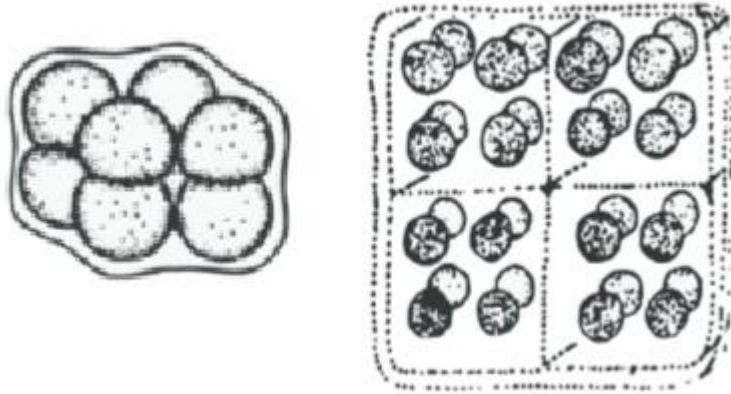
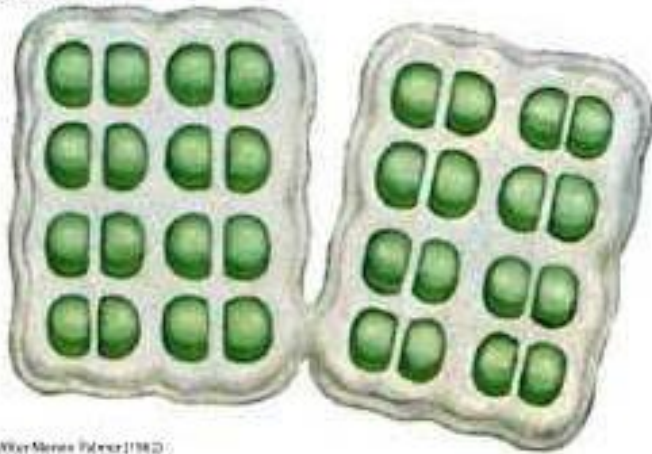
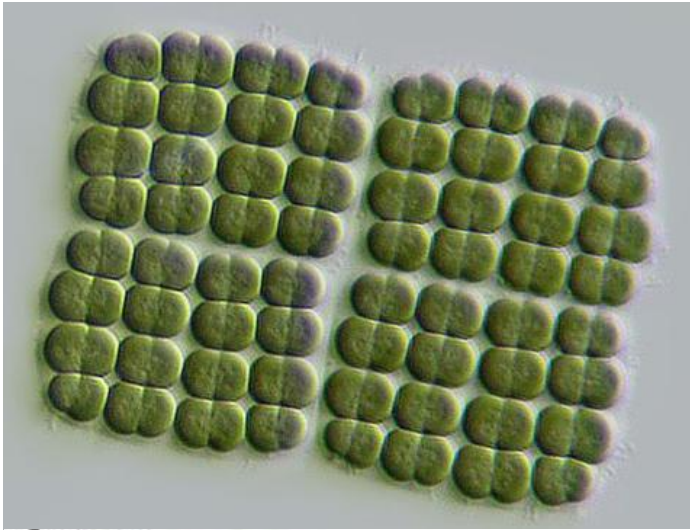


### **Cubical Colony – *Eucapsis* Sp.**



- Colonies are microscopic, mucilaginous, free-living and more or less cubic in form.
- Sometimes, It composed of subcolonies with cells arranged three-dimensionally (cube-like).
- Mucilage is colourless, hyaline, and usually diffuses at the margin.
- Cells are spherical or slightly oval, pale or bright blue-green or olive green,
- Cell division occurs regularly in three perpendicular planes in successive generations. Reproduction occurs by disintegration of colonies.

