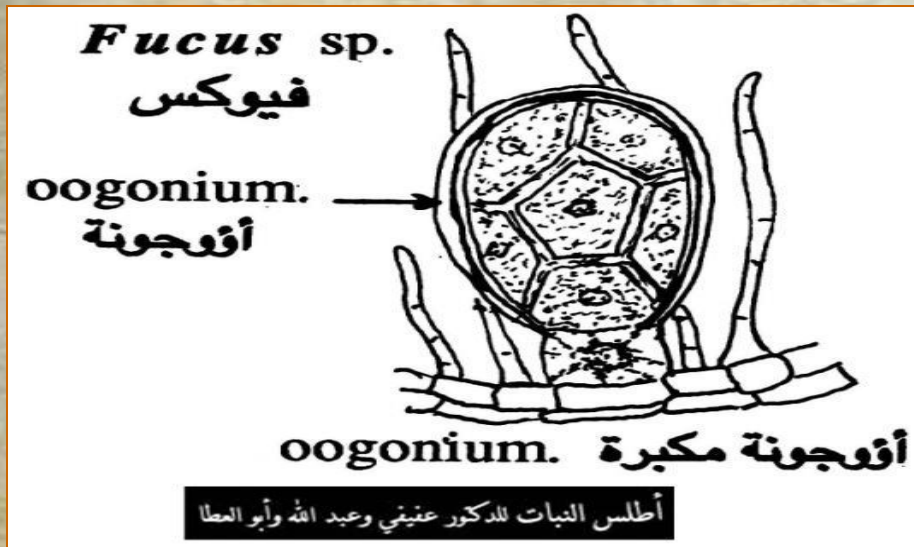


# Fucus

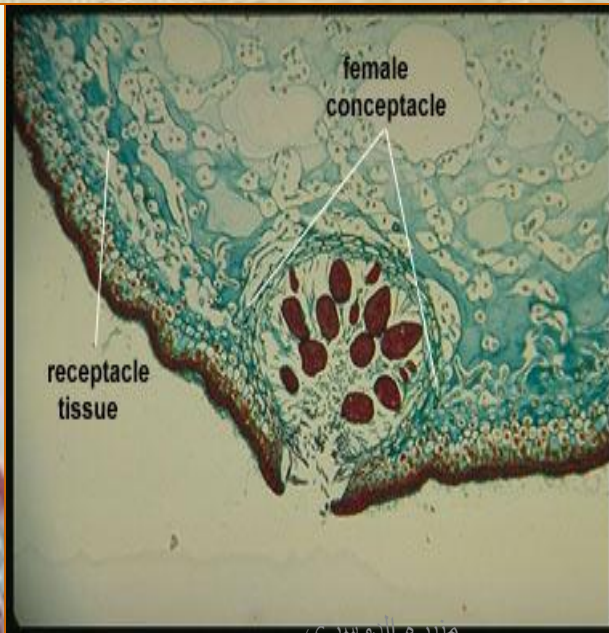
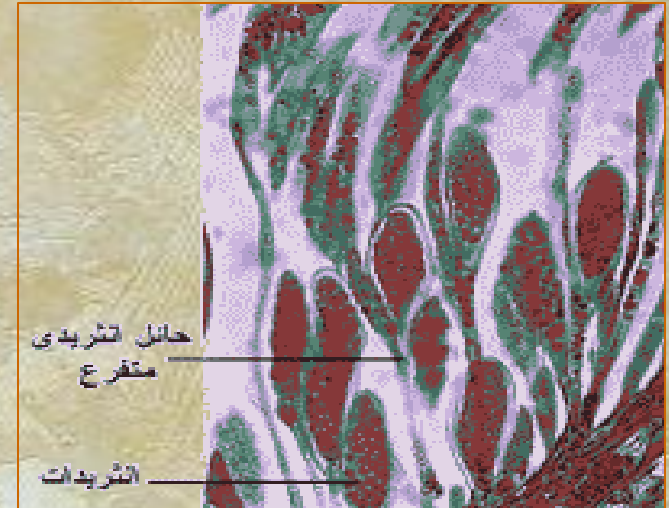
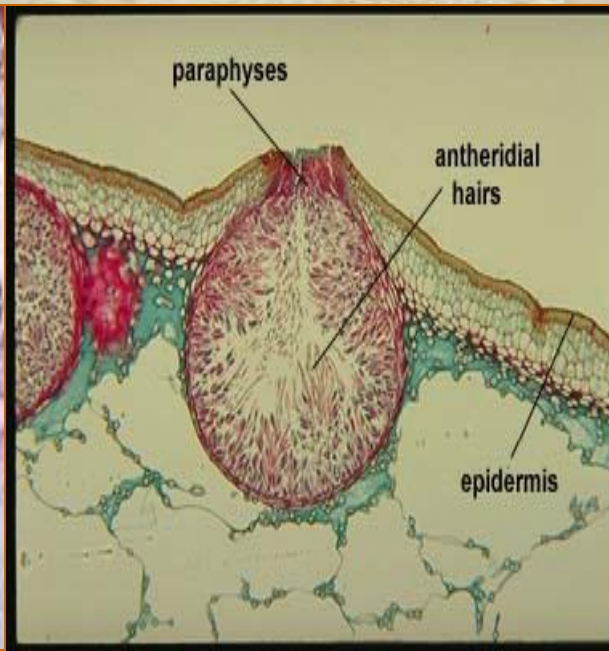
## حافطة جنسية مذكرة



