Biology Dept., College of Education,
Salahaddin University - Erbil,
Kurdistan region - Iraq

Division: Chlorophyta

Green Algae

Lab-6

Practical Phycology

Class: Chlorophyceae

Order: Volvocales

2- Family: Volvocaceae

1. Genus: *Pandorina* Sp.
2. Genus:*Eudorina* Sp.
3. Geunus:*Volvox* Sp.

Genus: *Pandorina* Sp.

External features

1. It is a **coenobial** form and the **coenobia are sub spherical or globular in shape.**

2. Each coenobium consists of **4, 8, 16 or 32 pyriform cells.**
3. Each cell is **uninucleate** and **biflagellate**.

4. It also contains a **cup shaped chloroplast, one** or **more** pyrenoids.
   - **Eye spot** and **two contractile vacuoles**.

6. Cells in the coenobium have a close contact that their lateral walls become **flattened** and thus the outer or peripheral end of the cells **is broader than the one facing toward center.**

7. Coenobium is surrounded by **gelatinous matrix.**

8. Reproductive structures.

a- Asexual:

1. **Daughter colonies are present**. These are formed in each cell of the parent colony. Before the formation of daughter colonies, the parent coenobium is not moved.

2. Daughter coenobia liberate outside through gelatinous matrix and **swim actively in the water.**

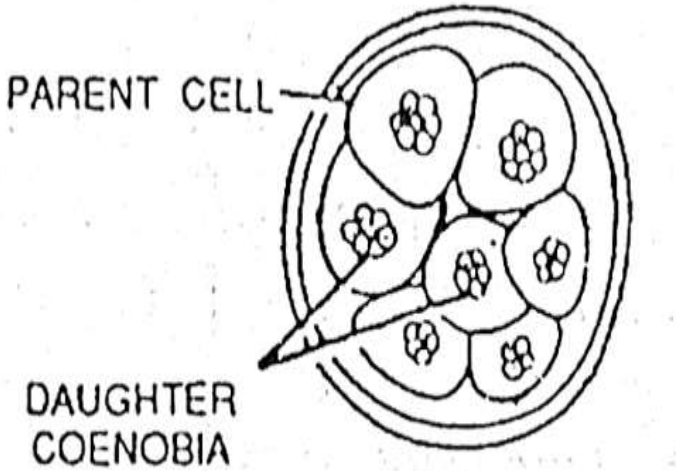


Fig. 3.6. *Pandorina*. Asexual reproduction.

B. Sexual:

1. Reproduction is **isogamous** and all species are **heterothallic.**

.2. Fusion between **similar male and female gametes** occurs **in water** on liberation through gelatinous matrix.

3. Ultimate result of the fusion of gametes is **zygote**.

Zygote is red in color due to the presence of a pigment haematochrome.

‘4. New coenobia are formed on germination of **zygote.**

Main traits used for identification:

1. **Cells** in the coenobium are **very close together**.

2. **Asexual reproduction** by **daughter coenobia**.

3. **Red colored zygote** due to the presence of the **pigment haematochrome.**

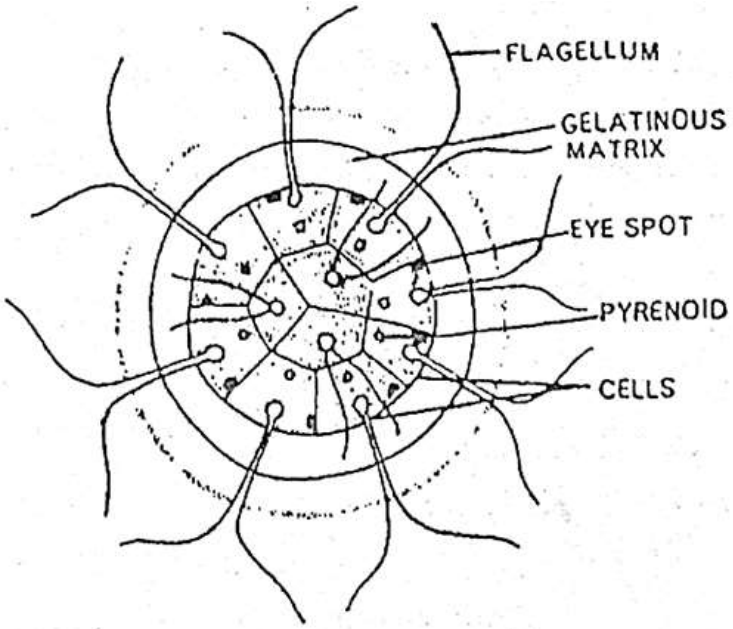
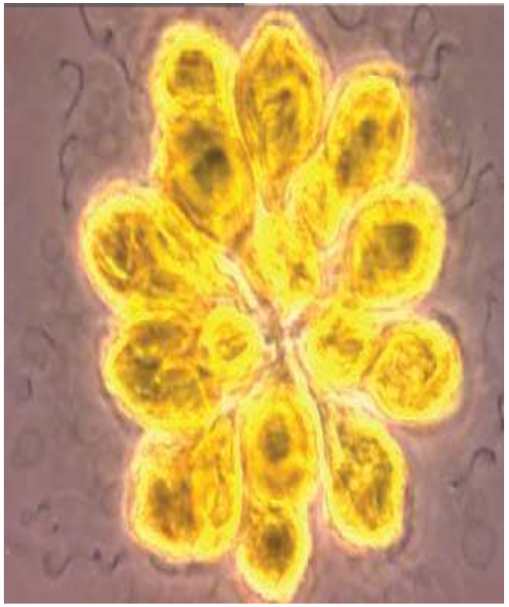