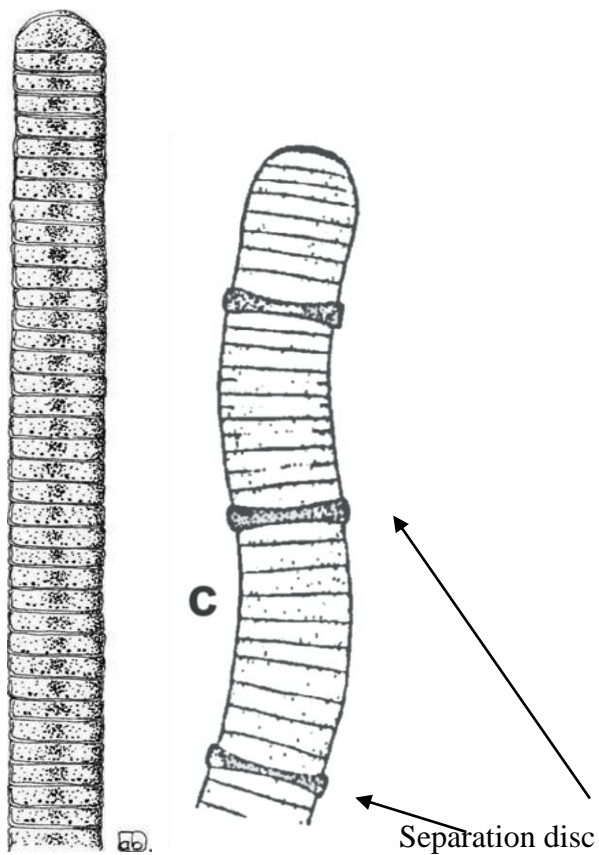
### Tabloid colony - *Merismopedia* Sp.



Walter Meyers (Palmer 1982)

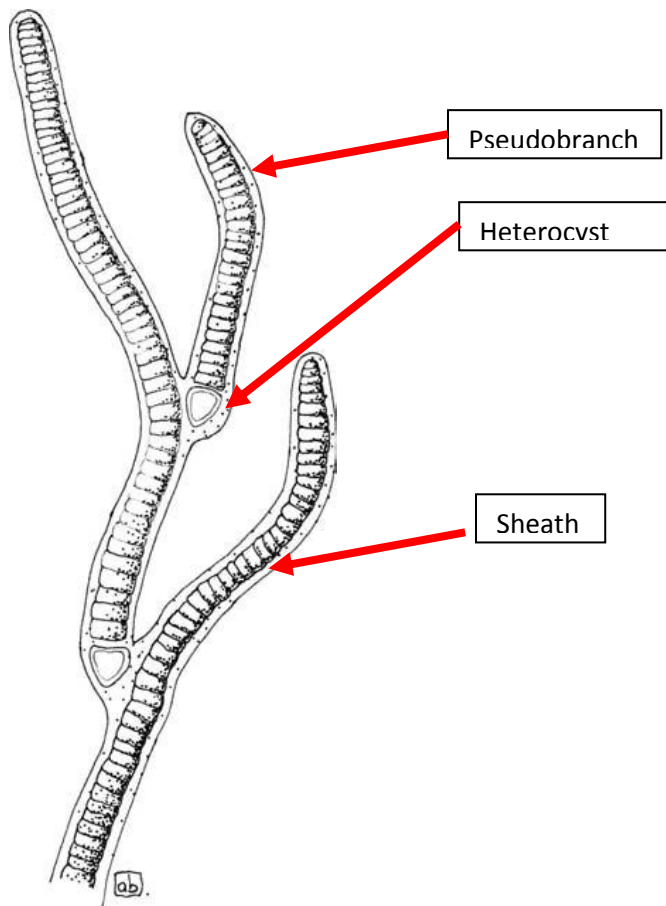
- Colonies are flattened, plate-like, flat or slightly wavy.
- Colony with single layer of cells, arranged loosely or densely in perpendicular rows.
- It is enveloped by fine, colourless, usually indistinct and marginally diffuse mucilage.
- Cells are spherical or widely oval, pale or bright blue-green in colour (rarely reddish).
- Cell shows binary fission occurring regularly in two perpendicular planes, perpendicular also to the plane of colony.
- Reproduction occurs by fragmentation of colonies.

