



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

Solution: The common fundamental features used for classifying animals include body symmetry, arrangement of cells, nature of coelom, level of organisation. Animal classification would be very confusing if fundamental features are not considered.

- Animals having different levels of organisation would have been placed in same group. E.g., Sponges and Cnidarians having cellular and tissue level of organisation respectively.
- Animals showing varied types of germinal layers would have been placed together, as diploblastic cnidarians and triploblastic platyhelminthes.
- Animals having different body symmetry would have been placed together, as coelenterates with radial symmetry and platyhelminthes with bilateral symmetry.
- There would have been no classification of animals based on with or without body cavity.
- Placing of oviparous and viviparous animals together.

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

Solution: Various steps considered to classify a specimen are:

- Mode of nutrition - It can be autotrophic, holozoic, saprophytic or parasitic.
- Complexity of body structure - Whether the specimen is unicellular or multicellular.
- Presence or absence of membrane bound organelles.
- Body symmetry, i.e., the plane by which organism can be divided into two equal halves.
- Presence or absence of coelom, it can be acoelomates, pseudocoelomates, eucoelomates.
- Phylogenetic relationship.

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

Solution: Organisms can be classified according to presence or absence of the coelom. The body cavity, which is lined by mesoderm is called coelom. Animals possessing coelom are called coelomates, e.g., annelids, molluscs, arthropods, echinoderms, hemichordates and chordates. In some animals, the body cavity is not lined by mesoderm, instead, the mesoderm is present as scattered pouches in between the ectoderm and endoderm. Such a body cavity is called pseudocoelom and the animals possessing them are called pseudocoelomates, e.g., aschelminthes. In pseudocoelomates, body cavity is derived from blastocoel of the embryo. The animals in which the body cavity is absent are called acoelomates, e.g., platyhelminthes.

4. Distinguish between intracellular and extra-cellular digestion.

Solution: Differences between intracellular and extracellular digestion are:

| | Intracellular digestion | Extracellular digestion |
|-----|--------------------------------|---|
| (i) | It occurs inside the cell. | It occurs outside the cell in the cavity of the alimentary canal. |

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|-------|---|---|
| (ii) | It involves secretion of digestive enzymes by the surrounding cytoplasm into the food vacuoles. | It involves secretion of digestive enzymes by special cells into the cavity of alimentary canal by ducts. |
| (iii) | Here, the products of digestion diffuse into the cytoplasm. | Here, the products of digestion diffuse across the intestinal wall into different parts of the body. |
| (iv) | It is less efficient and there is no regional differentiation. | It is more efficient and gut shows regional differentiation. |
| (v) | It occurs in unicellular organisms and some other lower organisms. | It occurs in multicellular organisms. |

5. What is the difference between direct and indirect development?

Solution: Differences between direct development and indirect development are :

| | Direct development | Indirect development |
|-------|------------------------------------|--|
| (i) | Young ones may resemble the adult. | In this young hatchlings (larvae) do not resemble the adult. |
| (ii) | Intermediate stages are absent. | Intermediate stages are present. |
| (iii) | Metamorphosis is absent. | Metamorphosis is seen in indirect development. |
| | <i>E.g., Hydra, man</i> | <i>E.g., Frog, cockroach</i> |

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