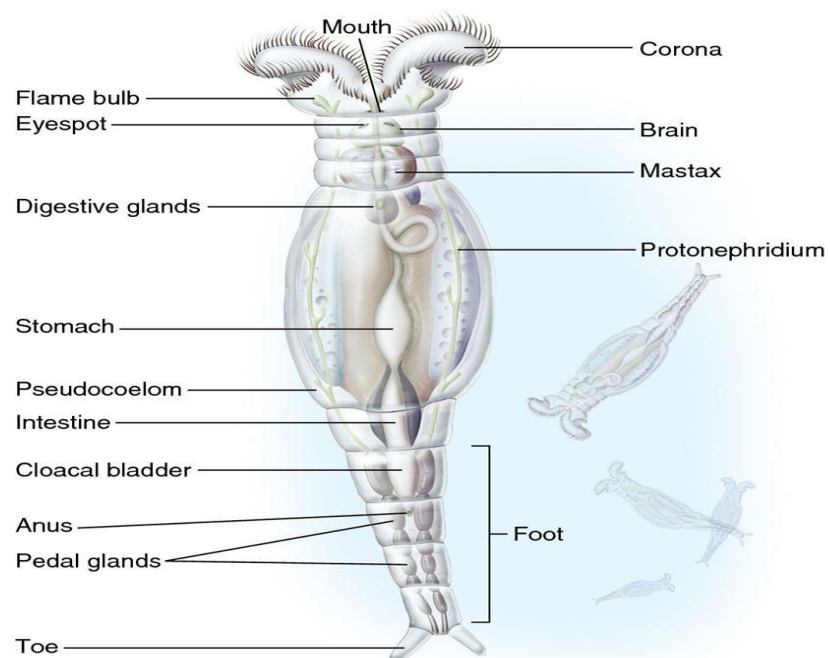


Phylum : Rotifera

1. Return to Super phylum: Aschelminthes.
2. Bilaterally symmetrical.
3. Body has more than two cell layers, tissues and organs.
4. Body cavity is a pseudo coelom.
5. Body possesses a through gut with an anus.
6. Body covered in an external layer of chitin called lorica.
7. Has a nervous system with a brain and paired nerves.
8. Has no Circulatory or Respiratory organs.
9. Reproduction mostly pathenogenetic, otherwise sexual andgonochoristic.
10. Feed on bacteria, Protista and parasitic.
11. All live in aquatic environments either free swimming or attached.
12. Have two ring of cilia at their anterior end.
13. Name Rotifera means wheel – bearer in latin that because it has two rings of cilia (hair – like) on its head, which on moving appear liketwo rotating wheels.



External anatomy of Rotifera

Rotifera body consist of a

1. Distinct anterior head bears the corona
2. Trunk
3. Posterior tail or foot. Except for the corona the body is not ciliated and is often covered by a non – living cuticle.

1. The corona (or crown) consist of either one or two rings of cilia.

Beating of coronal cilia creates water currents that help to draw food into Rotifera mouth. In some species, the corona can create currents strong – enough to pull the animals through the water – in other words, some Rotifers use their crowns not just for food – gathering but for swimming.

2.The trunk contains most of the animals' internal organs, and may bear sensory antennae. Some Rotifers have a true cuticle that consists of an outer layer of non-living material secreted by the epidermis, all have protein fibers embedded in epidermis that help to strengthen it. This tough epidermis and / or cuticle helps provide some protection from external dangers, but also helps the animal resist pressure generated from the inside. Rotifera are pseudo coelomates and them resist the internal pressure of the pseudo coelom, which might otherwise cause the epidermis to split.

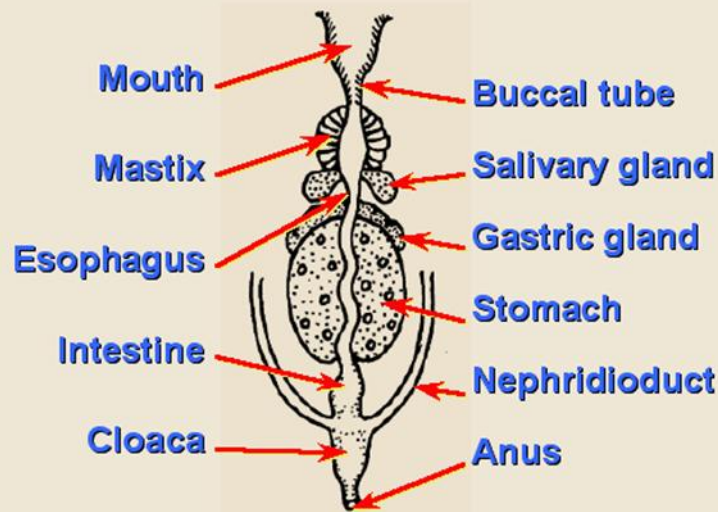
3.The foot of Rotifera is narrowed and usually bears from one to four toes. The foot contains pedal glands that secrete a glue – like materialthat a Rotifera can use to attach it self to surface.

Digestive system

The coronal cilia create a current that sweeps food into the mouth. The mouth opens into a characteristic chewing pharynx (called the mastax), sometimes via a ciliated tube and sometimes directly. The pharynx has a powerful muscular wall and contains tiny calcified jaw – like structures called (trophi) which are the only fossilizable parts of Rotifera.

