

VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

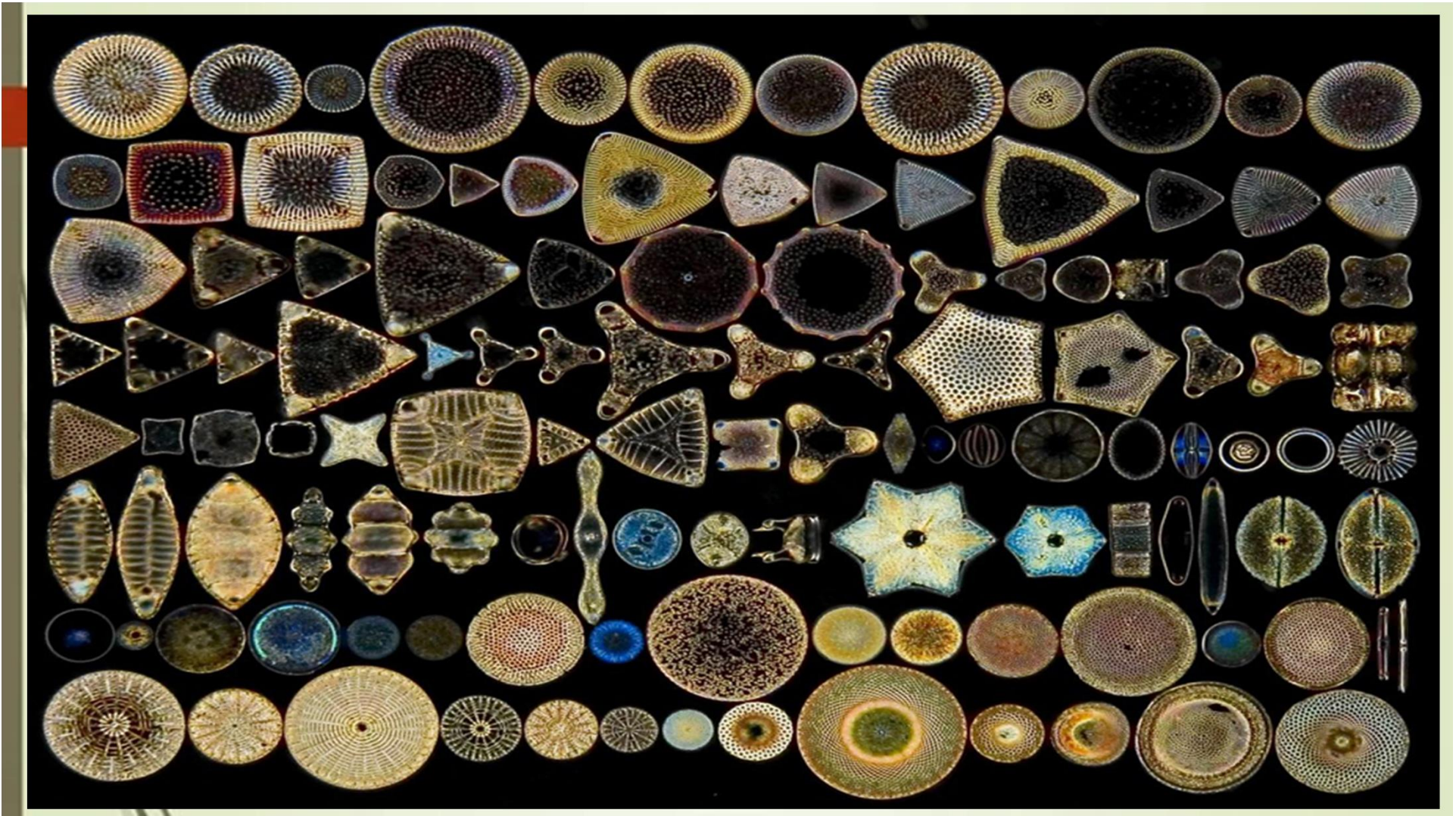
Department of Botany

B.Sc. I

TOPIC : DIATOMS

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M.Sc., Ph.D.





