

Oedogonium

Q. Describe the systematic position, structure and mode of reproduction in Oedogonium?

Ans:- Systematic Position →

Class - Chlorophyceae ✓

Order - Oedoniales

Family - Oedogoniaceae ✓

Genus - Oedogonium

Occurrence and structure of Oedogonium

Oedogonium is a common fresh water, green, unbranched, long filamentous, epiphytic algae which grow attached to some substratum in young stage, but generally become free floating in matured condition. The thallus consist several barrel shaped, cylindrical cell in a single cell series. The basal cell is called Hold fast. Having a basal disc which attached with the aquatic substratum. The length of an individual cell is greater than its breadth. The apical or intercalary cells have one or more concentric ring is known as cap cells. The cell bearing cap is called cap cells, Is the important character of this species. All the cells have a similar structure except the Hold fast (Lack of chloroplast). It include about 285 species. Which all are aquatic but Fritch collected its filament from the snow also.

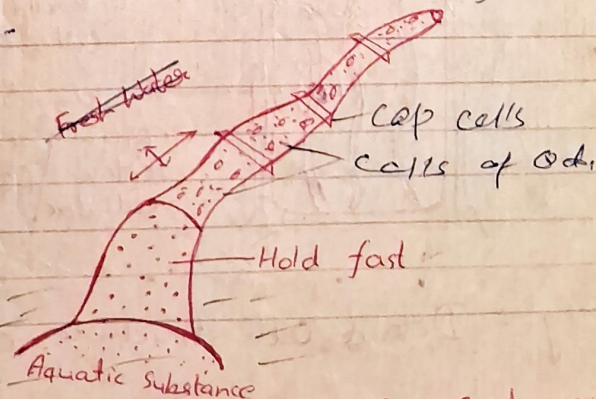


Fig - Single filament of Oedogonium

2.2
 Detail cell structure of Oedogonium → It cell wall is usually much thickened, rigid and divide into three layers. Out of which inner most layer is made up of cellulose, middle one is of pectose and outer most layer is of chitin. Each cell is broadly rounded at the apex. A single big size nucleus lies in the middle of the cytoplasm of each cell. And also possess reticulate chloroplast. Which run parallel to each other. A number of pyrenoid are embedded in the chloroplast. Some cytoplasmic vacuole are also present in the cell. The formation of the apical cap is related to the cell division and the number of caps on a cell indicates the number of times of its division. The cell division is intercalary as well as terminal and may take place in any cell except Hold fast.

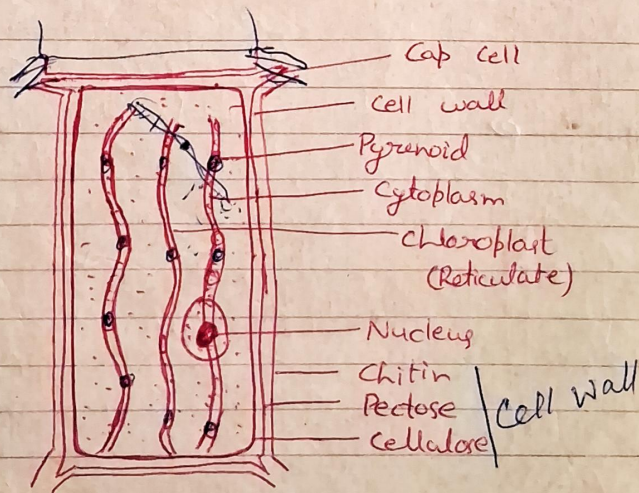


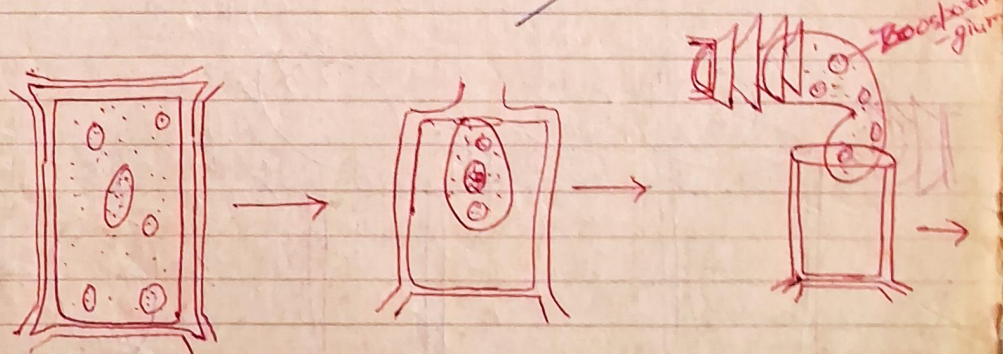
Fig - Detail cell structure of an Oedogonium

Reproduction → It takes place by three methods. They are -

1. Vegetative Reproduction → This simply occurs by fragmentation of filament. All though it is a ~~only~~ ^{latter} accident. Each fragment as a result of a cell division transform into a new thallus. This is more common in free floating species of *Oedogonium*.