# حافضة جنسية مؤنثة



## طحلب الفيوكس مذكر

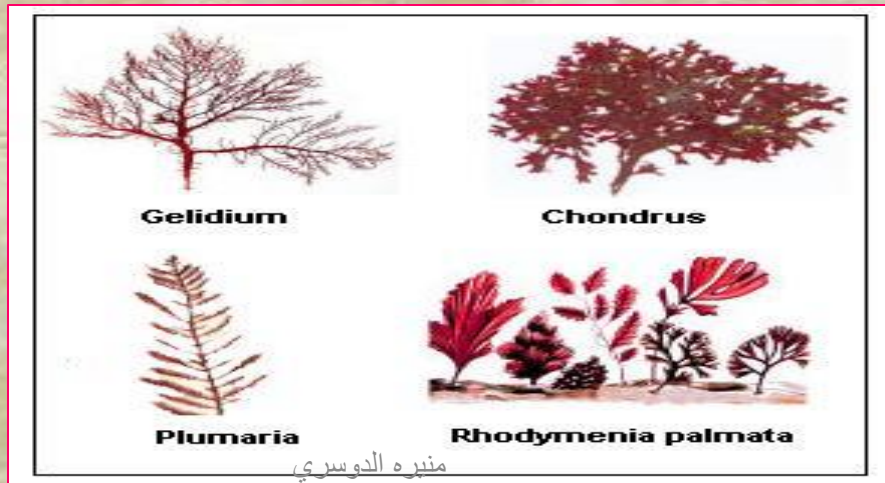
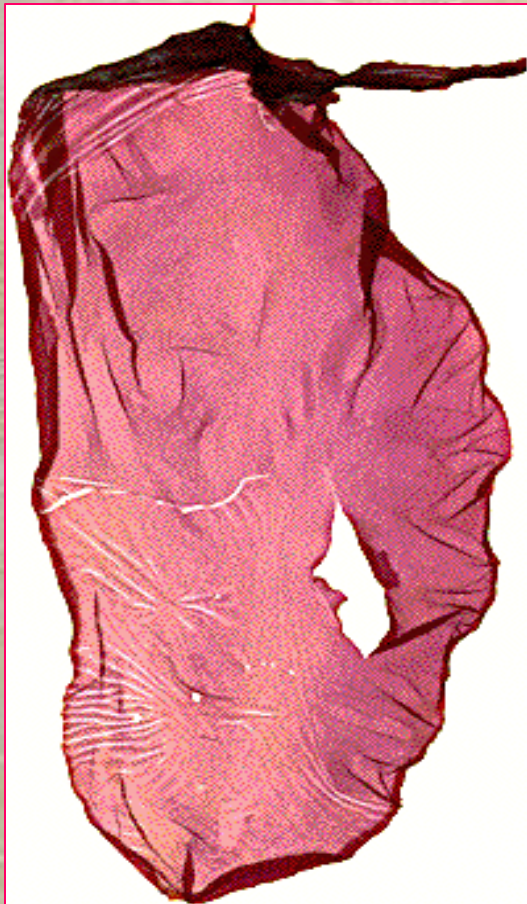


