Department of biology

((Plant groups))

Stage 2

Sixth lecture

Bacillariophyta (Diatoms)

By

Msc. Zainab Nadhum Aziz

Bacillariophyta(Diatoms)

- **Bacteria :** are single-celled organisms, microscopic and small in size, not visible to the naked eye.
- They have many forms, some of which are in the form of a ball, and some of which are similar to rods, and they are also found in the form of clusters in different shapes such as the shape of a bunch of grapes, So that they become able to work and protect themselves more during these gatherings.

Bacillariophyta(Diatoms)

- Some species of these organisms live inside the human body, and others are outside it.
- The sizes of bacteria vary greatly, some of which do not exceed half a micrometer in size, and some of which tend to share micrometers, and they are characterized by being small and complex. Which enables them to survive and live in harsh conditions, and some of them have special structures that help them build and adapt to different conditions.

Bacillariophyta(Diatoms)

- The **Bacillariophyta** are the most species-rich group of autotrophic algae, found in fresh, brackish, and marine waters , and also in land wet. They are well represented in marine phytoplankton and may account for 20% of global photosynthetic carbon fixation. However, the vast majority of the estimated 100,000 species are benthic, living attached to surfaces or gliding over sediments using a unique organelle, the raphe system. **Flagellate cells are absent**.

Bacillariophyta(Diatoms)

- Except in the sperm of some lineages. Diatoms possess a similar photosynthetic apparatus to that present in several other stramenopile lineages (with fucoxanthin and chlorophyll c as the principal accessory pigments) .
- But are easily recognized by the unique construction and composition of their cell wall, which is usually strongly silicified and consists of two overlapping halves (thecae); these in turn consist of a larger end piece (valve) and a series of narrow strips (girdle bands).

Bacillariophyta(Diatoms)

- Expansion of the cell occurs by sliding apart of the thecae and addition of new bands to the inner, overlapped theca. At cell division, each daughter cell inherits one of the thecae of the parent and forms a new theca internally. Hence, because the silicified wall is inelastic, average cell size usually declines during vegetative growth and has to be restored through expansion of a special cell, the auxospore, usually after sexual reproduction. A few diatoms have lost their plastids and are osmotrophic. Classification has traditionally relied on details of valve structure

البكتيريا العصوية

العصوية الفردية
Single bacillus

السلسلية
Streptobacilli

الخلايا السياجية
Palisades

Coccobacilli

العصوية المزدوجة
Diplobacilli

General Characteristics of Bacillariophyta

- **A.** Comprises a single class Bacillariophyceae, the members of which are popularly known as **diatoms**.

- **B.** Posses chl.a and chl.c and **fucoxanthin**

- **C.** The food as **oil** and **chrysolaminarin** or a protein-like food material called **volutin.**