## Uniseriate Trichome - *Oscillatoria* sp.



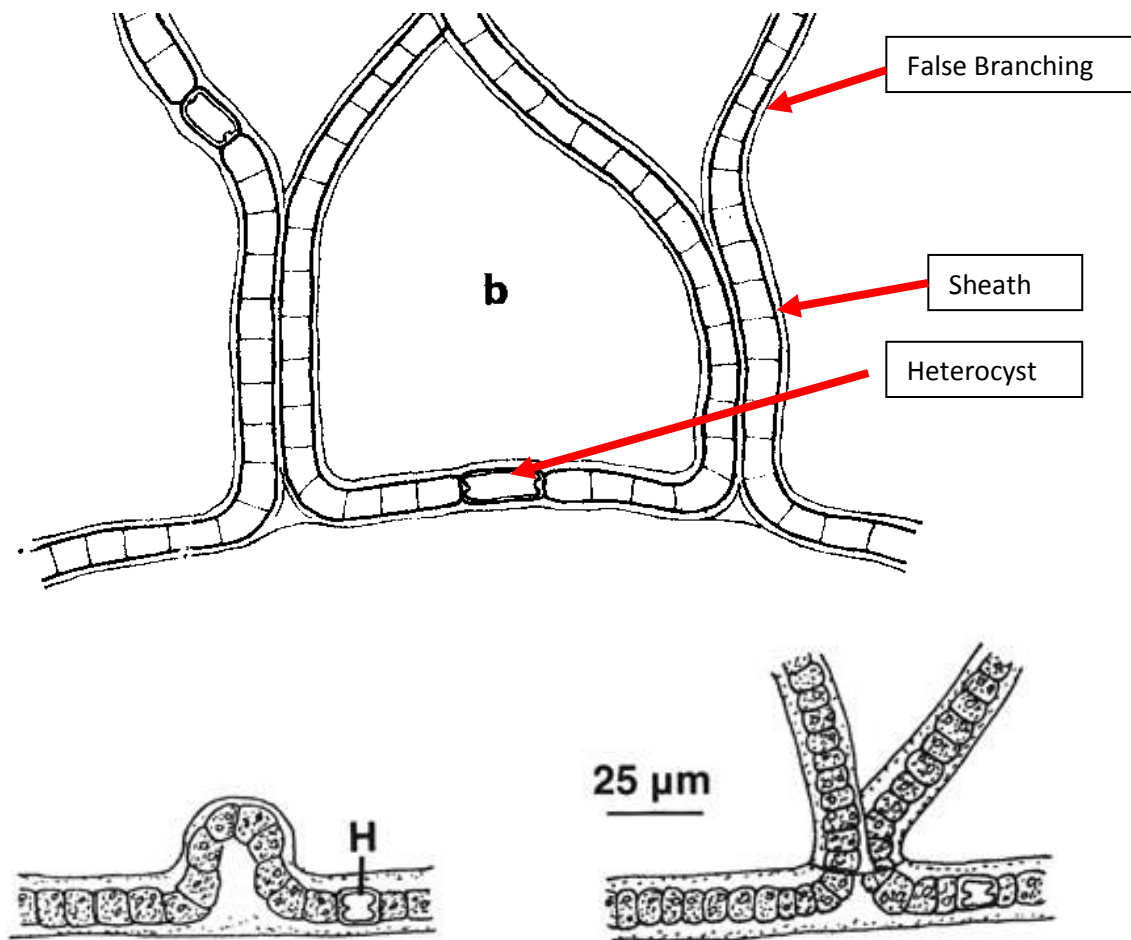
- The thallus is usually flat, macroscopic, smooth, layered, arranged in mats.
- Trichomes are straight or slightly irregularly undulating, cylindrical, coiled at the ends.
- Trichome without sheath and it is motile, gliding or oscillating.
- Cells are short and discoid, division occurs in rapid sequence perpendicular to the trichome axis.
- Reproduction occurs via fragmentations, short motile hormogonia.

