



Oedogonium sp.

1. Write about the ecological distribution of *Oedogonium*.

Oedogonium (Gr. oedos, swelling; gonos, reproductive bodies) is an exclusively fresh water alga. Out of about 400 species more than 200 have been reported from India. They are very common in pools, ponds, lakes etc.

The filamentous plant body may get attached with the stone, wood, leaves of aquatic plants, small branches of dead plant remain in water etc. by their basal cell the holdfast. Some species like *O. terrestris* are terrestrial.

2. Describe the morphological structure of *Oedogonium*.

The thalloid plant body is green, multicellular and filamentous. The filaments are unbranched and cells of each filament are attached end to end and form uniseriate row. The filament is differentiated into 3 types of cells: 1. Basal cell, 2. Apical cell and 3. Middle cells.

Basal Cell:

It is the lowermost cell of the filament. The cell is long, gradually narrowed and towards the basal end it expands to form simple, disc-like, multilobed or finger-shaped structure. The cell is generally colourless, which performs the function of fixation to the substratum and called holdfast.

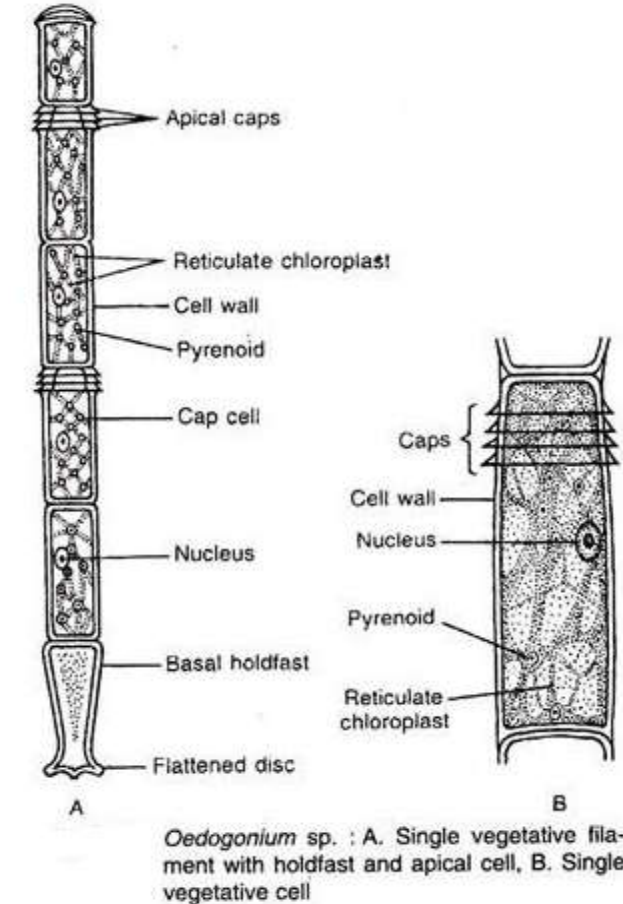
Apical Cell:

It is the topmost cell of the filament. The cell is usually rounded towards apical side and green in colour.

Middle Cells:

All the cells in between basal and apical cells are alike. The cells are longer than their breadth i.e., rectangular in shape. Towards the upper end of some cells a ring-like structure is present

known as cap or apical cap. The cell with cap is called cap cell. The number of caps on a cell indicates the number of cell divisions in that cell.



3. Write down the important features of *Oedogonium*.

1. This is a common fresh water alga growing on substratum like sand particles, rocks etc.
2. The plant body is unbranched, filamentous and differentiated into apex and base.
3. Cells have reticulate chloroplasts.
4. Presence of caps on the young dividing cells.



9. The male gametes i.e., antherozoids, are very much similar to zoospores but smaller in size.

Two antherozoids are produced in each antheridium.

10. Based on the size of male filament the plants are divided into two groups: Macrandrous and Nannandrous type.

11. In macrandrous type the antheridia develop into the filament of normal size. But in nannandrous type the antheridia develop on small and thin male filament, the dwarf male or nannandrium (remain attached with the oogonium wall or its lower cell, the supporting cell), develop on germination of andro- spore. The androspore forms singly in andro- sporangium, develop in the normal filament.