General Characteristics of Bacillariophyta

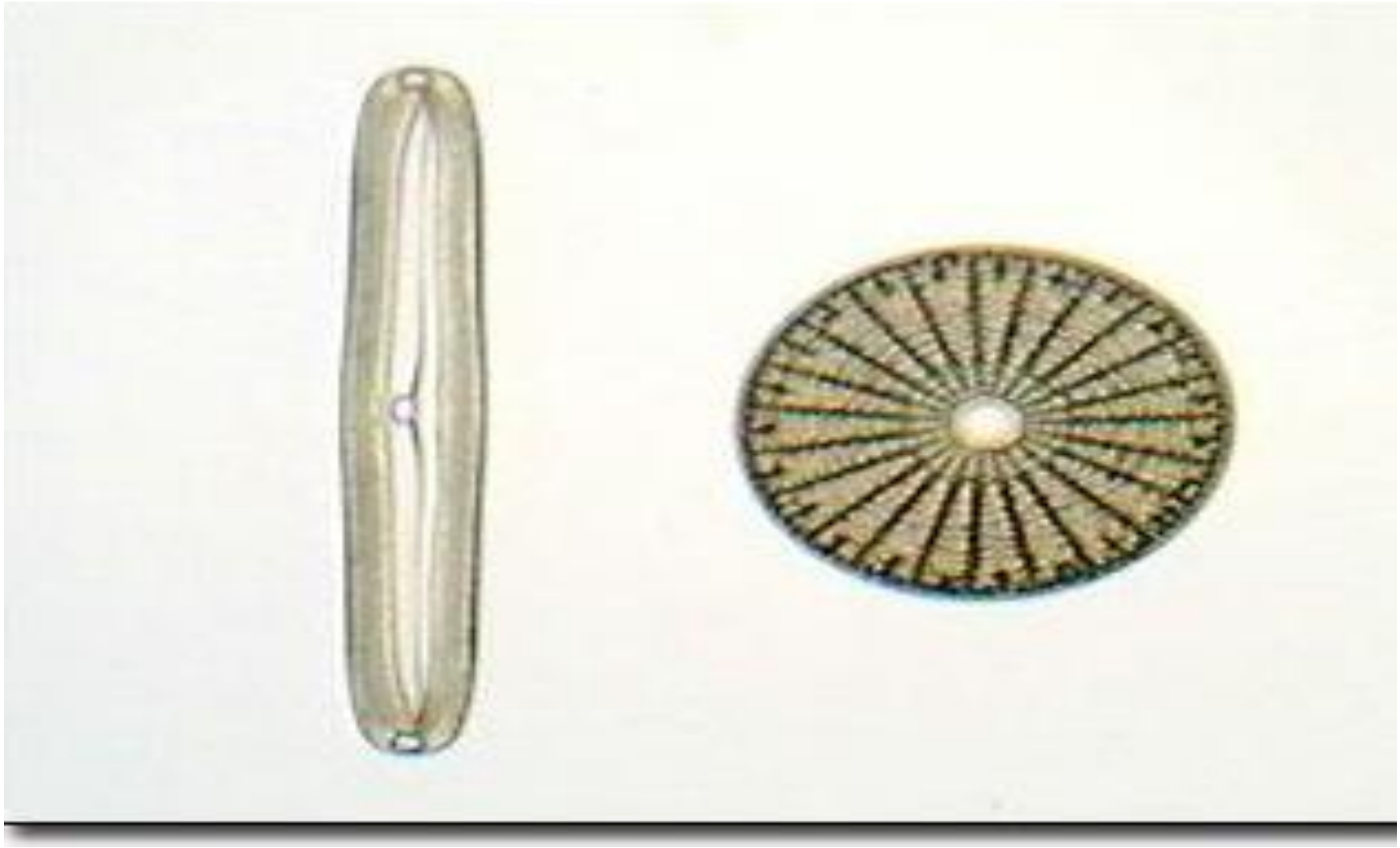
- **D.** The cells are surrounded by a rigid cell wall–box like in shape called **Frustule**. The cell wall is **silicified**.

- **E.** The economic importance of diatoms represented by the **diatomaceous earth,** this is a rock-like deposit, it extends hundreds and thousands of feet in depth in some locations. diatomaceous earth is mined in several parts of the world to obtain whitish powder(**diatomite**) which is put in many uses.

The diatoms placed under two taxonomic groups

- **1. Order: pennales:** are pen-shaped, the structure exhibits bilateral symmetry. The diatoms of this order called **pennate diatoms.**

- **2. Order**: **Centrales:** are cylindrical shaped, the structure exhibits radially symmetry. The diatoms of this order called **centric diatoms**.



Pennales

Centrales

The order of Centrales is characterized by the following characteristics:

1- Discoid valve .

2- Radial symmetry of valve.

3- Non-motile .

4- Multiple plate plastids .

5- Most of them are found in salt water and some in fresh water.

6- Sexual reproduction is of the Oogamy type.

As for the characteristics of the Pennales, they are:

1- Boat shape valve .

2- Bilateral symmetry of valve .

3- Some of them are mobile.

4- Plastids plates .

5- Most of them are found in fresh water and some in salt water.

6- Most of them are attached to plants, animals, mud, sand, or any surface present in their environment.

7- Sexual reproduction is of Isogmy type .


Thank
You!