

Learn the key concepts of Science topic - Animal kingdom

Today we will be studying about animal kingdom. Every day we come across a number of animals. These organisms, varying from sponges to sharks, ants to whales, earthworms to anacondas, all belong to the same group. i.e., Kingdom Animalia. Let's dive deep and learn thoroughly.

Kingdom Animalia

The kingdom Animalia is characterised by heterotrophic eukaryotic organisms that are multicellular and their cells lack a cell wall.

(i) Heterotrophic Nutrition: All animals are heterotrophs. They directly or indirectly depend on plants for food. Ex. Lions eat deers and deers eat grass

(ii) Holozoic Mode of Nutrition: Nutrition involving engulfment of the whole or part of a plant or an animal either in solid or in liquid state is called animal like or holozoic nutrition.

(iii) Multicellular: All are multicellular. Their body is made up of more than one cell

(iv) Growth: Animals show a definite growth pattern from birth to death. All of them grow into adults that have a definite shape and size

(v) Reproduction: Sexual reproduction is the major mode of reproduction which includes copulation between male and female followed by embryological development.

Basis of Classification:

In spite of differences in the structure and form of different animals, there are certain fundamental features which are common to various individuals in relation to:

1. Levels of organisation also called grades of organisation
2. Patterns of digestive circulatory or reproductive system
3. Body symmetry
4. Number of germ layers during embryonic development
5. Nature of coelom or body cavity
6. Presence or absence of segmentation in the body
7. Presence or absence of notochord.

Classification of animals

For a systematic study of animals, they are divided into various minor and major groups on the basis of similarities and differences and each group is given a particular name depending upon its characteristics. Various levels of classification of complexity in decreasing order can be shown as: Kingdom → phylum → class → order → family → genus → species

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Basically, the kingdom animalia is divided into the following '11' phyla: (1) Porifera (2) Coelenterata (Cnidaria) (3) Ctenophora (4) Platyhelminthes (5) Aschelminthes (6) Annelida (7) Arthropoda (8) Mollusca (9) Echinodermata (10) Hemichordata (11) Chordata

Phylum – Porifera

Members of this phylum are commonly known as sponges. They are also known as 'pore bearers' as their body walls possess numerous tiny pores.

Phylum –Coelenterata (Cnidaria)

General features:

1. Habitat: They are mostly marine but few are freshwater inhabitants (eg. Hydra)
2. Habit: There are two types of Habit: a) Solitary: Those animals which live singly and are independent. Ex. Hydra
b) Colonial: Those animals which live in the association of other individuals of the same type. Ex. physania, gorgonia, obelia
3. Body symmetry: The coelenterates are the radially symmetrical animals.
4. Level of organisation: They exhibit the tissue level of organisation. The tissues are arranged variously to perform the basic functions in their body.
5. Germ layers: These are the diploblastic animals as cells in their embryonic stages are arranged in two layers, outer ectoderm, Inner endoderm with an intervening gelatinous layer mesoglea. This mesoglea provides the jelly-like form to some coelenterates.
6. Digestive tract: The body of coelenterates bear a central gastro-vascular cavity which opens to the outside through a single opening called mouth.
7. Skeleton: Some of the cnidarians, e.g., corals have a hard skeleton composed of calcium carbonate.
8. Body forms: Two basic body forms are in cnidarians which differ in the structure and function from one another. These are called polyp and medusa Examples: physalia, adamsia, pennatula, meandrina

Phylum- Platyhelminthes

General features:

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1. Habit and Habitat: These are mostly endoparasites. Mostly aquatic, some may be terrestrial also.
2. Body symmetry: bilaterally symmetrical.
3. Level of organisation: organ level
4. Germ layers: triploblastic
5. Coelom: acoelomate
6. Body form: dorsoventrally flattened body Examples: Liver fluke, Tapeworm, Planaria.

Phylum- Aschelminthes (Nematoda)

They are commonly called roundworms. General features:

1. Habit and Habitat: free living or parasitic. May be aquatic or terrestrial.
2. Body symmetry: bilaterally symmetrical.
3. Level of organisation: organ level
4. Germ layers: triploblastic
5. Coelom: 'pseudocoelomates'
6. Body form: elongated cylindrical body
7. Digestive system: these have well-developed muscular pharynx.
8. Excretory system: excretory tube along with renette cell removes the body waste.
9. Fertilization: internal Examples: ascaris(roundworm), wuchereria, ancylostoma (hookworm).