## طحلب الفيوكس مؤنث



# Rhodophyta - Red algae

Red algae Contain pigments known as phycobilins



# ***Polysiphonia***



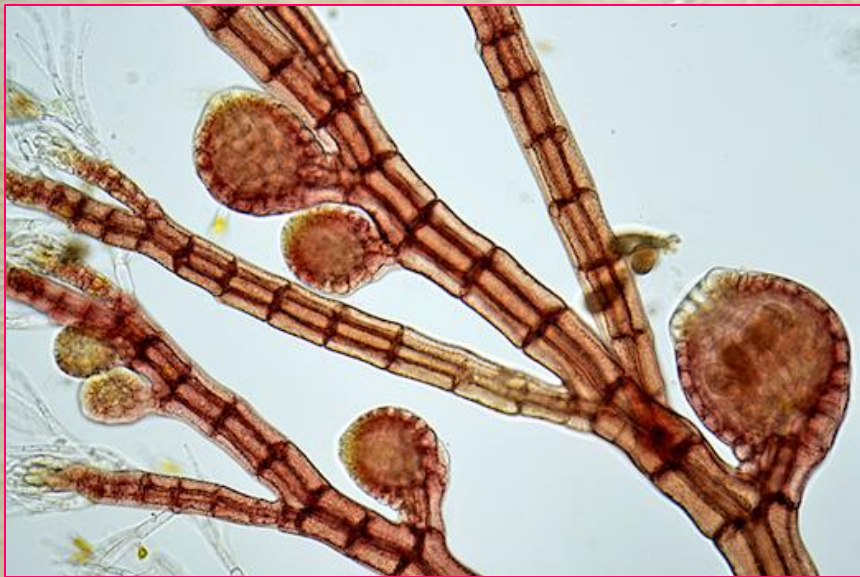
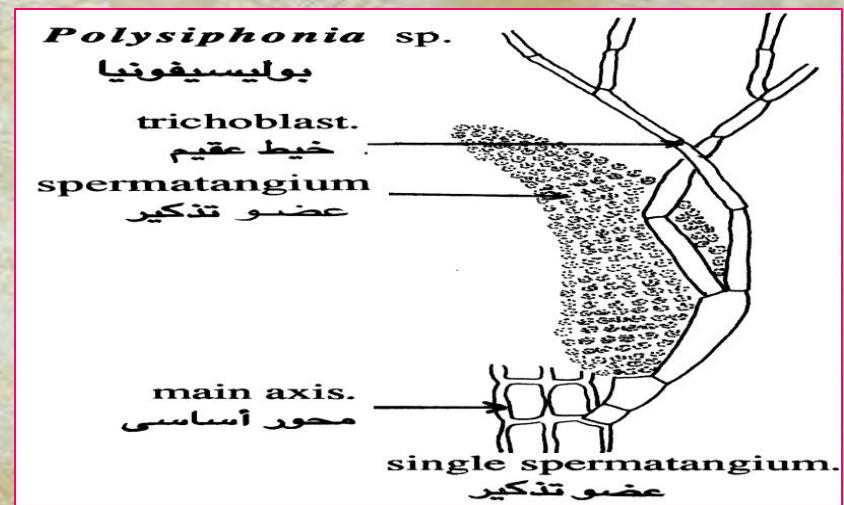
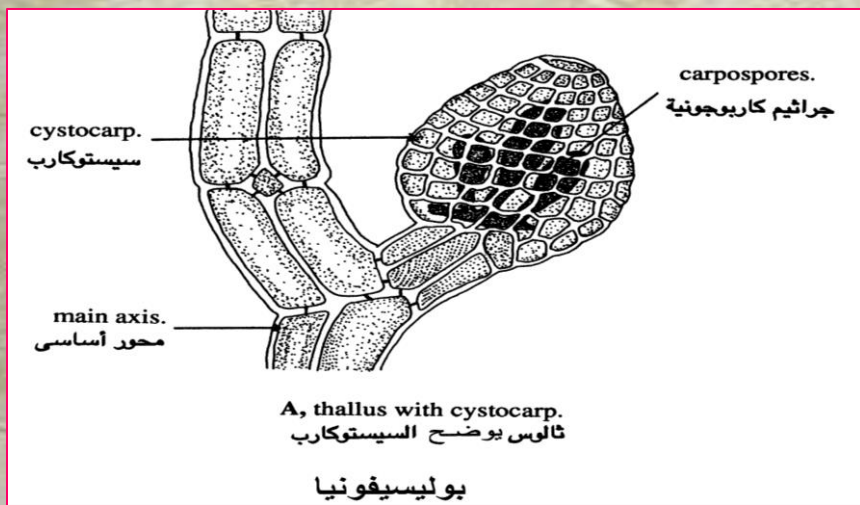
شكل الثالوس