2. Asexual Reproduction → It takes place by two methods when condition is favourable.

@ By Zoospores → When there is sufficient supply of water or condition is favourable asexual reproduction takes place by means of multi-flagellate oval or pyriform zoospores. Which is produced inside the zoosporangium. A single cell gives rise to a single zoospore. Any intercalary cell may act as zoosporangium. Prior to zoospore the protoplast of a cell recede from the cell wall and the nucleus moves to one side of the cell and a hyaline spot appears in the



A. Single cell

B. Receding of contents

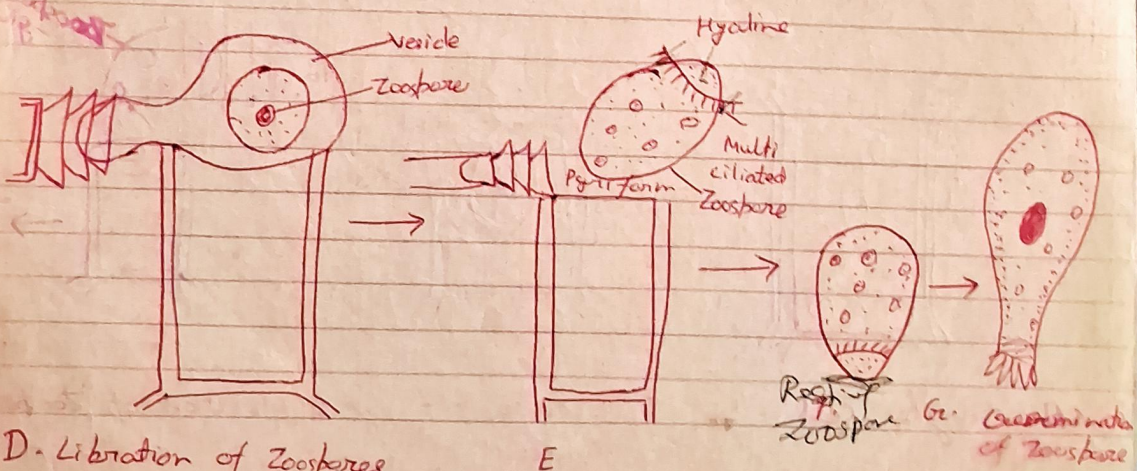
C. Liberation of Zoospore

Fig - Asexual Reproduction by Zoospore p.T.O

place of the nucleus and the several granules develops around the hyaline spot and each such granule can produce one flagella. Latter of the whole protoplast contracts and get transfer into a multi flagellate zoospore.

According to Setinkee, the protoplast secretes some gelatinous substance which pushed ~~some~~ ~~gelatinous~~ substance which the zoospore out. The zoospore finally comes out by the rupture of the cell wall. A vesicle surrounded zoospore as it comes out. After some time vesicle disappears and zoospore is finally set free to the out side.

Each zoospore is uninucleate, multi ciliated, spherical or pyriform in structure. Its anterior end is hyaline and the flagella are situated just beneath it. And the nucleus lies in the posterior end. After swimming some time its comes to rest by its anterior end and the cilia disappears as this stage. Then the cell divide into two of which lower cells form Hold-fast and upper cell divide again and again and give rise to new thallus of Oobogonium.



D. Liberation of Zoospores

E

Fig - Asexual Reproduction By Zoospore

⑥ By Akinetes → In dry condition some of the intercalary cells are incysted as thick cell wall known as Akinetes. According to white akinetes are form in chains (8-48). Akinetes have reserve food material in the form of starch and oil drops. In the return of favourable condition each akinetes germinate and forms a new thallus of Oedogonia.

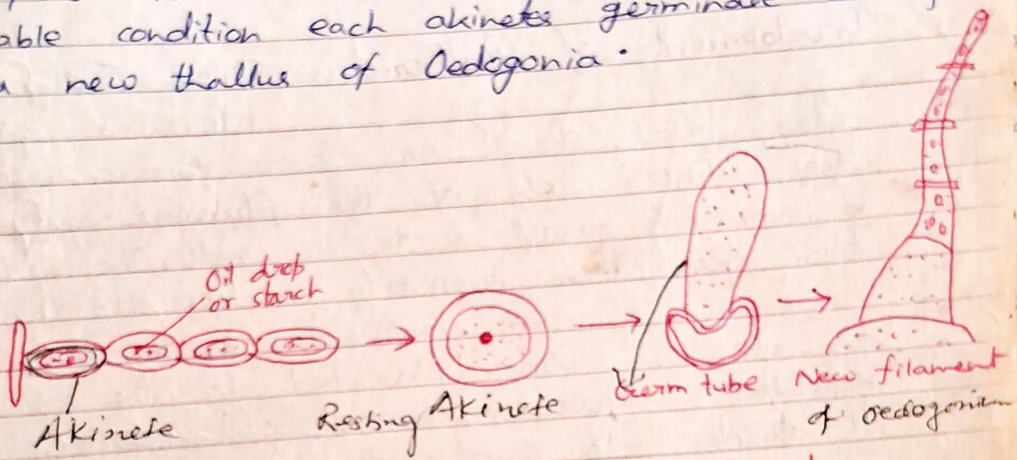


Fig - Asexual Reproduction by Akinete

3. Sexual Reproduction → It is Oogamous. There are two types of Oedogonium species due to their male reproductive organ. They are -

① Macrandrous form → Both the gametangia develop on the normal filament which is either dioecious or monoecious.

② Nanrandrous form → The Oogonia develops on the normal filament. But the Antheridia develop on the one called Nanrandrium or "dwarf male" are strictly dioecious.