Volvox

Q Life history of volvox ?

Ans → Volvox is a simple green motile coenobial alga which belongs to

class — chlorophyceae

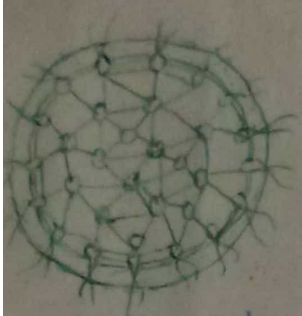
Order — Volvocales

family — Volvocaceae

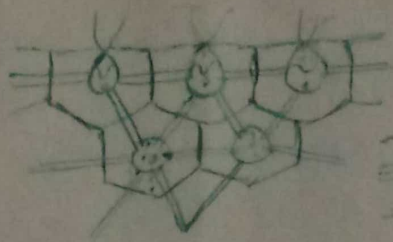
It occurs as minute green balls just as the size of a small pin head in both temporary and permanent fresh water or ponds or pools. The common indian spp are V. africanus, V. globator V. merilli, V. prolificuus and V. rosselet.

Form and structure :—

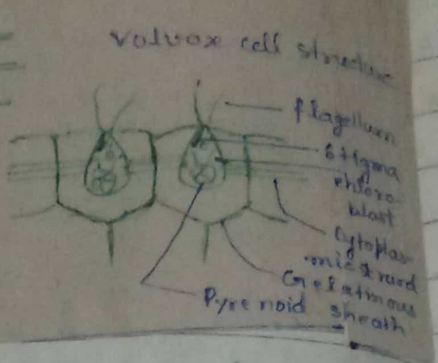
The hollow spherical colony of volvox consists of nearly 500 - 60,000 cells. The colony has a sharply marked form bounding layer of mucilage. Each cell has its own gelatinous sheath. All the cells of the colony are interconnected by means of protoplasmic thread. The cell is of chlamydomonas type. It has a stellate, laminite or pyriform single chloroplast. There is one or many pyrenoids, a single nucleus, two or more contractile vacuoles, two flagella arising from two basal granules and single red eye spot. The whole colony moves by the combined action of all the flagella. Thus volvox is not an individual but an accumulation of a number of independent cell.



Volvox colony



Enlarged peripheral cell.



Reproduction :- It is of two types.

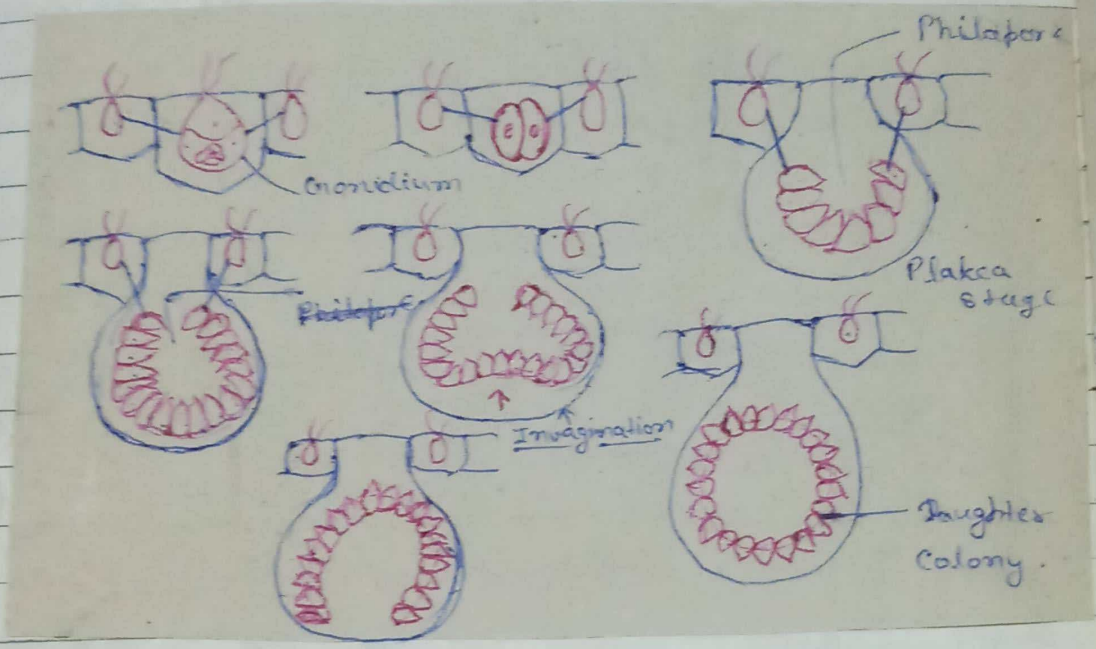
(1) Asexual reproduction (2) Sexual reproduction

