

#424352

**Topic:** Basis of classification

What are the difficulties that you would face in classification of animals, if common fundamental features are not taken into account?

**Solution**

Common characteristics are considered for the purpose of classification of animals.

On the basis of specific characteristics each organism will be placed in a separate group and the entire objective of classification would not be achieved. The classification of animals by specific character is important to compare different organisms and identify their individual evolutionary significance.

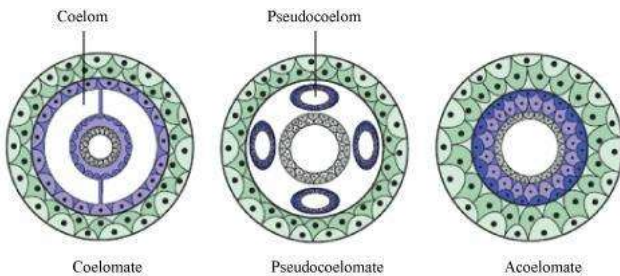
#424354

**Topic:** Basis of classification

How useful is the study of the nature of body cavity and coelom in the classification of animals?

**Solution**

Coelom is a fluid-filled space between the body wall and gut wall and lined by mesoderm on all of its sides. The presence or absence of body cavity or coelom plays a very important role in the classification of animals. Animals that possess a fluid-filled cavity between the body wall and digestive tract are known as coelomates. Annelids, mollusks, arthropods, echinoderms, and chordates are examples of coelomates. On the other hand, the animals in which the body cavity is not lined by mesoderm are known as pseudocoelomates. In such animals, mesoderm is scattered in between ectoderm and endoderm. Aschelminthes is an example of pseudocoelomates. In certain animals, the body cavity is absent. They are known as acoelomates. An example of acoelomates is Platyhelminthes.



#424358

**Topic:** Phylum Platyhelminthes

What are the peculiar features that you find in parasitic platyhelminthes?

**Solution**

*Taenia* (Tapeworm) and *Fasciola* (liver fluke) are examples of parasitic platyhelminthes.

Peculiar features in parasitic platyhelminthes are as follows :

1. They have dorsoventrally flattened body and bear hooks and suckers to get attached inside the body of the host.
2. Their body is covered with thick tegument, which protects them from the action of digestive juices of the host.
3. The tegument also helps in absorbing nutrients from the host's body.

#424359

**Topic:** Phylum Arthropoda

What are the reasons that you can think of for the arthropods to constitute the largest group of the animal kingdom?

**Solution**

The phylum Arthropoda consists of more than 75% of the animal species found on this earth. The reasons for the success of arthropods are as follows :

- i. Jointed legs that allow more mobility on land.
- ii. Hard exoskeleton made of chitin that protects the body.
- iii. The hard exoskeleton also reduces water loss from the body of arthropods making them more adapted to terrestrial conditions.

#424360

**Topic:** Phylum Chordata

Water vascular system is the characteristic of which group of the following:

- (a) Porifera (b) Ctenophora (c) Echinodermata (d) Chordata

**Solution**

Water vascular system is a characteristic feature of the phylum Echinodermata. It consists of an array of radiating channels, tube feet, and madreporite. The water vascular system helps in locomotion, food capturing and respiration.

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**#424361****Topic:** Phylum Chordata

"All vertebrates are chordates but all chordates are not vertebrates". Justify the statement.

**Solution**

The characteristic features of the phylum Chordata include the presence of a notochord and paired pharyngeal gill slits. In sub-phylum Vertebrata, the notochord present in embryos gets replaced by a cartilaginous or bony vertebral column in adults. But in cephalochordates, notochord persists throughout life as such and in urochordates, the notochord is present only in larval stages and absent in adults. Thus, it can be said that all vertebrates are chordates but all chordates are not vertebrates.

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**#424363****Topic:** Class Aves

What are the modifications that are observed in birds that help them fly?

**Solution**

Birds have undergone many structural adaptations to suit their aerial life. Some of these adaptations are as follows :

- (i) Streamlined body for rapid and smooth movement.
- (ii) Covering of feathers for insulation.
- (iii) Forelimbs modified into wings and hind limbs used for walking, perching, and swimming.
- (iv) The presence of pneumatic bones to reduce weight.
- (v) The presence of additional air sacs to supplement respiration.

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**#424365****Topic:** Phylum Arthropoda

Segmentation in the body is first observed in which of the following:

- (a) Platyhelminthes (b) Aschelminthes (c) Annelida (d) Arthropoda

**Solution**

The body segmentation first appeared in the phylum, Annelida (annulus meaning little ring). The fundamental characteristic of the phylum, Annelida, is the division of the body into a linear series of cylindrical segments, or metameres. Each metamere consists of a section of the body wall and a compartment of the body cavity with its internal organs.

