

B.Sc. (H), Zoology
Part - 1
Paper - 1st
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Dr. Prabhakar Ranjan
Apna 200
Rajasthan -
Cotia plival

Classification Paramecium caudatum

Phylum — Protozoa
Subphylum — Ciliophora
Class — Ciliata
Subclass — Holotrichia
Order — Hymenostomatida
Genus — Paramecium
Species — caudatum

- Its generic name Paramecium has been derived from Greek word - Paramekes = "oblong" and specific name - caudatum is due to tail like, long posterior Cilia or Caudal tuft of long Cilia.
- Paramecium is commonly known as "Slipper animalcule" because it was named Chousson by Johann, means Slipper-shaped.
- It is free living freshwater Ciliates, and more specialised than Sarcodines & flagellates.
- It is a microscopic organism & visible to the naked eyes as a minute elongate body.
- It appears light gray or white in colour measuring commonly between 170 to 290 μ in length & may attain a length up to 300-350 μ .
- Body is flat & elongated with blunt anterior end, and pointed posterior end. It has slightly convex dorsal (aboral part) & flattened ventral (oral part).
- Body covered by pellicle. Pellicle is thin double layered, elastic, tough, cuticular membrane.
- Pellicle made of Gelatin substance. It holds the shape of animal but is elastic enough to permit contraction.
- The electron microscopic study of pellicle by Ehrst & Powers has revealed that the hexagonal depressions correspond to regular rows of cilia (Alveoli)

It gives definite shape of body.

Cilia - It's uniform all over the body, i.e. Holotrichous. It arises from Kinetosomes (Basal granules). The posterior tail like long tuft of cilia is known as "Caudal tuft"

- Oral groove - It's a left ventral oblique depression. It contains of a funnel like vestibule leading in to cytoplasm by a Cytostome or cell mouth. They together form "Feeding apparatus."

- Cytopyre (also termed as Cell anus) or anal - spot - or Cytopyge - lies on the ventral surface of the body almost - ventrally behind the Cytostome or mouth - Undigested food particles are eliminated through the cytopyre

- Cytoplasm - It lies ~~between~~ in ground substances and differentiated in to Ectoplasm & Endoplasm.

- Ectoplasm - It's outer & homogeneous layer of protoplasm below pellicle. It contains

- Trichocyst - These are spindle-shaped organelles for Anchorage. In some times ciliates the trichocyst - act as a organelles of offence. After trichocyst - are discharged, new ones are regenerated from Kinetosomes.

- Intra - Ciliary System: It consists of basal granules (Kinetosomes) situated at the base of cilia. These are connected by contractile fibres called kinetodesma. It helps in Morphogenesis.

- Neuromotor System - It's an another internal fibrillar network. It controls & co-ordinates the ciliary beat.

- Endoplasm: It's inner heterogeneous & more fluid like central mass of protoplasm. It contains

- Nuclei (Nucleus) :

P. caudatum is heterokaryotic having two dimorphic nuclei & this phenomenon is called nuclear dimorphism.

- Macronucleus - It's conspicuous, ellipsoidal or kidney-shaped body. It possesses many nucleoli & much more chromatin materials (DNA). It is somatic or vegetative nucleus, it is derived from micronucleus & divides amitotically & controls vegetative functions (Metabolic activities) of the animal.

Micronucleus - It's small and round, embedded in Macro or Meganucleus, it's surrounded by st. gt.

- It contains di'chromatin (hereditary chromatin)

- It divides mitotically & controls reproduction

- The number of micronucleus varies with species, it is one in *P. caudatum*, two in *P. aurelia*, & many in *P. multimicronucleatum*.

- Groves (1949) has reported that the Macro & Micronucleus are identical in chemical composition.

- cyr (contractile vacuole) - There are two cyr one at ant. end. & other at post. end. Each has (5 to 12) tubular radiating canals.

- It helps in osmoregulation & excretion.

- fv (food vacuoles (Gastrioles)) - These are numerous, it's roughly spherical, non contractile bodies varying in size & numbers lying in the endoplasm. They contain ingested food particles principally Bacteria and a small amount of fluid bounded by a thin definite membrane.

