

Chapter: Animal Kingdom

Exercise

Question 1: What are the difficulties that you would face in the classification of animals if common fundamental features are not taken into account?

Answer:

The common fundamental characteristics are considered for the classification of living organisms.

If we consider the specific characteristics, then due to this each organism will be placed in a separate group and it will be difficult to achieve the entire objective of classification.

The classification of animals is also important for the comparison of different organisms and for judging their evolutionary significance. If we consider only a single characteristic then this objective would not be achieved.

Question 2: If you are given a specimen, what are the steps that you would follow to classify it?

Answer:

There is a common fundamental feature that helps in the classification of living organisms. The features that can be helpful in the classification are as follows.

(i) Level of classification

- (a) Cellular level
- (b) Tissue level
- (c) Organ level

(ii) Body cavity

- a. Absent
- b. Present

(iii) Type of body symmetry

- a. Radial
- b. Bilateral

(iv) Type of coelom development

- a. Acoelom
- b. Pseudocoelom
- c. True coelom

(v) Type of true coelom

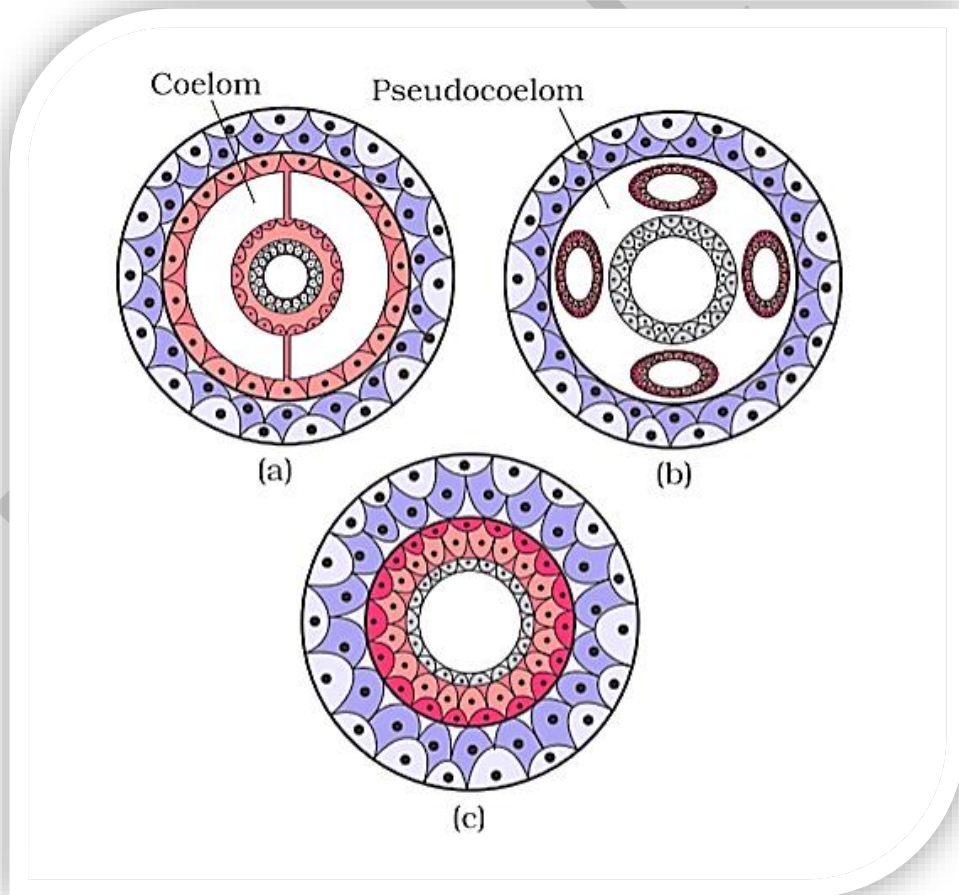
- a. Enterocoelom
- b. Schizocoelom

With the help of the above features, it is very easy to classify a specimen into its respective category.

Question 3: How useful is the study of the nature of the body cavity and coelom in the classification of animals?

Answer:

The coelom is a fluid by which the space between the body wall and the digestive tract is filled. The presence or absence of the body cavity or coelom plays a vital role in the classification of animals. The animals that possess a fluid-filled cavity between the body wall and the digestive tract are called the coelomates. Examples of coelomates are annelids, mollusks, arthropods, echinoderms, and chordates. On the contrary, the animals in which the body cavity is not lined by the mesoderm are called pseudocoelomates. In these animals, the mesoderm is collected in between ectoderm and endoderm. The aschelminthes are an example of pseudocoelomates. The acoelomates are the animals in which the body cavity is absent. The Platyhelminthes is an example of acoelomates.



Diagrammatic sectional view of: (a) Coelomate (b) Pseudocoelomate (c) Acoelomate

Question 4: Distinguish between intracellular and extracellular digestion?

