

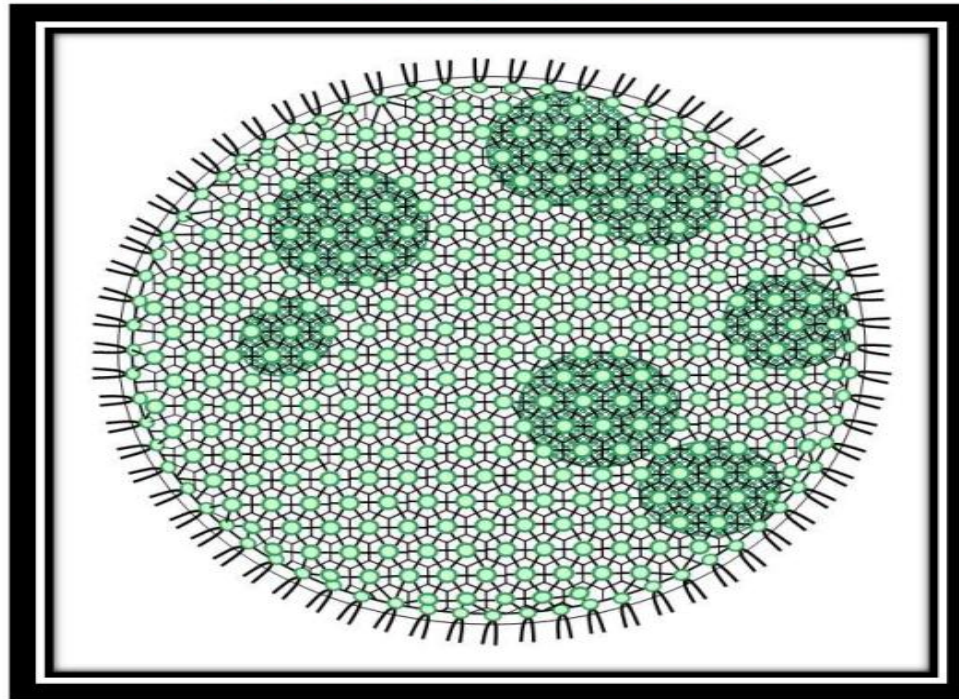


Bhagalpur National College, Bhagalpur

(A Constituent unit of Tilka Manjhi Bhagalpur University, Bhagalpur)

PPT Presentation for B.Sc. I- Life Cycle of Volvox

volvox



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SYSTEMATIC POSITION

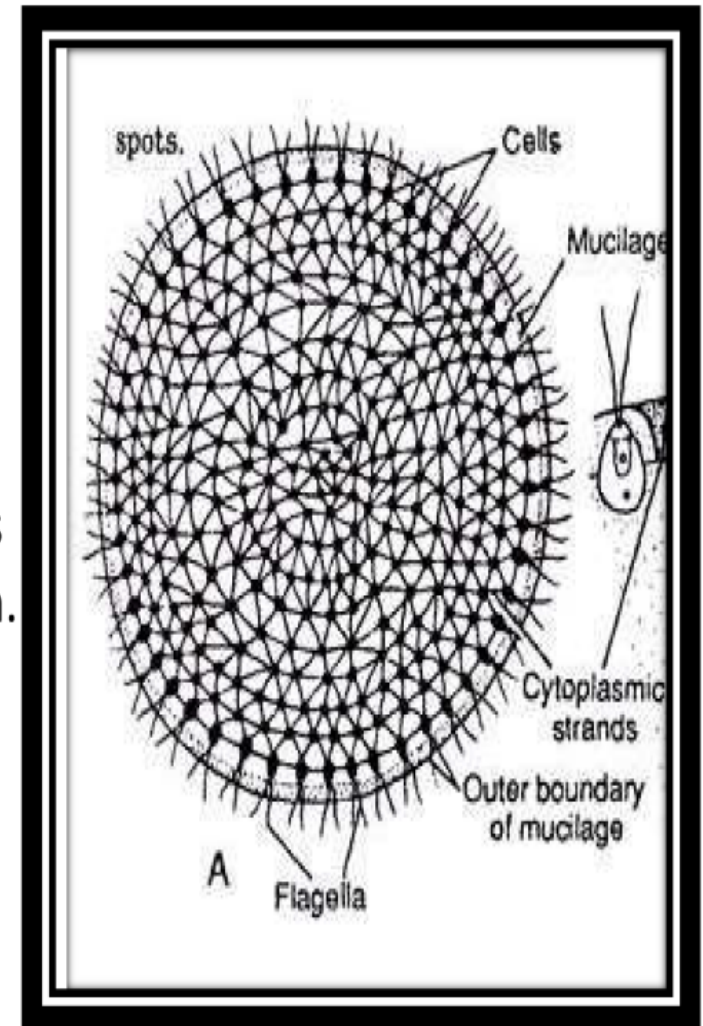
- Kingdom : Plantae
- Division : Chlorophyta
- Class : Chlorophyceae
- Order : Volvocales
- Family : Volvocaceae
- Genus : Volvox