Asexual reproduction :- It takes place during favourable condition a few cells in the posterior half of the coenobium withdraw their flagella, increase in size and becomes more or less rounded in form. These special reproductive cell are called gonidia which divides and reduvide to form a daughter colony within the parent cell.

Development of daughter colony :-

Any cell in larges and function as goniolium. Each gonidium divides and redivides longitudinally. The eight cell plakea stage where as in the 16 celled stage, it takes of the shape of hollow sphere and is also provided with small opening called philapore at the anterior end. The division of the cell continue At the end of the division stage, all the cells are naked and in contact with one another the anterior end of each is directed forwards the centre. It turns in side out by invagination through the phialapor

The ends of the phialopore ~~The ends of the~~ finely meet, now flagella develops after inversion the cells begin to separate from each other by the development of mucilagenous cell wall. The parent colony ruptures and the daughter colony is liberated to the outside and lead an independent life.



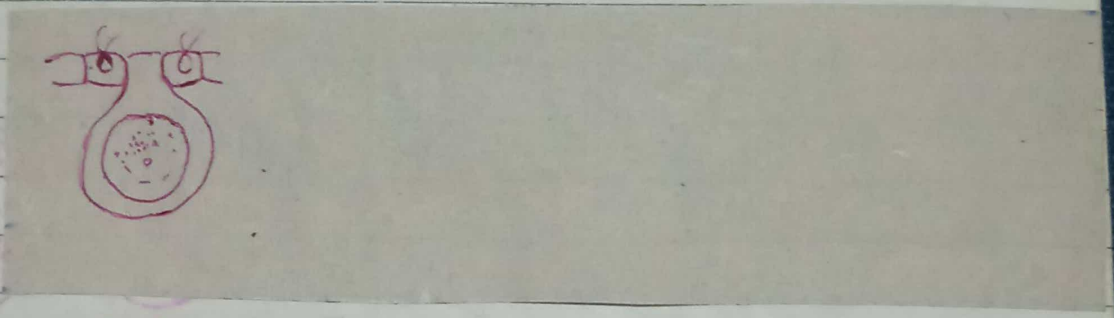
Sexual reproduction :-

It is oogamous and it takes place towards the end of the favourable condition. It may be dioecious or monoecious. Monoecious spp are protandrous. A few cells withdraw their flagella round off and enlarge to become gametangia in the posterior region of the mature colony. The male gametangia are called the antheridium and female oogonia.

Antheridia :-

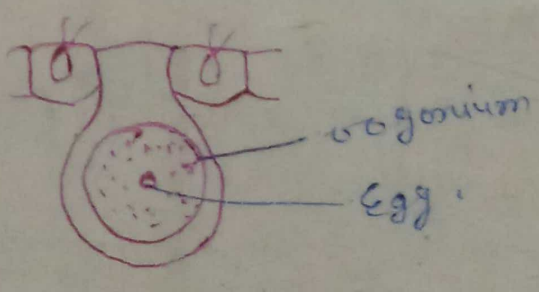
The cell developing into the antheridium enlarge retracts its flagella

and pushes back into the colony their contents divide and redivide to form usually 64-128 small yellowish conical motile spermatozoids. They are arranged in the form of a plate. Each sperm is a biflagellate conical or funiform elongated structure. The flagella may be inserted apically or sub-apically at the anterior end. The sperms are liberated by the rupture of antheridial wall. They swim for sometime.



