

Chapter 4: Animal Kingdom

NCERT · Class 11 · Biology

Textbook exercises

Question 1

What are the Difficulties that you Would Face in the Classification of Animals if Common Fundamental Features are Not Taken Into Account?

Solution

Ans. Common fundamental features are taken into account in the classification of living organisms. But if we consider specific characteristics, then each organism will be placed in a separate group and the entire objective of classification would not be achieved.

Another difficulties are:

- In comparing different organisms and judging their evolutionary significance the classification of animals is also important.
- If only one character is considered, then this objective would not be achieved.
- The delicate balance between organisms will become harder to untangle.
- Increased obstacles for future studies on animal symbiosis.
- Development of new species of animals will become difficult.

Question 2

If You are Given a Specimen, What are the Steps that You Would Follow to Classify It?

Solution

Ans. To classify the given specimen we will consider a certain common fundamental feature that helps in the classification of living organisms. The features that can be used for classification are as follows:

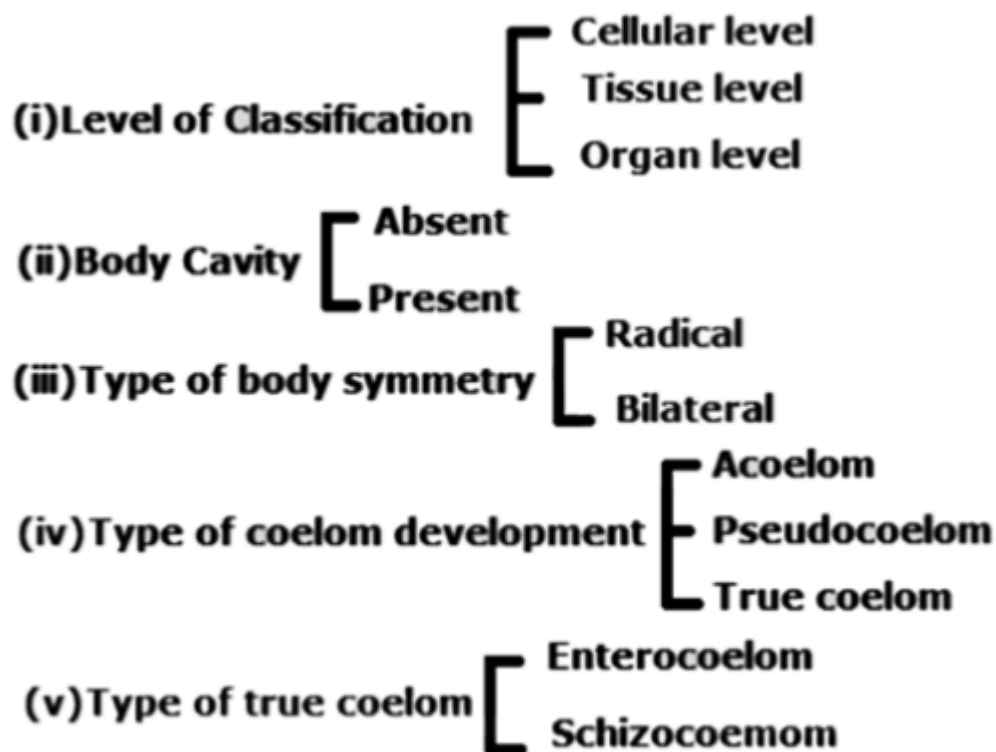


Image: Classification of Living Organism on the Basis of Different Characters

Based on the above-mentioned features, we can easily 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?

Solution

Ans. The coelom is a fluid-filled space between the body wall and digestive tract that acts as a cavity for other organs. The presence or absence of body cavity or coelom plays a very important role in the

classification of animals as it decides the complexity for any animal at the organ level. Based on the nature and presence of the body cavity the animals can be classified into:

1. **Coelomates:** These are the animals that possess a fluid-filled cavity between the body wall and digestive tract. Annelids, mollusks, arthropods, echinoderms, and chordates are examples of coelomates.
2. **Pseudocoelomates:** These are the animals in which the body cavity is not lined by the mesoderm and remains scattered in between the ectoderm and endoderm. Aschelminthes is an example of pseudocoelomates.
3. **Acoelomates:** These are the animals in which the body cavity is absent. Platyhelminthes is an example of acoelomates.

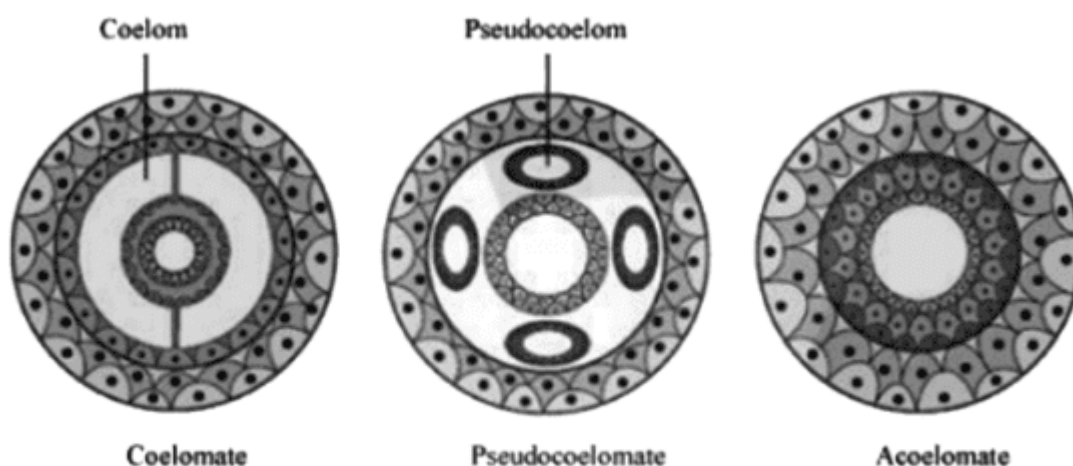


Image: Types of Coelomic Conditions, Image Credits-NCERT

Question 4

Distinguish Between Intracellular and Extracellular Digestion?