HABITAT

- Include about 20 species.
- All are aquatic and free floating.
- They mostly occur in fresh water bodies.
- It form a beautiful green coloured phytoplankton on the surface of water body.
- It occur as green rolling balls of pin head sized coenobia.

Vegetative structure

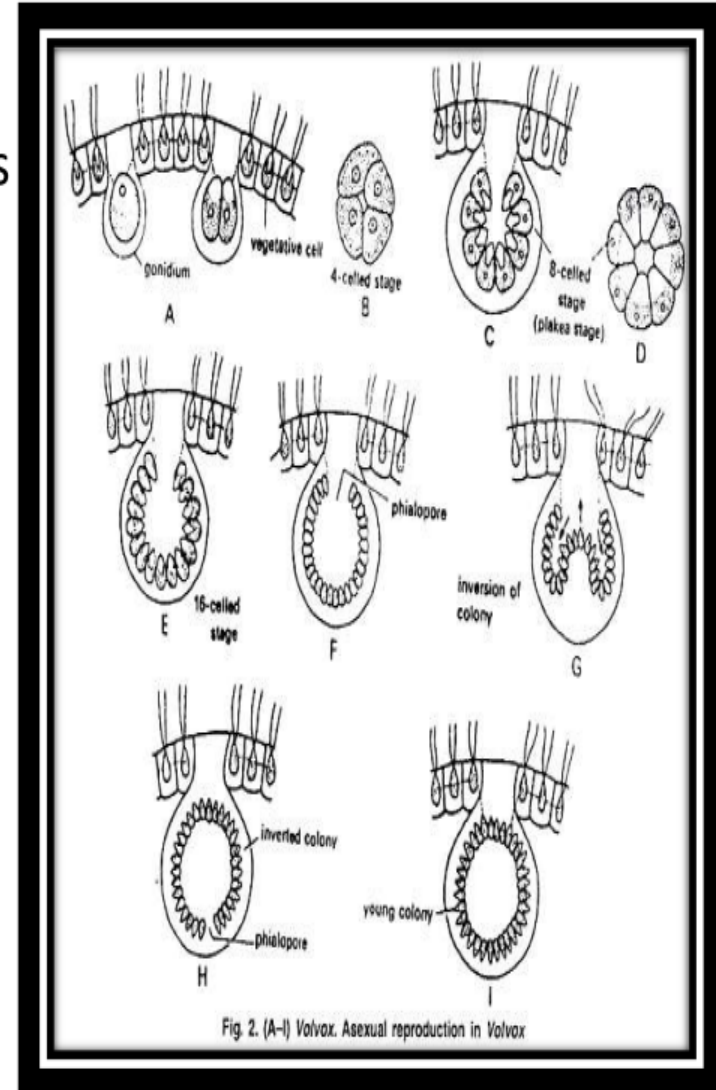
- Plant body a **multicellular** motile coenobium.
- The **coenobia** of *Volvox* are **spherical**, **oval** or **ellipsoidal** in shape.
- Each cell is **biflagellate** and the alga rolls over the surface of water by the joint action of flagella. The **coenobium** of *Volvox* is an assemblage of similar and independent cells. Each cell perform its own function of nutrition, respiration and excretion.
- Each cell has its own **gelatinous sheath**. It is connected with the sheath of other cells by a series of cytoplasmic Strands called **plasmodesmata**.