The shape of the trophi varies between different species, depending partly on the nature of their diet. Behind the mastax lies an Esophagus which opens into a stomach where most of the digestion and absorption occurs. Stomach opens into short intestine that terminates in a cloaca on the posterior dorsal surface of the animal. Up to seven salivary glands are present in some species, emptying to the mouth in front of the esophagus while stomach is associated with two gastric glands that produce digestive enzymes. A pair of protonephridia open into a bladder that drains into the cloaca. These organs expel water from the body helping to maintain osmotic balance.

Rotifer digestive system



Nervous system

Rotifers have a small brain, located just above the mastax from which a number of nerves extend throughout the body. The number of nerves varies between species, although the nervous system usually has a simple layout. Close to the brain lies a retro cerebral organ, consisting of two glands either side of medial sac, that sac drains into a duct that divides into two before opening through pores on the upper most part of the head. Its function is unclear. Rotifers typically possess one or two pairs of short antennae and up to five eyes. The eyes are simple in structure sometimes with just a single photoreceptor cell. In addition the bristles of the corona are sensitive to touch and there are also a pair of tiny sensory pits lined by cilia in the head region.

Feeding

Rotifers eat particulate organic detritus, dead bacteria, algae and protozoans. They eat particles up to 10 micrometers in size. Like crustaceans Rotifera contribute to nutrient recycling, for this reason they are used in fish tanks to help clean the water to prevent clouds of waste matter. Rotifera affect the species composition of algae in ecosystems through their choice in grazing.

Reproduction and life cycle

Asexual reproduction does not play a major role in this phylum as it does in most other animal phyla, rotifers even have poor ability to regenerate parts sexual reproduction predominates, rotifers are dioecious however, females predominate in most populations in some species males are unknown males, when present, are minute, degenerate and/or short-lived commonly only $\sim 1/3$ rd as long as females in some species males are only found for a few weeks each year in others males are degenerate (no digestive tract).

males are ready for mating within an hour after hatching, rotifers have internal fertilization, the male uses sensory receptors on its corona to find a female, the male attaches its penis to the coronal region of the female and transfers sperm into her body cavity, the male dies soon afterwards in some species the males are unknown, females can reproduce by parthenogenesis recent research has shown that the DNA of these rotifers is loaded with genes from bacteria, fungi and plants, this apparently provides adequate mutations to shuffle genes as an alternative to sexual reproduction, in some species, females can produce different kinds of eggs:

amictic eggs:

diploid eggs produced by parthenogenesis produced during most of the year

mictic eggs:

haploid eggs, capable of being fertilized by male sperm, produced only at certain times of the year

if a female with mictic eggs is not impregnated she immediately lays the eggs and they hatch as males

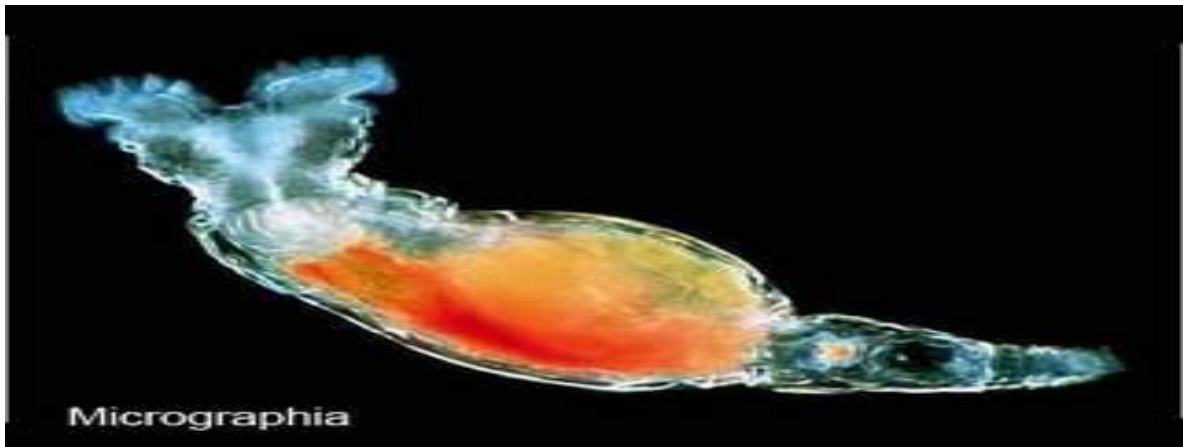
resting (winter) eggs:

heavy and thick shelled, overwinter on sediment, extremely resistant to drying and extreme temperatures, in some rotifers, the eggs are retained in the female until they hatch (ovoviviparous)

→ a rotifers bear live young

Philodina gregaria

1. Relatively large for Rotifera phylum and easily observed through microscope, so they used in studies to investigate Rotifera behavior and anatomy.
2. They have more than two layers as well as tissues and organs.
3. They possess open digestive system.
4. Covering the body is an external layer of chitin referred to also lorica.
5. Nervous system is comprised of a brain and paired nerves.
6. Respiration is carried out through simple diffusion.
7. Reproduction is mostly parthenogenic.
8. They prey on largely algae.
9. They live for a long period in a frozen state and in summer months can be found in such large aggregations that the bottoms of lakes and pools may appear a rusty red color.



Philodina gregaria

