CLASSIFICATION According to Ruppert and Barnes (2006)

Phylum Annelida: General characters and Classification

Introduction

Annelida includes Earthworms, Leeches, Blister worms etc. They are triploblastic, bilaterally symmetrical schizocoelomate protostomes. They exhibit metameric segmentation and true coelom. Their fluid filled coelom acts as hydrostatic skeleton and helps for burrowing and locomotion.

General Characters of Phylum Annelida

Cephalization is more pronounced with distinct head, bearing tentacles, eyes etc.

Annelida exhibits homonomous metamerism. Body is divided into linear series of similar segments, which are separate from one another externally by inter segmental grooves and internally by inter segmental septa.

In Annelida, body is divided into three regions: prostomium, trunk and pygidium. Trunk consists of a longitudinal series of similar segments. Growth results from the addition of new segments from teloblastic growth zone located just in front of pygidium.

Body wall consists of fibrous collagenous cuticle, epidermis, dermis, musculature and parietal peritoneum.

Chitinous bristles that project out from the epidermis are called setae. They provide grip on the substratum.

Body cavity is schizocoelom, formed by the splitting of mesodermal cells. Each segment has a pair of coelomic cavities separated from each other by dorsal and ventral mesenteries. Coelomic fluid acts as hydrostatic skeleton.

Alimentary canal is straight muscular type in Annelida. Digestive glands occur in the walls of the alimentary canal.

Exchange of respiratory gases occurs by diffusion through the body wall and gills. In many polychaetes parts of parapodia are modified into gills.

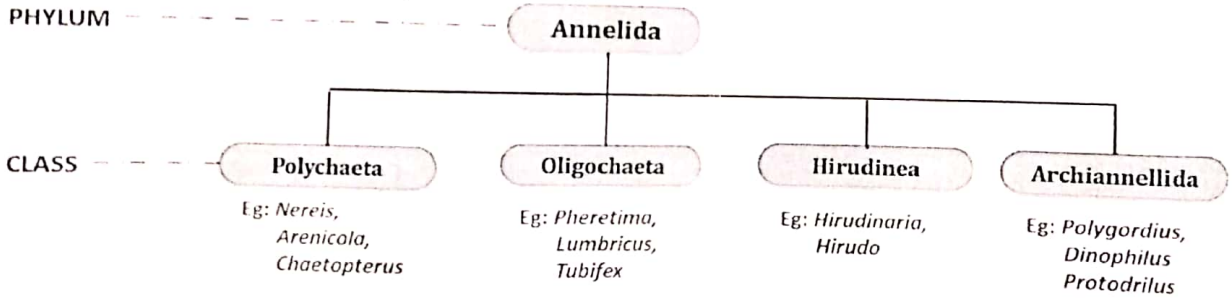
Blood vascular system is of closed type. In all non-chordates respiratory pigments if present, are dissolved in the blood plasma unlike chordates where they are retained in the blood corpuscles.

10. Excretory organs are segmentally arranged metanephridia. They open into coelom by nephrostome and to exterior by a nephridiopore.
11. Nervous system consists of circum-pharyngeal nerve ring and a ganglionated double ventral nerve cord.
12. Sensory structures include eyes and simple receptors like photoreceptors, chemoreceptors and mechanoreceptors.
13. Unisexual forms spawn gametes through metanephridia. Bisexual forms have gonoducts.
14. Cleavage is spiral and holoblastic in Annelida. Development is direct or indirect. Larva is trochophore.
15. During metamorphosis the larval episphere becomes the prostomium whereas the part posterior to the telotorch becomes the pygidium. Trunk segments arise from a growth zone anterior to the telotorch.

Classification of Phylum Annelida

There are 8,700 species described in this phylum. This phylum Annelida is divided into four main classes on the basis of presence and absence of parapodia, setae, metameres and also other morphological characters.

The following is the classification of phylum Annelida:



Class I: Polychaeta (Gr.polys=many, chaite=hair)

These are commonly called as bristle worms. They are the most diverse group of Annelida.

These animals are chiefly marine and some fresh water forms are also present

The segmentation in these animals is both internal and external.

These animals have a distinct head with eyes, palps and tentacles.

They also have numerous setae on lateral parapodia. The setae exist as bundles.

Clitellum is absent in these animals

The sexes are separate. Most of the segments bear gonads in many species of this class. Gonads are absent or temporary in some species.

The gametes are shed into the coelom and are spawned through metanephridia.

Fertilization is external and development includes trochophore larva.

Examples: *Nereis, Arenicols, Chaetopterus*

Class II: Oligochaeta (Gr. oligos=few, chaite=hair)

This class includes terrestrial earthworms and many other fresh water and marine forms

The segmentation in these animals is both internal and external.

Appendages are absent in the animals belonging to this class.

Head is distinct without appendages.

Only few setae are present embedded in the skin. Parapodia are absent.

Clitellum develops at sexual maturity. This clitellum will be a glandular clitellum helpful in cocoon formation.

These animals are hermaphrodites with testis anterior to ovaries.

Gonads are confined only to some genital segments. Gonoducts are present.

Fertilization is external and development is direct with no larval stage.

Examples: *Pheretima, Lumbricus, Tubifex*

Class III: Hirudinea (L. Hirudo=leech)

This class includes leeches.

Majority of the animals of this class inhabit in fresh water. Only a few occur in sea water and on moist land.

The animals of this class are blood-sucking ectoparasites. Some are carnivorous predators too.

The number of segments in these animals is fixed to 33 in number. Each of these segments is externally sub-divided into annuli.

Appendages, parapodia and setae are absent

Both posterior and anterior ends of the body bear suckers. These suckers are helpful in locomotion

Coelom is reduced due to the presence of nutrient-storing botryoidal tissue

These are copulating hermaphrodites with a penis.

Gonads are confined to some genital segments. Gonoducts are present.

Fertilization if internal and development is direct, inside the cocoons without larval stages.

Examples: *Hirudinaria, Hirudo*

Class IV: Archiannellida (Gr. arch=first)

This class includes about a dozen genera.

These are small, marine worms.

The segmentation in these animals is chiefly internal.

No parapodia or setae are present

Sexes are usually separate

Development includes trochophore larva

Examples: *Polygordius, Dinophilus, Protodrilus*