

# 4) PHYLUM ASCHELMINTHES (NEMATODA)

The largest class of Phylum ~~Aschelminthes~~ is nematoda and many taxonomists have given it the status of a phylum. Therefore we will also consider it as a separate phylum viz Phylum Nematoda.

The word Nematoda is of Greek origin which means thread. Nematodes are also called as round worms.

## BODY STRUCTURE

Body is cylindrical, tapering at both ends.

## SIZE

Most roundworms are less than 5cm long and many are microscopic but some parasitic roundworms are more than one metre in length.

## HABITAT

The roundworms are free living or parasites, and live in soil, roots, human and animal intestines and muscles.

This phylum includes some highly beneficial soil worms as well as some notorious pests and parasites.

# SYMMETRY

These worms exhibit bilateral symmetry, having three germ layers i.e triploblastic.

# PSEUDOCOELOMATES

They are pseudocoelomates i.e the body cavity is not a true coelom.

# \* SEGMENTATION (Non-Segmented, Non-ciliated)

The body is non-segmented. Nematodes donot have any cilia on their body.

# \* HYDROSTATIC SKELETON

The highly pressurized pseudocoelom of these animals can function as a hydrostatic skeleton, which can be useful in drilling through soil or a host's body tissue.

[Annelids, cnidarians and platyhelminthes] also have hydrostatic skeletons

# ABSENT SYSTEMS

No respiratory or circulatory system is present. The fluid contained in the body cavity performs the function of the blood.

# PROTECTION

A hard layer of cuticle is present on the body for protection.



# ALIMENTARY CANAL

The alimentary canal is well developed with an anterior opening (mouth) and posterior opening (anus).

# EXCRETORY SYSTEM

The excretory system consist of two longitudinal canals on each side which open on the ventral side by a small excretory pore close behind the mouth.

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# NERVOUS SYSTEM

Nervous system consists of a nerve ring which encircles the pharynx, ~~and~~ from which nerve cord and fibres extend in various directions.

# MASCULAR LAYER

In nematodes, the muscles are arranged in four longitudinal bands. Circular muscles are not present in these worms. Therefore, they show special type of whipping movements.

# DIGESTIVE TRACT

Digestive tract is complete. It is a straight tube with mouth and anus at opposite ends of the body.

# REPRODUCTIVE SYSTEM

Sexes are generally separate.



Males are smaller than females. In males, the testes is a long, coiled thread with a seminal vesicle which posteriorly opens into rectum by a short ejaculatory duct. Female reproductive ~~st~~organs are a pair of very much coiled ovaries passing into uterus and two uteri unite posteriorly forming vagina which on the ventral surface at the female genital aperture situated in the middle line.

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## NO REGENERATION

The power of regeneration is absent in Phylum Aschelminthes.

## COLOUR

Most nematodes are either white or cream coloured except *Ascaris* having a reddish tinge, due to dissolved haemoglobin.

## CLASSES OF PHYLUM ASCHELMINTHES

According to the classification followed by Hegner and Engemann, Phylum Aschelminthes consists of following five classes:

1. Class Gastrotricha
2. Class Rotifera
3. Class Kinorhyncha (spiny, marine, microscopic animals)
4. Class Nematoda
5. Class Nematomorpha (Resemble Nematoda)

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# EXAMPLES

Examples of Nematodes include Ascaris, Pin worm, Hookworms, and Trichinella Spiralis etc.

## ASCARIS Lumbricoides

The common animal of this phylum is Ascaris lumbricoides. It is an endoparasite in the small intestine of man. It lives freely in the lumen (cavity of the small intestine). The body is elongated, cylindrical and tapering on both sides. Sexes are separate. The female is 8-16 inches long but the male is 6-12 inches in length.

The anterior part of both male and female ascaris is curved with two spine like structures called penial setae. In female the posterior end is not sharply pointed. A female Ascaris may contain as many as '27' million eggs at one time and each female lays about 200,000 eggs per day.

## \* DISEASES CAUSED BY NEMATODES

### 1. INFECTIONS BY ASCARIS

It is estimated that 25% of the world's population is infected with Ascaris. These infections causes abdominal pain, vomiting, diarrhea and peritonitis.



# INFECTION CYCLE

Giant kidney worms are able to ~~parasit~~ parasitize many mammals, including humans. The worms live in the kidney of a vertebrate host, and their eggs leave the body in the host's urine. From here the eggs might be consumed by an aquatic worm (from the Phylum Annelida). Juvenile kidney worms can be transferred to fish or amphibians; if these secondary hosts are consumed by vertebrates, the infection cycle is completed.

The Ascaris, is a parasite of human intestine. Female Ascaris lay upto 200,000 eggs per day, which are excreted in the faeces and ingested by a new host through contaminated water or food.

## 2. DISEASES BY PINWORM

*Enterobium*<sup>s</sup> ~~in~~ *vermicularis* is another human parasite commonly known as pinworm. It mostly parasitizes children which ingest its eggs with soil or in some other way. It lives in the caecum, colon and appendix of its host. It causes severe itching of the anus, inflammation of the mucus membrane of colon and appendix. This results in sleeplessness (insomnia) and loss of appetite.



### 3. RIVER BLINDNESS

River Blindness is a type of filariasis, caused by tiny worms (microfilariae) that are the larval stage in the life cycle of the nematode worm *Onchocerca volvulus*.

River blindness affects retina of the eye

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### 4. ECONOMIC LOSSES

These parasitic forms cause great economic losses in terms of expenditure in health sector and crop destruction.

## \* IMPORTANCE OF NEMATODES

~~These parasitic forms~~

Free living soil nematodes decompose organic matter and play a major role in fertilization. Nematodes are an important part of most food chains and food webs and are therefore economically very important.

### EXAMPLES

1. *Ascaris lumbricoides*
2. Pinworm (*Enterobius vermicularis*)
3. Hookworm
4. Filaria
5. Trichina worm



Ascaris

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