

Paramecium

Paramecium, the commonly called Slipper Animalcule is a free living protist belonging to the phylum Ciliophora. It is small in size measuring 0.3 mm length and occurs in fresh water bodies like ponds, lakes, ditches etc. Its body is flat with a blunt anterior and pointed posterior ends.

Morphology

Paramecium is a single celled animal with an outer covering called Pellicle. On the pellicle, there are numerous sac like folding called alveoli from which the cilia arise. Each cilium arises from the basal body embedded in the ectoplasm of the cell below the pellicle. The cilia are arranged in longitudinal rows called kineties. The kinety is a single row of repeated units called kinetids. The kinetid has a basal body, cilium and associated fibres called kinetodesma. All the kineties form the Infraciliary system of the body. The Infraciliary system is concerned with the coordinated movement of the cilia by which the animal can make a spiral forward movement.

Feeding and Digestion

Extending obliquely backwards from the anterior end, there is a shallow groove called Oral groove or Peristomial groove. The Peristomial groove leads into the cytostome or gullet which extends into the body. The cytoplasm of the body is divisible into outer ectoplasm and inner endoplasm. Arising from the ectoplasm, there are numerous bottle shaped structures called Trichocysts which are placed alternate with the alveoli. Trichocysts are concerned with defence functions and are also used to food capturing. The trichocyst discharges a long thread like structure when the animal is disturbed.

The Peristomial groove is concerned with the passage of food into the body. By the ciliary movement of the Peristomial groove, food particles are directed into the cytostome from where it becomes a food vacuole which pinches off into the endoplasm. The food vacuole passes through the cytoplasm due to the streaming movement of cytoplasm called Cyclosis. During this movement, digestion occurs through intracellular digestion. The digestive enzymes present in the cytoplasm digest the food in the food vacuole. The food vacuole filled with undigested matter fuses with the cell membrane at a site called Cytoproct from where it will be expelled out.

Excretion and Osmoregulation

Excretion in Paramecium is carried out by the Contractile vacuoles. There are two contractile vacuoles in paramecium present at both the ends of the body. Each contractile vacuole has a central bladder and six radiating canals. These radiating canals absorb water and waste materials from the surrounding cytoplasm and pass into the central bladder from where the contents are expelled out periodically through the permanent opening of the contractile vacuole present in the pellicle. Contractile vacuoles are the Osmoregulatory structures of paramecium. Osmoregulation is the maintenance of both water and ionic contents of the body. Being a freshwater animal, large quantity of water enters into the body of paramecium, so that contractile vacuole helps the animal to remove the excess water from the body.

Reproduction

Nuclear dimorphism is found in paramecium. It has two nuclei in the endoplasm. These are Macro and Micro nuclei. Macronucleus is the vegetative nucleus that controls and coordinates all the functions of the body. Micronucleus is concerned with the transfer of genetic characters during sexual reproduction. Paramecium can engage both in asexual and sexual reproduction. Under favourable conditions like plenty of food and fresh water, paramecium undergoes transverse binary fission during which the body divides into two halves in the transverse plane. Each half will develop into a new paramecium. Due to continuous binary fission, paramecium loses its vigour and it engages in sexual reproduction. The sexual reproduction is called Conjugation. During conjugation, two paramecia (Conjugants) come close together and their bodies fuse at a point and a connection called Conjugation canal establishes. Through the conjugation canal, they exchange the micronuclei. After the exchange, the paramecia (Exconjugants) separate and rejuvenate the lost vigour.

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