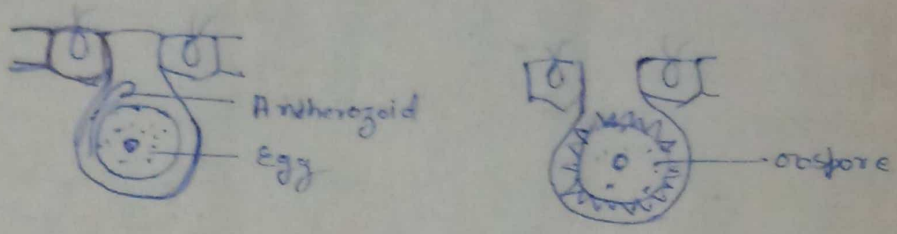
Oogonia :-

Any vegetative cell may enlarge in size and withdraws its flagella. These enlarged cell with protoplast in the middle becomes an oogonium. The contents of oogenium does not divide. It is uninucleate green flask shaped with beak like protusion nonmotile gamete. The beak like protusion which probably marks the point of entry of sperm.



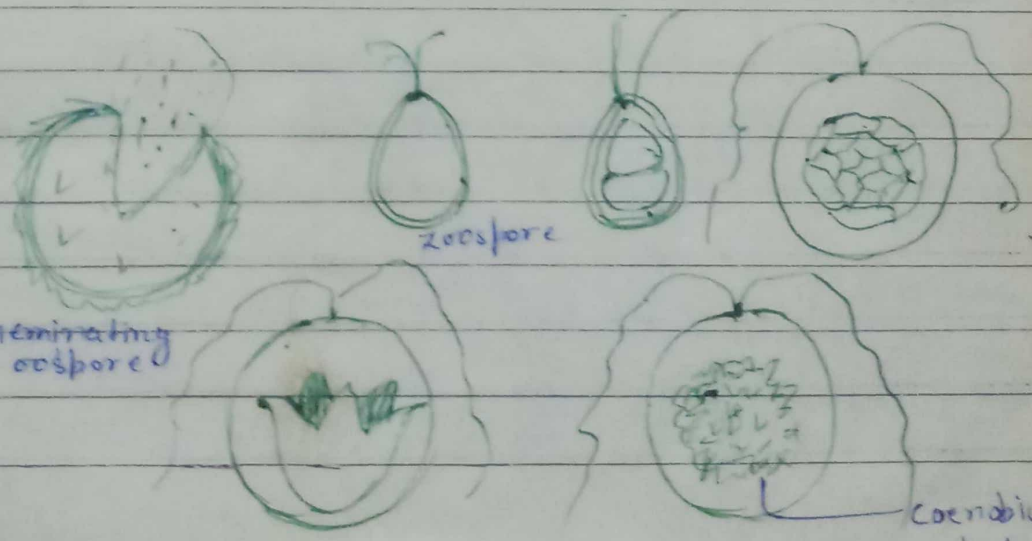
Fertilization :-

The antherozoid swim to egg enter through gelatinous sheath and finally fertilization is accomplished. The resulting zygote develops a thick often stellate wall and undergoes a resting period.



Fertilization

Germination of zygote :- On the approach of favourable condition the zygote divides by meiosis to develop 4 haploid daughter nuclei. In V. rousseletii, only one nucleus remains functional and develops into a large biflagellate microspore which forms a new colony. In V. aureus and V. minor the haploid protoplast surrounded by the inner layer develops directly into a colony like asexual reproduction.



Graphic life cycle :-