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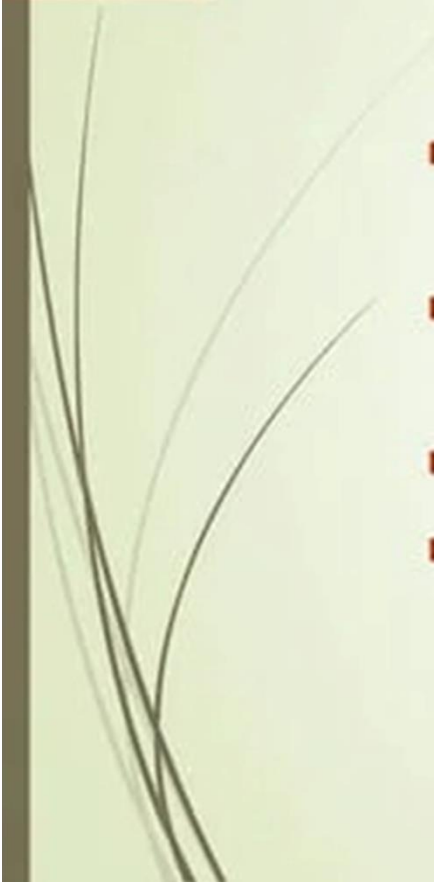
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INTRODUCTION



OCCURENCE

- ▶ *There are about 16,000 species grouped under 200 genera.*
 - ▶ *They occur in various habitats like fresh water, saline water and also in terrestrial condition.*
 - ▶ *They occur as epiphytes.*
 - ▶ *There are epizoic also.*
- 

CLASSIFICATION

Class: Bacillariophyceae

Order: Centrales

Order: Pennales

DIFFERENCES BETWEEN

CENTRIC DIATOMS

- 1. Shape and size varies.*
- 2. Radial symmetry.*
- 3. Discoid chloroplast.*
- 4. Raphe is absent.*
- 5. Radiantly arranged striations.*

PENNATE DIATOMS

- 1. Boat shaped.*
- 2. Bilateral symmetry.*
- 3. Elongated chloroplast.*
- 4. Raphe is present.*
- 5. Pinnate striations.*

Centric diatoms

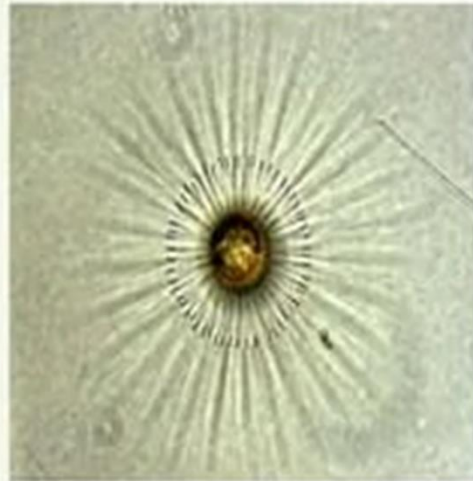


Fig 1: Corethron



Fig 2: Clycotella

Pennate Diatoms

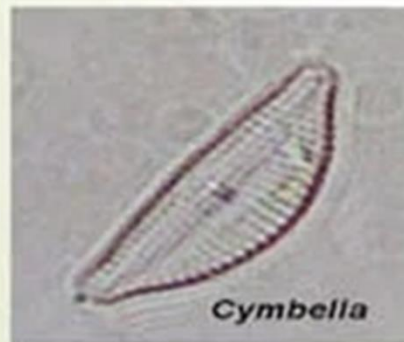
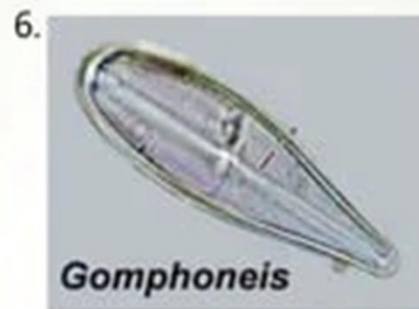


Fig 7.

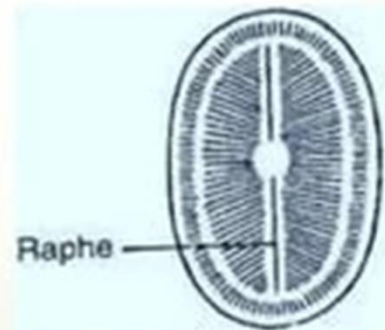


Fig 8: Cocconies
placentula



Fig 9: Tubellaria fenestrata



CELL STRUCTURE

Structure of cell wall consists of two parts.