Fig. 3.4. Pandorina coenobium.



2.Genus: *Eudorina*

External features

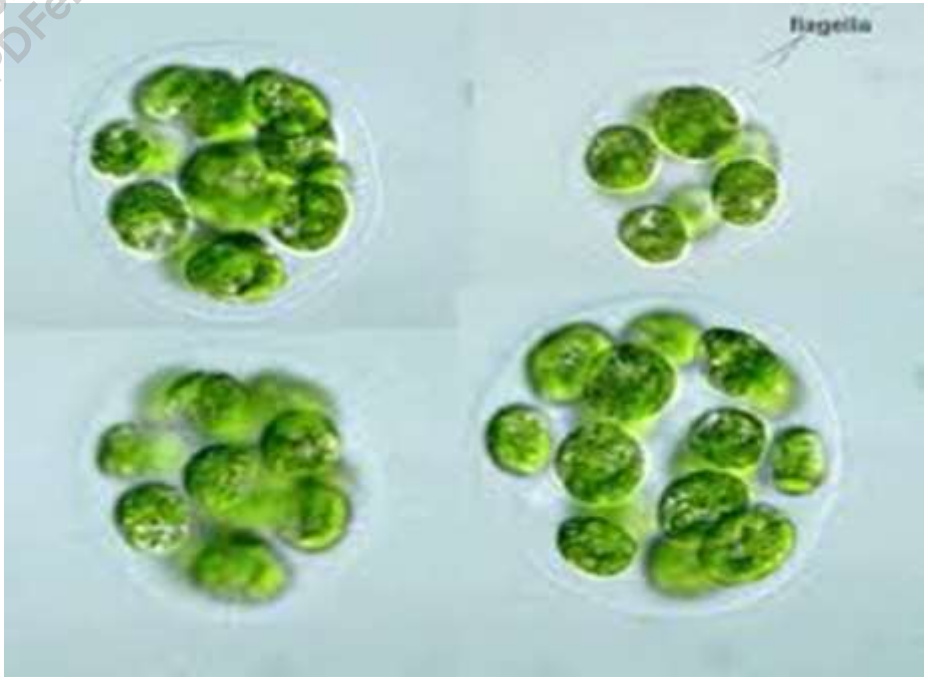
1. It is a coenobial green algae and the coenobia are **ovoid** or **spherical** in shape.
2. Each coenobium is surrounded by an envelope of mucilage and **each cell in the coenobium has its own sheath**.
3. Each coenobium consists of **16, 32 or 64 cells**.
4. Cells are linked with each other by **cytoplasmic strand**.
5. Each cell is a **chlamydomonad** shape in structure and each is **uninucleate** and **biflagellate** structure with spherical shape.

Reproductive features

1. Asexual reproduction

a. **Several daughter coenobia** are present in the parent colony.

b. **Akinetes** is also observed in the colony which **help in asexual multiplication**.



