

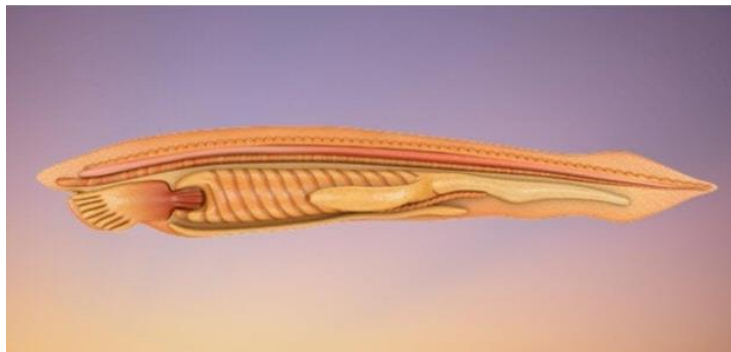


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((Invertebrates))

2 stage

Lecture one

**General Characterizations of
Invertebrates**



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Invertebrates :

- 1 - Organisms without vertebral column without bony skeleton .**
- 2 – Invertebrates have heart exoskeleton and spinal cord .**
- 3 – Invertebrates about 1, 123 , 000 species .**
- 4 – Invertebrates 97% while Vertebrates 3% .**
- 5 – All vertebrates are multicellular but Invertebrates are unicellular and multicellular .**
- 6 – All vertebrates in one phylum (Chordata) while invertebrates are distributed in nine phyla .**

The Cell : Two types

- 1 - Prokaryotic (Bacteria) and some algae**
- 2 - Eukaryotic / animal and human cells**



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Animal Kingdom

Invertebrates

1 – Protozoa

2 – Coelentrata

3 – Sponges

4 – Mollusca

5 – Platyhelminthe(Flat Worms)

6 – Nemathelminthe (Thread worms)

7 – Annelida

8 – Echinodermata

9 – Arthropoda (Insects , Crustasia , Arachnida) .