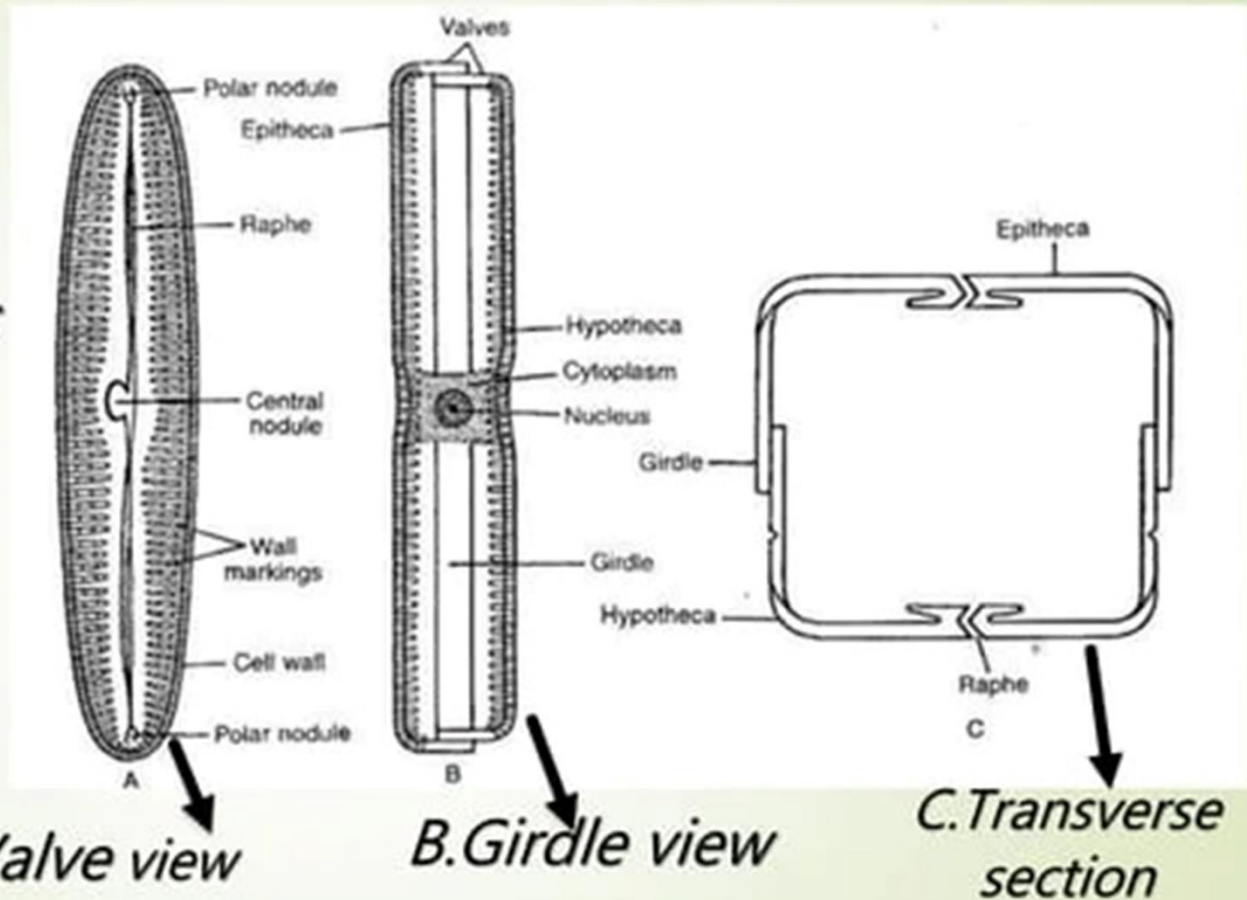
1. Cell Wall

2. Protoplast

1. Cell Wall

- ▶ *Cell wall is made up of pectic substances impregnated with silica.*
- ▶ *Cells are covered by siliceous wall, the frustule.*
- ▶ *These consists of two overlapping halves, the theca.*

Fig10: Cell structure of Pinnularia viridis.



