

## **Pseudocoelomates**

They are a rather heterogeneous group of organisms

Most members of the group have a condition known as **eutely**, a constant number of cells or nuclei in the individuals of a species.

Most have a complete digestive tract.

## **Phylum Rotifera**

The body is comprised of a **head, trunk, and foot.**

The head bears a ciliated crown called the **corona.**

The mouth opens to the **mastax**, a modified muscular pharynx that is unique to the group.

The mastax is comprised of jaw-like structures and is used for chewing.

The anterior region also bears a bi-lobed brain, eyespots, and other sensory structures.

The foot of the animal is equipped with **pedal glands**

Rotifers are dioecious

For species without males, reproduction is **parthenogenetic**

Some species are capable of producing amictic eggs and eggs which have undergone meiosis and are therefore haploid (**=mictic eggs**).

## ***Bdelloid Rotifers***

Although many rotifers reproduce without sex, bdelloids as a whole reproduce only asexually – 18 genera and 360 species

*Q. Why would we normally expect asexual reproduction to lead to extinction?*

*What is good about sex itself?*

## ***The Twofold Cost of Sex***

Darwinism expects that individuals will strive to pass on as many of their genes as possible

Wouldn't a mutant female who behaves like a bdelloid rotifer, and passes on 100% of her genes to every offspring instead of 50%, do twice as well?

## ***The Red Queen Hypothesis***

Evolutionary arms race, a species must continually adapt to a dynamic environment or risk extinction.

Sexual reproduction provides increased genetic variability through recombination, and novel genotypes

## ***An Under-appreciated Consequence of Sex***

Sex brought into existence the gene pool and made meaningful the species

**Phylum Gastrotrichia (Gr. Gaster = belly; thrix = hair)**

The body is covered by bristles and scales; the ventral side is flattened and covered in a dense layer of cilia that are used for gliding.

Gastrotrichs are hermaphroditic, but for some species the male reproductive structures are nonfunctional; female system produces offspring parthenogenetically.

**Phylum Kinoryncha (Gr. Kineo = to move; rhynco = beak or snout)**

The body is covered by an external, chitinous cuticle.

Move using their active, eversible head

Along the length of the body are a series of recurved spines

The first segment is the head, which displays several rings of curved spines called **scalids**.

The mouth and piercing stylets are eversible (termed an **introvert**)

Kinorynchs are dioecious.

**Phylum Loricifera (L. lorica = corselet; fero = to bear)**

Have an anterior introvert surrounded by recurved spines or scalids.

Also, the mouth bearing piercing stylets is eversible (=introvert).

The posterior half of the body is covered by 6 overlapping plates comprising an external cuticle or **lorica**.

The outer body lacks external cilia.

Loriciferans are dioecious.

**Phylum Priapulida (Gr. Priapos = phallus)**

The body is divided into eversible proboscis and spines, a trunk, and one or two caudal appendages.

The outer body is covered with a chitinous cuticle that is periodically molted.

Priapulids are dioecious.

**Phylum Nematoda (Gr. Nematos = thread)**

Roundworms are covered with a tough, flexible body covering called the **cuticle** composed of collagen

Muscles are all longitudinal fibers

The alimentary canal of roundworms is comprised of a mouth, muscular pharynx, intestine, rectum and anus.

Possess the unlined fluid filled body cavity called the **pseudocoelom**.

Advantages of body cavities:

Allows for the reproductive and digestive systems to evolve more complex shapes and functions.

Offers protection to the gut

The fluid filled body cavity acts as a skeleton – **hydrostatic skeleton**,  
The fluid filled body cavity helps transport nutrients throughout the body.

Reproduction among the roundworms is usually sexual; sexes are separate  
Males are usually bear a pair of **copulatory spicules** for mating.

### *Parasitic Nematodes*

#### Life cycle of a typical hookworm

Eggs are shed with the feces and hatch on the ground.  
Larvae go through 3 molts and then re-enter a host by penetrating skin.  
They are carried in the blood to the lungs where they are coughed up and swallowed, thus getting into the intestines.

### *Filaroid worms*

#### Abbreviated Life Cycle

Adult worms often occur in the lymph vessels and obstruct the flow of lymph that normally returns to the bloodstream.  
This causes fluid accumulation in the legs and other body regions.  
The person with the infection thus has hugely swollen legs, etc, a condition called **elephantiasis**.  
The definitive hosts are humans; the intermediate hosts are mosquitoes.  
Mosquitoes obtain juvenile stages of the worms when they take on a blood meal.  
The worms re-enter the humans when the mosquito takes on another blood meal.

### *Trichinellid worms*

#### Abbreviated Life Cycle

Adults live in the small intestine of man, pigs and a few other carnivorous or omnivorous mammals.  
After mating the females burrow into the intestinal lining and release larvae.  
Larvae then enter the blood stream and are carried to skeletal muscles where they become *encysted*  
If the cysts are eaten by another animal, adults will be established in the intestine.  
Humans become infected from eating undercooked pork.  
Humans can experience a considerable amount of tissue damage from this infection.

### **Phylum Nematomorpha (Gr. Nematos = thread; morphe = form)**

Adults are free-living, but apparently do not feed (no gut evident among adults).  
Larval stages are parasitic; marine forms often parasitize crabs, while freshwater species are found in association with insects.

**Phylum Acanthocephala (Gr. Akantha = spine or thorn; kephale = head)**

The anterior region of acanthocephalans bears an invaginable **proboscis** with several rows of recurved spines; used to attach to the wall of the intestine.

Internally the trunk contains a unique **lacunar system**

Sexes are separate; males have a protrusible penis to inseminate females.

**Phylum Cycliophora**

Occurs in association with the mouthparts of lobsters.

It attaches by means of an **adhesive disc** at the base of a short stalk.

The anterior region is characterized by a ring of compound cilia that is used to accumulate food particles.