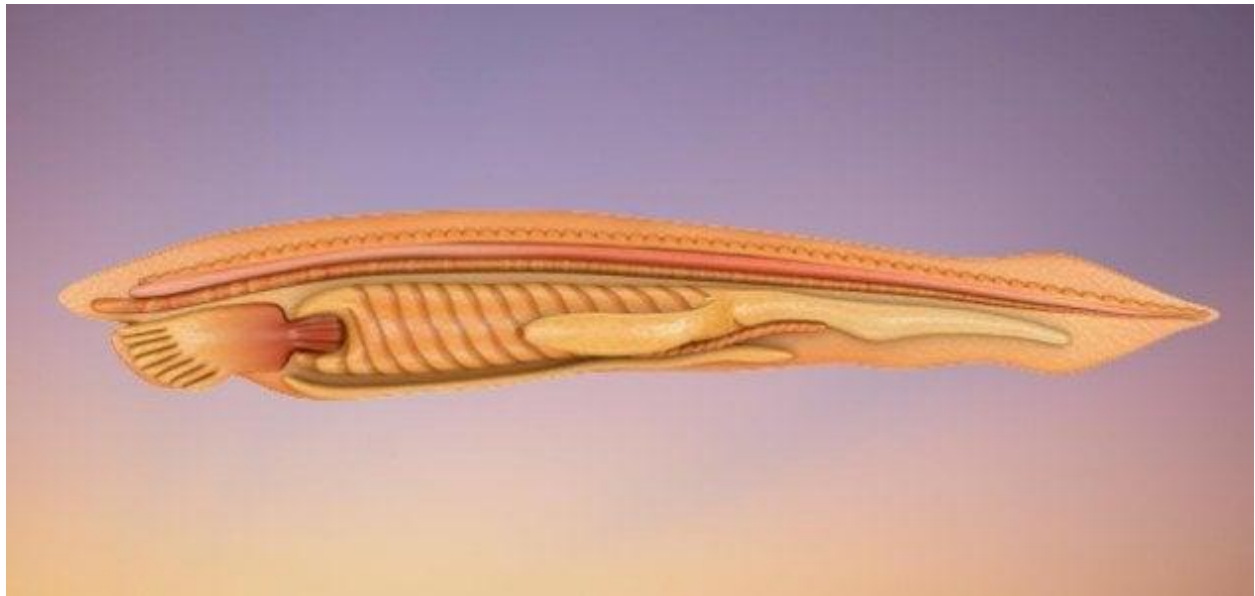
Vertebrates

10 – Chordata

(Mammals , Birds , Fish

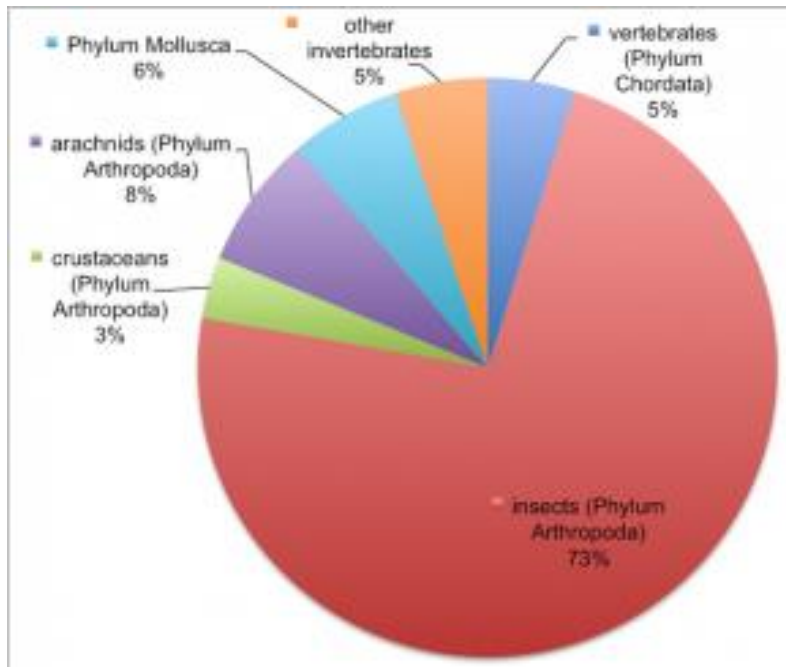
Reptiles , Amphibians)

Amphioxus : It is an animal invertebrate and vertebrate (no vertebral column but have spinal cord , so classified as Chordata) . Lancelet in shape like fish , without scales 5 – 7 cm in length .





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Carl Linnaeus : Swedish biologist 1707 – 1778 worked on Taxonomic Classification of an organisms //

Phylum --- Class ---- Order --- Family --- Genus --- Species

Scientific Nomenclature of organisms :

***Leishmania donovani* (Leishmania genus name start with capital letter) (donovani species name) .**

Scientific name of human (*Homo sapiens*) .



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Number of extant species

By far the largest number of described invertebrate species are insects. The following table lists the number of described [extant](#) species for major invertebrate groups as estimated in the [IUCN Red List of Threatened Species, 2014.3.](#)^[1]

Invertebrate group	Phylum	Image	Estimated number of described species ^[1]
Insects	Arthropoda		1,000,000
Arachnids	Arthropoda		102,248
Snails	Mollusca		85,000
Crustaceans	Arthropoda		47,000
Clams	Mollusca		20,000



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Invertebrate group	Phylum	Image	Estimated number of described species ^[11]
Corals	Cnidaria		2,175
Octopuses/Squid	Mollusca		900
Velvet worms	Onychophora		165
Nautilus	Mollusca		6
Horseshoe crabs	Arthropoda		4
Others jellyfish , echinoderms , sponges , other worms etc.	—	—	68,658
Total:			~1,300,000

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Tree of life



Importance of Invertebrates :

Advantages of Invertebrates :

1 – Some invertebrates used as food (nutrition) for human such as Shrimp , Crabs , Oysters .

2 – Many invertebrates used in research work because small in size and have short life cycle such as in Drossophila used in genetic experiments .



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3 – Some invertebrates participate in fertilization of many plants .

4 – Others are produce honey while other insects produce silk .

Disadvantages of invertebrates :

1 – Destroy farms / plant farms .

2 - Cause many of human and animal diseases .

Quiz : 1 – Where can be found DNA in organism .?

2 - Highest number of chromosomes in which organism .?

3 – Lowest number of chromosomes in which organism .?

4 - Number of chromosomes in human cells ?