## Pseudobranch filaments- *Tolypothrix* Sp.



- Thalli form woolly mats or tufts colonies, greyish blue-green to dark brownish in colour.
- Young filaments are heteropolar with basal heterocytes and free apical ends.
- Trichomes are uniseriate, with false branching beginning next to the heterocyst.
- Cells are long cylindrical to short barrel-shaped, blue-green, olive green.
- Heterocytes are spherical or cylindrical with one or two pores, situated intercalary, originally singly or in pairs, often at the base of branches.
- Reproduction occurs via hormogonia that separate from the filament ends or from a disintegrating part of a filament.

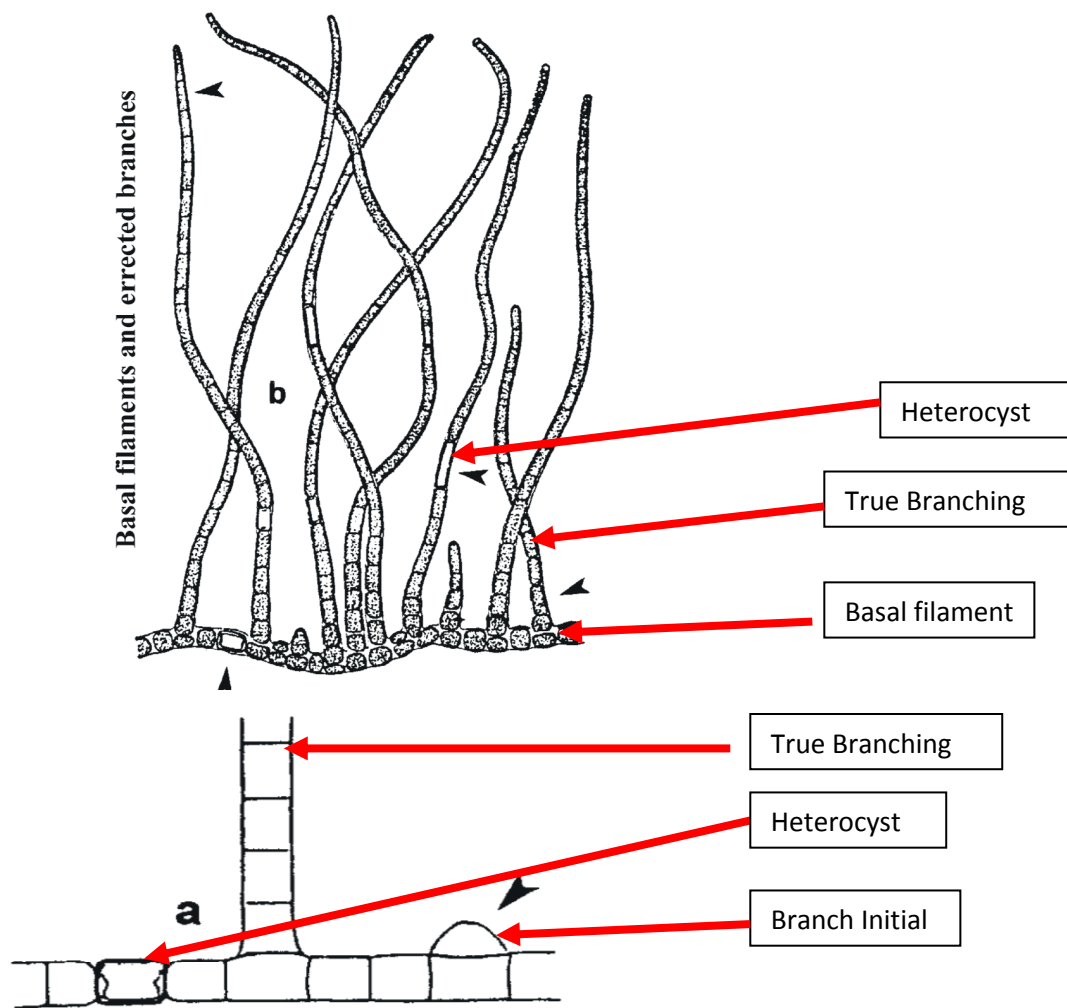
*Pseudobranching filaments - Scytonema sp.*