**Spermatangium**



**Carpogonium**

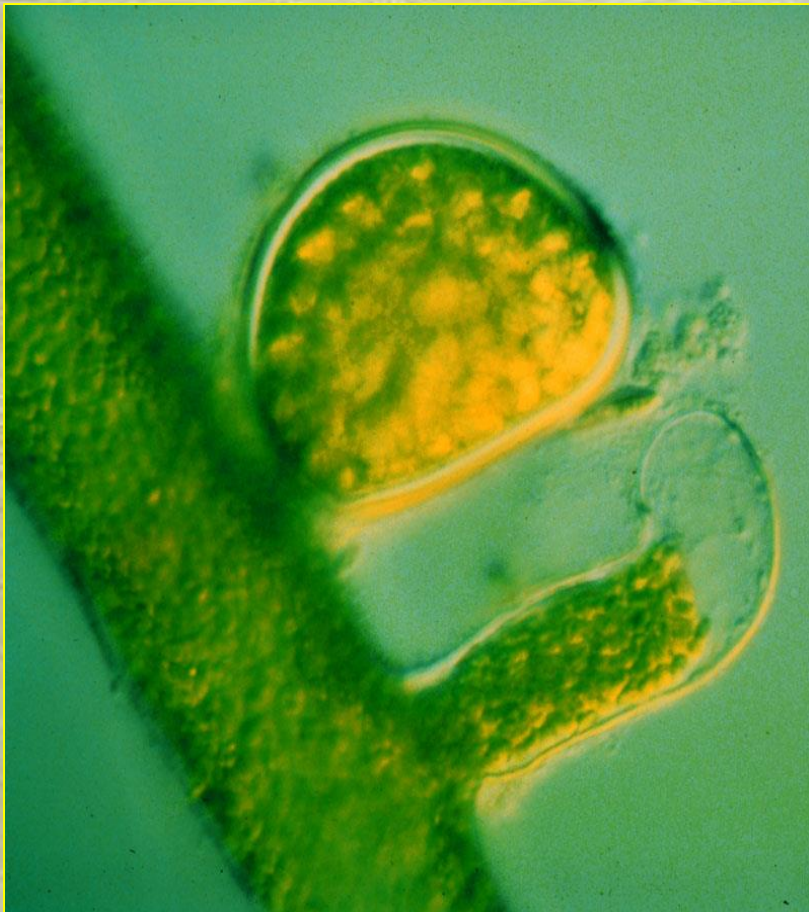


الثالوس المشيجي المؤنث  
female gametophyte

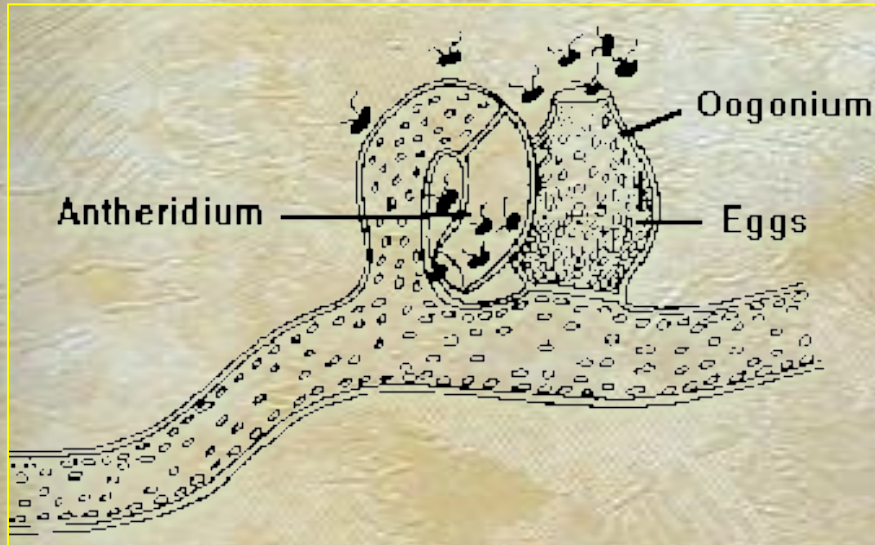
الثالوس المشيجي المذكر  
male gametophyte