STRAITIONS

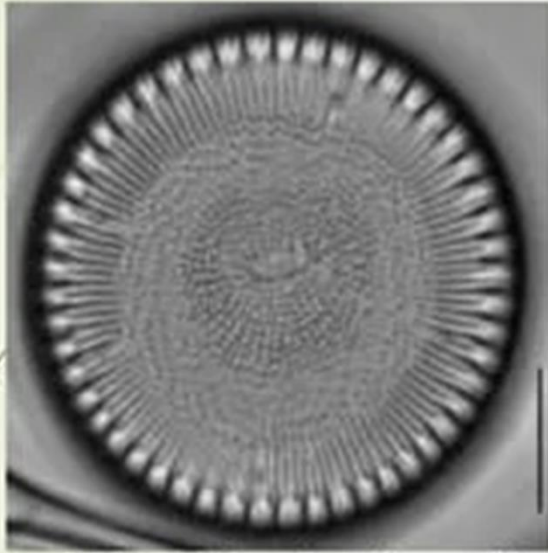


Fig 11: Cyclotella
bodanica

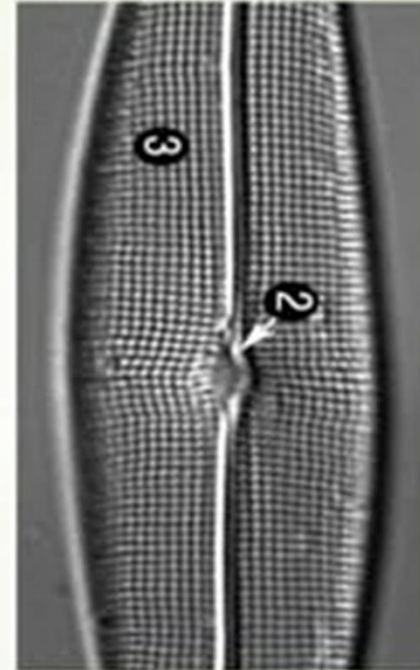
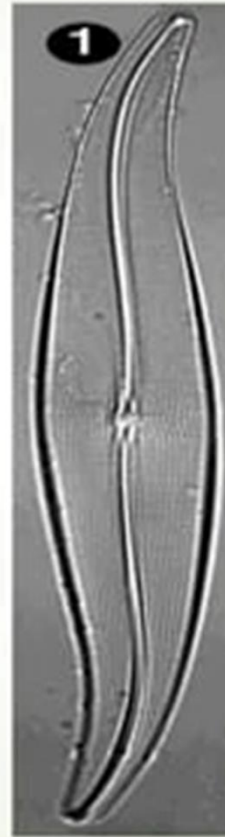
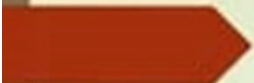


Fig 12: Navicula
acumtaina



2. Protoplast

- *The entire content present inside the cell wall is protoplast.*
- *The cytoplasm contains single nucleus and other cell organelles.*
- *Reserve food material is chrysolaminarin, volutin and oil droplets.*
- *The photosynthetic pigment chlorophyll a, chlorophyll chlorophyll C₂, beta-carotene, fucoxanthin etc.*
- *Diatoms are colour due to the presence of carotenoids and an accessory brown pigment called a diatomin.*