Reproduction

ASEXUAL REPRODUCTION

- Occurs during **growing season** at maturity, few cells in **posterior half** are pushed back into **hollow cavity**.
- Cells withdraw their **flagella**, **increase in size**, become **round** shaped.
- These **reproductive** cells are called **gonidia**.
- The **protoplasm** of each **gonodium** divides by successive longitudinal division and forms **daughter coenobium**.
- Sometimes, **young coenobia** are formed inside the young daughter coenobia, called **grand daughter colonies**.



Sexual Reproduction

oogamous type

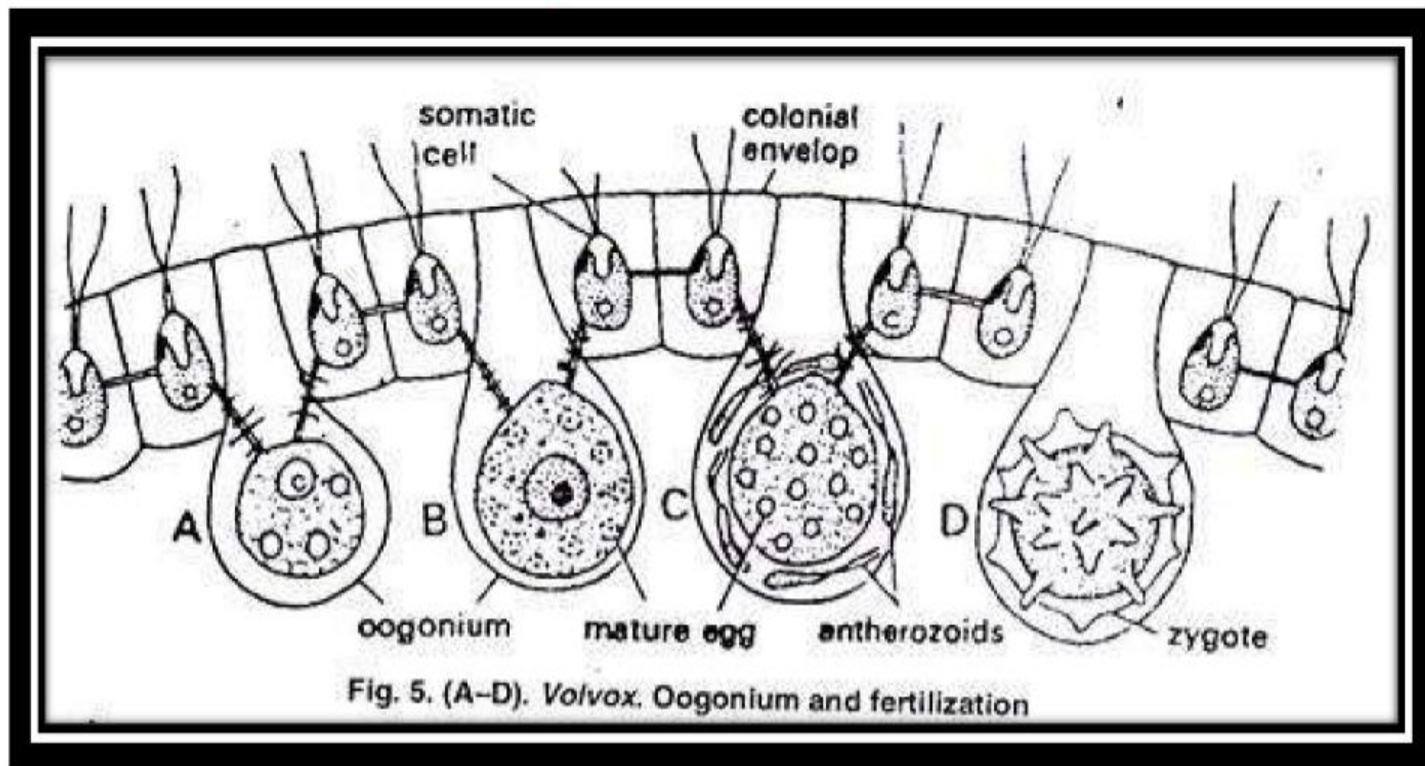
- Male sex organ : Antheridia (androgonia).
- Female sex organ : Oogonia (gynogonidia).
- Some species are monoecious and some are dioecious.
- Some cells at posterior half of coenobium retract flagella, enlarge and become gametangia.
- Male gametangium give rise to antheridium and female gametangium to oogonium.