12. The androspores are smaller than zoospores (produced asexually), but larger than antherozoids.

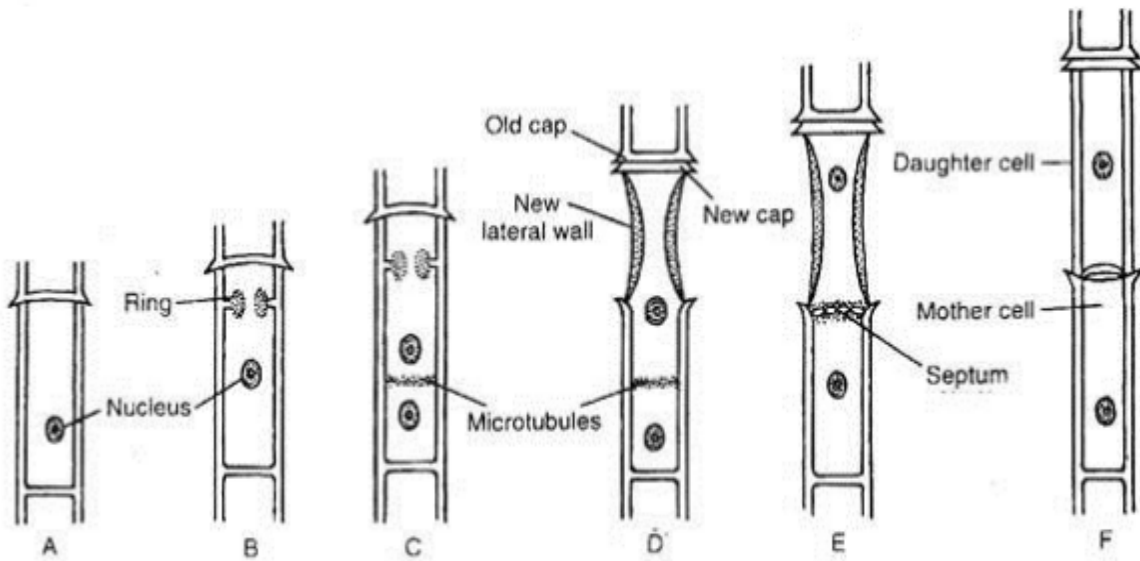
13. The zygote undergoes meiotic division and produces four zoospores. In dioecious species two produce male and other two produce female plants.

4. How cells are divided in Oedogonium?

Growth of the filament takes place through cell division. All cells except apical and basal ones are capable of dividing through cell division though division remains restricted in some of the cells of the filament.

The steps of cell division are:

1. Initially the nucleus becomes shifted from peripheral position towards the centre and then moves slightly towards the upper half of the cell.
2. Ring-like thickening develops towards the upper part of the cell wall which gradually increases in thickness.



Oedogonium sp. : A-F. Successive stages of cell division

3. The nucleus undergoes mitotic division and form two nuclei.
4. At the end of cell division (telophase), a row of microtubules develop and accumulate as a layer between the daughter nuclei. This layer remains in floating condition which will develop the future septum.
5. The ring-like thickening gradually elongates and splits the mother wall towards the apical region. The ring expands much more and forms a concave cylindrical structure. The ring material ultimately forms the cuticle of the upper daughter cell.



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6. The upper part of the ruptured mother wall remains attached to the anterior end of the new daughter cell as a cap i.e., the apical cap. The other part remains towards the basal region of the daughter cell.
7. The floating septum gradually goes up to the base of the future daughter cell i.e., at the top of the mother cell at the ruptured end and it becomes fixed. Later on it develops into mature cross wall.
8. New side wall develops between the cuticle and the plasmalemma of the upper cell. Thus the two cells are formed. It is evident that the cell with cap is the younger one which develops between the two old cells.

References:

1. <https://www.biologydiscussion.com/algae/oedogonium-occurrence-features-and-reproduction/46929>
2. Hait G, Bhattacharya K, Ghosh A k. A Textbook of Botany (vol.1). New Central Book Agency (P) Ltd. 2017; ISBN:81-7381-547-x

(All the information is collected from above references and will be used only for teaching and learning purposes)