Answer:

Intracellular digestion		Extracellular digestion	
1.	The digestion of food occurs inside the cell.	1.	The digestion occurs inside the cavity of the alimentary canal.
2.	The digestive enzymes are produced by the surrounding cytoplasm into the food vacuole.	2.	The digestive enzymes are produced by special cells into the cavity of the alimentary canal.
3.	The digestive products are diffused inside the cytoplasm.	3.	The digestive products diffuse across the intestinal wall inside various parts of the body.
4.	It is a less efficient method as compared to extracellular.	4.	In digestion, it is a more efficient method.
5.	It takes place inside unicellular organisms.	5.	It takes place inside multicellular organisms.

Question 5: What is the difference between direct and indirect development?

Answer:

Direct development		Indirect development	
1.	It is a development in which an embryo develops into a mature individual without including a larval stage.	1.	It is a development that includes a sexually-immature larval stage that has different food requirements than the adults.
2.	There is an absence of metamorphosis.	2.	There is a presence of metamorphosis including the development of larva to a sexually mature adult.
3.	It takes place inside the fishes, reptiles, birds, and mammals.	3.	It takes place in the invertebrates and amphibians.

Question 6: What are the peculiar features that you find in parasitic Platyhelminthes?

Answer:

The *Taenia* (Tapeworm) and *Fasciola* (liver fluke) are examples of the parasitic Platyhelminthes.

The peculiar features in the parasitic Platyhelminthes are as follows.

- They contain dorsoventrally flattened bodies with hooks and suckers to get attached inside the body of the host.

- Their body is covered with thick tegument, which helps to protect the parasites from the action of any digestive juices of the host.
- The tegument also helps in absorbing many nutrients from the body of the host.

Question 7: What are the reasons that you can think of for the arthropods to constitute the largest group of the animal kingdom?

Answer:

The Arthropoda is a phylum that consists of more than two-thirds of the animal species present on earth. Following are the reasons for the success of arthropods:

- The legs joint allows more mobility on land.
- The exoskeleton is hard and made up of chitin that helps to protect the body.
- The exoskeleton also helps to reduce water loss from the body of the arthropods which makes them more adapted to terrestrial conditions.

Question 8: Water vascular system is the characteristic of which group of the following:

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

Answer:

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

Question 9: “All vertebrates are chordates but all chordates are not vertebrates”. Justify the statement.

Answer:

The characteristic features of the Chordata phylum contain the presence of a notochord and the paired pharyngeal gill slits. In the Vertebrata which is a subphylum, the presence of notochord in the embryos is replaced by a cartilaginous or a bony vertebral column in the adults. Thus we can say that all vertebrates are chordates but not all chordates can be referred to as vertebrates as protochordate (urochordates and cephalochordates) are not vertebrates (they lack a vertebral column). Protochordate can be referred to as invertebrate chordates.

Question 10: How important is the presence of air bladder in Pisces?

Answer:

The gas bladder or the air bladder is a sac that is filled with the gas present in fish. It also helps in the maintenance of buoyancy. Hence it helps fishes to ascend or descend and stay in the water current.

Question 11: What are the modifications that are observed in birds that help them fly?

Answer:

The birds undergo several structural adaptations to suit their aerial life. These adaptations are as follows.

- The streamlined body for rapid and smooth movement.
- The covering of feathers for the insulation.
- The forelimbs in these organisms are modified into wings and their hind limbs are used for walking, perching, and swimming.
- The presence of pneumatic bones helps to reduce weight.
- The presence of additional air sacs for the respiration supplement.

Question 12: Could the number of eggs or young ones produced by an oviparous and viviparous mother be equal? Why?

Answer:

The number of eggs produced by an oviparous mother will be more than that of the young ones produced by a viviparous mother. This is due to, in oviparous animals, the development of young ones happens outside the mother's body. Their eggs are more prone to environmental conditions and as well as to predators. Hence to overcome the loss, more eggs are produced is required by mothers so that even under harsh environmental conditions, some eggs might be able to survive and will be able to produce young ones. Also in viviparous organisms, the development of young ones happens in a safe condition that is inside the mother's body. They are less exposed to predators and environmental conditions. This results that there are more chances of their survival and therefore less number of young ones are produced as compared to the number of eggs.

Question 13: Segmentation in the body is first observed in which of the following:

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

Answer:

The body segmentation first presents in the phylum, Annelida.

Some of the characteristics of phylum, Annelida are as follows:

- The phylum, Annelids can be coelomate and triploblastic.
- They exhibit the organization of organ system level.
- The body is segmented in this phylum.
- They respire with the help of their body surface.
- The nephridia are considered excretory organs.

- They contain a well-developed circulatory as well as the digestive system.

Question 14: Match the following:

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

Answer:

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

Question 15: Prepare a list of some animals that are found parasitic on human beings.

Answer:

S. No.	Name of organism	Phylum
1	<i>Taenia solium</i>	Platyhelminthes
2	<i>Fasciola hepatica</i>	Platyhelminthes
3	<i>Ascaris lumbricoides</i>	Aschelminthes

4	<i>Wuchereria bancrofti</i>	Aschelminthes
5	<i>Ancylostoma</i>	Aschelminthes

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