

TYPE STUDY : PARAMECIUM

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Paramecium caudatum

Systematic position

| | | |
|-----------|---|-------------------|
| Phylum | : | Protozoa |
| Subphylum | : | Ciliophora |
| Class | : | Ciliata |
| Subclass | : | Holotricha |
| Order | : | Hymenostomatida |
| Suborder | : | Peniculina |
| Genus | : | <u>Paramecium</u> |
| species | : | <u>caudatum</u> |

Paramecium is a typical ciliate genus containing about 10 known species differing in shape, size, structure.

Note: - Protozoa which move with the help of cilia are called as ciliates and are included in the subphylum ciliophora. Besides the possession of these locomotor organelles, all ciliates possess two type of nuclei namely macronucleus and micronucleus (nuclear dimorphism), and a unique form of asexual reproduction (conjugation).

The largest species of para Paramecium caudatum, has a single comparatively large and compact micronucleus with chromatin material scattered throughout the nucleoplasm. It occurs widely and abundantly.

Occurrence -

Paramekes (Gr. oblong + L. caudata, tail)

Worldwide distribution.

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It is found in freshwater ponds, pools, ditches, streams, river, lake, reservoirs etc. It is usually abundant in those water which contain a great deal of decaying organic matter. It thrives well in ponds or slow running streams containing aquatic plants.

External structure:-

(1) Size:-

It is microscopic, elongated organism.

Length varies from 80μ to 350μ (from species to species). Diameter is $\frac{2}{3}$ rd of its entire length.

Individuals of the same species may exhibit minor morphological and physiological differences.

(2) Shape:-

- Slipper-shaped, cigar shaped or spindle shaped. Due to its slipper like shape it is also called as slipper animalcule.
- Body is elongated blunt and rounded at the anterior end and somewhat pointed at the posterior end.
- Anterior half of the body is slightly twisted. The body is distinguished ~~between~~ into an oral and ventral surface and an aboral or dorsal surface.

(3) Oral groove :-

Ventral surface of the body bears a prominent, oblique and shallow depression called oral groove. It originates from the middle of body and extends to the left side of anterior end. Posteriorly, the oral groove leads into a deeper conical vestibule which in turn communicates with a buccal cavity having a basal mouth or cytostome.

(4) Pellicle :-

External envelope of body is a living, clear, firm and elastic cuticular membrane, the pellicle. When stained specimens are observed under light microscope, the pellicle appears to be a regular series of polygonal/hexagonal depressions with their raised rims. A single cilium emerges out from the middle of each polygon. Polygons are defined by a corresponding regular series of cavities, the alveoli. All the alveoli collectively form a continuous alveolar layer, which is delimited by an outer alveolar and inner alveolar membrane. The outer alveolar layer lies in close contact beneath the outer cell membrane. Thus the pellicle of paramecium includes a series of three membranes :-

- (a) outer cell membrane.
- (b) outer alveolar membrane.
- (c) inner alveolar membrane.

(5) Cilia :-

The entire body surface is covered by numerous thin hair like fine projections, called cilia. These measure

10 - 12 μ in length and 0.27 μ in diameter.
→ 10,000 - 14,000 cilia covers the complete body surface and are arranged in regular longitudinal rows. Their length is uniform throughout, except for a few longer cilia at the extreme posterior end of the body.

This cilium has the same fundamental structure as seen in a flagellum. It consists of a fluid matrix, surrounded by an outer membrane sheath, which is continuous with the outer cell-membrane of the body. Within this matrix are 9 longitudinal peripheral fibres, which run along the whole length of cilium body. Each fibre is formed of two sub-fibres, one of which carries a double-row of short arms or projections, all running in the same direction (clock-wise). In the centre of matrix are two single fibres, which are enclosed within an inner membranous sheath. In between the central and peripheral fibres, are nine additional

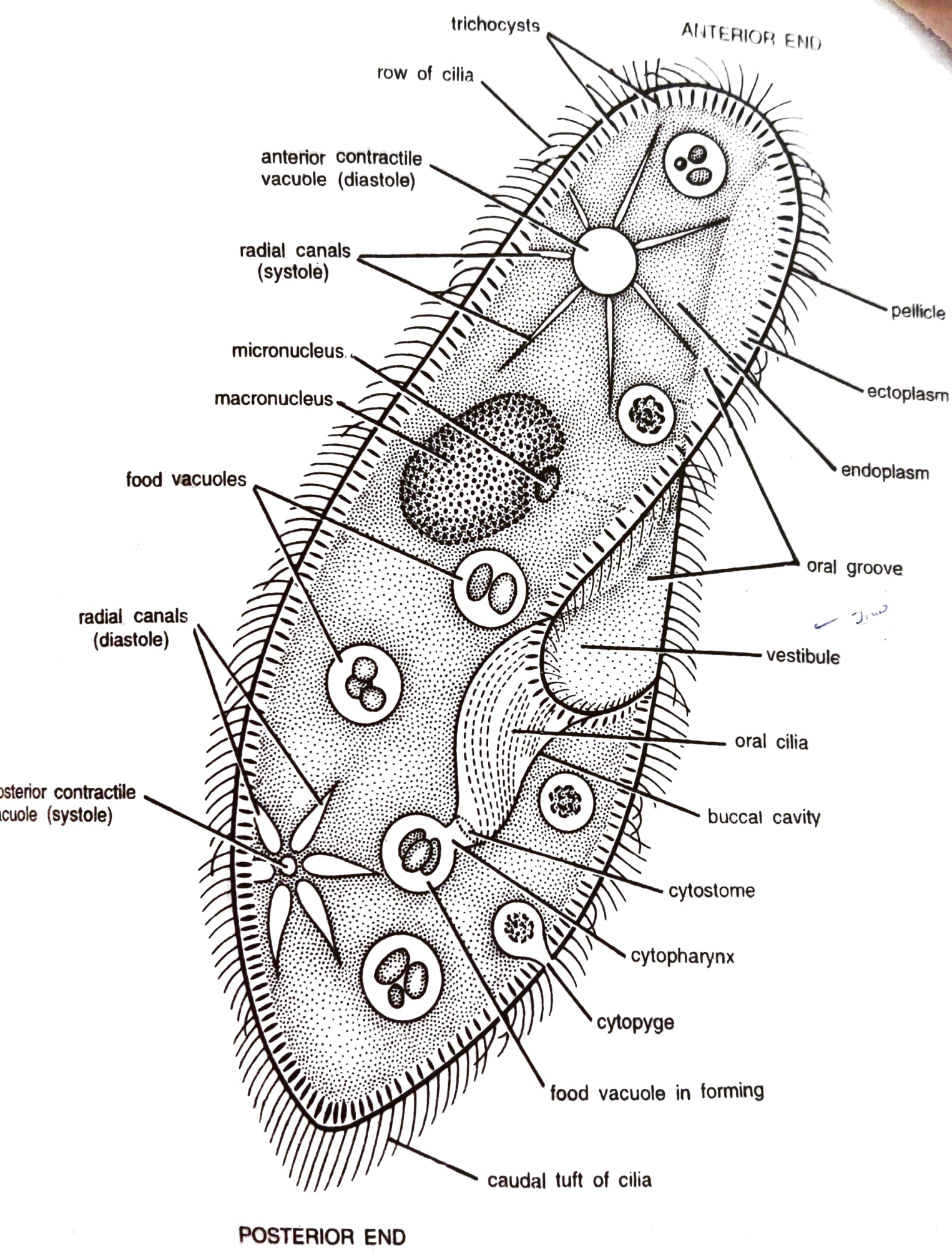


Fig. 1. *Paramecium caudatum*.

