

OEDOGONIUM

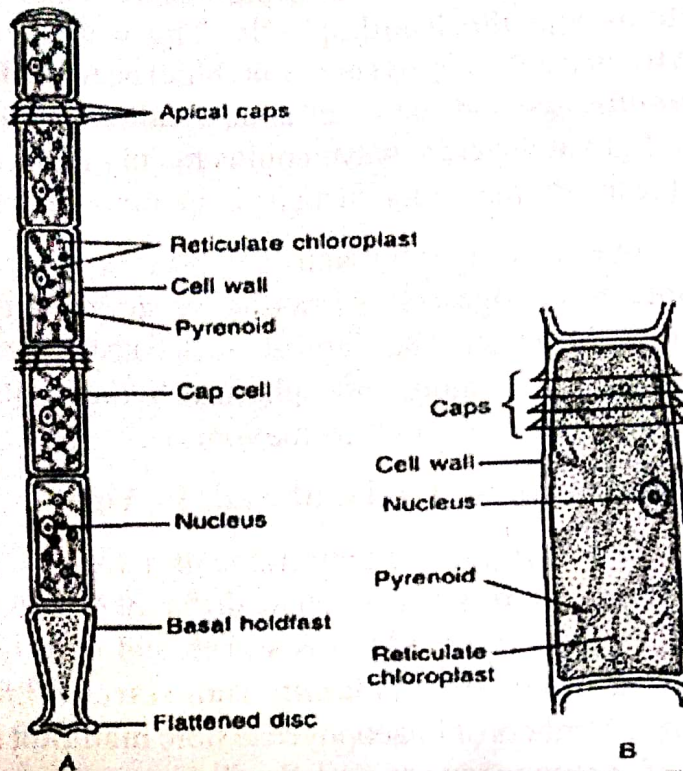


Fig. 3.72 : *Oedogonium* sp. : A. Single vegetative filament with holdfast and apical cell. B. Single vegetative cell

Class – Chlorophyceae

Order - Oedogoniales

Family -Oedogoniaceae

Genus – *Oedogonium*

*Oedogonium* is a freshwater , filamentous alga and occurs in ponds, lakes and stagnant water. The filaments are attached to rocks. Some are epiphytic on aquatic plants. *Oedogonium terrestre* is a terrestrial form and grow in moist soils. The young filaments are attached but older ones are free floating.

### Thallus structure

The thallus is filamentous, multicellular and unbranched. All the cells of the filament are cylindrical except the basal and apical cell. The basal cell is colourless and forms hold fast. The proximal end of the hold fast extends to produce finger like projections which help the filament to attach on the substratum. The apical cell is rounded or elongated in shape. Each vegetative cell is cylindrical and possesses a thick cell wall. The inner layer is cellulosic and the outer layer is made up of pectin. A thin layer of chitin is present above the pectin layer. Next to the cell wall a plasma membrane is present. A large vacuole is present. The protoplasm contains reticulate chloroplast and it extends from one end of the cell to the other. A single nucleus and many pyrenoids are present. The distal end of some cells possess ring like markings called apical caps. Such cells are called cap cells. The presence of cap cell is characteristic feature of *Oedogonium*

### REPRODUCTION

*Oedogonium* reproduces by vegetative, asexual and sexual methods. Vegetative reproduction takes place by fragmentation and akinete formation. During asexual reproduction zoospores are formed. During favourable conditions, some of the vegetative cells function as zoosporangia. Usually a single zoospore is produced per zoosporangium. A ring of short flagella is found at the base of colourless, beak like anterior end of the zoospore. This kind of flagellation is called stephanokont. The zoospore is released from the zoosporangium and swims in water (Figure 2.6). If it reaches a suitable substratum, it divides into two cells. The lower cell forms holdfast. The green upper cell divides and produces the filament.

Sexual reproduction is Oogamous. The male gametangium is antheridium and female gametangium is called Oogonium. Based on the

distribution of sex organs there are two types of species namely Macrandrous and Nannandrous.

Macrandrous monoecious – Antheridia and Oogonia occur on same filament – *Oedogonium fragile*.

Macrandrous dioecious – Antheridia and Oogonia occur on separate filaments – *Oedogonium crassum*

In nannandrous species antheridia are produced on reduced male filaments called dwarf male plants(*O. concatenatum*).

In nannandrous species antheridia develop on specialised 2–4 celled filaments called dwarf males. The dwarf male is developed from androspores released from the androsporangium.. If the androsporangia and oogonia develop on same filament, it is called **gynandrosporous** (*O. concatenatum* ). If they are borne on different filaments it is called **idioandrosporous** (*O. conferatum*). The antheridium produces multiflagellate antherozoids. They are released by transverse splitting of the wall of antheridium. Antherozoids are attracted chemotactically towards the mature oogonium. A single antherozoid enters the oogonium through the opening present on the wall of the oogonium. The male nucleus fuses with the egg to form a diploid zygote. After fertilization the zygote separates from the oogonial wall and a thick wall is secreted around it. The diploid zygote undergoes meiosis to produce 4 haploid multiflagellate zoospores. The wall of the zygote ruptures to release the zoospores. The germination of the zoospore produces haploid filaments of *Oedogonium*