# Chrysophyta (Xanthophyceae)

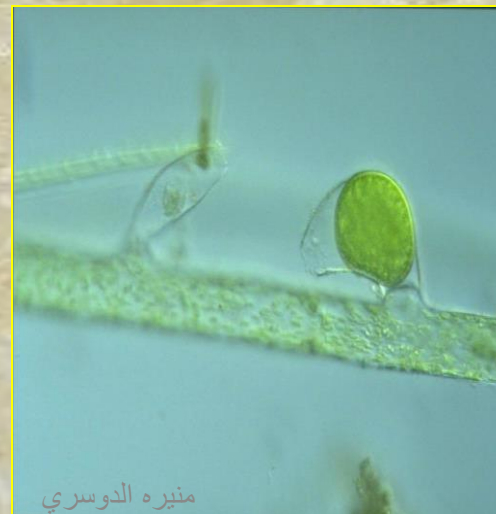
Contain pigments carotenoid and xanthophyll



# *Vaucheria*



**Oogamous**



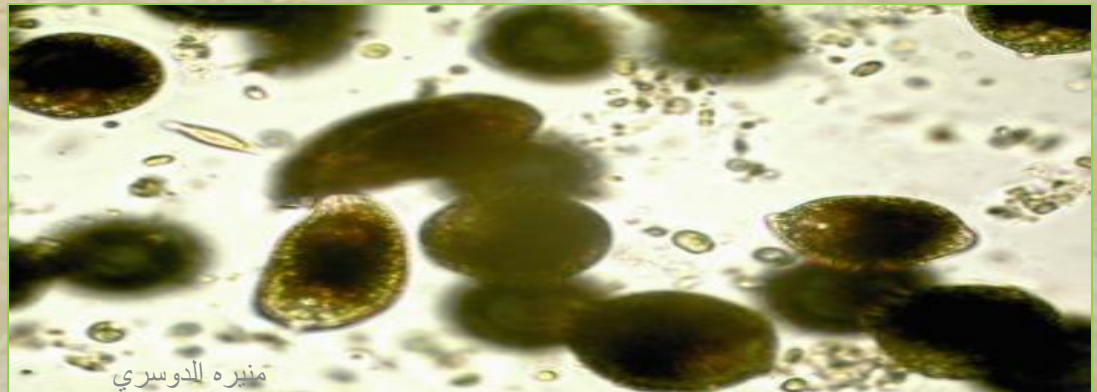
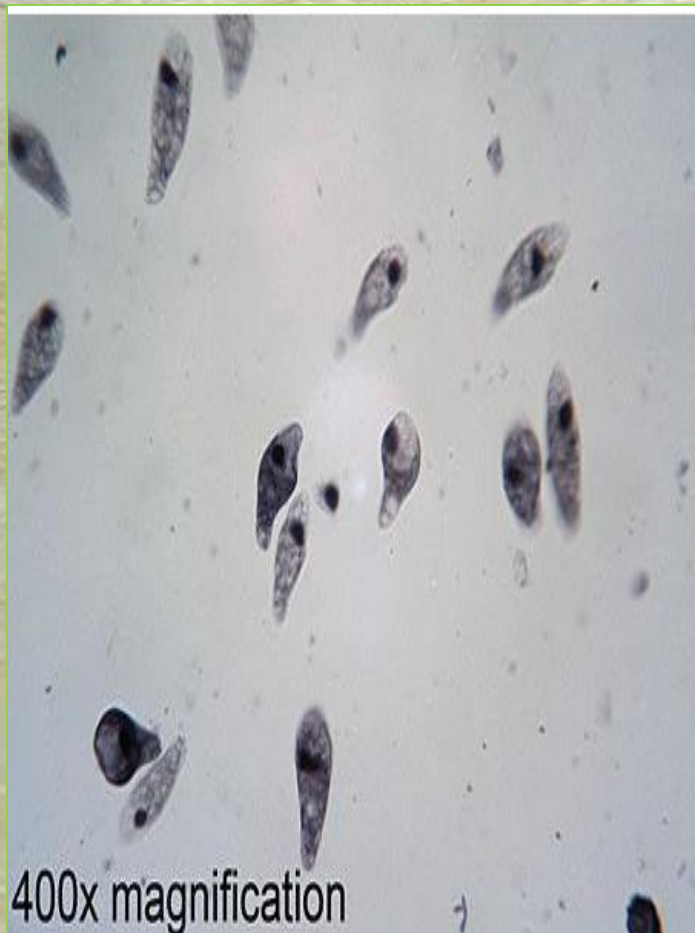
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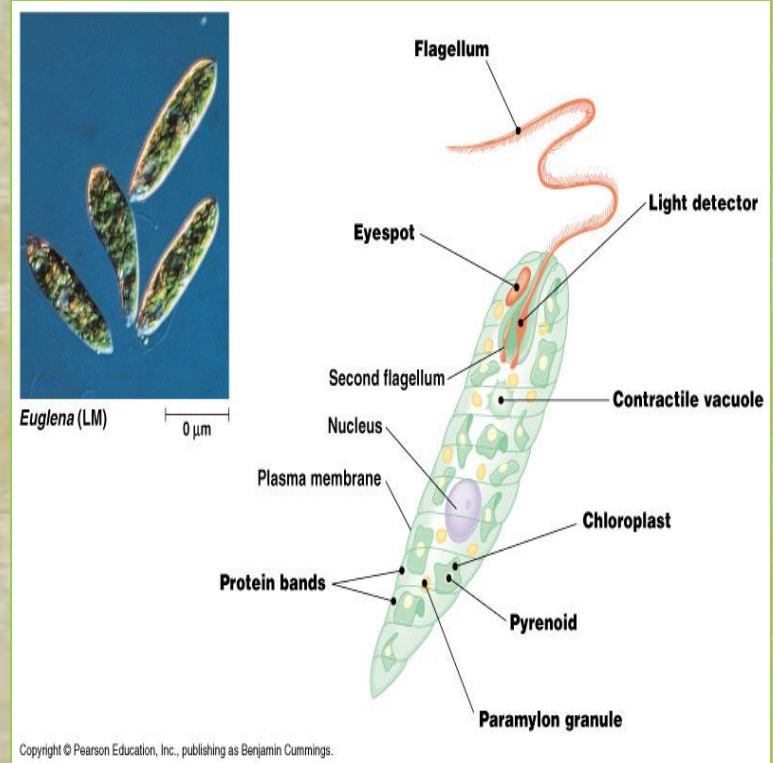
أنثريدة