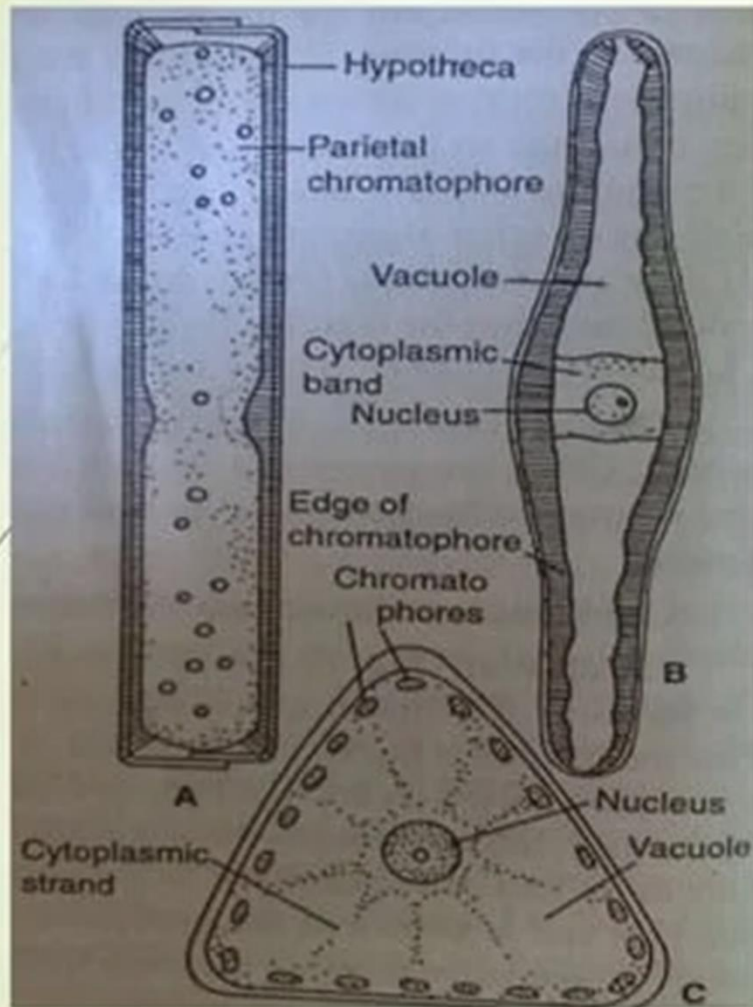
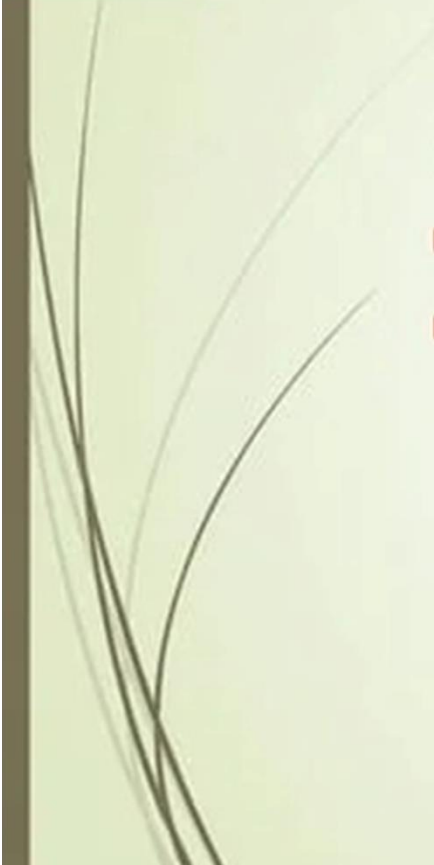


Fig 13:
Chromatophores in
Pinnularia viridis
(Pennales) (A-B)
and valve view of centric
diatoms (C)



REPRODUCTION

There two types of reproduction.