- Volkovskiy (1934) - proposed the name Gastrioles for these vacuoles; it helps in digestion.

Kappa particles: - It is rod like, self duplicating cytoplasmic nucleic acid in Paramecium aurelia. It helps in cytoplasmic inheritance.

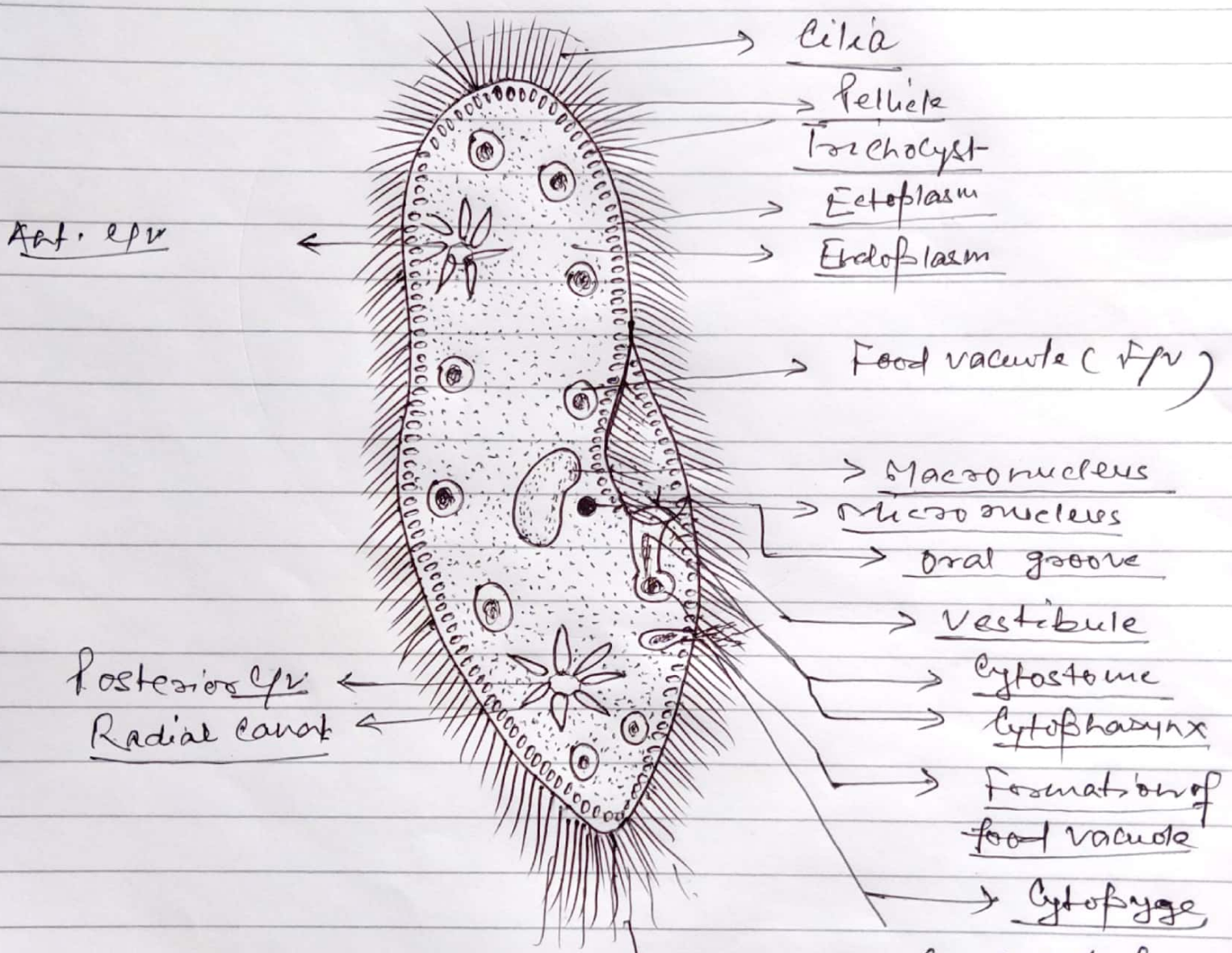


Fig shows: - Paramecium caudatum