**Formation of Pseudo branching by Loop formation**

- Thalli uniseriate, occur as woolly mats or irregular clusters, yellow to brownish in colour.
- Filaments are free floating or in fascicles, curved, sometimes densely coiled.
- Sheaths are firm, lamellate, or without visible structure, sometimes wide, often yellow-brown in colour due to the presence of scytonemin (Pigment).
- Trichomes are isopolar, cylindrical, at their terminal parts cylindrical or sometimes widened, constricted or unconstructed at the cross walls.
- Cells cylindrical to barrel-shaped sometimes elongated in the central part of the trichome; apical cells are rounded. Heterocysts are solitary and intercalary.
- False branching results either when a cell dies or separation discs or loop formation. The filament divides rapidly in one part and a loop is formed which breaks through the sheath. This then breaks in the middle and two false branches are formed.
- Reproduction occurs via hormogonia released at both ends of the trichomes.

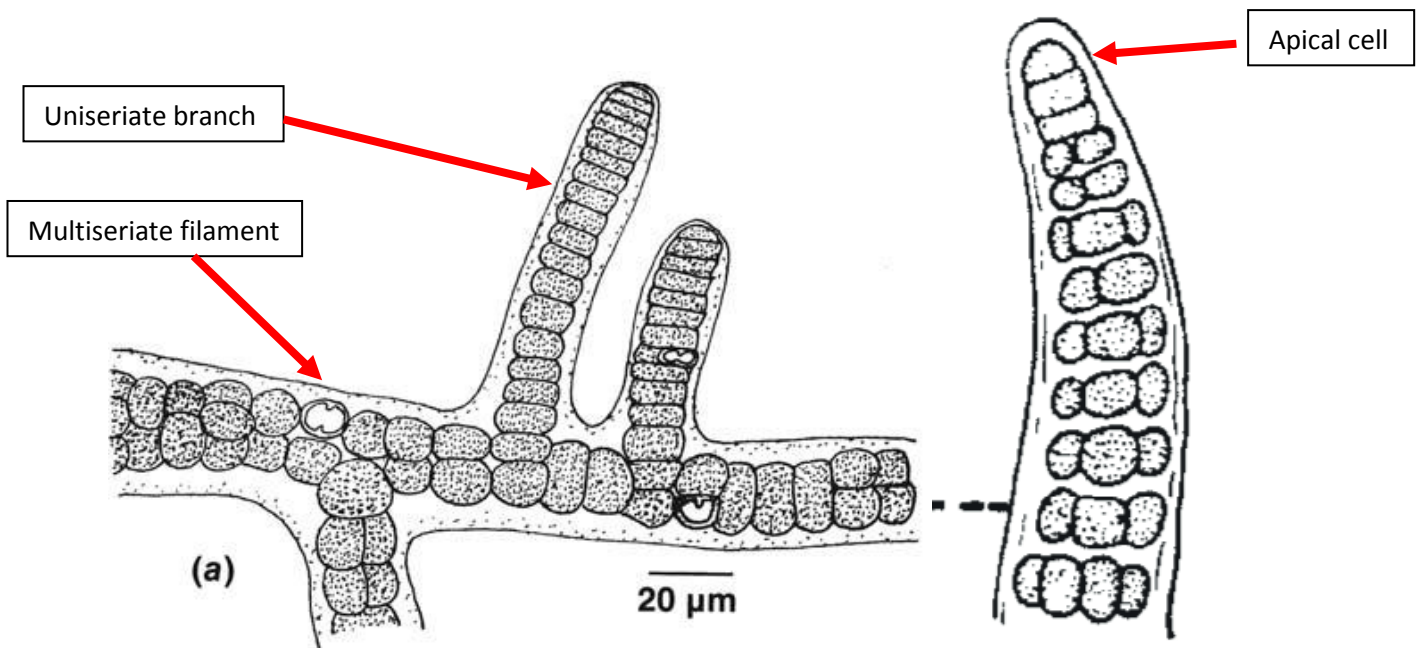
## Simple True branched filament - *Hapalosiphon* Sp.