# Euglenophyta

Flagellated , have eye spot and animal-like characteristics



# *Euglena*

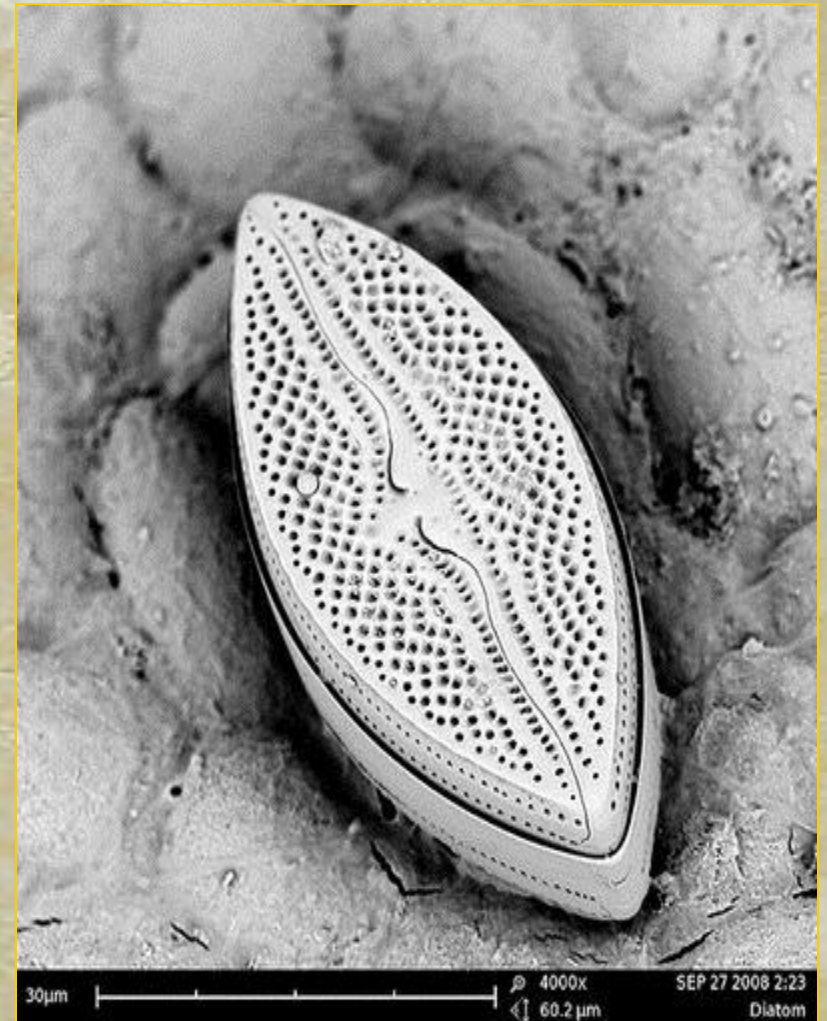
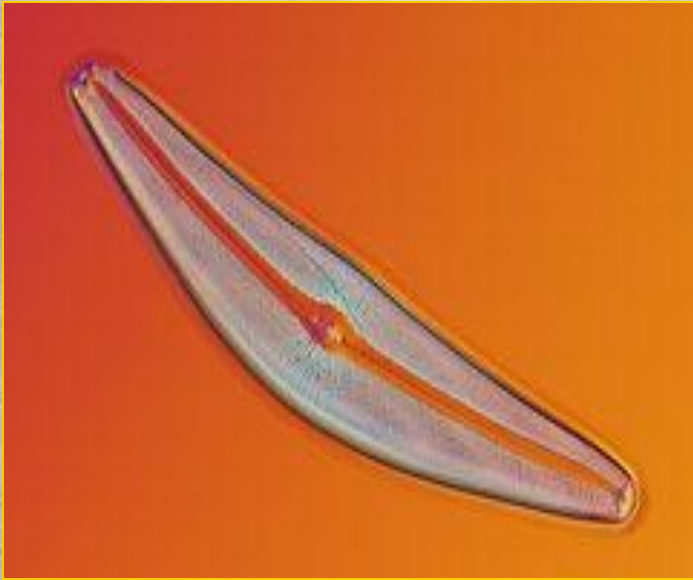