Solution

Ans. The differences between intracellular and extracellular digestions are as follows:

Intracellular Digestion	Extracellular Digestion
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The digestion of food occurs within the cell.	The digestion occurs in the cavity of the alimentary canal.
Digestive enzymes are secreted by the surrounding cytoplasm into the food vacuole.	Digestive enzymes are secreted by special cells into the cavity of the alimentary canal.
Digestive products are diffused into the cytoplasm.	Digestive products diffuse across intestinal wall into various parts of bodies
It is a less efficient method.	It is a more efficient method of digestion.
It mostly occurs in unicellular organisms.	It mostly occurs in multicellular organisms.

Question 5

What is the Difference Between Direct and Indirect Development?

Solution

Ans. The difference between direct and indirect development are as follows:

Direct Development	Indirect Development
It is a type of development in which an embryo develops into a mature individual without involving a larval stage.	It is a type of development that involves a sexually immature larval stage, having different food requirements than adults.
Metamorphosis is absent.	Metamorphosis involving the development of larva to a sexually mature adult is present.

It occurs in fishes, reptiles, birds, and mammals.	It occurs in most invertebrates and amphibians.
Example- Hydra	Example- Frog

Question 6

What are the Peculiar Features That You Find in Parasitic Platyhelminthes?

Solution

Ans. The peculiar features that are found in parasitic platyhelminths are as follows:

1. They have dorsoventrally flattened bodies and bear hooks.
2. Their body is covered with thick tegument, which protects them from the action of the digestive juices of the host.
3. The tegument also helps in absorbing nutrients from the host's body.
4. Mostly Hermaphrodites and free-living and have organ level of organisation.
5. Incomplete digestive tract or may be absent.

Examples include: Taenia (Tapeworm) and Fasciola (liver fluke)

Question 7

What are the Reasons That You Can Think of for the Arthropods to Constitute the Largest Group of the Animal Kingdom?

Solution

Ans. The phylum, Arthropoda, which consists of more than two-thirds of the animal species on earth constitutes the largest group of the animal kingdom. The reasons for the success of arthropods are as follows:

1. Presence of jointed legs that allow more mobility on land.
2. Hard exoskeleton is present which is made up of chitin that protects the body,
3. The hard exoskeleton also reduces water loss from the body of arthropods making 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

Solution

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

Question 9

“All Vertebrates are Chordates but All Chordates are Not Vertebrates”. Justify the Statement.

Solution

Ans. The presence of a notochord and paired pharyngeal gill slits are the characteristic features of the phylum Chordata. In sub-phylum Vertebrata, the notochord present in embryos gets replaced by a cartilaginous or bony vertebral column in adults. Thus, it is said that all vertebrates are chordates but all chordates are not vertebrates.

Question 10

How Important is the Presence of Air Bladder in Pisces?

Solution

Ans. An air bladder is a gas-filled sac present in Pisces which helps in maintaining buoyancy. It is important as 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?

Solution

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

- 1.They have a Streamlined body for rapid and smooth movement.
 - 2.Covering of body with feathers for insulation.
 - 3.Their forelimbs are modified into wings and their hind limbs are used for walking, perching, and swimming.
 - 4.The presence of pneumatic bones to reduce weight.
 - 5.Presence of additional air sacs to supplement respiration.
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Question 12

Could the Number of Eggs or Young Ones Produced by an Oviparous and Viviparous Mother Be Equal? Why?

Solution

Ans. The number of eggs produced by an oviparous mother will be more than the number of young ones produced by a viviparous mother. This is because, in oviparous animals, the development of young ones takes place outside the mother's body. Their eggs are more prone to environmental conditions and predators. Therefore, to overcome the loss, more eggs are produced by mothers so that

even under harsh environmental conditions, some eggs might be able to survive and produce young ones. On the other hand, in viviparous organisms, the development of young ones takes place in safe conditions inside the body of the mother. They are less exposed to environmental conditions and predators. Therefore, there are more chances of their survival and hence, less number of young ones is produced compared to the oviparous animals.

Question 13

Segmentation in the Body is First Observed in Which of the Following:

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

Solution

Ans. The body segmentation has first appeared in the phylum, Annelida (annulus meaning little ring)

Question 14

Match the Following:

Column I	Column II
(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
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Solution

Ans.

Column I	Column II
(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.

Solution

Ans. The list of some animals that are found parasitic on human beings is as follows:

Sl.No	Name of Organism	Phylum
1.	Taenia solium	Platyhelminthes

2.	Fasciola hepatica	Platyhelminthes
3.	Ascaris lumbricoides	Aschelminthes
4.	Wuchereria bancrofti	Aschelminthes
5.	Ancylostoma	Aschelminthes