### Formation of true branching

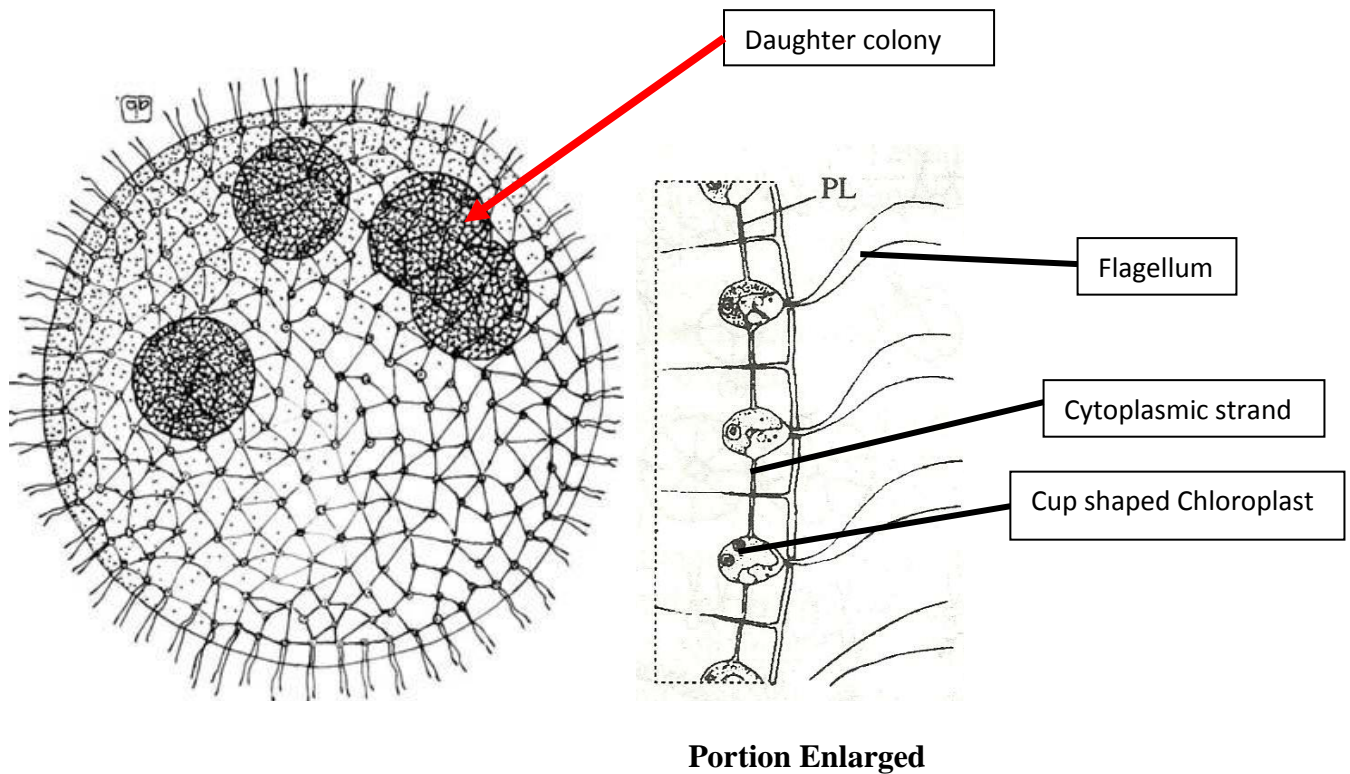
- Thallus is filamentous, composed of free, coiled filamentous clusters, initially attached to the substratum, later free floating.
- Filaments are irregularly curved with uniseriate trichomes.
- True branching is usually lateral (T-type), with no morphological differentiation in the main and lateral trichomes.
- Sheaths are colorless, thin, firm, rarely indistinctly lamellated.
- Cells are dividing horizontally and heterocysts are intercalary in position.
- Reproduction occurs via hormogonia separated by necridic cells.