# Baciillariophytae (Diatoms)

mostly unicellular, have silica in their cell walls

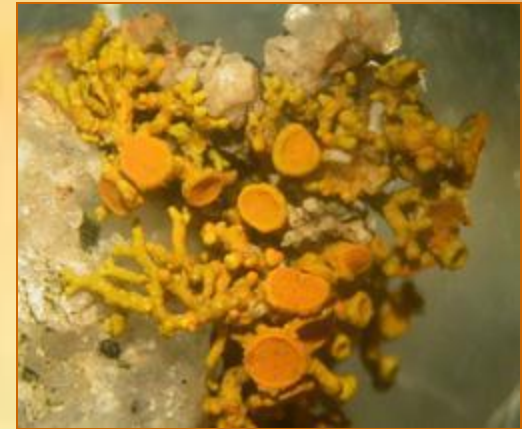
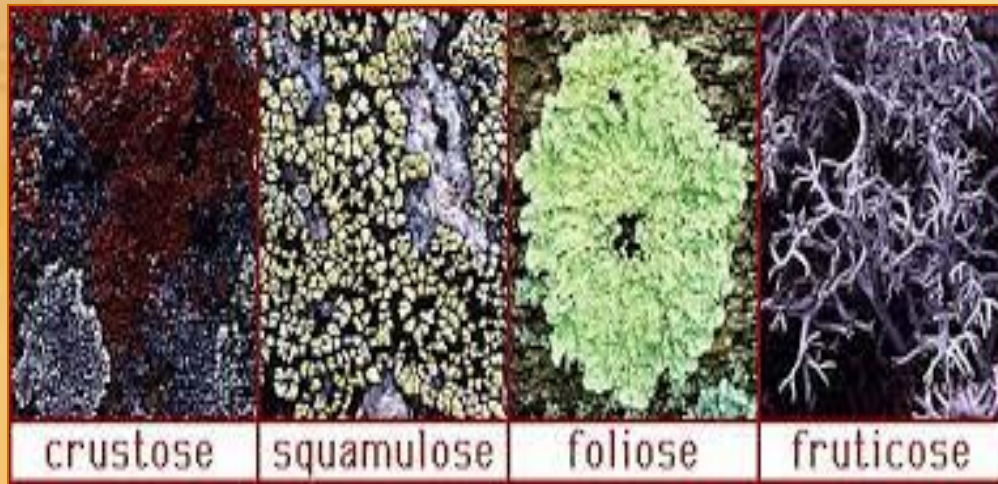