Antheridia and oogonia

- Each **antherozoid** is **uninucleate**, **biflagellate** and possesses a small **chloroplast**.
- The mass of **antherozoid** (spermatozoids) is released at maturity.
- The **protoplasm** of **female gametangium** does not divide, but **metamorphosed** into **single**, **non flagellated** green spherical **egg** or **oosphere**.
- The **female gametangium** is now called **oogonium**.

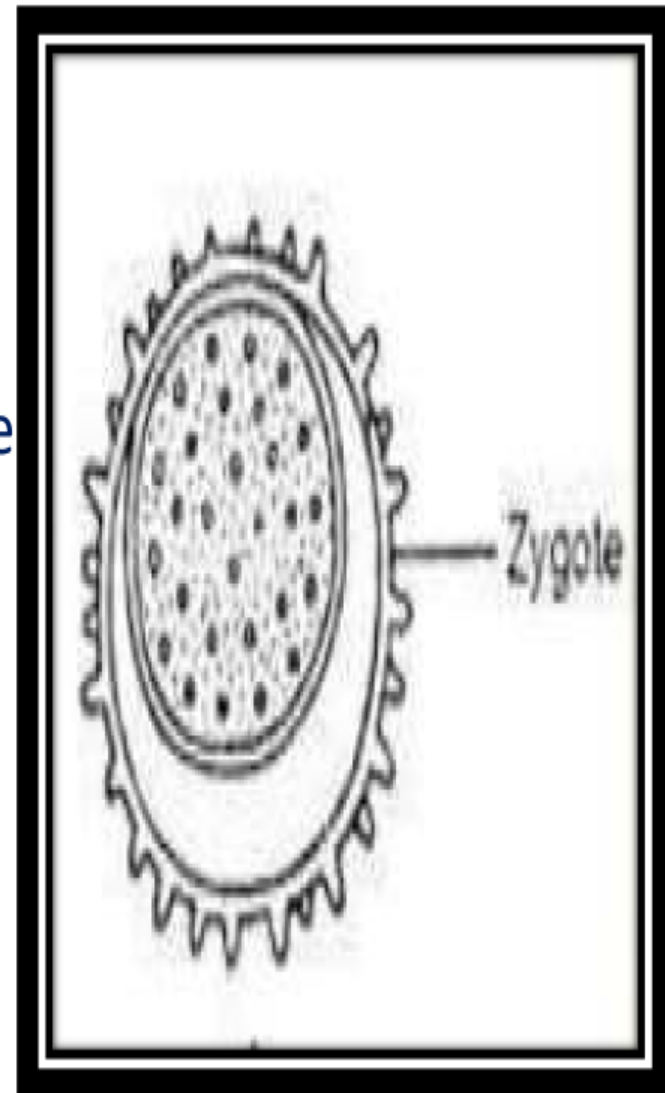
fertilization

- The **antherozoid** are attracted **chemotactically** towards **oogonium**.
- Only one **antherozoid** fuses with the **egg** from the side and the egg now become **zygote**.



zygote

- Zygote secretes its own **cell wall**. It is three layered- **exospore** ,**mesospore** and **endospore**.
- The zygote remain embedded inside the **oogonium** and tides over the **unfavorable condition**.
- Finally the **parent colony** decays and the **zygote** divides by **meiosis**.
- Prior to germination ,the diploid nucleus of zygote divides by meiosis.
- Zygote **protoplasm metamorphoses** into a **zoospore**.
- Zygote divides to form a hollow sphere of cells and produces a **young coenobium**.