## True branched multiseriate filaments - *Stigonema* Sp.



- Thallus is multiseriate filamentous, woolly or crusty, usually attached to substratum and it composed of free, coiled, true-branched filaments.
- Sheaths are thin or thick, lamellated, and usually yellowish brown in colour.
- Branches are thick, irregularly lateral, narrowed toward the ends, but with the apical cells often larger than others.
- Cells are barrel-shaped or irregularly rounded, usually connected by one pore (pit connections) with one another
- Heterocytes are intercalary, solitary, and occasionally lateral.
- Cell division occurs in all planes; horizontal (crosswise) fission is most common. The meristematic zones are present only in sections where hormogonia arise.
- Reproduction occurs via hormogonia, it is uniseriate, usually more cylindrical and consisting of two to many cells.

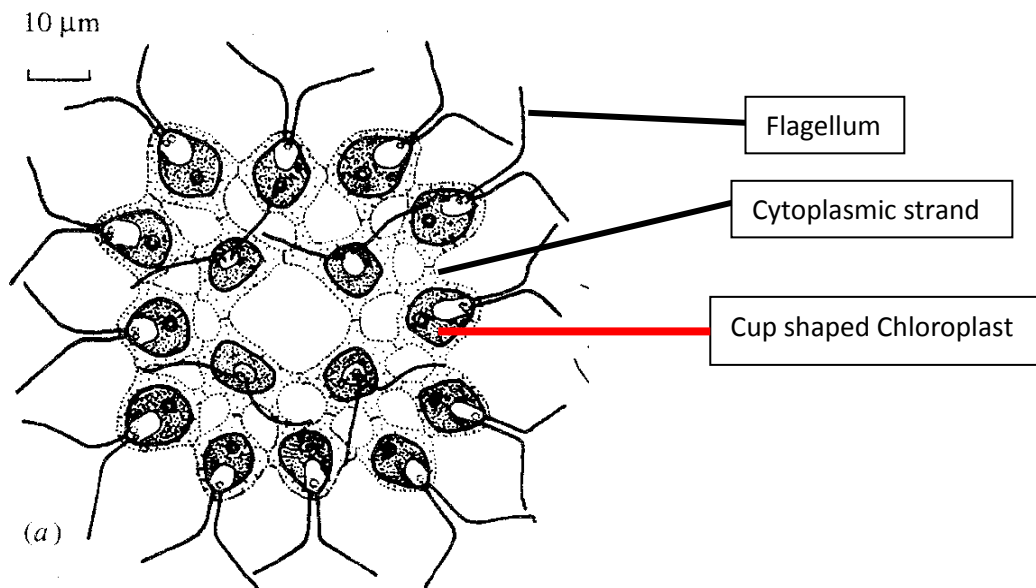
## Motile Coenobium - *Volvox Sp.*



- Colonies are spherical, subspherical or ovoid, containing 500-50,000 cells.
- The parental colony is with daughter or sometimes with grand-daughter colonies.
- Cells are arranged radially at the periphery of a gelatinous matrix, forming a hollow colony.
- Somatic cells are spherical, ovoid, or star-shaped, each with two equal flagella, a cup-shaped chloroplast with a single pyrenoid.
- Cells are connected by thick or thin cytoplasmic strands.
- Asexual reproduction is by means of gonidia (approximately 50 large reproductive cells) cells, which is situated in posterior region of a colony.
- Sexual reproduction is oogamous.
- Monoecious species the sexual colony has both sperm packets and eggs.
- In dioecious species, the male colony contains androgonidia, which divide successively into sperm packets.
- The female colony has eggs, whose number is nearly the same as that of gonidia.
- After fertilization zygotes develop a heavy cell wall that may be ornamented with reticulation or spines.