- ▶ *Vegetative reproduction*
 - ▶ *Sexual reproduction*
- 

Vegetative REPRODUCTION

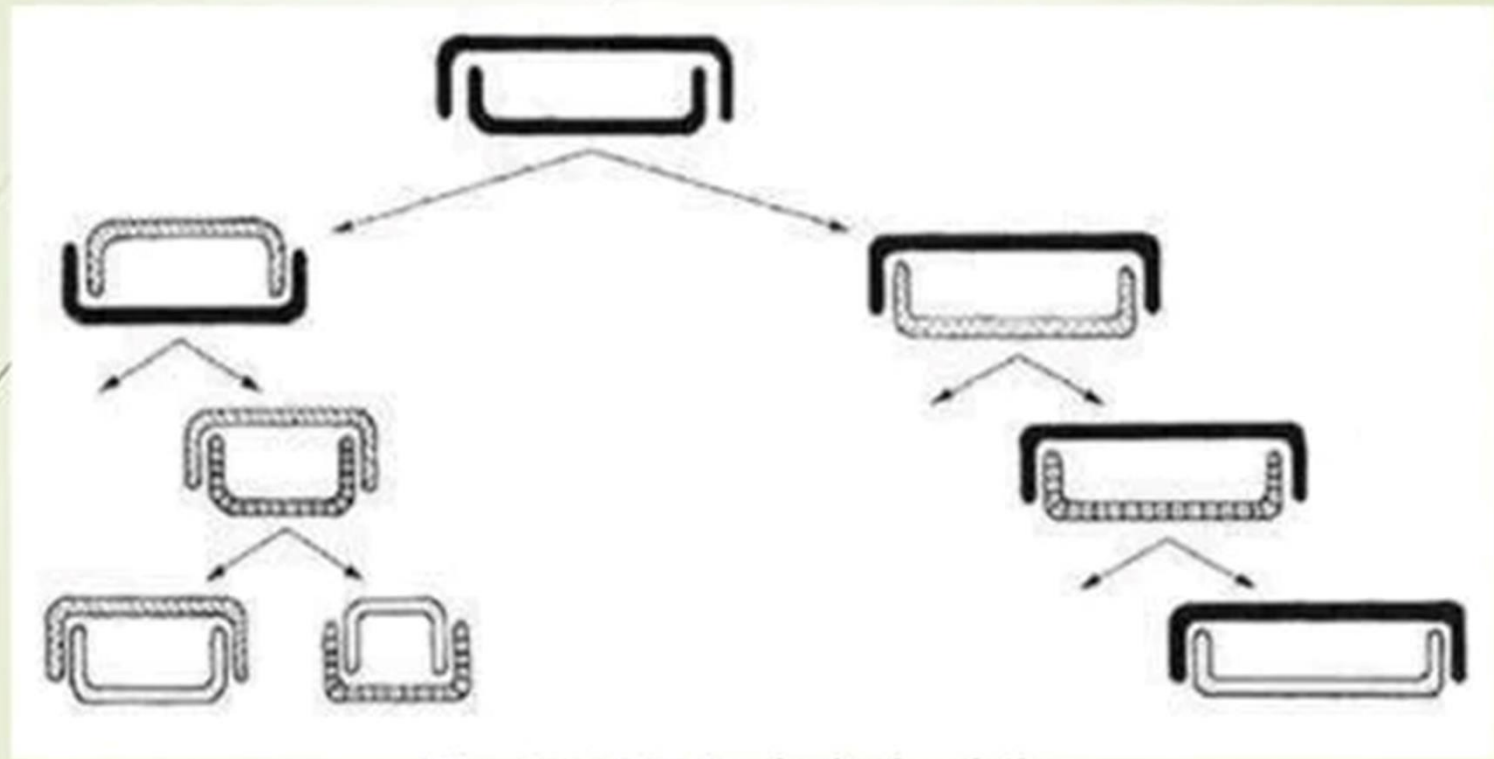


Fig 14: *Navicula halophila*

SEXUAL REPRODUCTION

Auxospore formation in Pennales are of different types:

- ▶ *Production of one auxospore by two conjugating cells.*
- ▶ *Production of two auxospore by one conjugating cells.*
- ▶ *Production of one auxospore by a single cell.*
- ▶ *Production of auxospore by autogamy.*
- ▶ *Production of auxospore by parthenogenesis.*
- ▶ *Production of auxospore by oogamy.*