2. Sexual reproduction is of advanced **anisogamous** Species may be **Homothalic** or **Heterothalic**. **Fertilization is internal forming quadriciliate zygote.**

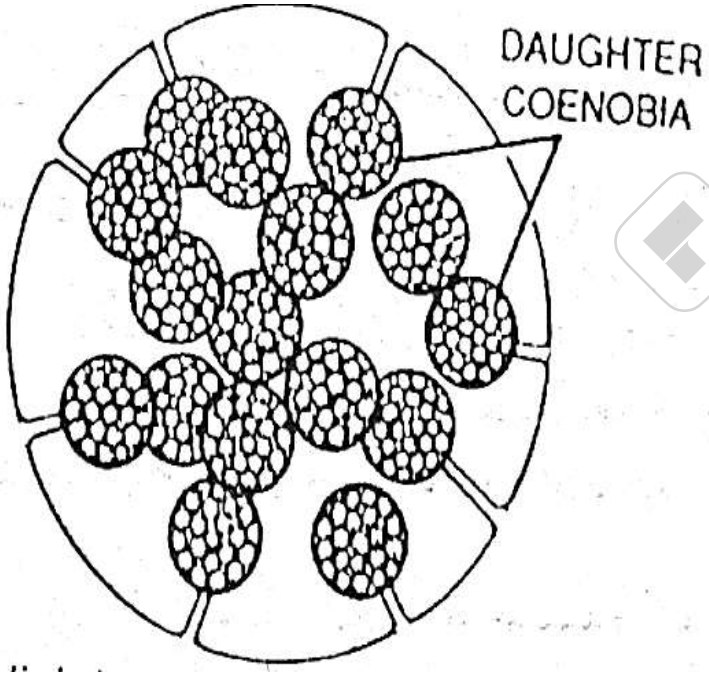


Fig. 3.8. *Eudorina*. Vegetative colony.

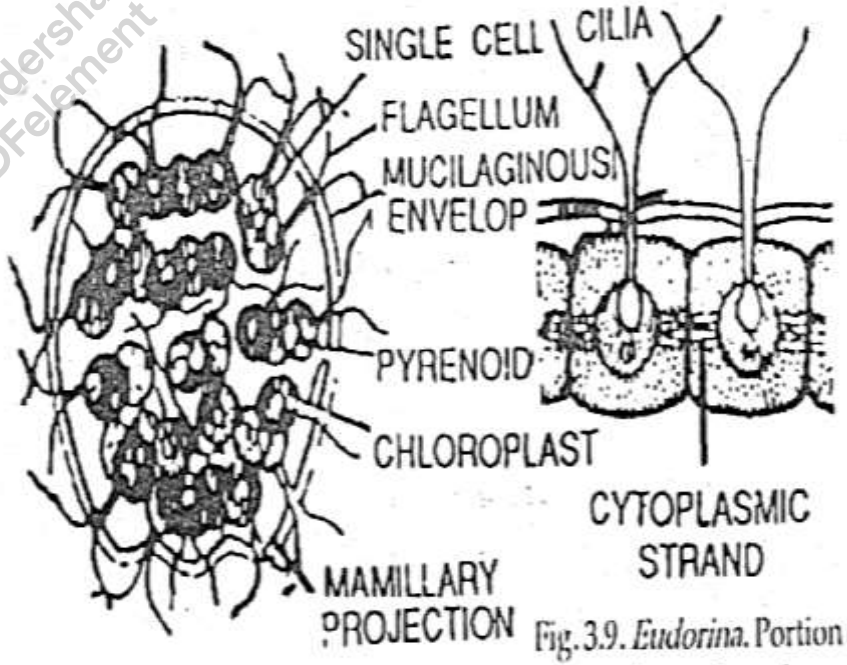
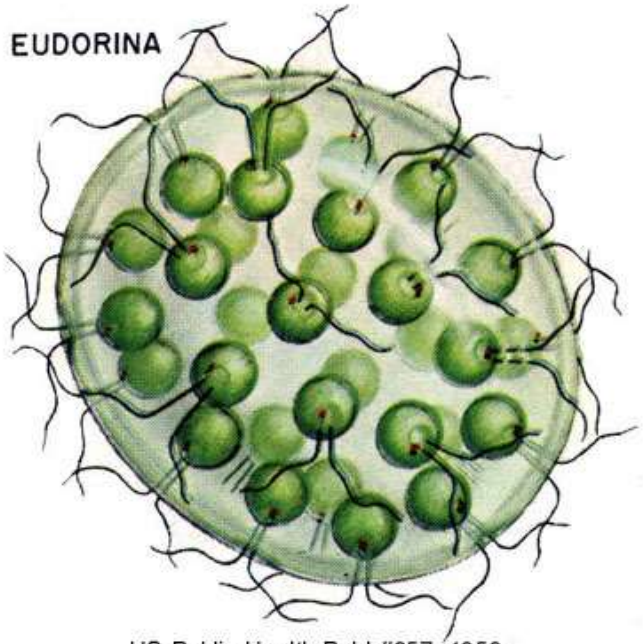
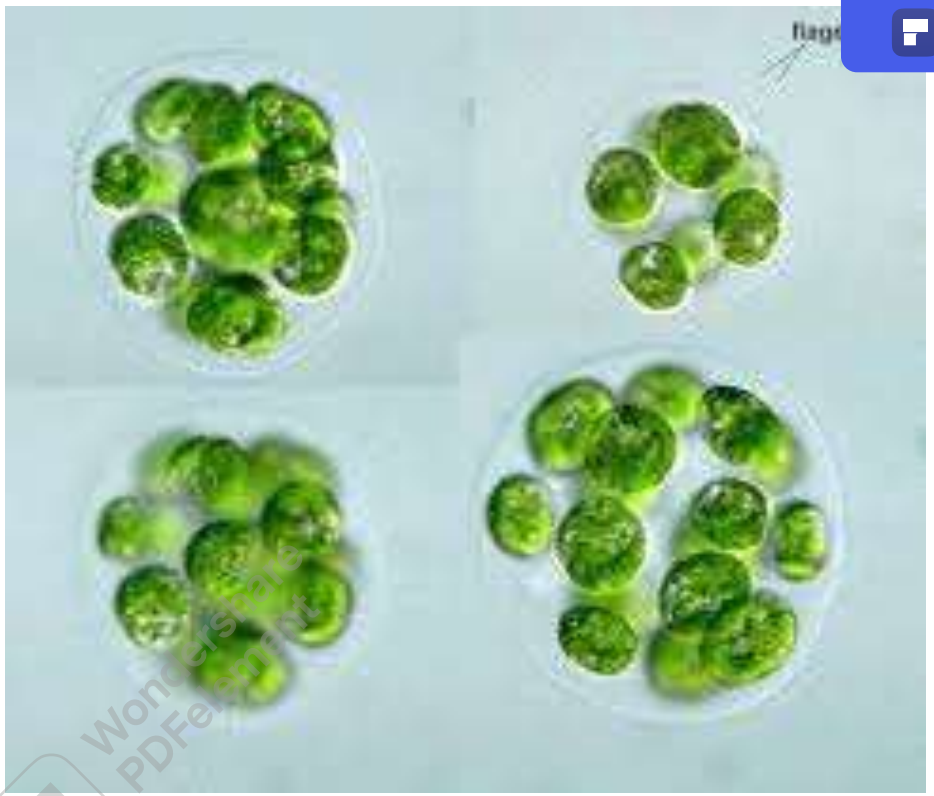