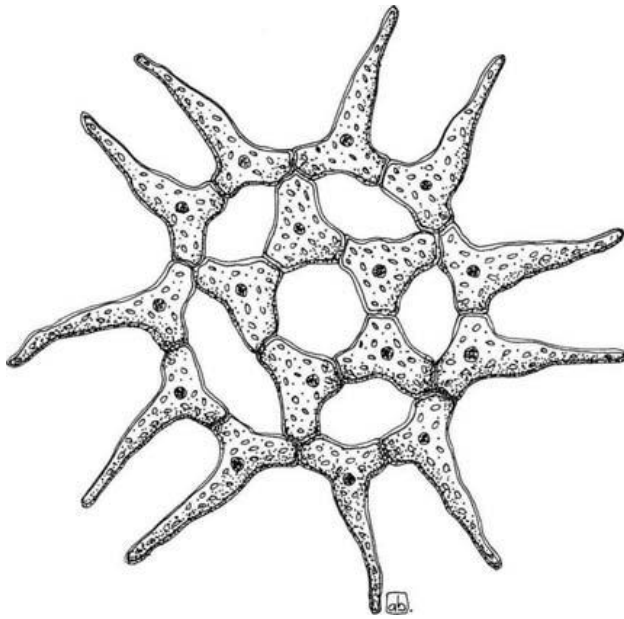


## Motile Coenobium - *Gonium* Sp.



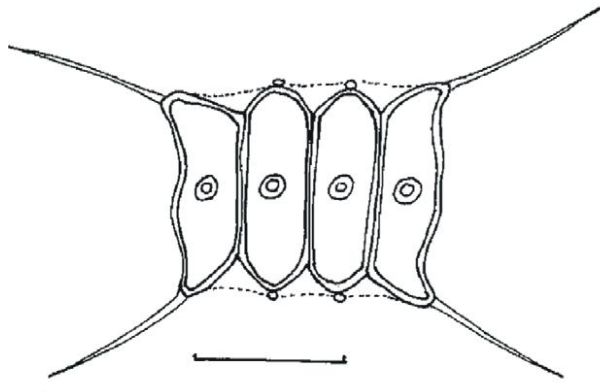
- Colonies are flattened, containing eight, 16, or 32 cells arranged in one layer.
- Cells are ovoid to angular, each with two equal flagella, a stigma and two contractile vacuoles at the base of the flagella.
- Cells show a massive cup-shaped chloroplast with one or multiple pyrenoids.
- Cells attach or connect to one another by the union or attachment of the sheaths, thus forming a colony.
- Sexual reproduction is isogamous, forming hypnozygotes with smooth wall.
- A germinating zygote produces four biflagellate gone cells that are joined in a colony (germ colony).

**Non-motile Coenobium - *Pediastrum* sp.**



- Colony free floating, circular, single plate-like layer of cells, colony contiguous or colony perforate.
- Peripheral cells show one to two lobes or processes or the margin without processes.
- Cell walls smooth or variously ornamented, Chloroplast parietal with single pyrenoid.
- Asexual reproduction by biflagellate zoospores or auto spores formation.
- Sexual reproduction carried out by isogametes.

**Non-motile Coenobium - *Scenedesmus* sp.**



- Colony flattened and consists of 2 to 4 to 8 to 16 to (32) celled.
- Cells arranged in parallel, laterally adjoined, or in single linear or alternating series.
- Shapes of the cells are ellipsoidal, ovoid, or crescent or tapering towards each end.
- Cell wall is smooth or with short bristle; spines present or absent.
- Cell shows single parietal chloroplast and usually with one pyrenoid.
- It is reproducing through the production of autocolonies.