Phylum- Annelida

General features:

1. Habit and habitat: may be aquatic or terrestrial
2. Body symmetry: bilateral symmetry
3. Level of organisation: organ system level
4. Germ layers: triploblastic animals
5. Locomotion: have the capability to locomote.
6. Segmentation: body is metamerically segmented, body segments are called metamers.
7. Body form: segmented body
8. Digestive system: it is complete, and entirely extracellular.
9. Circulatory system: closed type.
10. Excretory system: nephridia help in excretion as well as osmoregulation.
11. Nervous system: Body control is provided by the nervous system consisting of paired ganglia
12. Reproductive system: Earthworms and leeches are monoecious. Example: neries (sandworm), pheretima (earthworm), hirudinaria

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Phylum- Arthropoda

It is the largest phylum of the animal kingdom. General features:

1. Habit and habitat: oceans- limulus, freshwater- daphnia, land-cockroach
2. Body symmetry- bilaterally symmetrical
3. Level of organisation- organ system
4. Germ layers- triploblastic animals
5. Coelom- true coelom present, hence -coelomates
6. Segmentation: body is segmented
7. Body form: the body of them is covered by hard, waterproof exoskeleton made up of chitin.
8. Digestive system: tract is complete and has glands
9. Circulatory system: circulatory is of open type.
10. Excretory system: through malpighian tubules.
11. Reproductive system: these are mostly dioecious. The females are mostly oviparous.

Phylum- Mollusca

General features:

1. Habit and habitat: Marine and Freshwater bodies
2. Body symmetry- bilaterally symmetrical
3. Level of organisation- organ system
4. Germ layers- triploblastic animals
5. Coelom- true coelom present, hence -coelomates
6. Segmentation: body is unsegmented
7. Body form: soft fleshy body
8. Digestive system: tract is complete and has glands
9. Circulatory system: circulatory is of open type.
10. Excretory system: through metanephridia Examples: Octopus, Snails, Chiton, Mussels

Phylum- Echinobermata

General features:



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1. Habit and habitat: Exclusively Marine
2. Body symmetry- bilaterally symmetrical
3. Level of organisation- organ system
4. Germ layers- triploblastic animals
5. Coelom- true coelom present, hence -coelomates
6. Segmentation: body is unsegmented
7. Body form: Spiny skinned organisms usually with a skeleton made up of calcium carbonate.
8. Nervous system: Simple radial nervous system
9. Circulatory system: circulatory is of open type.
10. Excretory system: through metanephridia
11. Reproductive system: They reproduce sexually through gametic fusion and asexually through regeneration.
Fertilization is external. Examples: Sea cucumber, Sea urchins, sea stars

Phylum- Hemichordata

General features:

1. Habit and habitat: exclusively marine
2. Body symmetry- bilaterally symmetrical
3. Level of organisation- organ system
4. Germ layers- triploblastic animals
5. Coelom- true coelom present, hence -coelomates
6. Segmentation: segmentation is absent
7. Body form: these animals have a very soft, fragile and worm-like appearance.

Phylum chordata

Animals in this kingdom have four characteristics i.e. notochord, dorsal hollow nerve cord, pharyngeal and post anal tail. It is divided into 3 distinct regions i.e. proboscis, collar, trunk.

(1) Cephalochordata: • members are exclusively marine • notochord extends from head to tail region Example: branchiostoma/amphioxus/lancelet.

(2) Vertebrata: • possess notochord during embryonic period • The notochord is replaced by a cartilaginous or bony vertebral column in the adult.

Class- Cyclostomata • all are ectoparasites • have sucking and circular mouth • body is devoid of scales • paired fins absent • migrate to freshwater for spawning. Examples: petromyzon(lamprey), myxine(hagfish)



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A) Class- Chondrichthyes: • marine animals with streamlined body • skin is tough, containing minute placoid scales • These animals are predaceous. • They swim constantly. • heart is two chambered Examples: torpedo (electric organ), Trygon(stingray), scoliodon(dog fish), pristis(saw fish).

B) Class- Osteichthyes: • body is streamlined • four pairs of gills present an air bladder is present which regulates buoyancy. • cold blooded animals. • sexes are separate Examples: marine- exocoetus (flying fish) Freshwater- labeo (rohu) Aquarium- betta (fighting fish)

C) Class- Amphibia: • have two pairs of limbs • can survive both in water and on land • skin is moist (without scales) • 'tympanum' represents ear • oviparous and development is indirect Examples: bufo (toad), rana (frog), hyla (tree frog), ichthyophis (limbless amphibia).

This was all about Animal Kingdom. Hope you all your question related to this topic is clear. Stay connected for more such blogs.