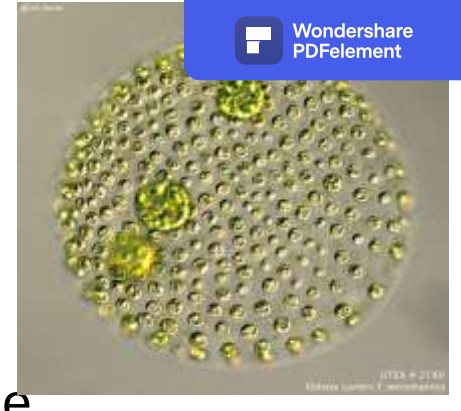
Fig. 3.9. *Eudorina*. Portion of colony enlarged.



US Public Health Publ #657. 1959.



3.Genus: *Volvox*



A. External features:

1. Thallus is **multicellular** and **motile** colony.
2. Colonies are mostly **spherical**, **rounded** or **oval** in shape.
3. The number of cells in a colony varies from **500-6,500** according to the species.
4. It is **hollow in the center** and cells are arranged in a single layer towards the periphery. **Layer of cells is surrounded by a gelatinous layer.**
5. Each cell inside the colony is connected with a few of the neighboring cells by **thin and delicate cytoplasmic strands.** Each cell is enveloped by an **individual gelatinous sheath.**

6. All the cells of a colony are typically **chlamydomonad** in shape, size and structure.

7. Each vegetative cell is **biflagellate of equal in length, motile and ovoid.**

8. 2 to 6 contractile vacuoles, **A single nucleus**, **cup shaped chloroplast** with **one or more pyrenoids** and an **eye spot are also present in each cell**.