# *Cymbella* sp.



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# 2 - Types of Lichens



# Characteristics



- **Thallus (they have no leaves, no root, nor trunk)**
- **Symbiotic Relationship**
- **(association between a fungus and an alga)**
- **found growing on rocks, walls and trees**
- **Long Lifespan (9000 Years Old)**

# Types

**There are about 30,000 species of lichen worldwide, covering 8% of the land surface. There are 3 main types...**

**Leafy (foliose)**



**Crusty (crustose)**



**Shrubby (fruticose)**

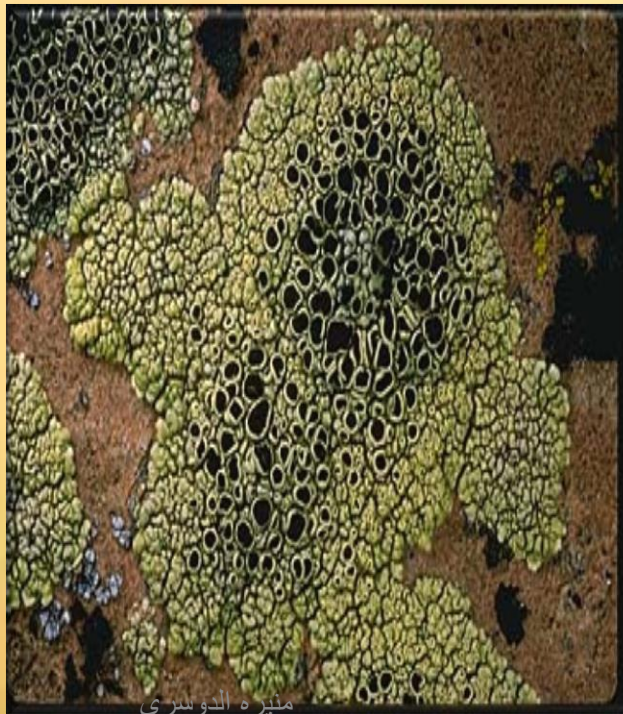


# Crustose (Crusty)

**flattened, scalelike,  
No lower surface, tightly  
bound to substratum  
(removal difficult)**



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[www.alrfoto.com](http://www.alrfoto.com)

# Foliose (Leafy)

**Circular Growth**

**Lobes**

**Rootlets Called Rhizines**



# Fruticose (Shrubby)

**Round Branches**

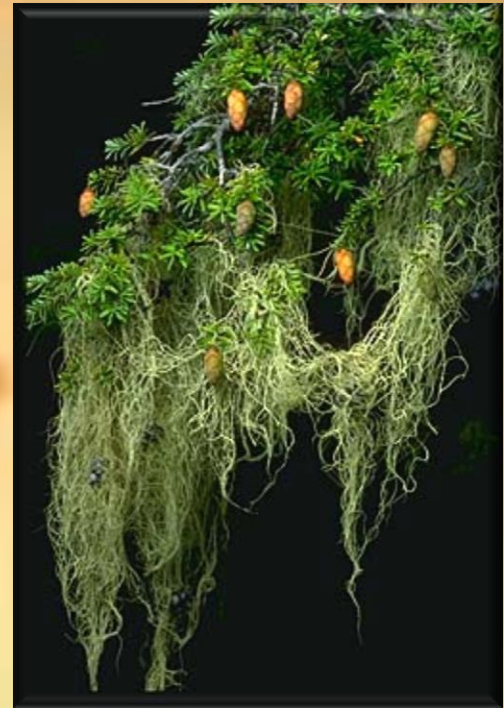
**Vertical Growth Pattern**

**Globets**

**Threads**

**Shrub-like or Mounded**

**Beard-like**



# Munirah Al-Dossari



**Thank You**

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