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**#424366****Topic:** Phylum Annelida

Match the following :

- |                 |                                      |
|-----------------|--------------------------------------|
| (a) Operculum   | (i) Ctenophora                       |
| (b) Parapodia   | (ii) Mollusca                        |
| (c) Comb plates | (iii) Porifera                       |
| (d) Radula      | (iv) Reptilia                        |
| (e) Hairs       | (v) Annelida                         |
| (f) Choanocytes | (vi) Cyclostomata and Chondrichthyes |
| (g) Gill slits  | (vii) Mammalia                       |
| (h) Scales      | (viii) Osteichthyes                  |

**Solution**

- | Column I        | Column II                            |
|-----------------|--------------------------------------|
| (a) Operculum   | (viii) Osteichthyes                  |
| (b) Parapodia   | (v) Annelida                         |
| (c) Comb plates | (i) Ctenophora                       |
| (d) Radula      | (ii) Mollusca                        |
| (e) Hairs       | (vii) Mammalia                       |
| (f) Choanocytes | (iii) Porifera                       |
| (g) Gill slits  | (vi) Cyclostomata and Chondrichthyes |
| (h) Scales      | (iv) Reptilia                        |

#424367

Topic: Phylum Platyhelminthes

Prepare a list of some animals that are found parasitic to human beings.

**Solution**

Sr. No.	Name of organism	Phylum
1	<i>Taenia solium</i> (Tape worm)	Platyhelminthes
2	<i>Fasciola hepatica</i> (Blood worm)	Platyhelminthes
3	<i>Ascaris lumbricoides</i> (Round worm)	Aschelminthes
4	<i>Wuchereria bancrofti</i> (Filarial worm)	Aschelminthes
5	<i>Ancylostoma</i> (Hook worm)	Aschelminthes

#424395

Topic: Phylum Arthropoda

Answer in one word or one line.

- (i) Give the common name of *Periplanata americana*.
- (ii) How many spermathecae are found in earthworm?
- (iii) What is the position of ovaries in cockroach?
- (iv) How many segments are present in the abdomen of cockroach?
- (v) Where do you find Malpighian tubules?

**Solution**

- (i) The common name of *Periplanata americana* is the American cockroach.
- (ii) Four pairs of spermathecae are present between sixth and the ninth segments. They help in receiving and storing the spermatozoa during copulation.
- (iii) The female reproductive system of cockroach consists of two large ovaries. The ovaries lie laterally in the 12th and 13th segments. Each ovary is formed of a group of eight ovarian tubules or ovarioles. They contain a chain of developing ova. Oviducts from each ovary unite into a single median oviduct.
- (iv) The abdomen consists of 10 segments. In females, the 7th segment is boat shaped. The 7th sternum; together with the 8th and 9th sterna; forms a brood or genital part. In both sexes, the 10th segment bears a pair of jointed filamentous structures called anal cerci.
- (v) The Malpighian tubule system is a type of excretory and osmoregulatory system found in some insects, myriapods, arachnids, and tardigrades. The system consists of branching tubules extending from the alimentary canal that absorbs solutes, water, and wastes from the surrounding hemolymph. These tubules are found in cockroaches.



#424396

Topic: Basis of classification

If you are given a specimen, what are the steps that you would follow to classify it?

**Solution**

There is some common fundamental feature that helps in classification of living organisms and the features that can be used in classification are as follows:

1. Level of classification: Cellular, tissue or organ Level.
2. Body cavity: Absent or present
3. Type of body symmetry: Radial or bilateral
4. Type of coelom development: Acoelom, Pseudocoelom and true coelom.
5. Type of true coelom: Enterocoelom and Schizocoelom.

#464551

Topic: Class Mammalia

Explain how animals in Vertebrata are classified into further subgroups.

**Solution**

Vertebrates are classified into further subgroups on following bases:

1. Pisces: Typically lives in water. It has a streamlined body. Locomotion is carried out with the help of muscular tail. Body is covered with scales. Paired gills are present; which can breathe oxygen dissolved in water. Animals are cold blooded. They lay eggs. Possesses 2 chambered heart.
2. Amphibia: These animals can live both, on land and in water. The animals breathe through skin when in water and through lungs when on land. Animals are cold-blooded.
3. Reptilia: Crawling movement is observed in animals classified under Reptilia. Scales are seen. Most of the reptilians have three chambered heart but crocodile has four-chambered heart.
4. Aves: These animals are evolved for flight. The body is covered with feathers. Wings are modified from fore-limbs. Animals are warm blooded. Possesses 4 chambered heart. Bones are hollow (pneumatic); which assists in flying. This class comprises of all birds.
5. Mammalia: Hair covers the body. Sweat and sebaceous glands are observed. Mammary glands are present in females and are used for nourishing the young ones. Most of the animals of this class are viviparous. Some of the mammals lay eggs and are called as oviparous.