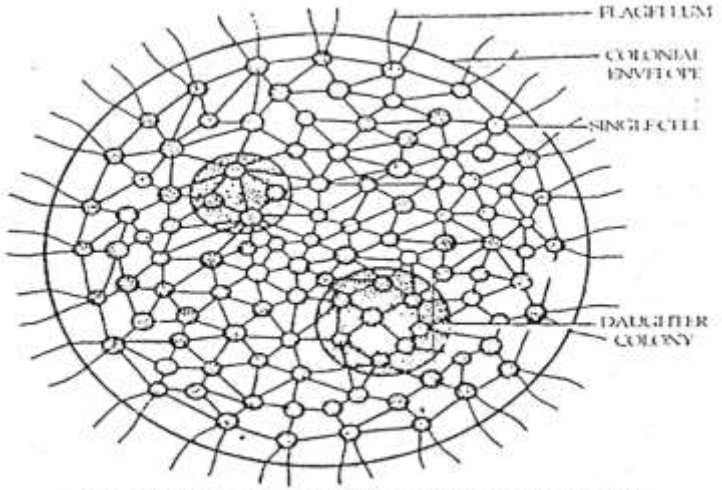


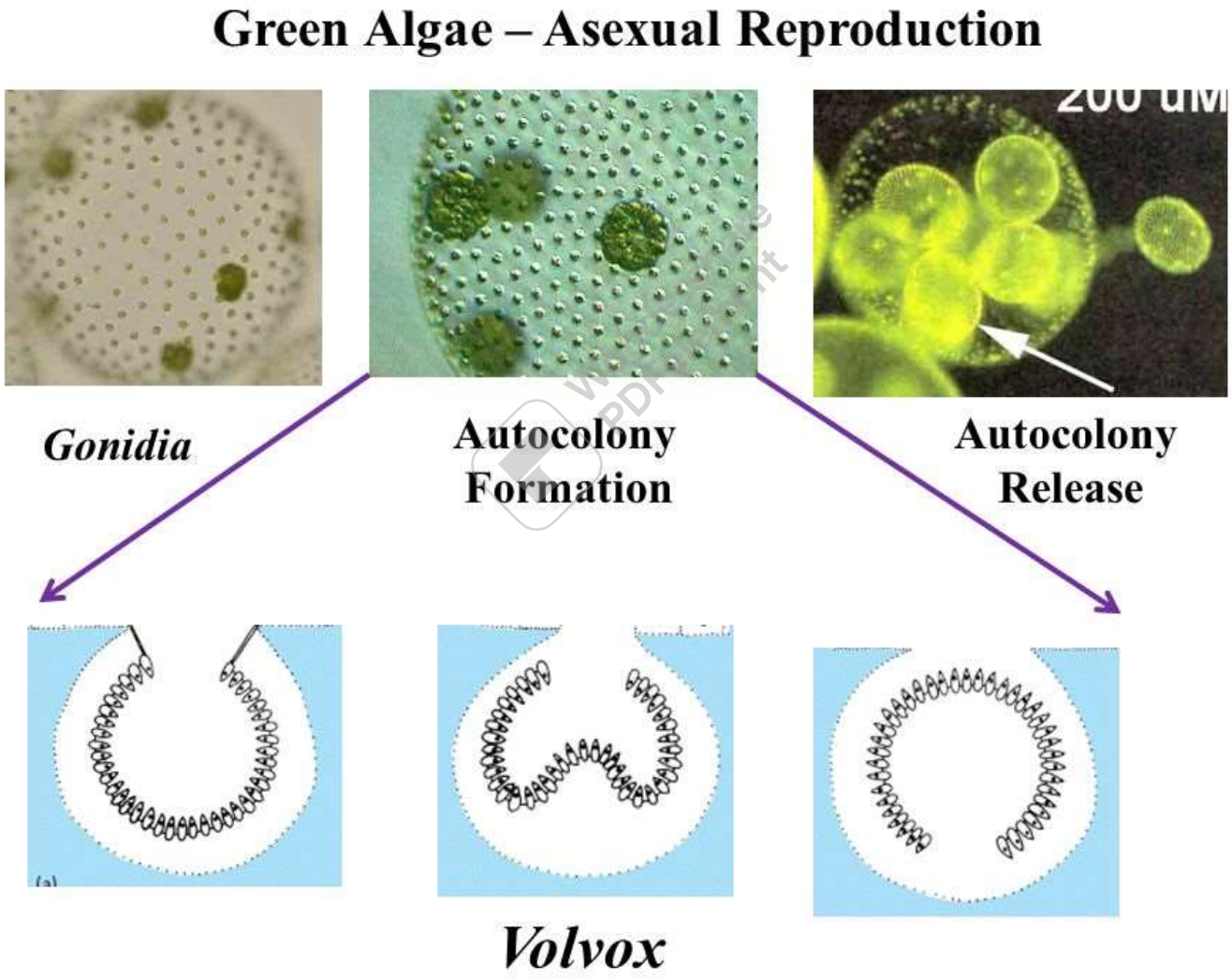
Fig. 3.10. *Volvox*. Parent colony with daughter colonies.

9. Reproductive structure:

1. **In asexual reproduction,** daughter colonies produced in the parent colony. Daughter colonies formed on the posterior side of the colony.