Production of two auxospore by two conjugating cells

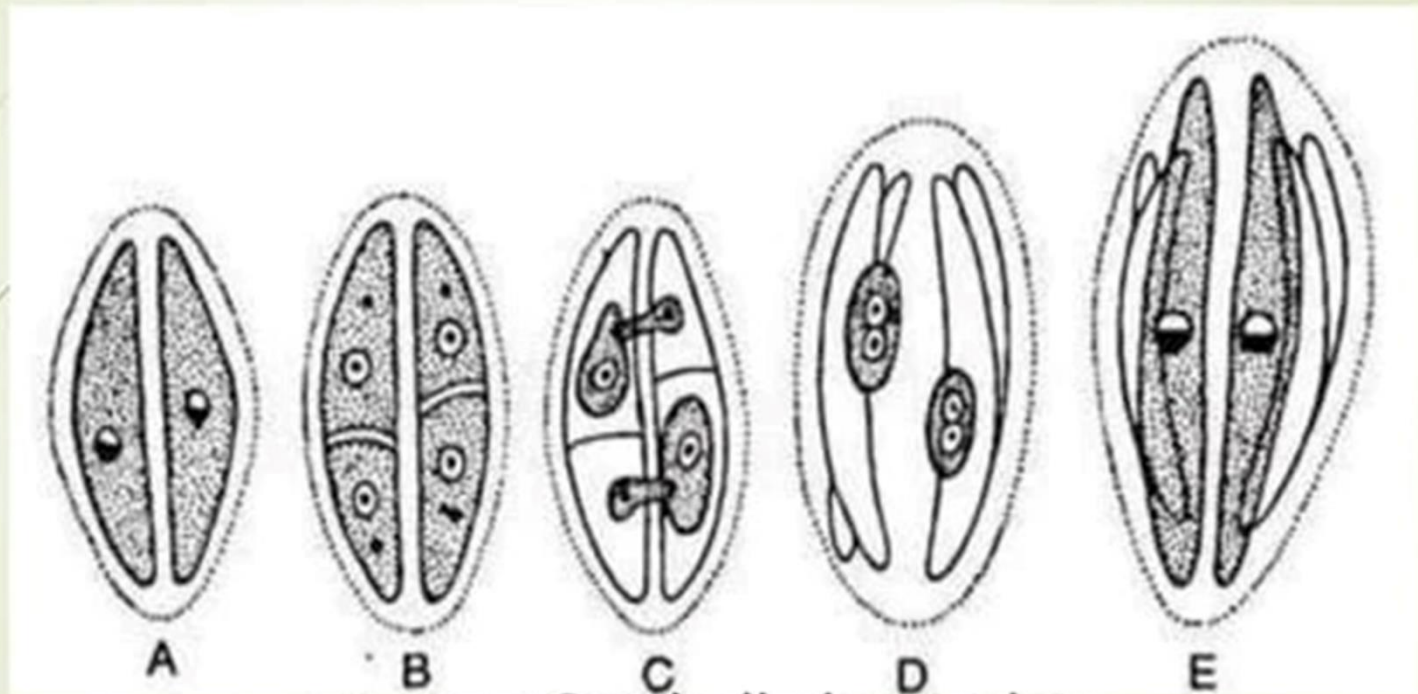


Fig 15: Cymbella lanceolata

ECONOMIC IMPORTANCE

- ▶ *Diatomite: Very much useful in Industries.*



Fig 16: A



Fig 17: B

► *Testing of microscopic lenses.*

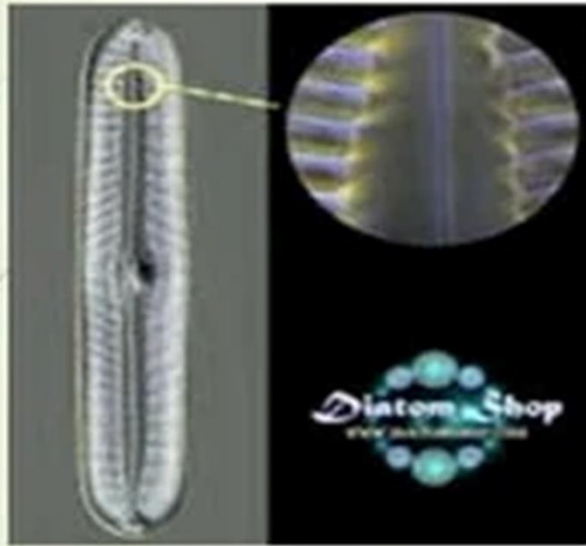