LIFE CYCLE OF *VOLVOX*

- Volvox* is haploid (n) algae, the haploid gametes fertilize to make diploid zygote ($2n$) which divides by meiosis to make haploid cells (n) which mature into haploid *volvox* colony.

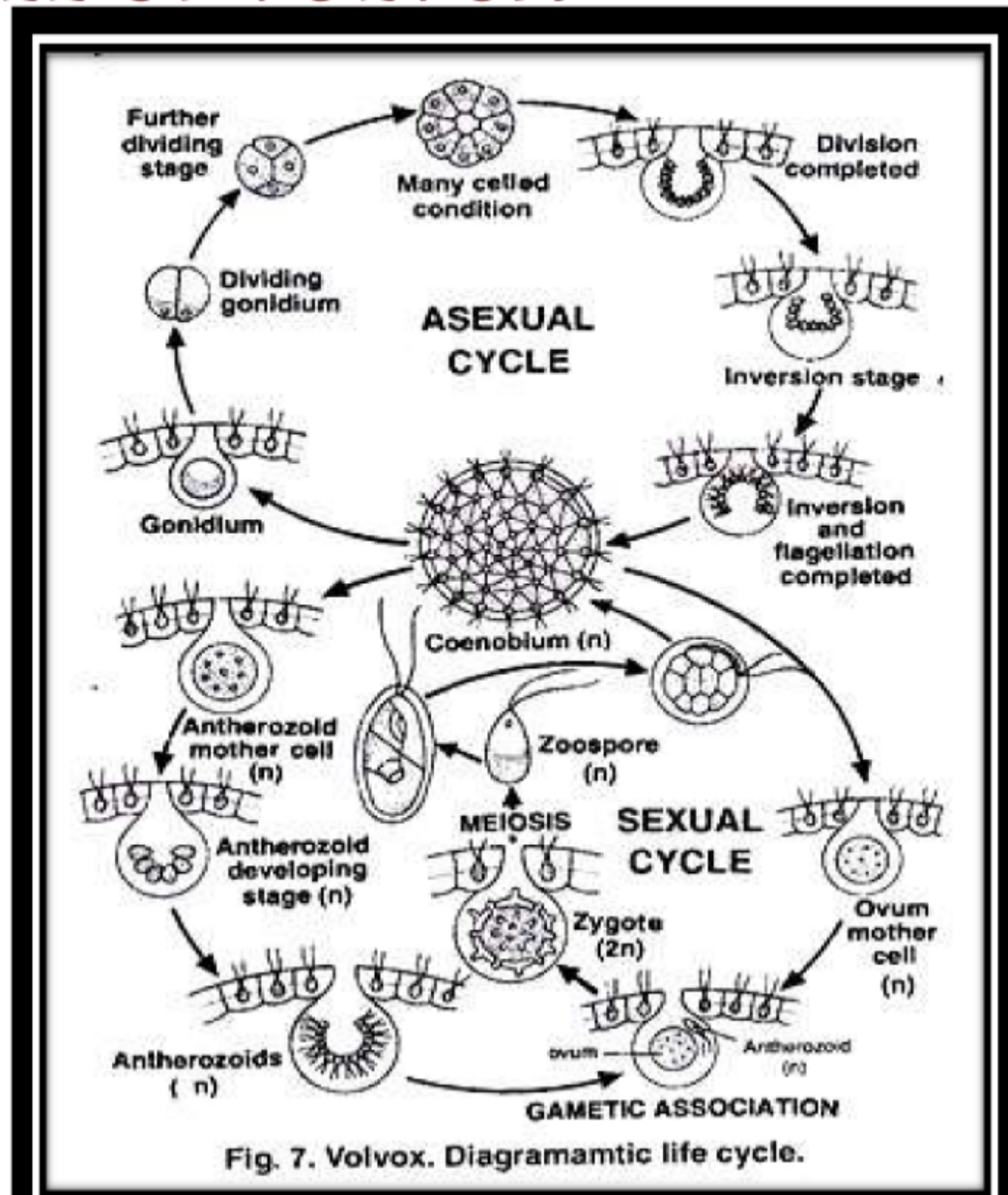


Fig. 7. *Volvox*. Diagrammatic life cycle.

THANX