They **are 5-20 in number and embedded in the parent colony.** Daughter colonies move for sometime within parent colony**. Daughter colonies come out by rupturing of the parent colony.**

Asexual Reproduction



2. Sexual reproduction is **oogamous** and the colony may be **homothallic** or **heterothallic.**

1. Homothallic species are protandrous i.e. antheridia develop first, oogonia later on.

2. Sex organs (**antheridia and oogonia**) are present in the posterior half of the colony.

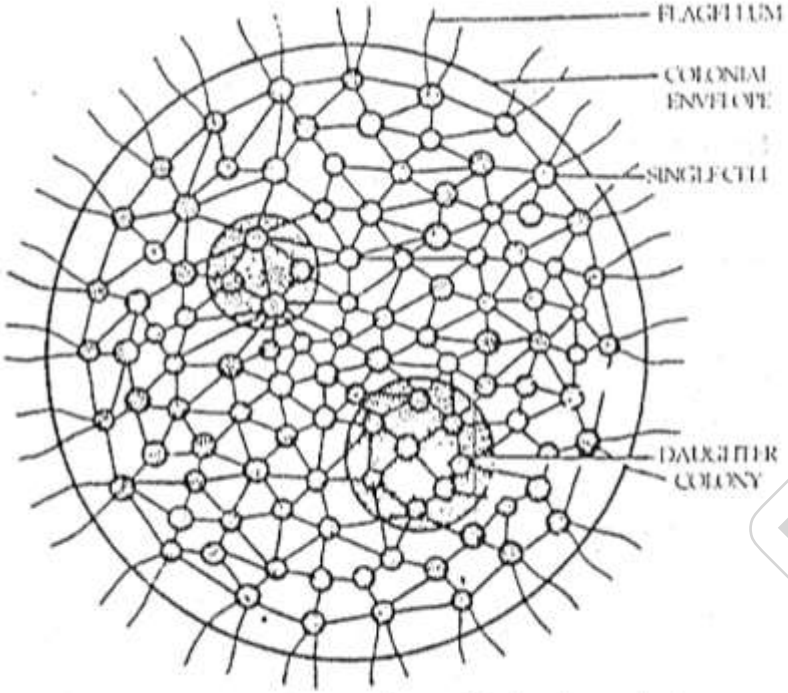


Fig. 3.10. *Volvox*. Parent colony with daughter colonies.