Fig 18: Pinnularia dactylus

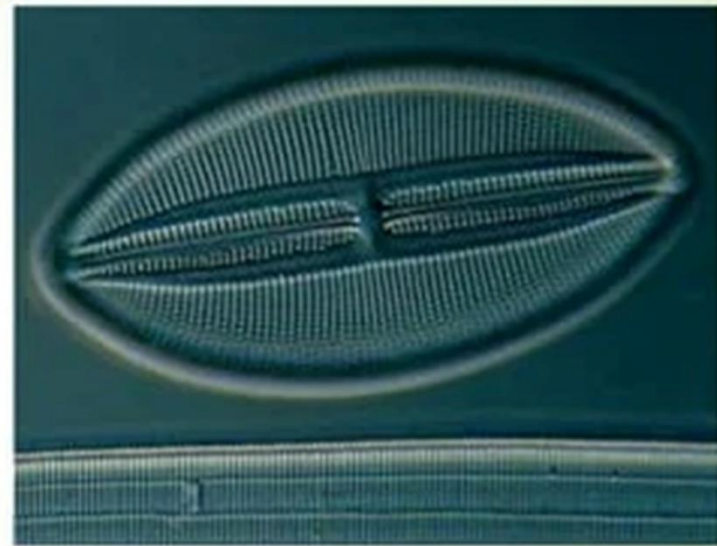


Fig 19: Pictinifra

➤ *Used as food.*

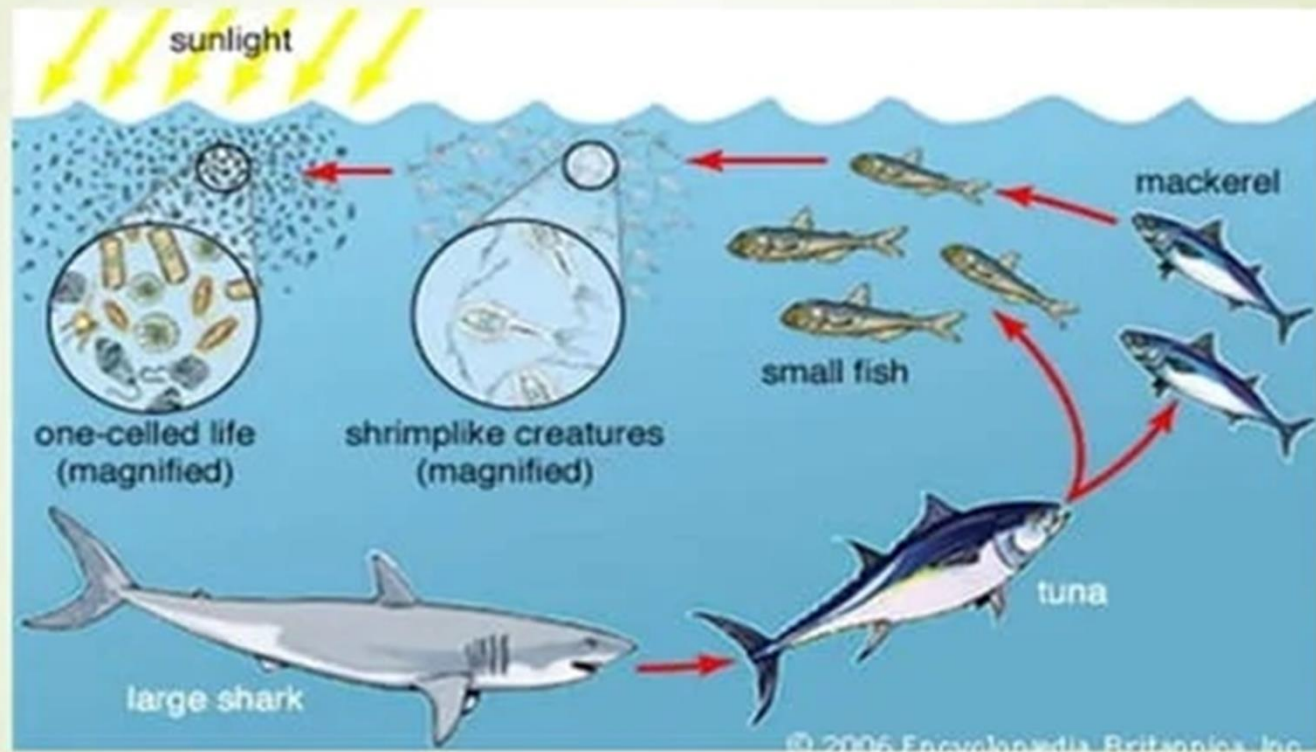



Fig 20.

- 
- *Petroleum is considered to be diatom origin.*
 - *It is used as Pollution Indicators.*
 - *Diatom is used in tooth paste.*