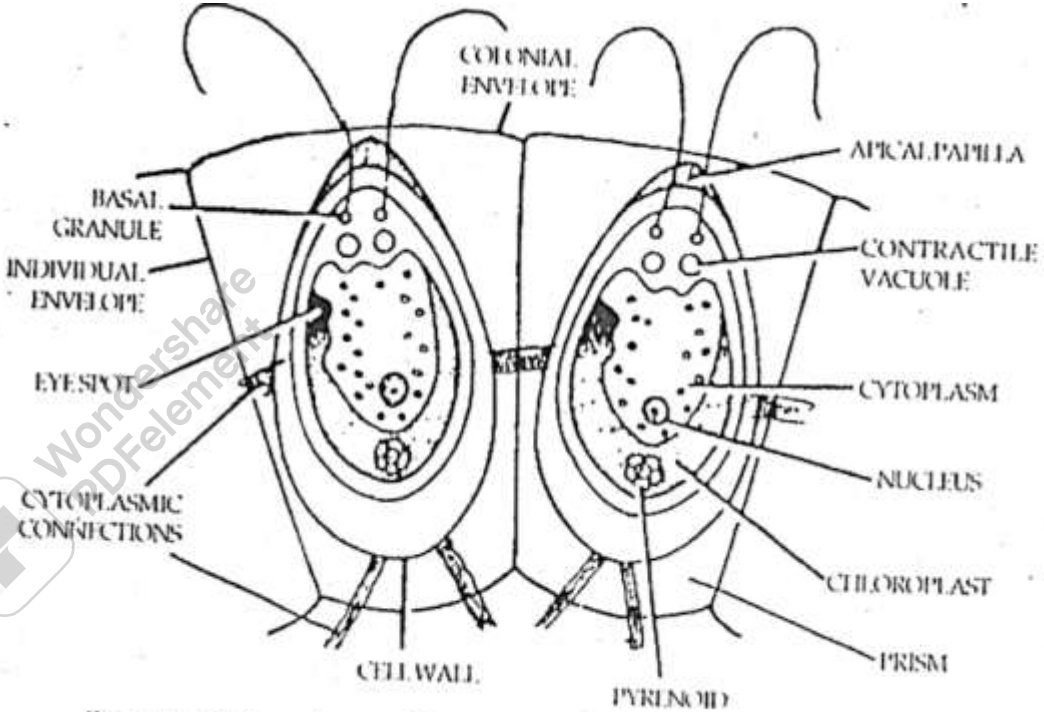
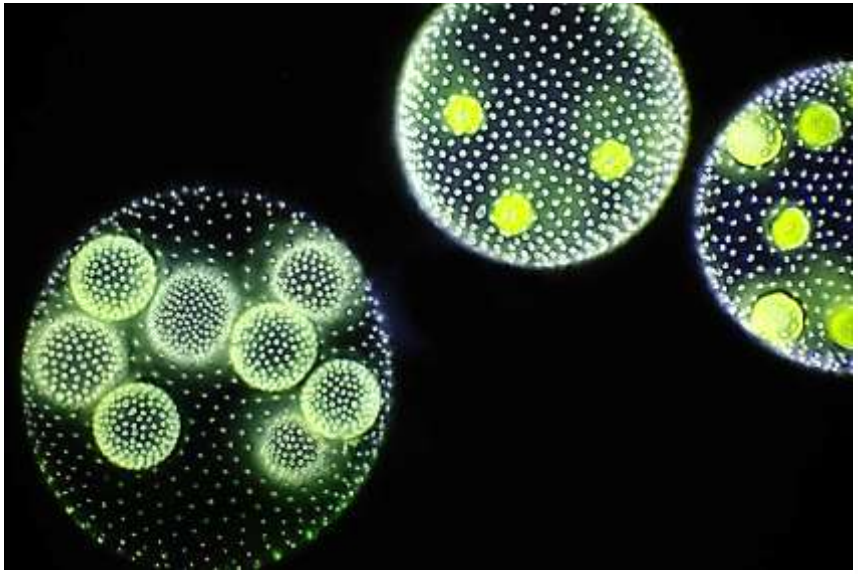
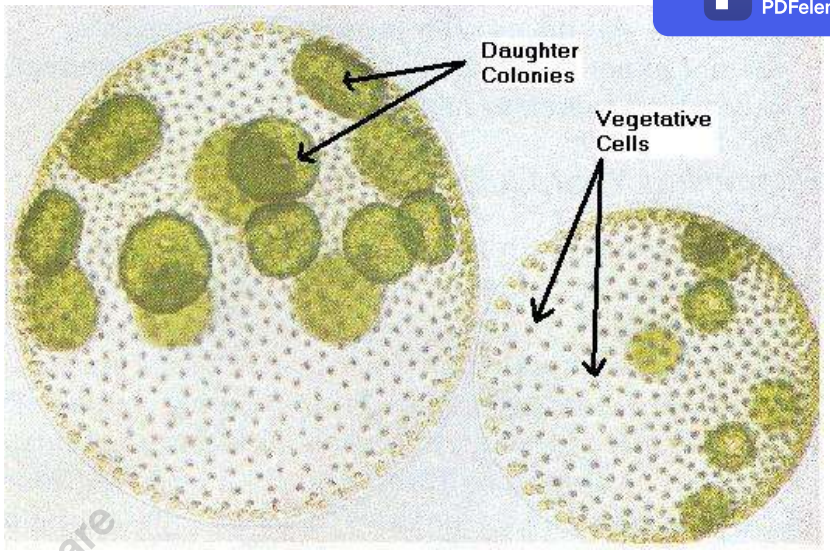
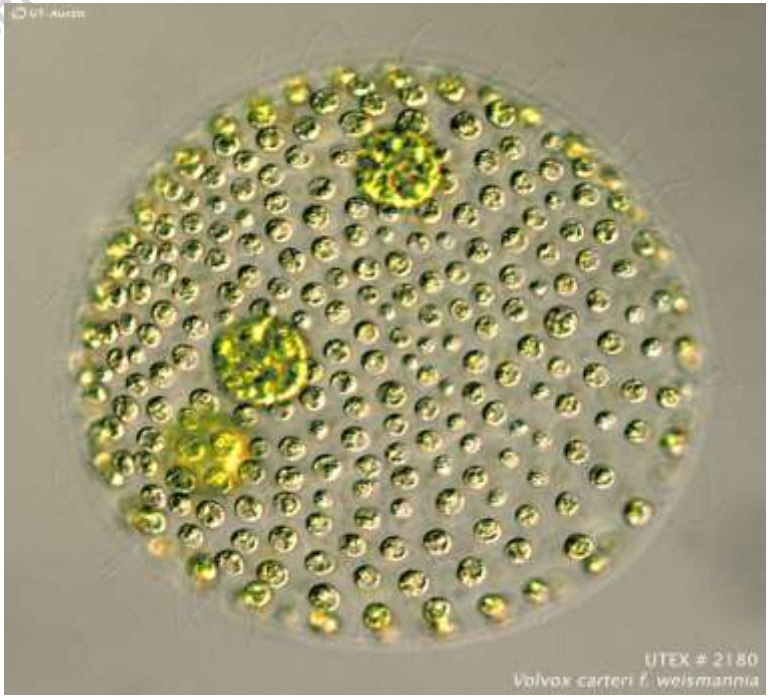


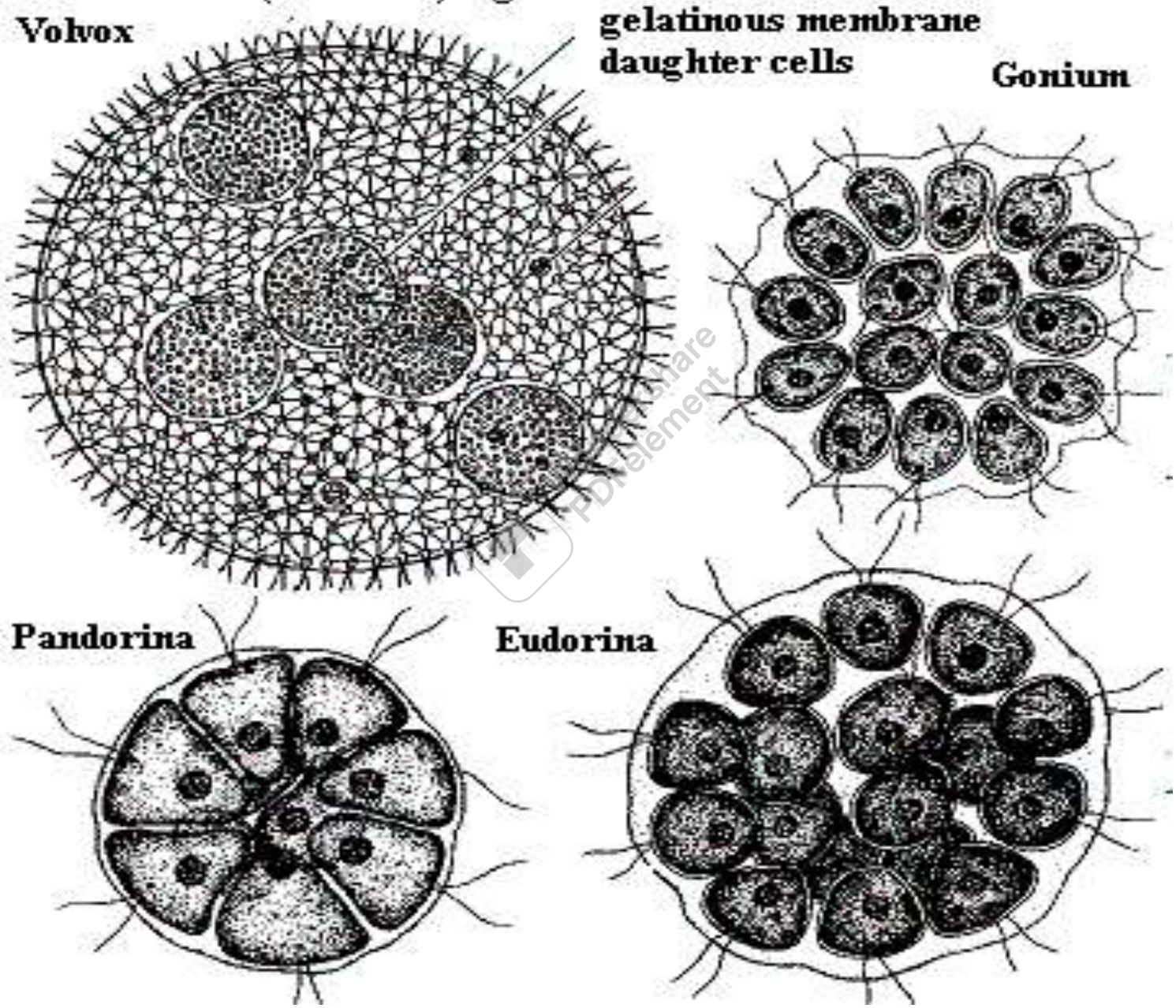
Fig. 3.11. *Volvox*. A part of the colony showing arrangement of cells.







9.42 Colonial (coenobial) algae



Q & A